Global trends for farmed salmon

The 5th annual conference and trade show of the Irish Salmon Growers' Association, Bradan '90, was held in Galway on Ireland's west coast last October.

PAT KEOGH, deputy chief executive of Bord Iascaigh Mhara (Irish Sea Fisheries Board), gave this address on global trends in production and marketing of farmed Atlantic salmon.

The purpose behind a global focus on the production and marketing of farmed Atlantic salmon is that Ireland, despite the major development of its industry over the past decade, is still but a small player on the international scene.

In 1989, Irish salmon production was slightly less than 4 per cent of world production at 5,800 tonnes. Ireland is therefore a price taker rather than a price maker. Hence it is critical to examine and decipher international production and marketing trends in order to make an informed assessment of the future prospects for the industry, and devise appropriate marketing and production strategies.

At the beginning of 1990, Bord Iascaigh Mhara (BIM) undertook a review of the international Atlantic salmon production and market situation following on from an earlier report in 1986 (carried out by UK company, Landell Mills Associates). Some of the main production and marketing trends to emerge from this review were outlined in Mr Keogh's speech, of which an updated version follows.

Production trends

Starting with global production trends there has been a phenomenal growth in the Atlantic salmon farming industry over the past decade – from a mere 4,800 tonnes in 1980, rising to 170,000 tonnes in 1989 with an estimated 243,000 tonnes in 1990. In the early 1980s when the production base was low, annual growth rates were sometimes over 100 per cent.

Since the mid 1980s when production reached a much higher base, the annual growth rate has been in excess of 50 per cent for most years, the notable exception being 1987. Norway has retained its dominant position over the decade, and in 1990 was estimated to account for two- thirds of world production, followed by Scotland with 15 per cent and Ireland with under 4 per cent. This increase in production has of course been achieved at the expense of a major reduction in farmed salmon prices.

The first depression in salmon prices occurred in late spring of 1986. However, the slackening growth in output for 1987 meant that this depression was short-lived and market prices had already returned to previous levels by the start of the following year. There followed a two year boom until the next major downturn in prices set in towards the end of 1988. As figure 1 illustrates, this latest depression in the market has already proven to be of much longer duration, and shows every sign of persisting well into 1991.

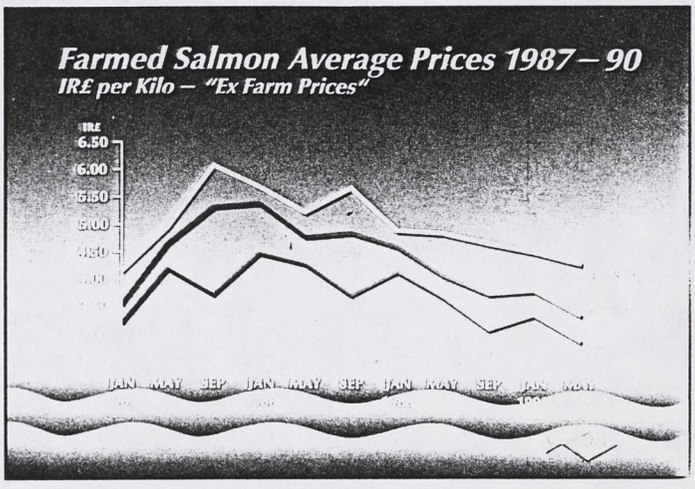

Figure 1

Norway

What are the factors which have contributed to current market difficulties? To attempt an answer to this question and to assess future prospects, we must look first at recent developments in Norway.

Firstly with the benefit of hindsight, we now know that Norwegian investors and bankers became over-confident about the resilience of the market following the price strengthening of 1987–1988. The rush to invest was facilitated by the issue of new licences from 1988 onwards and by the lift in the maximum size of new units from 8,000 to 12,000cu m.

The traditional shortage of salmon smolts and correspondingly high prices meant that the frenetic expansion in sea cage capacity was matched if not exceeded by investment in new (and often high tech) smolt rearing facilities. The oversupply of Norwegian smolts first occurred in 1988 and has persisted since then. Informal estimates suggest that of the 75m smolts produced, as many as 15m were surplus to requirements. In some instances, late season smolts changed hands for as little as 10 per cent of the recommended price.

Following the relative smolt famine and high prices of earlier years, the temptation to overstock in 1988 and 1989 proved irresistible. Forced to sell smolts at way below the cost of production and often with extended credit, many smolt units began to suffer serious cash flow problems, leading to a number bankruptcies, closures or re financing under new ownership after 'bargain basement' sale of the assets.

The financial state of the Norwegian on-growing sector is equally acute and it is feared that over 100 farms were likely to go bankrupt in 1990 alone – mostly recently established farms nor of Trondheim. The way the N wegian industry has been funde has contributed to the financial crisis in the industry. On the one hand, producers under financial pressure were compelled to sell all fish of saleable size to meet cash flow strictures. On the other hand, producers had little choice but to restock with smolts up to the highest levels as insur 1 'stock in the sea' constituted c lateral for bank loans.

Added to these difficulties was the erosion of market discipline imposed by the Norwegian Fish Farmers Sales Organisation (FOS). The FOS is funded by a 2.5 per cent levy, half of which is paid by farmers and the other half by buyers. While farmers negotiate directly with buyers, they are required to respect minimum prices set by the FOS and all payments for salmon are

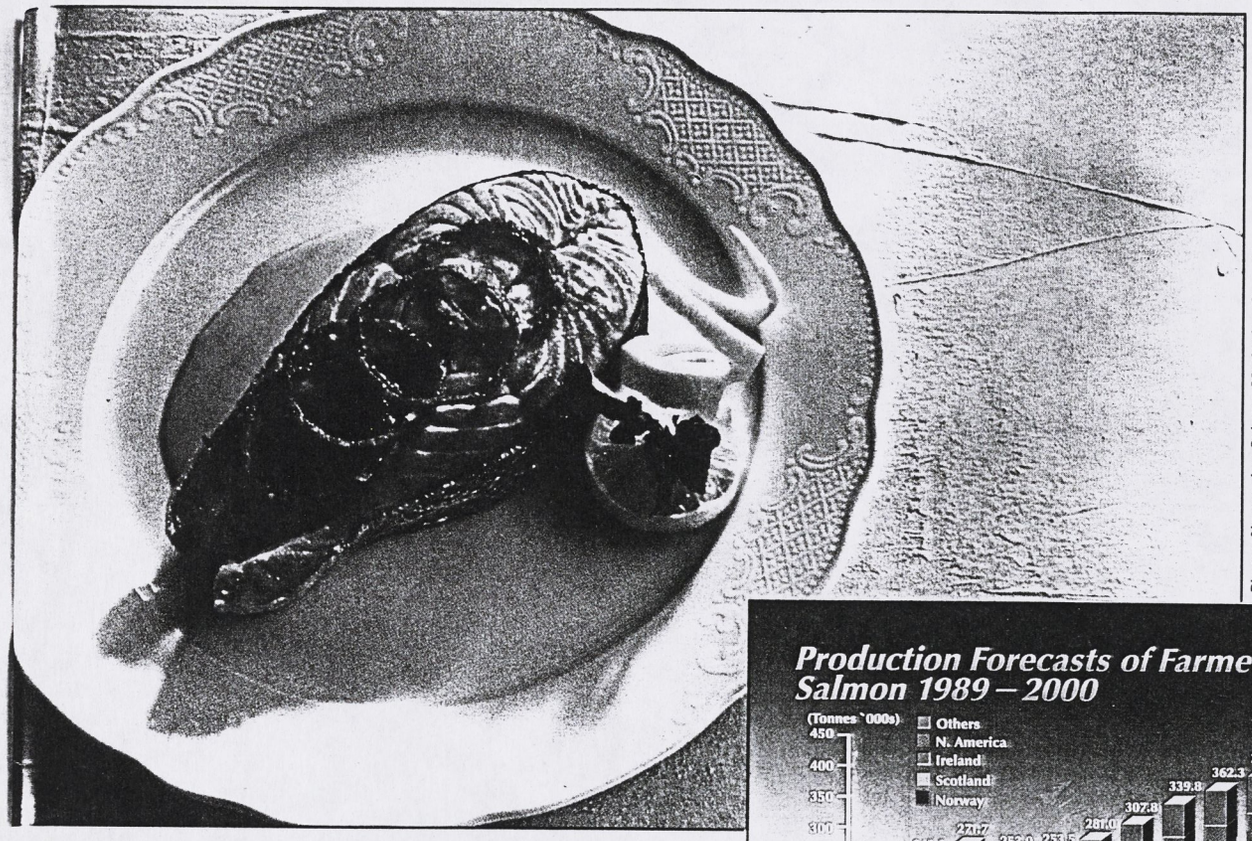

Photo: Norwegian Salmon Marketing Council

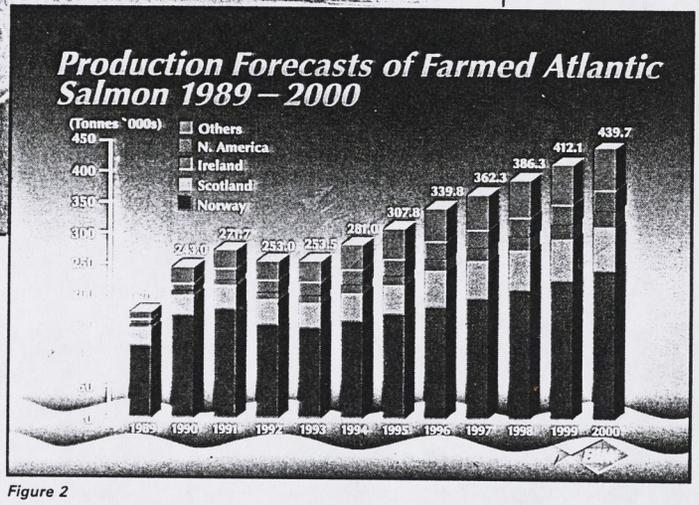

Figure 2

BIM and aquaculture

Bord Iascaigh Mhara (BIM) – The Irish Sea Fisheries Board – promotes the development of aquaculture as part of its wider remit for development of the Irish seafish industry. It does this through the provision of a wide range of marketing, financial, technical and training support services.

The chief financial incentives for development are BIM's Aquaculture Grant Schemes which operate only outside the Irish speaking (Gaeltacht) areas and complement aids available from the EC Structural Funds.

Technical support comes in the form of advice and assistance in developing new and better production techniques for existing and new species.

Recent marketing initiatives include the launch of the new Quality Assurance Scheme for Irish farmed salmon and research and promotional programmes for aquaculture and seafood products at home and abroad.

made through the medium of the FOS. With the transformation from a buyers' to a sellers' market, the minimum prices were eventually not market clearing prices and it was widely reported that farmers and buyers collaborated to circumvent the minimum price system.

Control was also complicated by the existence of secondary buyers who could buy from licensed exporters at the 'going' price. This led to the phenomenon of 'Friday fish' arriving towards the end of the week on markets such as Rungis in France, seeking buyers at whatever price could be obtained on the day. The main effect of the Norwegian oversupply situation was that ex-farm prices in 1989 were reduced by over 17 per cent compared with the previous year and Irish, Scottish and North American producers sought the imposition of special duties to counteract low priced imports of Norwegian salmon.

The response of the FOS was to cut its minimum prices in mid-1989 and at the beginning of 1990 introduced a withdrawal system in an effort to restore balance between supply and demand. Under this scheme, the FOS hoped to withdraw and freeze down up to 40,000 tonnes of salmon which was to be funded from a 5Nkr/kg ($0.79/kg) levy on normal fresh sales. The exporter was required to extract this levy from the market whilst at the same time respecting minimum prices. If minimum prices plus the levy could not be got from the market, then the fish would be withdrawn at the minimum price.

In January 1990 when the withdrawal scheme got under way, prices received an initial boost of up to 5kr/kg ($0.79/kg) but from February onwards however, prices reverted to previous levels or below, especially for smaller fish less than 3kg. The total quantity of fish withdrawn in the first half of 1990 amounted to over 31,000 tonnes and a further 7,000 tonnes were to be withdrawn in the latter half. This compares with sales of fresh salmon amounting to 44,000 tonnes in the first half of the year and 65,000 tonnes in the latter half, making for total sales of 147,000 tonnes. If production grade fish is included, the total production is estimated at 160,000 tonnes in 1990.

The outlook for 1991 is that production is likely to increase by a further 10,000 tonnes but a marked reduction in the number of smolts going to sea in 1990 and 1991 will result in a reduced output in 1992/1993.

A factor which could have an important bearing on the market situation is the imposition of protectionist measures by the US government and the recent proposal for similar measures by the European Community Commission (EC). In the USA, the International Trade Commission has concluded that there is *prima facie* evidence to show that the American industry has been damaged by sales of Norwegian salmon at 'less than fair value' (LTFV).

The US government has now imposed a special levy of 2.45 per cent across the board against Norwegian salmon imports and further supplementary levies varying from 0.13–4.9 per cent against individual shipments.

Alleged dumping of Norwegian salmon on the Community market has now been investigated by the EC Commission, and the Commission submitted proposals for the imposition of an 11.3 per cent import duty in addition to the existing 2 per cent import tariff. However, this punitive levy is not now being imposed, as member countries other than Ireland and the UK resisted the proposal (*Seafood International*, January).

While the EC is keen to protect the peripheral areas where much of the salmon farming is carried out, processors in Denmark, France and Germany have benefited from low prices. Other salmon importing countries such as Italy and Spain were also not likely to welcome the higher

prices that would have resulted from imposition of the duty.

Scotland

Turning now to the world's second most important producer – Scotland where production has been growing at an average annual rate of 54 per cent over the past decade. Scottish production is estimated at 32,000 tonnes in 1990 compared with 28,600 tonnes in 1989. The high incidence of furunculosis, higher mortalities and lower growth rates has meant that production in 1990 was considerably below earlier forecasts. There are 176 companies engaged in on-growing and 90 in smolt production. A very high percentage of Scottish smolt production is vertically integrated with on-growing, but Shetland producers have to buy smolt from the mainland. The six largest firms, of which Marine Harvest is the biggest, control about 50 per cent of production. Most of the main growers have integrated forward into processing and marketing, or as in the case of the Shetlanders, have formed themselves into co-operative marketing groups.

The dominance of larger firms and the integrated nature of the Scottish industry have helped it to better withstand the recent price depression. Nevertheless, a large section of the industry is believed to be making losses and a continuation of this trend into this year will result in further closures and rationalisation. All in all, the outlook is for a much more gradual increase in output to 37,000 tonnes in 1991 and to approximately 47,000 tonnes by 1995.

Ireland

The structure of the Irish salmon farming industry bears closer resemblance to Scotland than to Norway. There are a total of 31 Irish on-growing farms operating on 34 marine sites, and 25 smolt producers at 32 sites. Most on-growers are integrated back into smolt production.

With fewer suitable sites than in the case of Scotland, the Irish industry has been to the forefront in pioneering the use of offshore cages and over 50 Bridgestone cages are now in use around the Irish coast. The higher water temperatures have been a double-edged sword in that they lead to higher growth rates in the colder months of the year, but increase susceptibility to disease in the summer months.

The high disease mortalities in 1989 and depressed markets have created financial pressures for producers, but to date the Irish industry appears to have weathered these problems much better than Norway and possibly also Scotland. The higher average farm size making for economies of scale and lower labour and smolt production costs have worked in Ireland's favour, though against this are higher disease mortality and higher transport costs to main markets. There has been an increasing availability of multi-sea winter stock and clearly the incentive from the market place is to produce larger sized fish. However, the increased returns are offset somewhat by the additional cost and availability of working capital finance.

Irish farmed salmon production has increased from 5,800 tonnes in 1989 to an estimated 7,500 tonnes in 1990. Based on the number of smolts put to sea, output should increase to 9,500 tonnes by 1991 and possibly up to 13,500 tonnes by 1992. New investment will be required if further expansion is to take place, and apart from production economics and availability of finance, the main factor affecting investment decisions on the on-growing side will be the perceived environmental impact and related restrictions on licensing. Already there are signs that the rate of investment in on-growing has fallen below the level needed to absorb the prospective supply of smolts from the freshwater side of the industry.

Other producers

About 12 per cent of the current world Atlantic salmon market (21,000 tonnes) is supplied by the Faroe Islands, Iceland and North America. The Faroes' salmon industry has grown very rapidly to 7,500 tonnes, most of which is marketed through Denmark. Bulk shipment reduces the otherwise disadvantageous transport costs, making its product competitive with Norway's. About 12,000 tonnes output is expected in 1990, rising to

Net Consumption of Atlantic Salmon
In Round WT Terms

Units: Tonnes, 000s

	Population (m)	1980	1985	1989
France	55.55	2.4	8.5	46.1
USA	242.94	0.0	6.0	23.7
West Germany	60.94	3.4	7.0	17.5
UK	56.65	1.8	8.6	22.5
Denmark	5.12	−2.0	−2.8	0.6
Spain	39.02	0.0	1.7	9.3
Belgium/Lux	9.87	0.7	2.1	5.6
Italy	57.27	0.8	1.8	14.4
Netherlands	14.61	−0.2	0.6	2.9
Switzerland	6.48	0.0	1.1	1.6
Sweden	8.36	1.9	3.0	6.5
Ireland	4.00	0.7	0.8	2.9
Norway	4.17	0.7	4.0	13.8
Japan	124.0	0.0	0.5	2.5
World	685	10.1	48.0	174.1
	Annual growth	%	%	%

Figure 3

Import Pattern For Atlantic Salmon

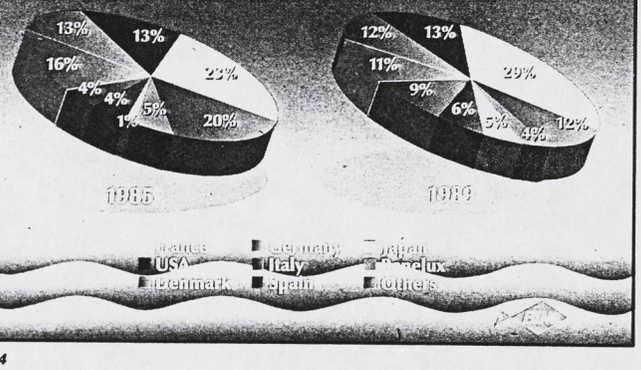

Figure 4

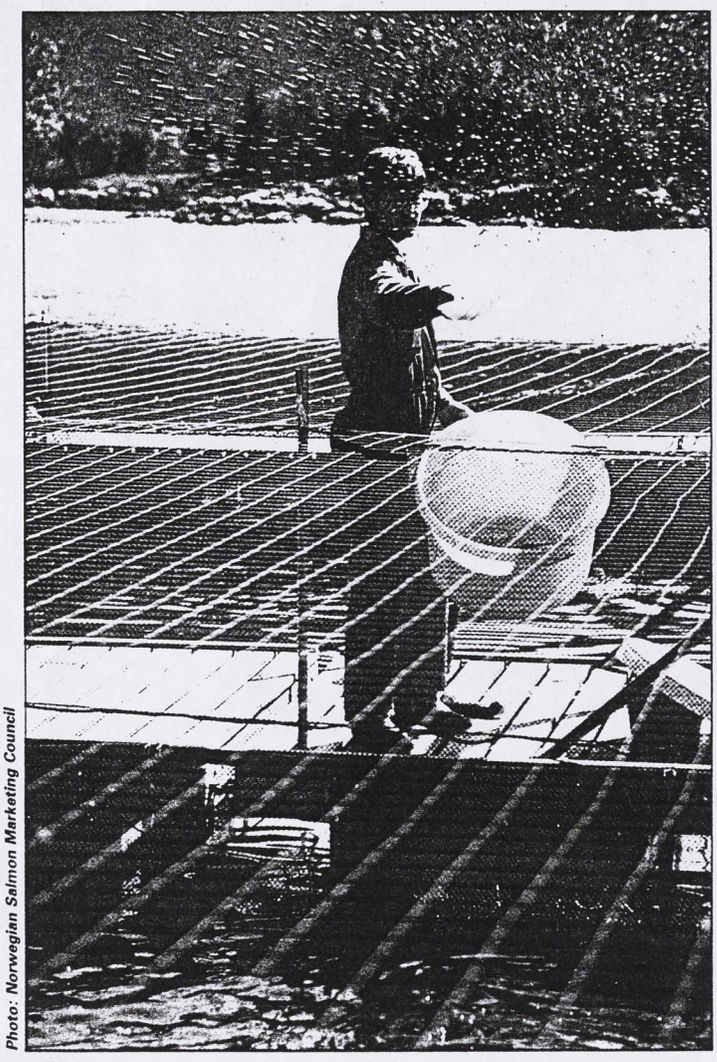

Photo: Norwegian Salmon Marketing Council

14,000 tonnes in 1991.

Iceland is generally climatically and topographically unsuited to salmon farming. However, it produced through conventional means 1,480 tonnes in 1989, and 118 tonnes through sea ranching. Despite the failure of two major producers and a 17 per cent reduction in the number of farms (to 105) by 1989, production is still expected to grow to about 6,000 tonnes by 1991. A growing proportion of this output will come from sea ranching which is expected to gain a small price premium as 'wild' salmon.

In North America, production of Atlantic salmon on the east coast (mainly in the Bay of Fundy) reached 6,900 tonnes in 1989 with 800 tonnes produced in British Columbia, making for combined production of 7,700 tonnes. Fifteen companies in Maine (USA) and 44 farms in New Brunswick (Canada) are operational. The ice bound coasts of Nova Scotia and Newfoundland are expected to be major limitations to expansion of the industry in the east. West coast expansion seems to offer greater scope, provided current problems associated with Pacific salmon farming (poor growth and disease incidence) can be overcome. About 16 companies operate in British Columbia. The combined North American production forecast for 1990 is 11,000 tonnes of Atlantic salmon with 18,000 tonnes projected for 1991, rising to 26,000 tonnes by 1995.

Chile, in South America, is potentially a large, low-cost producer of Atlantic salmon, benefiting from low feed costs, low labour costs, and isolation from diseases affecting production in the northern hemisphere. Its obvious market is North America, which it could supply competitively compared to European suppliers. Major European, Norwegian, American and Japanese interests are already investing in this industry and production is modestly forecast at 30,000 tonnes by 1995. Norwegian and Japanese interests have also invested in Australian Atlantic salmon production, which totalled 1,500 tonnes in 1989. However, a small domestic market and an unpromising export market are preventing expansion.

Global trends

Collating projected output figures for salmon producing countries points up the scale of the increases in production currently under way, as illustrated in figure 2.

Clearly the year when the biggest bulge in production had to be absorbed was 1990 and to a lesser extent 1989. The additional production chasing market outlets will fall considerably in 1991, and 1992 is likely to see a drop in world supplies for the first time since farming got underway in the late 1970s. Extrapolating on the basis of more normal growth rates from the mid 1990s onward, the global production of farmed salmon could be of the order of 440,000 tonnes by the turn of the century.

The market

Obviously the corollary to increased production of farmed Atlantic salmon has been the rapid development and expansion of markets over the past decade. Figure 3 shows the consumption trends in the fourteen key markets over the period 1980–89. All these countries show major growth in consumption over the past 10 years. France has clearly emerged in recent years as by far the most important international market for Atlantic salmon, taking over 46,000 tonnes in round weight terms or a quarter of all supplies. Next in importance comes the USA, the UK and Germany. If we focus on the market growth rate over the period 1985/89, then we can identify three broad country categories.

Firstly, the most rapidly expanding markets with average annual growth rates in excess of 50 per cent are Japan, Italy, Spain and France. Next we have a group of countries whose markets have been growing at between 30–50 per cent per annum. These countries are the Netherlands, the USA, Norway, Ireland and Sweden. Finally there are those markets such as Belgium, the UK, Germany, Switzerland and Denmark where growth has been less than 30 per cent per annum.

The consumption of salmon per head of population varies considerably from one country to another, and seems to be greatly influenced by the traditional propensity to eat seafood and proximity to salmon producing areas. That the Norwegians themselves are leading consumers of farmed salmon followed by the Swedes does not really surprise us, although the figures probably overstate the true consumption level. France ranks third in importance followed by Ireland and Belgium. In the Irish case, a consumption figure of 730g per capita would represent about five servings of salmon per head per annum. However, the consumption base is very narrow – a survey carried out by BIM on the home market earlier this year revealed that only 29 per cent of Irish consumers admitted to ever eating salmon and a mere 4 per cent were regular eaters.

However, many of the high salmon consuming countries are also important producers, eg Norway, the UK and the USA. What is of most interest is the extent to which countries meet their market requirements through imports. Figure 4 points up the shifting import pattern for Atlantic salmon over the period 1985–1989. France heads the league of salmon importing nations, accounting for 29 per cent of total traded supplies in 1989, followed by the USA, Denmark and Germany. Over the period 1985–1989, France, Italy, Spain and Japan have all increased their relative share of imports, while Germany has declined in relative terms.

Import trends

The increased sales of Atlantic salmon on the French market have been achieved not only through overall market expansion, but through substitution for Pacific salmon. Broadly speaking, the Atlantic and Pacific species are well differentiated in the various product/market segments.

Fresh salmon sales, whether for retail or catering, are exclusively Atlantic salmon. On the other hand frozen salmon sales, whether retail or catering, have to date consisted almost exclusively of the cheaper species of Pacific salmon. In the case of the processed sector, added-value salmon products in frozen form such as recipe meals are invariably based on Pacific salmon, while smokers are utilising Atlantic salmon to an increasing degree at the expense of Pacific.

The inexorable increase in salmon supplies over recent years together with fluctuating prices have put a strain on the French distribution system. The main effects have been reduced margins along the distribution chain and some importers going out of business. There is a noticeable trend towards importing on an agency basis rather than at firm prices.

The prospects for increased sales of farmed salmon on the French market, lie mainly in the fresh retail and smoked sectors, with relatively less growth opportunity in the catering sector

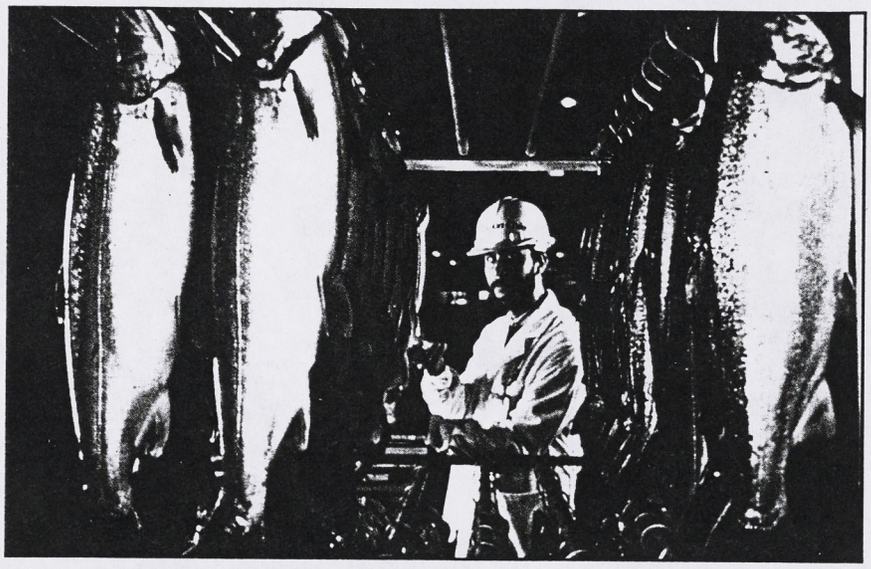

Photo: Association of Chilean Salmon and Trout Farmers

tor. Since the mid-1980s, French hypermarket chains such as Auchan have used salmon as a flagship for increasing sales of fresh seafood. Salmon has featured prominently in in-store promotions with some estimates claiming 50 per cent of all hypermarket sales at promotional prices. In the context of tightening supplies of wild fish at much higher prices, retail sales of fresh salmon are projected to increase by at least 15 per cent per annum.

The recent rapid growth in the smoked salmon sector of the market in France is expected to continue, but this is being achieved at prices and margins which are increasingly competitive. Pacific salmon will continue to be replaced by Atlantic, and there are hopes that smoked salmon consumption outside the peak festive seasons can be further developed. Country of origin is an important selling point in the smoked salmon sector, and many hypermarkets like to carry product of Norwegian, Scottish and Irish origin.

In the French catering sector, salmon features on nearly every quality restaurant menu. There appears to be limited scope for increasing consumption in the quality sector, but with the lower prices of recent years, salmon has become cheaper than comparable fish and meat items and this should lead to increased uptake in the middle quality catering sector.

The outlook on the French market is that Pacific salmon consumption will continue its decline, while the market for Atlantic salmon should grow at about 15 per cent per annum up to 1992, with growth thereafter falling to about 6 per cent to 1995.

Retail growth

The USA, which is the next most important market after France, has played a pivotal role in the overall market for Atlantic salmon. Unlike France where the market is 100 per cent supplied by imports, US imports of 20,000 tonnes of Atlantic salmon were only 14 per cent of the total US salmon market in 1989. Because of its size and diversity it is difficult to generalise about the US market. However, the growth of the market will be determined by the fact that Atlantic salmon has no particular competitive advantage over the Pacific salmon species except for its availability in winter when Pacific is out of season; increasing North American production will enjoy a transport cost advantage over imports from Europe; Chilean imports will provide stiff competition, especially on the West Coast, and the dollar exchange rate will have a major influence on the competitiveness of European supplies.

The best route for increased sales is likely to be the retail sector for fresh, smoked and other processed products and the total market is likely to double to about 40,000 tonnes by 1995.

There are also two Southern European markets which traditionally have not been consumers of Atlantic salmon. From consuming a mere 400 tonnes of Pacific salmon in the early 1980s, the Spanish market for Atlantic salmon grew to 10,000 tonnes in 1989. Again the retail sector is likely to offer much greater growth opportunities than the catering sector, and the total market is projected to grow to about 26,000 tonnes by 1995.

On the Italian market, salmon in fresh form was relatively unknown until recently, but there is a small traditional market for smoked salmon based mainly on the Pacific species. Italian imports of Atlantic salmon have already increased to over 4,000 tonnes compared with 160 tonnes in 1985. Further growth is likely to be on a scale similar to that experienced in Spain, the main focus of growth being the industrial cities of Northern Italy.

In relation to the various markets, there is evidence of widely different mark-ups from point of import to final consumption. (For comparability purposes prices are denominated in a common currency, the ECU.) As can be seen from figure 5, the UK, the USA, Germany and Italy are 'high mark-up' countries where the retail price is approximately twice the CIF level, whereas countries such as France and Spain have a mark-up which is only half that level. To what extent can the great expansion of sales in France and Spain be attributed to this phenomenon?

Distribution Mark – Up for Salmon

	Fresh Salmon Prices ECU/Kg			Mark – Up
	CIF	Wholesale	Retail	Fresh Salmon CIF to Retail
France	4.6	6.1	7.0	50%
UK	4.9	5.1	10.4	113%
USA	6.4	6.5	11.9	86%
Germany	5.6	5.5	11.5	108%
Spain	5.0	5.2	7.2	45%
Italy	5.6	6.6	13.0	129%

Figure 5

Projected Global Supply and Demand

	Projected Production	Norwegian Withdrawal	Projected Demand	Shortfall or (Excess) Demand
1990	243	38	197	46
1991	272	25	228	44
1992	253	—	266	(13)
1993	253	—	291	(38)
1994	281	—	326	(45)
1995	308	—	372	(64)

Figure 6

Supply and demand

What then will be the likely evolution of supply and demand over the next five years? In addition to the production estimates earlier, we have made market demand projections based on traders' opinions in the various markets and in the light of past trends. With the objective of identifying dis-equilibrium between initial supply and demand, these first phase projections deliberately ignore the dynamic interplay between supply and demand. These projections point to excess supplies of between 40,000 and 50,000 tonnes for each of the years 1990 and 1991 (see figure 6). These excess supplies will be reduced but not eliminated by the Norwegian withdrawal system. If we are to achieve supply/demand equilibrium, downward pressure on prices is likely to continue until well into 1991. However, market demand will overtake production from 1992 onwards, thus leading to a recovery in prices. ■

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White Mountains salmon farm: $12 million project, 125 jobs

By MARTHA REINKE

Imagine biting into a filet of Atlantic salmon that's so fresh, it tastes like it's just been scooped out of the water. Not a very practical thought in a state like Arizona.

But wait — it could really happen. Within the next two years, Arizonans and Southern Californians could be feasting on as much as 3.3 million pounds of Atlantic salmon a year, all courtesy of a salmon farm that's being planned in the White Mountains near Snowflake and Taylor.

The fish is being provided by Butler Research & Development, a 125-year-old family-held business based in St. Paul, Minn. "We've spent four years developing new technology to grow Atlantic salmon for the commercial market," says Walter Butler, an avid fish connoisseur and entrepreneur who spent more than 25 years working with Alaska Arctic fisheries.

The $12 million project not only will provide a plethora of fish to meet increased market demand in Los Angeles — the most fish-consuming population in the country — but also will result in other benefits to the Snowflake/Taylor economy.

Bruce Semingson, city manager of Show Low and the man who played a part in bringing Butler into the state, says the fish farm should create 125 jobs and will result in increased agricultural production for the area. "We've had nothing like this happen in 25 years," he says. "This will be a tremendously big industry."

Please see New, page 33

New venture should put state on the map for salmon production

Continued from page 1

Semingson says he called on Butler after visiting family in North Dakota and reading about a similar operation Butler is opening this summer in Wisconsin. The White Mountains provided all of the natural resources necessary to accommodate the operation, and Butler soon came to visit the Lakeside/Pinetop area.

Economic developers in that region contributed $18,000 to the cause and began environmental and hydrology studies, only to find that the area would require too many wells to be drilled over too large an area.

Rather than throw the baby out with the bathwater, officials looked north to Snowflake and Taylor — two communities that wanted to be home to the project — and it looks as though the fishery has found a home.

In addition to providing an abundance of natural resources, the region provides easy access to Interstate 40, so salmon can be trucked overnight into Los Angeles. Butler says that after about six months of additional research and development, construction of the plant will take nine months. The fish then will take 15 months to mature from the eggs before they're ready to market.

"This thing, technologically, is just this side of NASA," he says.

Butler says the original technology was developed in Sweden and improved in Canada, and that his company has now provided the latest advancements to capitalize on the fish-consuming population. "There's a special niche in the marketplace," he says.

According to Butler, Norway was among the largest distributors of salmon in North America, providing some 26 million pounds a year. But increased tariffs have caused Norwegians basically to withdraw from the market. Though Chile also has traditionally been a large producer of salmon, the shipping distance to North America can be cost-prohibitive.

"There's a void in the marketplace of many millions of pounds that we intend to fill," says Butler.

So why fill the void with Atlantic salmon? Purely economics, Butler says. King salmon, which is produced in great quantities in Alaska, now sells for about $2.25 a pound; Atlantic salmon is going for about $3.30 a pound. "Atlantic is also easier to grow than King," he says.

Butler says the fish farm will include a reservoir of about 500 acres, which can be used to increase agricultural production in the area. "It will take Navajo County from No. 6 to No. 4 in agricultural production" in Arizona, he claims. "This will double agricultural production in the entire state."

Semingson says irrigation in Navajo County has been on the decline in recent years because of the high cost of pumping water. But with the reservoir, water production will become more affordable for agriculture. Though the area typically has grown corn and alfalfa for cattle, domestic farmers now appear to be taking interest. "It could put 6,000 to 8,000 new acres of land production into that area, so agriculture could expand," says Semingson.

The company now has three to four sites in the Snowflake/Taylor area under consideration, and officials seem confident that financing will not be a problem. Butler says he's looking for public funds — the communities of Snowflake and Taylor have reportedly contributed $10,000 each — and could rely on private investment dollars as well.

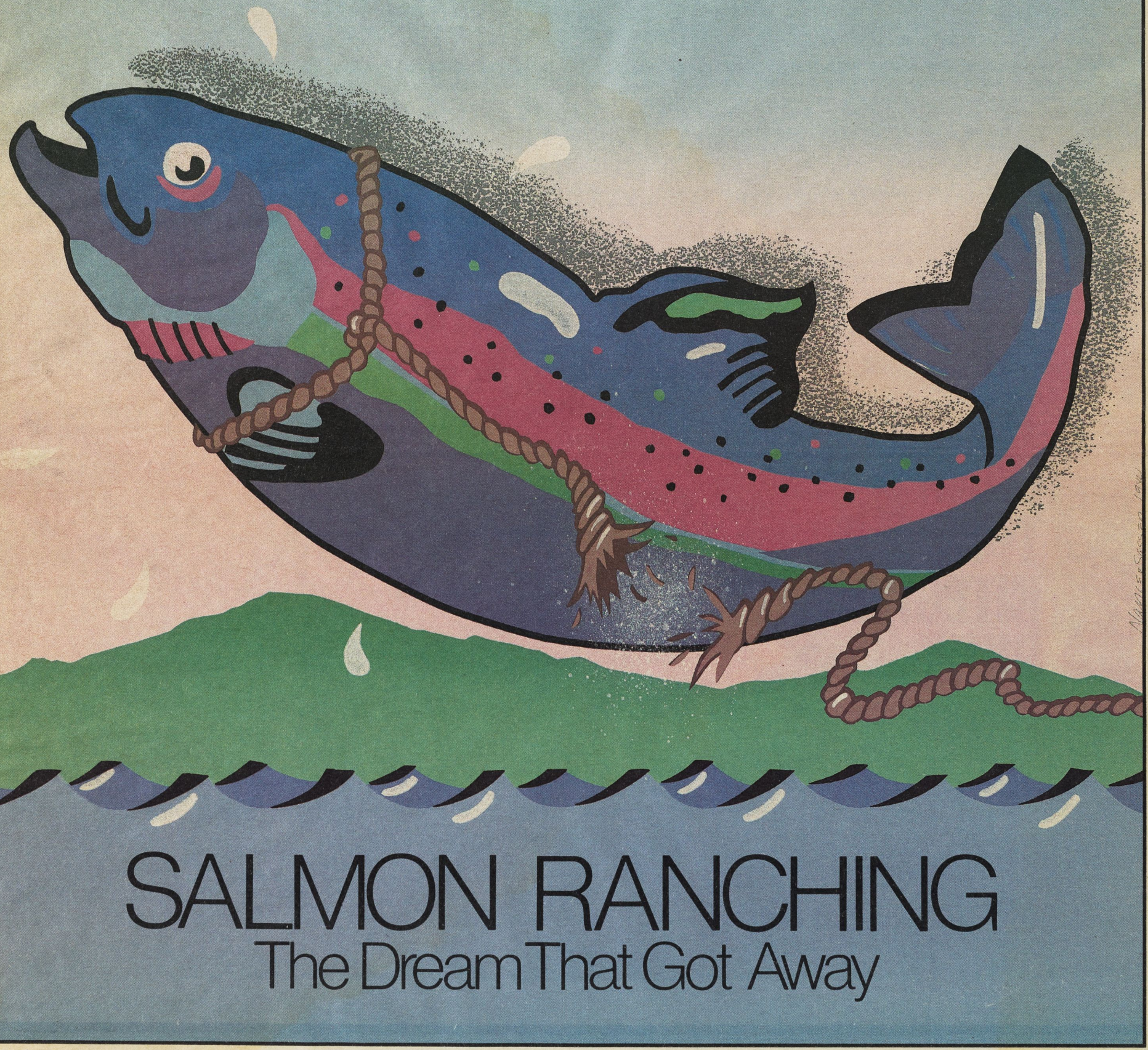
"We have the financing in tow," says Butler.

Although there are various routes for obtaining financing, Butler says he's looking for municipalities to become involved. "I'd say it has an excellent chance of being a fact," he says. "This is not pie-in-the-sky."

A similar operation in Wisconsin should start construction this summer, and Butler says he has two other farms planned in the area as well. The Arizona farm, he continues, should be the second to open. Beyond that, Butler's not sure where his research and development will take him.

"We're talking about $40 million to $45 million worth of fish-producing facilities just with the ones we're doing right now," he says. Butler Research & Development, a private firm that also is involved in engineering and construction, does not release financial reports, Butler says.

NORTHWEST



SALMON RANCHING

The Dream That Got Away

LETTERS

Worse ways

In regards to your May 27 story "Compulsion" by Lionel Fisher, if running is such addictive behavior, it is too bad that more people are not "hooked" on it. I can think of worse ways to deal with stress, such as alcoholism, drug usage or smoking.

For the *minority,* running may be a compulsion. For the *majority* of runners, it is a very healthy thing to do.

I hope that you soon will print an article dealing with the mental and cardiovascular benefits of running. It bothers me to think that your article might have discouraged potentially healthy people from pursuing fitness!

Gail Flower
Portland

Real problem

When I was interviewed last summer for your story "Compulsion," by Lionel Fisher, I was struggling with a running injury. Going from intense exercise to practically no exercise at all is an extremely hard thing to go through, especially for those who depend on it as a way to release stress or to maintain a certain weight. Having experienced this, *and* having to stay away from the activity I love most — running — gave me a lot to think about.

What makes people compulsive about eating and exercise? Is it for the love of it? The pain of it? The need to become better than others? Or from the pressures of the fitness craze and the idea that "thin is in?" I don't know the answer, but I do believe others have experienced, or are experiencing, what I have.

I feel that it is a long process to heal or at least to subdue any type of compulsive behavior, be it an eating disorder or the need to exercise three times a day. It is a very real problem that is worth being brought out into the open and worked through. People can't go through life purging themselves to death.

Susan Bauman
Hood River

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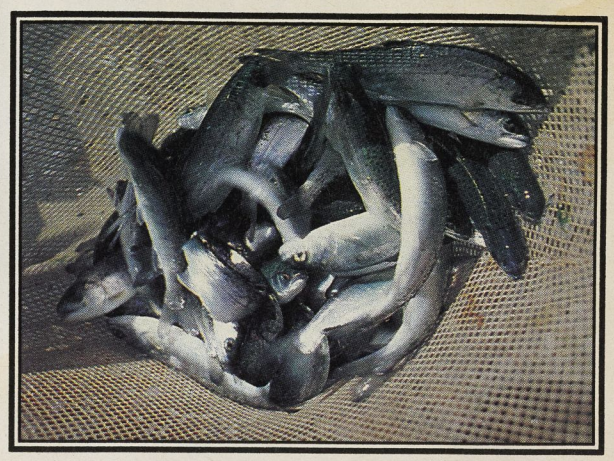

Northwest/RANDY L. RASMUSSEN

Small herds from salmon ranching (page 4).

CONTENTS

June 24, 1984

"Salmon Ranching" *Hard times on the salmon range*	4	Don Smurthwaite and Neil Armantrout
Destination Northwest *Rafting the Rogue in style*	9	Yvonne Horn
Northwest Outdoors *Touring Oregon's covered bridges*	12	Roberta Lowe
Designs for Living *Dreamy evening wear*	14	Vivian McInerny
Design Sense *Conspicuous labels*	16	Lucretia Krebs
Taste of the Northwest *Tasty shad*	17	Matt Kramer
Ground Rules *Northwest plants and flowers*	19	Andy Rocchia
Literary Arts	20	
Northwest Pages *When booksellers meet*	21	Paul Pintarich
Fiction *Anatomy of a marriage*	24	Andrew Fetler
The New York Times Magazine Crossword Puzzle	26	

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Salmon from the Oregon Aqua Foods hatchery explode from a pipe into a saltwater holding pen in Newport prior to their release into the ocean.

Salmon Ranching

The Dream That Got Away

Story by Don Smurthwaite
and Neil Armantrout

Photographs by
Randy L. Rasmussen

The scheme seemed like a Pacific Northwest natural — and it promised enormous profits. What it actually delivered was something else again.

Little distinguishes Whiskey Creek from hundreds of other small streams that gurgle seaward along the northern Oregon coastline. Like the others, Whiskey Creek isn't very long, a half-dozen miles winding through a patch of cedar and Douglas fir before reaching the flatland and slapping into the waters of Netarts Bay. At the crest of summer, it may barely flow, only a few feet wide and inches deep. Later in the year, after the rains start, Whiskey Creek runs full, its water driving down the channel toward the Pacific, a muddy brown ribbon slicing across the flood plain.

But 16 years ago a combination of Whiskey Creek's unpretentious qualities and a remnant run of fish offered the promise of a new industry — private salmon ranching.

The year was 1968, and Bill McNeil, then an associate professor of fisheries at Oregon State University, first set up wooden boxes along Whiskey Creek to capture spawning chum salmon as they shimmied their way upstream. The idea then — and now — sounds simple: catch the salmon, collect their eggs, raise the smolts and release the young fish. Then in three, four or five years, stand by and watch as the fish, not to mention the profits, returned home. Whiskey Creek, though not picturesque, was ideally suited for the venture. Although the size of its chum run had declined through the years, it still was the site of one of the largest such runs in Oregon. And the glamour fish — coho, chinook and steelhead — didn't inhabit the stream. So there would be no conflict with commercial or recreational fisheries.

McNeil viewed the set-up as an experiment, nothing more, but entrepreneurs saw it as an opportunity to get a fast start in a new industry. They expected demand for salmon to skyrocket and the ocean seemed unlimited in its capability to produce. Major efforts to rebuild depleted runs of coho and chinook had been in progress for years with good results. Salmon stocks in other parts of the world were at a low ebb.

It all sounded so easy, a dream waiting to happen. At the time, it seemed foolproof. And there was evidence that the scheme could work. The Japanese had plunged into salmon ranching a few years earlier and their business was thriving.

"I remember," McNeil says wistfully, "two fellows coming to me and asking for some advice concerning aquaculture. I told them to keep it simple and inexpensive, to be prepared to make an eight-year commitment and, thirdly, not to go into an area where there was a lot of recreational interest. That was all I said. Then they added an attorney and three more partners. The next thing I knew, they'd talked the state Legislature into expanding the law to include private releases of coho and chinook, as well as chum."

By then it was 1973, five years after McNeil sloshed through Whiskey Creek with his wooden boxes.

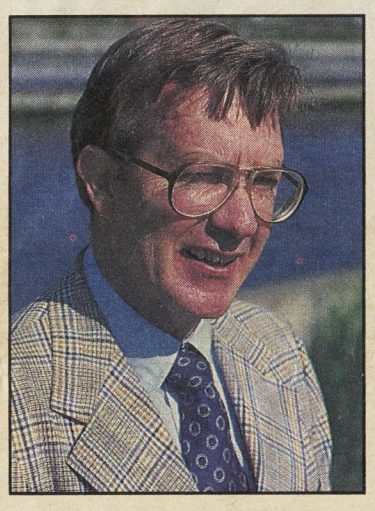
The encouragement from the Legislature only hinted at things to come. Like a winter gale sweeping inland from the sea, interest in the industry fanned to investors throughout the Northwest. At first, it attracted mostly mom and pop investors who worked to establish a series of small chum hatcheries up and down the coast. But it wasn't long before some corporate heavyweights — Weyerhaeuser and British Petroleum, to name a couple — also were in the salmon ranching business.

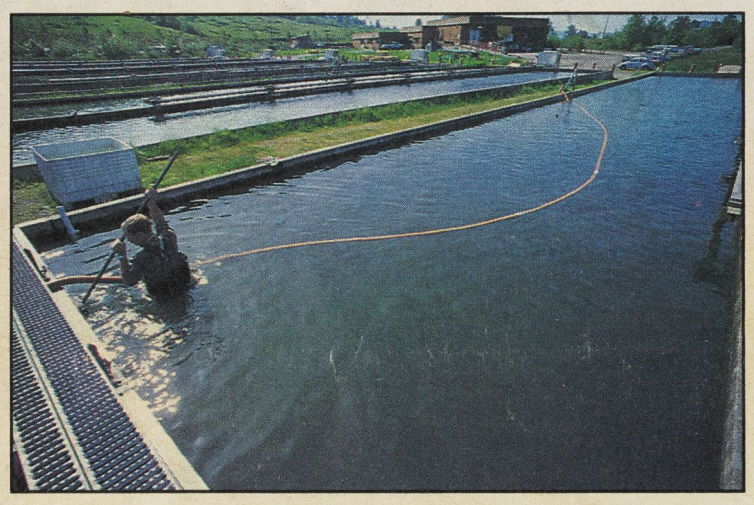
Expectations were limitless and the financial backing from the coporations was on the same grand scale. By 1976, a stack of applications had piled up for state processing. Those early days of private salmon ranching coincided with the largest run of coho on record. The commercial fleet doubled, then tripled in size. The number of sport charters grew at an unparalleled rate. Boom times lay ahead and salmon ranching was right at the heart of the Oregon coast's rising economic fortunes.

Salmon-ranching mania overwhelmed McNeil. "I was amazed," he says.

"It was a damn train going down the track," recalls Rollie Rousseau of the Oregon Department of Fish and Wildlife. "More was better. That ocean was unlimited and we could throw millions of fish in and take millions out."

Yet somewhere along the line, the train to sure-fire fortunes derailed. The industry that once looked so promising now is in trouble. Commercial fishermen, once some of the strongest supporters of the industry, are calling for its end. A long and complex battle in the state Legislature may be approaching the final rounds. Earlier this year, opponents attempted to circulate initiative petitions calling for restrictions on private ranching, but the petition drive never caught on with the public.





Bill McNeil, formerly an independent salmon rancher, now manages the sprawling, Springfield-based Oregon Aqua Foods, a subsidiary of Weyerhaeuser.

In August, the third-largest private hatchery in Oregon failed after revenues were reported at about 10 percent of what was expected. The supposedly limitless ocean has proved to be anything but. A moratorium on new ranching permits was put into effect three years ago.

Even some salmon ranchers, frustrated by the formidable opposition and unpredictability of the fishery, now privately express doubts about its future. It has been a decade and a half and upwards of $50 million since McNeil placed his wooden boxes in Whiskey Creek and the first profit from salmon ranching has yet to be made.

The question, then, is obvious. What went wrong?

Bill McNeil still is a salmon rancher, though his current workplace is more elaborate than Whiskey Creek. He is the general manager of Oregon Aqua Foods, a modern, sprawling structure just north of Springfield that passersby often mistake for a sewage treatment plant.

"That's probably the way a lot of our detractors think of us," McNeil says, standing on a knoll and talking about the 25-acre, $15-million complex.

Ore-Aqua is a wholly owned subsidiary of Weyerhaeuser, which bought the business from Fisher Mills of Seattle in 1975. A couple of miles to the south of Ore-Aqua the huge smokestacks of a Weyerhaeuser plywood mill puff away, a constant reminder to McNeil of the salmon ranch's umbilical relationship with the wood-products giant.

Ore-Aqua began small but now is easily the largest, most innovative and best-bankrolled of the salmon ranchers. But a curse goes with those blessings. Ore-Aqua also is the most visible aquaculture firm, and consequently, the lightning rod for industry opponents.

The main holding and rearing tanks were located at Springfield to take advantage of hot water from the nearby plywood plant, McNeil explains while walking down a gravel road from the main office toward rows of elongated concrete basins. The water, used to cool machinery at the mill, is piped to the hatchery at temperatures of up to 100 degrees. It's blended with cold water from the McKenzie River, which flows close by, to produce optimum conditions for raising smolts in the basins.

The warm water, together with a rich diet, accelerates fish growth. Coho, for example, are released after only six months. Wild runs of coho usually head downstream after a couple of years.

The reason for the short stay at the salmon ranches is basic: economics. Raising the fish costs money, lots of it. So anything that shortens the raising time reduces costs. Because of the shorter growing period, the ranch fish are smaller than the natives when they go to sea. Partly to make up for their petite size, the hatchery fish are released in summer rather than spring, when natural runs occur. That gives the ranch fish a couple of months more to fatten up on their high-cal diet.

Because of a ban on releasing fish into freshwater where native populations might live, the Ore-Aqua salmon are trucked to Newport, held for a few days, and turned loose in Yaquina Bay. When the fish return and are trapped at the Yaquina Bay site, some are marketed — mostly to Southern California and the East Coast — and the rest returned to Springfield to help start the next cycle.

The operation seems simple enough and commercial fishermen would appear to profit from the large number of salmon released by the private hatcheries. So what's the problem with salmon ranching?

McNeil leans back in a worn chair inside Ore-Aqua's main office and begins to list the problems that have beset his industry. There have been plenty. "Everything that can go wrong in the ocean the last few years has," he says.

One of the things that has gone wrong, McNeil points out, is the failure of cold, nutrient-rich water to rise to the surface, a process called upwelling. Upwellings off the Oregon coast create some of the best feeding conditions in the world. But they weakened after 1976, and the salmon's chow supply dwindled accordingly.

Worse, late in 1982, the warm water of El Nino appeared offshore, causing the upwellings to disappear almost altogether. The result is easy to predict.

"I can't help but feel that if there is a young salmon and no food, he's not going to hang around," says McNeil. History backs him up: The last strong upwelling was 1975, the last good year for salmon was 1976.

A second fisheries biologist offers an even more grim assessment of the upwelling problem. "The salmon," he says, "are simply starving out there."

A domino effect followed the weak upwellings. With less food and a lower smolt-survival rate, a smaller number of adults returned. With fewer fish to spawn, runs diminished and catches dropped. And the sport and com-

DON SMURTHWAITE is a Eugene free-lancer who has published in Pacific Northwest magazine and Sports Illustrated, among others. NEIL ARMANTROUT holds a Ph.D. in fisheries biology from Oregon State University. RANDY L. RASMUSSEN is the Northwest Magazine staff photographer.

mercial fleets, built up during the good years, plunged into a depression.

"Timber and fishing. That's all we have. When they're both down, the coast just goes belly up," says Larry Stone, a Coos Bay commercial fisherman. Stone should know. He came to the Oregon coast seven years ago from California and a secure job. "It was called extreme job burn-out. Fishing looked good," explains Stone, who learned the trade during a brief stay in Alaska. But last year, he put to sea fewer than a half-dozen times. Catches were so poor that he couldn't make enough to cover expenses. He and his partner ended up selling their boat. "We gave up before we lost a lot of money," Stone says, "although it still wiped out my finances."

Stone is one of the founders of the Pacific Fisheries Enhancement Corp., an organization that seeks public and private money for fisheries enhancement projects. He, like other commercial fishermen, believes more lies behind the disappointing performance of the salmon ranching industry than the lack of upwellings and El Nino.

"El Nino exists and it's been a problem, no doubt about that," Stone acknowledges. "But the major problem for private hatcheries has been poor management practices."

One practice that Stone and other salmon-ranching critics believe is especially harmful is the upturn in coho releases by Ore-Aqua during the last few years. Releases gradually increased until they topped the 60-million mark last year. One-third came from Ore-Aqua. But as releases have climbed, runs have fallen.

Biologists fear that by increasing the releases of coho, the private fish simply have displaced many fish that would have returned to the rivers and public hatcheries.

"By the sheer volume of fish the private hatcheries are putting out, they're endangering the run," charges Stone. Or, as the fish and wildlife department's Rollie Rousseau implied, millions of fish thrown in doesn't necessarily mean millions of fish taken out.

If displacement is occurring, it isn't helping private ranchers, either. Low returns plague the private hatcheries.

"Last year, we got an average return of 0.7 percent on our cohos," says McNeil. Two percent is the break-even point, he estimates, and ranch return rates have been inching upward the last few years.

Returns are getting better, opponents contend, not because of improved survival rates but because of favored treatment in the way fishing seasons are managed.

"How can private aquaculture make a profit if the fishermen take over half of their fish?" asks Paul Hanneman, a dory fisherman, boat builder and member of the Oregon Legislature (R-Cloverdale). "One way is to reduce seasons or reduce fishermen."

Seasons are set by the Pacific Fisheries Management Council, a federal agency, in cooperation with the Department of Fish and Wildlife and other state, federal and Indian agencies. Seasons are based on the return rate of jack salmon, fish that come back to spawn after only a few months at sea. By law, only jacks from public hatcheries and natural runs enter into the calculations. So the seasons are set without considering that a single fish has been produced by private aquaculture. Allocations to sport and commercial fishermen are made on the basis of a smaller number of fish than are actually in the ocean, resulting in excessively short seasons, many fishermen believe.

"It's wrong, very wrong," Stone says. "Until recently, they didn't even have a commercial fisherman on the council."

Industry opponents also believe that Jack Donaldson, director of the Oregon Department of Fish and Wildlife and one of the founders of Ore-Aqua, is too soft on the industry he is supposed to help regulate.

"A lot of his decisions have benefited private aquaculture," says Stone.

Counters Rousseau, Donaldson's assistant at the fish and wildlife department, "You'd have to be pretty naive to think one man could work out something. That's an impossibility with all of the agencies around that are involved."

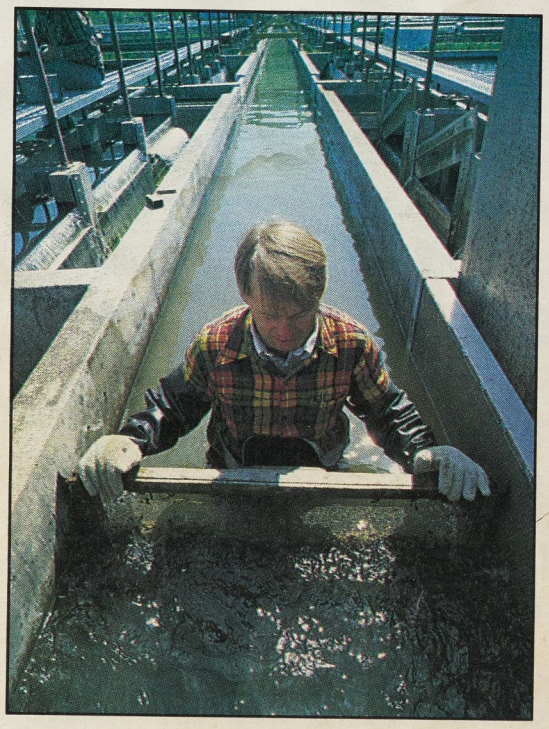
"The department is our regulator," McNeil says. "It basically controls our operation. We don't always agree, but we go along."

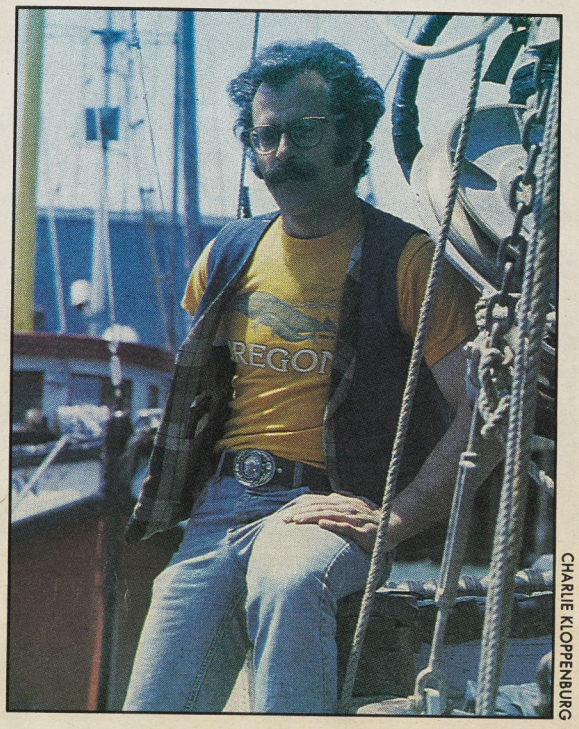
Hanneman, who introduced the legislation expanding ranching to include coho and chinook, thinks the control hasn't been tight enough. He pushed a bill in the 1983 Legislative session that would have put stronger limits on private ranchers. It never reached the House floor. Hanneman credits that to the strong lobbying efforts of Rousseau and Weyerhaeuser representatives.

"They blocked all of our efforts," says Hanneman. "They said we were trying to damage an industry during an economically tough time."

Times would have been even tougher for commercial fishermen the last few years were it not for the private hatcheries, according to McNeil. Anywhere from 12 to 25 percent of a commercial fisherman's catch is privately released.

"If it weren't for the hatchery programs, there wouldn't be a salmon run. Period," MeNeil says, alluding to the work of public hatcheries to build runs in the 1950s and 1960s, after overfishing and habitat destruction decimated the fishery.





CHARLIE KLOPPENBURG

A Ore-Aqua hatchery worker (left) herds salmon smolt toward capture. Coos Bay fisherman Larry Stone decries management practices of private salmon ranches.

Private salmon ranchers wanted to continue building runs. They geared up to take advantage of the plentiful eggs from the bonanza runs in the mid-1970s. Building a hatchery takes time, though, and when the ranchers were finally ready, runs were decreasing and eggs becoming hard to find.

Ranchers rushed to find eggs elsewhere, looking to Puget Sound and the Soviet Union. But of the millions of eggs imported from the Soviet Union, hardly any were captured as adults by Ore-Aqua.

"I think we got seven fish back," recalls McNeil. One of them is on the wall of the Ore-Aqua office in Springfield, neatly mounted on a plaque. "Our $20,000 fish," laments McNeil.

Luck was a little better with coho eggs from Puget Sound, but the imported fish created a new problem. Fish adapt to a certain habitat and location. For example, a fish that spawns high in the Columbia River basin will be genetically adapted for an early return and long migration. Moved to a small coastal stream, the fish wouldn't adjust well. Its different genetic make-up would make it more susceptible to disease, adverse local conditions and a shift in ideal migration times.

"The private ranchers are raising a Hood Canal fish, a small fish, high mortality, and it's not doing very well," says Dave Schlip, a doryman from Pacific City. "It doesn't contribute here."

Salmon ranchers recognize the problem but still are frustrated by the lack of local eggs. As surpluses dwindled, the state drew up a priority list. Private ranching was relegated to fifth place.

"We can't predict that we'll have eggs to sell," said Ed Cummings, fish and wildlife department point man for private salmon ranching. "It doesn't look that good."

Ranchers continue to build their runs with out-of-area eggs, although there is a sign that private ranchers may be cutting back coho releases. In December, Ore-Aqua surprisingly offered to sell eggs to the state. It didn't take long for the state to say "no thanks." Genetic purity was undoubtedly the reason behind the answer.

The worry about purity may be unnecessary anyway. Much to the dismay of fishermen and biologists, the Ore-Aqua fish have shown a strong, almost uncanny knack to stray from their release site on Yaquina Bay during the trip home. In one check, 75 percent of the salmon found in a stream were privately released.

If the stray fish have interbred with native stocks, the genetic make-up of the local fish has been altered. And all those unwanted traits of the imports — poor timing, lower disease resistance and inflexibility to respond to changes — could become a part of the wild coho. Does it mean farewell to the native coho runs as they've been in the past? Hanneman thinks the answer is yes and that the salmon ranchers are to blame.

"We don't have any more wild fish," says the doryman and legislator. "Have they altered the genetic stock? How can you say no?"

Genetics may not be the only reason for straying. Some fisheries biologists believe that the ranch fish are held too short of a time in release ponds before being sent to sea. The biologists say a few days is not enough time for imprinting, the process that helps salmon to recognize clues on the way back to their birthplaces. With only a weak memory of their release site, the returning adults readily stray into streams all along the coast. Some straying occurs in natural runs, but the private releases seem especially adept at getting lost.

Stone, the landlocked fisherman, adds, "It may be 10 years before we know the full effect of straying."

Beyond the question of straying, an even more immediate concern is the size of the fish. Coho were small last year, smaller than ever before, some longtime fishermen say. Private hatchery fish have always been little, recently running about two pounds less than public hatchery and wild stocks. McNeil pegs El

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Nino as the big reason for the small fish, but commercial fishermen believe the warm water current is only part of the cause.

Stone thinks rushing the ranch salmon to sea not only hinders imprinting but also doesn't allow them enough time to gain weight. In addition, the ranch salmon, "don't even recognize food when they're put in the ocean because they've been fed pellets."

The small fish are showing up at a time when the salmon runs in Europe, Japan and Alaska are on the rebound. Pacific Northwest fishermen are going to a competitive market with an inferior product.

"We can get fish a lot cheaper out of Alaska," says Skip Baldwin, general manager of Lazio Fish Co. in Newport. "A person has to buy where he can get the best price. That's just business."

The financial pinch hurts private salmon ranchers as well. When the market is down, McNeil says, Ore-Aqua also suffers.

"We'd like the fish bigger, too. It's nonsense to think we want small fish. There's a market for the little dinks; we can sell them. But not for a great price."

Nature's capriciousness, poor returns, egg problems, straying and small fish have turned high hopes for private salmon ranching into a struggle for survival. Yet McNeil outwardly doesn't seem bothered by all the controversy. His confidence is complete that the industry will someday fulfill its lofty promise. If there is a storm brewing around him and his livelihood, he is determined to weather it.

"We will always be a scapegoat. The commercial fishermen would like to see aquaculture banned. They don't like the idea of farming the ocean. I guess we went through the same thing in agriculture and forestry. The fishermen have a romantic sense about them. They represent the last of the hunter-gatherer in our society. But the transition is inevitable."

If Weyerhaeuser, with the largest stake in salmon ranching, is getting fidgety, McNeil hasn't noticed. "They realize it was a pioneering effort. I don't sense them losing faith. It's mostly a case of time and patience and a little luck in the ocean. We haven't been getting that lately."

Survival of private aquaculture in the future may well depend on taking a step back to the past — to the early days of ranching at Whiskey Creek, when the whole concept was viewed as an experiment and expectations were more closely matched with what was possible.

While much of the industry charged ahead 10 years ago, the Whiskey Creek hatchery still is regarded as an experiment by those who run it. The creek still tumbles and splashes down from the Coast Range foothills before lazily floating across a flatland. The small hatchery still is near its mouth, although McNeil's wooden boxes have been replaced by concrete traps. And chum still is the species produced.

Chum, in fact, may be the key to the industry.

Chum are cheap to produce. Unlike coho and chinook, they go to sea soon after birth. So expensive rearing plants aren't needed. When they return, chum don't take hooks; so competition between the private ranchers and fisherman isn't a problem. While the small private ranchers who stuck with the chum haven't made a financial killing, most have avoided large losses and the rage of commercial fishermen.

Building the industry around chum would take time. With only a limited remnant run along the Oregon coast, chum eggs are in short supply. But the experiment at Whiskey Creek shows that chum can be ranched successfully.

Stone, who represents many in his industry, could accept an all-out effort to build the private chum run. "There would be no complaint," he says, "if it were done the right way."

It's easy to understand how the euphoria and hope for new prosperity on the Oregon coast led people away from the early, simple concepts of private ranching. But it may not be too late for the ranchers to realize the true vision of their industry's first few stages really never went beyond the banks of Whiskey Creek.

Without that realization, private salmon ranching in Oregon may disappear forever, a wild scheme that turned out to be just another dream that got away. NW

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Sports

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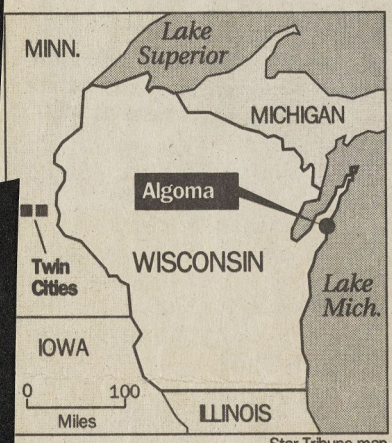
PAGE 2

TODAY'S QUOTE

Colorado Rockies manager Don Baylor after his team's 10th consecutive loss at Florida, 7-6 on Thursday: **They feel invincible here, like we do at home. They beat us here at will.**



Star Tribune map

TROUT *from* C1

Record catch puts Wenker in Wisconsin's record books

"I come here to try to relax, but it's been nonstop since yesterday," Wenker said with a weary chuckle. "It was absolutely a zoo."

The fish currently is in a freezer, and will be mounted.

Mike Toneys, a DNR fish biologist who certified the fish, said it was a strain of brown called a seeforellen, which tends to grow larger than other strains.

"It was fin-clipped. We believe it was stocked in 1991 as a yearling, so it could be 6 years old. Most browns in our fishery are 2 to 5 years old. That size of a fish is a rarity, to say the least. It had quite a belly, so it was very well-fed.

"The fishing was slow to start this summer, but it has been fantastic the past three weeks."

Toneys said a 5- to 10-pounder would be considered a nice brown in the area. He said a 44-pound, 15-ounce chinook salmon caught nearby two years ago attracted even more attention.

Wenker, who runs an insurance agency in Shoreview, has been fishing in the Algoma area for 13 years, traveling there on weekends and for several weeks during the summer with his wife, Karen.

"I used to fish walleyes all the time in Minnesota, but I kind of got hooked over here," Wenker said. "I haven't fished in Minnesota for the last 10 or 12 years."

Don't expect to see him on the water in Minnesota soon.

GOLF

e Open lead

to Roger Buhrt. He's taught me the mechanics, and once you get those, the game becomes a lot easier."

Buhrt was a familiar name on the state golf scene two decades ago, and played briefly on the PGA Tour in the early 1970s. He is now retired, but still works with some students.

"I've played in the National Car three or four times and I've never made the 36-hole cut," Cook said. "But I've been playing pretty well this year. I won an event at Oak Glen, and I was third at the State Assistant Pros tournament last week. I've had several other top-five finishes in one-day events.

"Once you feel you have the mechanics of the golf, your confidence increases and there isn't the mental pressure on you. Like today, it was just fun to play."

Stansberry, 40, is still enjoying his State Amateur victory, and some of the momentum may have carried over. He didn't have a bogey in his lowest round in National Car Open play.

"I've probably been in the top 10 seven times the other times I've played in this tournament," Stansberry said. "I played in the first one in 1976, and it seems like the quality of the field has really gotten better; a lot of new, young guys who can really play."

That's a description of several of the contenders — Cook, Paulson, Kelly — in pursuit of the $7,000 first-place payoff. The tournament will end Sunday.

ternational lead

Roundup

share the first-round lead of the $800,000 Northville Long Island Classic in Jericho, N.Y.

McCullough birdied two of the last four holes on the 6,842-yard Meadow Brook Club course to draw even with Raymond Floyd and Larry Gilbert.

Women's British Open

After chasing down Karrie Webb last week for her first professional title, American Emilee Klein is running away from her Australian rival in the Women's British Open.

Klein, 22, who beat Webb by two strokes Sunday in the Ping Welch's Championship in Canton, Mass., shot a 7-under-par 66

Associated Press

Bob Wenker of White Bear Lake holds a 35-pound, 11-ounce brown trout he caught in Lake Michigan on Wednesday.

Reeling in a record

White Bear Lake man hooks 35-pound brown trout

By Doug Smith
Star Tribune Staff Writer

Bob Wenker knew he had a big fish on the line Wednesday night while trolling Lake Michigan, but even now he has a hard time believing just how big.

After a half-hour struggle, the White Bear Lake man, helped by two friends, hefted a 35-pound, 11-ounce brown trout into their boat — and into the record books.

The fish is a Wisconsin record and likely a world record for a brown trout caught on 20-pound test line.

"I knew the fish was big, but I didn't think it was *that* big," Wenker said Friday from his summer residence in Algoma, Wis., 300 miles east of the Twin Cities. "It's unbelievable, actually."

The previous record was a 32-pound, 8-ounce brown trout caught by a shore angler off Milwaukee in 1978.

Wenker, 46, was trolling with a downrigger and a homemade spoon 40 feet down in 100 feet of water when the lunker hit.

"It did a pretty good run on me," he said. "I got the other rods out of the way and played it for half an hour."

The lure had only a single hook on it, not a treble.

"I like running singles," Wenker said. "I figured it was pretty well set if it didn't get off in 20 minutes. It was unreal."

But even after landing the fish, Wenker thought it was one of the large chinook (king) salmon that ply the waters there.

"We put it in the cooler and kept fishing," he said, catching another 10 fish that evening, all much smaller.

The action for Wenker intensified a day later after the fish was identified, weighed and certified as a state record brown trout by the Wisconsin Department of Natural Resources. Newspaper and TV reporters, residents and taxidermists all called or flocked to see the fish.

***Turn to* TROUT *on* C3**

Colleges

Northwestern fullback has Hodgkin's disease

Junior fullback **Matt Hartl**, a starter on Northwestern's Rose Bowl team and a key blocker for **Darnell Autry**, will miss the 1996 season after being diagnosed with Hodgkin's disease.

"The doctors are very optimistic that he will have a complete recovery, but it will mean he will miss this season," Wildcats coach **Gary Barnett** said.

Barnett said a chest X-ray showed a tumor, and a lymph node was removed, revealing the Hodgkin's disease. Hartl will begin 12 weeks of chemotherapy next week and then undergo five more weeks of radiation.

➤ Michigan senior strong safety **Clarence Thompson**, an all-Big Ten selection last year, is academically ineligible this season, coach **Lloyd Carr** said.

➤ Miami Hurricanes linebackers **James Burgess** and **Jeffrey Taylor**, suspended after being charged with felonies, pleaded no contest in Miami to reduced charges of trespassing and might rejoin the team on Monday.

➤ Louisville football coach **Ron Cooper** was treated for exhaustion in Louisville, Ky., after being hospitalized for chest pain.

Auto racing

Burton wins pole for Goodwrench 400

Jeff Burton drove his Ford to a lap of 185.395 miles per hour as he won the pole position for Sunday's GM Goodwrench 400 at Brooklyn, Mich. The pole is the first of Burton's NASCAR Winston Cup career. Burton edged **Bobby** during practice last month at Michigan International Speedway, was fourth in provisional qualifying for Sunday's Texaco-Havoline 200 at Elkhart Lake, Wis., with a lap of 139.943 mph. **Bryan Herta** won the provisional pole with a lap of 140.285 mph.

Track and field

Bailey beats Mitchell in Cologne 100 meters

Canada's **Donovan Bailey**, the Olympic champion and world record-holder, surged from behind to beat **Dennis Mitchell** in the 100-meter dash at the IAAF Grand Prix meet in Cologne, Germany. Bailey won in 10.03 seconds. Mitchell was second in 10.07, and **Frankie Fredericks** of Namibia was third in 10.14. In the women's 100 meters, **Merlene Ottey** of Jamaica won in 10.99 seconds. **Gwen Torrence** was second in 10.99, and **Gail Devers** was third in 11.12.

Tennis

Sampras triumphs in RCA quarterfinals

Pete Sampras beat **Tommy Haas** 6-3, 6-4 in the quarterfinals of the RCA Championships in Indianapolis. **Goran Ivanisevic** defeated **Lionel Roux** 7-6 (7-5), 6-7 (5-7), 6-2, and **Todd Martin** defeated **Thomas Enqvist** 6-3, 1-6, 7-6 (7-3).

➤ Wild-card player **Alex O'Brien** ousted **Yevgeny Kafelnikov** 6-4, 6-4, and **Jan Siemerink**, beat **Richard Krajicek** 7-6 (7-3), 6-2 in the quarterfinals of the Pilot Pen International at New Haven, Conn. **Wayne Ferreira** beat **Daniel Vacek** 6-2, 6-7 (6-8), 6-3.

➤ **Anke Huber** defeated **Irina** Date of Japan 6-4, 4-6, 6-2.

Etc.

➤ Private funeral services will be held Monday in East Brunswick, N.J., for ESPN sportscaster **Tom Mees**, who drowned in a neighbor's pool.

➤ **Frankie Randall** (53-4-1) won the WBA junior welterweight championship, taking the title from **Juan Coggi** (70-4-2) of Argentina on a unanimous decision at Buenos Aires, Argentina.

➤ Major League Soccer said it will add two teams in 1998 and hopes to have 16 by 2004.

➤ U.S. Olympic gymnast **Kerri Strug** said she has enrolled at UCLA and will be a volunteer assistant coach for the Bruins women's team.

➤ Los Angeles Clippers coach **Bill Fitch**, who underwent emergency triple-bypass surgery on Aug. 9, was released from a hospital in Conroe, Texas.

➤ **Doris Glenn Easterly** of Fort Lauderdale, Fla., won her second 1-meter springboard title in the National Diving Championships at Moultrie, Ga. Easterly won by 17 points over **Beth Leake** of Louisville, Ky.

➤ **Tom Wilkens** of Middletown, N.J., who won the 400 individual medley and the 200 breaststroke earlier in the week, won the 200-meter IM in 2 minutes, 3.19 seconds at the Phillips 66 National Swimming Championships at Fort Lauderdale, Fla. **Jennifer Parmenter** of Granada Hills, Calif., won the women's 200 IM in 2:15.93. **Diana Munz** of Chagrin Falls, Ohio, won the women's 1,500 freestyle in 16:36.64. **Liesl Kolbisen** of Half Moon Bay, Calif., won the women's 50 free in 26.11. **Bill Pilczuk** of Cape May Point, N.J., won the men's 50 free in 22.68.

➤ **Canterbury Park** 11:45 a.m., Calder a 1 p.m., Arlington 1:0 Prairie Meadows an

➤ **St. Croix Meadow** 11:30 a.m. and 6:3

➤ **Call for latest sc** per minute on either

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Crash overshadows record times, spee

by John Gilbert
Star Tribune Staff Writer

BRAINERD, MINN. — The cooler Friday evening qualifying sessions at NHRA events traditionally are dominated by track records. It was the same Friday at Brainerd International Raceway, but all the quick times and fast speeds were nearly overlooked after one of the most spectacular crashes in BIR history.

Amazingly, Shelly Anderson, who had won the last NHRA meet at Seattle, escaped injury after losing control of her Top Fuel dragster halfway down the track. The long, slinky machine went airborne into a "blowover;" the power to the rear wheels caused the light front end to come up, then air got underneath the dragster and caused it to snap skyward at about 250 miles per hour.

The dragster barrel-rolled in the air before landing upside down on its nose. The impact caused it to bounce back upright and it skidded sideways as the parachute deployed. The chute slowed the skid, but the racer finally flipped onto its side, skidding through the finishing lights and coming to rest with the top of the rollbar against the right guardrail.

Anderson was helped from the wreckage, but walked to an ambulance. Before the crew got the wreckage cleaned up, she was riding back to the pit area on a golf cart, waving as she received an ovation from 20,000 fans.

"I'm OK," she said. "And I've got a brand new car we were going to debut at Indianapolis [in two weeks], but we'll run it tomorrow instead."

That would be in today's final two qualifying rounds, although the racers will be hard-pressed to approach Friday's record runs. The previous BIR Top Fuel records had been erased in the mid-80s heat of the afternoon, when Kenny Bernstein ran a 4.708-second pass and Joe Amato followed by hitting 306.01. Both records were reset in the second session.

Eddie Hill — who has won one race already this season at age 60 — ran a 4.666-second run for the track elapsed-time record, the second-best time of a racing career that dips into six decades. Hill hit a top speed of 307.06 mph, which was briefly a BIR record until Cory McClenathan drove to a stunnin top speed on a 4.73-

In Funny Car, Jo tled the fans and hi afternoon-session turned sideways. U came back in the e and obliterated bo Car records.

Force brought roar from the crow nected for a 5.01- 304.25 mph in hi racer, topping the 5.771 and 300.20.

In Pro Stock, W narrowly missed t when he ran a 7.1 ning-session time 7.110 record of arc the series leader, seventh Friday. Jo was 194.46 mph, s BIR mark of 195.14

"And we had an of some kind on t son said. "It cut ou

NHRA Nationals

- **What:** Champion Auto Stores Nationals
- **Where:** Brainerd International Raceway (Hwy. 371 in Brainerd)
- **When:** Gates open at 7 a.m. today and Sunday. Pro qualifying is noon and 4 p.m. today.
- **Tickets:** Call 218-829-9836

NW lawmakers don't predict change in failed salmon effort

THE ASSOCIATED PRESS

WASHINGTON – Efforts to restore salmon runs in the Columbia River Basin have amounted to a $3 billion failure, but key members of Congress from the Northwest don't expect the overall strategy to change any time soon.

Many lawmakers said they felt helpless to change a recovery program that employs more than 2,000 people, but shows no signs of success in stopping the decline of salmon.

Sen. Ron Wyden, D-Ore., said every member of Congress is to blame for the failure of the 15-year recovery effort.

"No one can take comfort in what's been done," he said in the Sunday (Portland) Oregonian. "This is going to go down as the textbook example of what happens when you just throw money at something."

Sen. Slade Gorton, R-Wash., called the recovery program "a spectacular and expensive failure. ... There's no place where the buck stops."

The Oregonian interviewed 13 of 15 delegates from the Northwest states – all senators or representatives from Oregon, Washington and Idaho. Opinions differed on several issues, even the exact causes of the salmon decline.

Another sticking point is the inability for lawmakers to determine how important saving the salmon is to their constituents. None of those surveyed could estimate how much voters would be willing to pay for restoration programs.

Rep. Peter DeFazio, D-Ore., said he thought support for salmon was strong but "not without limit." He said, however, that he did not know how to calculate that limit, or even whether it was possible.

Many lawmakers also said they weren't likely to support a plan that would cause economic harm to agriculture or industry.

The Army Corps of Engineers is evaluating the costs and benefits of breaching one or more dams on the Lower Snake River to allow the river to flow naturally.

That would help fish but cut power production to the region by 5 percent and render the river unnavigable by barges that travel as far inland as Lewiston, Idaho.

The economic blow to farming, shipping and the Bonneville Power Administration would be significant but remains unmeasured.

Additionally, the Northwest Power Planning Council, which oversees salmon recovery, is weighing a proposal to lower the level of John Day Reservoir to re-expose miles of gravel-strewn river that would be good spawning ground for fall chinook. Irrigators and bargers would be hard hit by that.

Sen. Gordon Smith, R-Ore.; Rep. Bob Smith, R-Ore.; and Rep. Helen Chenoweth, R-Idaho, said they were firmly against such actions, no matter how effective they might be at restoring salmon.

"It simply goes too far to tear out the infrastructure," Gordon Smith said. "I'd take such proposals off the table."

Others said they believed the costs and benefits of such actions should be determined before any decision is made.

The dilemma makes it more difficult for Congress to address one of the region's thorniest public-policy dilemmas: how – or whether – to restore runs of seagoing fish to what was once one of the world's great salmon rivers.

It also exerts pressure on an effort, intensified in recent weeks and led by Oregon Gov. John Kitzhaber to develop a forum among Oregon, Washington, Idaho and Montana to set new salmon policy.

But Congress' role in salmon recovery is crucial because most of the annual $400 million in funding for recovery programs comes from a federal agency, the Bonneville Power Administration.

Three of the lawmakers have asked the White House for help.

Rep. Elizabeth Furse, D-Ore., who said she plans to ask Vice President Al Gore for his assistance, said that saving salmon was not elective.

"They are an icon of a healthy environment for the Northwest," Furse said. "If they go down, we're all going down."

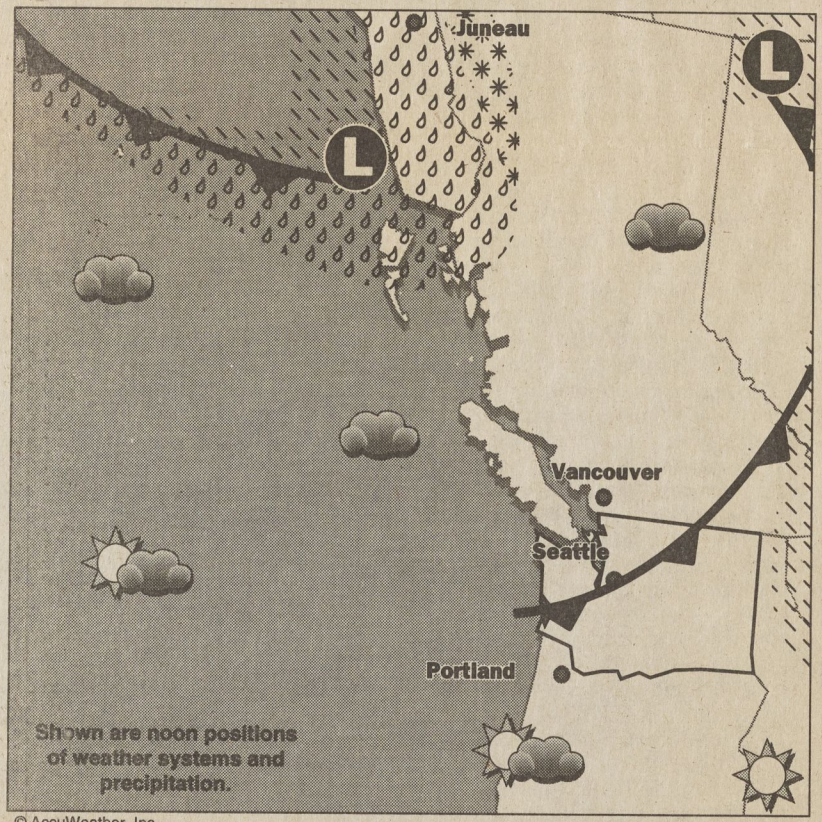
NORTHWEST ACCU WEATHER® FORECAST TODAY

THE ACCU WEATHER® FIVE-DAY FORECAST

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Turning out partly sunny. High 58, low 46.	Increasing clouds. High 60, low 48.	Windy with rain. High 60, low 50.	Breezy, showers. High 56, low 44.	Cool and showery. High 58, low 46.

SEATTLE TODAY

Morning clouds and fog, then turning out partly sunny today. High 58. Partly to mostly cloudy tonight. Low 46. Increasing cloudiness tomorrow with a chance of rain late in the day. High 60. Windy with rain Wednesday. High again 60.



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Army: Deal

From Page B1

"he would have violated the (federal) Anti-Deficiency Act ... by obligating government funds before an appropriation was made."

Hart is civil law chief of the Fort Lewis judge advocate's office, the same military legal office that helped draft the agreement in the first place.

In a reply letter to Lt. Gen. G.A. Crocker, the current Fort Lewis commander, state parks director Cleve Pinnix said the Army's rationale "strains credibility, and will not be accepted by the commission or the recreational public that it represents."

Trail users indeed are incensed.

"The commanding generals (at Fort Lewis) changed. ... The guy who is there now is not wanting to honor a memorandum of agreement made by his predecessor," Ed Armstrong, a member of the John Wayne Pioneer Wagons and Riders, said last week.

For 16 years, Armstrong's group has conducted an annual wagon-train ride the length of the trail, which he said is ideal for horse-drawn wagons.

The Army's assertion about Schwartz's lack of authority had particular irony for Joe Shorin, a state assistant attorney general who helped negotiate the 1991 agreement.

Even back then, parks staffers didn't trust the Army to keep its word, Shorin said. So to make the agreement as airtight as possible, he put in a clause stating that the document was binding on all the affected parties, and "by signing this agreement, each signatory represents that he or she is authorized to do so on behalf of the stated party."

"I was very angry," Shorin said of his reaction to the Army's letter. "I'm still very angry."

The Washington Times

THURSDAY, JULY 31, 1986

For the globe-trotting fisherman: one ticket (round trip) to Siberia

By Myron Struck
THE WASHINGTON TIMES

Beginning this fall, American fishermen may be able to cast lines into the Ob', Lena or Amur Rivers — in Siberia.

Trout Unlimited, an American environmental group, last week became the first private organization to sign an international conservation agreement with the Soviet Union, opening the door to an exchange of fishermen and sport-fishing technology.

Robert Herbst, executive director of Trout Unlimited, said the agreement was made with Rosohotrybolovsoyuz, — the All Russian Union of Hunters and Fishermen — in an effort to promote an exchange of technical and popular information on fish and wildlife, sport fisheries management and environmental preservation of spawning areas.

The agreement, which has unofficial State Department backing, contains the hope that Soviet officials will allow the taimen, a huge trout that has become extinct in Northern California, to be reintroduced to North America from its existing habitat in Siberia.

Mr. Herbst said a Trout Unlimited group will visit Siberia in October to explore whether the taimen, which usually averages 40 pounds when fully grown, can be made to spawn again in land-locked lakes in Northern California. In the United States, the salmon-like fish was called a McLean Run trout.

"This new program primarily involves the exchange of technical information on sport fishing and the possibility of exports of American fishing equipment to the Soviet Union," Mr. Herbst said. "It also involves inviting them over here to fish and teaching them fly fishing, which they don't do."

Mr. Herbst said that Trout Unlimited will sponsor trips for Soviet fishermen to the United States beginning this fall. American anglers will be able to take trips through Intourist, the Soviet travel agency, to various parts of the Soviet Union.

Under the agreement, sport-fishing equipment manufacturers will be able to pierce the Soviet market.

Officials on the State Department's Soviet desk said yesterday that President Reagan has made it U.S. policy to encourage non-strategic materials trade with the Soviet Union to improve the balance of trade situation.

An economics expert on the Soviet desk said "this proposal fits right into that type of trade, even though we did not, apparently, give it an official sanction."

The official, however, said he was unaware of the part of the agreement that would allow Soviet fishermen any special new access to U.S. rivers.

Trout Unlimited and Rosohotrybolovsoyuz plan annual conferences, alternating between the United States and the Soviet Union, that will focus on promoting sport fishing and fish conservation.

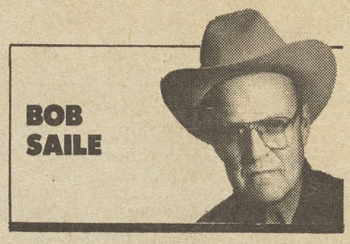
"There have not been enough such cultural exchanges, and it is important both in that regard and on the technical level," said Mr. Herbst, who, in the Carter administration, served as assistant secretary of interior for fish, wildlife and parks.

Stephen Lundy, Trout Unlimited's Rocky Mountains regional vice president and a coordinator of the exchange, said, "Americans will now be able to enjoy some of the great hunting and fishing in the Soviet Union, and the Russians will benefit from our techniques and, of course, our dollars."

William Davies, president of the Arizona chapter of Trout Unlimited, said both the Soviet Union and the United States face problems that threaten wildlife.

40-pound trout settles the issue

Big brown will hold world record



I don't know what Howard "Rip" Collins really expected to catch when he cast a tiny jig out into the flow of Arkansas' Little Red River earlier this year, but what he finally wrestled to shore was the resolution of an angling controversy that dates back more than a century.

In the past 20 years, the major players in the hassle have been the International Game Fish Association (IGFA), Field & Stream magazine and the National Fresh Water Fishing Hall of Fame. What has been at stake is the all-tackle world angling record for brown trout.

Collins, of Heber Springs, Ark., landed a 40-pound, 4-ounce brown on 4-pound-test line from the Little Red, a tributary of the White River. Aside from being a light-line angling feat of Herculean proportions, Collins' catch also will go into the record books as the largest brown ever caught on standard tackle.

Maybe a small asterisk should accompany that statement, temporarily. IGFA, the salt- and fresh-water records-keeping organization based in Pompano Beach, Fla., is still plodding through the procedure it follows in verification of a would-be record. Collins caught his fish in May.

But Jim Brown, assistant to the president of IGFA, tells me there appear to be no major questions about the catch.

"We have a letter out (to Collins) asking for a little more verification," said Brown, "It's more or less a formality."

The Hall of Fame, a non-profit fishing museum and independent records-keeping organization based in Hayward, Wis., reports that Collins dotted all the I's and crossed all the T's. The hall officially has accepted his trout as the all-tackle record.

Fish from Utah, Michigan, Scotland, Argentina, Sweden and even another one from Arkansas have at one time or another laid claim to the hallowed spot atop the brown-trout category, and some of those had rather large asterisks attached.

You have to look back as far as 1866 to follow the twists and turns of the brown-trout saga. That was the date given for the reported catch on a wet fly of a 39-pound, 8-ounce brown in Loch Awe, Scotland, by someone identified as W. Muir.

This fish found its way into the world-record listings of Field & Stream, which prior to 1970 (when the Hall of Fame was organized) was the only keeper of fresh-water records. In more recent years, IGFA decided to take on fresh-water records duties as well as salt-water supervision. The magazine turned over its big-fish files to IGFA.

Before that happened, the Hall of Fame, doing creditable detective work, learned from European sources that the Scotland brown trout had been foul-hooked — and thus was ineligible for records recognition.

The hall disqualified that fish and replaced it with a succession of browns caught in various waters and weighing up to 34 pounds, 8 ounces.

Field & Stream and the Hall of Fame became embroiled in a mud-slinging contest over who was the keeper of world records. Eventually, when Field & Stream abdicated those duties to IGFA, the Scotland fish was dropped from the magazine's list. IGFA initially installed a 35-pound, 15-ounce brown caught in 1952 in Argentina as the world record, but it has been replaced by a 37-pound, 7-ounce brown caught last year in Sweden.

In 1988, Michael Manley caught a 38-pound, 9-ounce brown from the North Fork River in Arkansas. At that time, the Hall of Fame recognized Manley's catch as the world record, but IGFA didn't. IGFA rejected the fish because it was caught on a baited treble hook (as opposed to a single hook), even though lures with treble hooks are considered kosher by IGFA.

Now enter Collins, a retired military man, to put to rest all this confusion with his 40-pound, 4-ounce beauty.

Give the man a medal.

Bag limit looks duckier

Colorado hunters will be able to bag one more mallard drake this year under a just-announced revision in the point-system bag limit. The U. S. Fish and Wildlife Service, bending to requests from state wildlife officials, has lowered the point value on mallard drakes from 50 to 35 in western portions of the Central Flyway.

What it means is that East Slope hunters will be able to bag three mallard drakes before reaching or going over the 100-point standard, instead of just two drakes.

FERREIRA FIRE: South Africa's W against Michael Chang in a U.S. Ope York last night.

Free agency

PAIGE from Page 1D

Instead, the league appealed, delayed, negotiated, threatened and relied on intimidating tactics — failing to contribute to the players' pension fund, for instance — and eventually reached a settlement with the executive director of the NFL Players Association, Ed Garvey, which allowed the league owners to basically continue their policy of see-no-free-agency, hear-no-free-agency, speak-no-evil in return for promises of higher salaries.

So, just because a jury in Minnesota found the NFL guilty of slavery yesterday, don't expect a quick, bloodless end to indenture.

Even before the decision was announced, one NFL owner said privately: "If we lose, we'll appeal for years, and eventually the only people who will make any money out of this mess will be the attorneys."

The players and their represen-

Harvest bumper crop of '92 football cards

By Allen Daniel
Denver Post Sports Writer

...the leaves are about to turn, the ...raphy, glossy finish and appreciation potential make dipping into the checking account worthwhile.

Golf...
$19.95 + tax
Including Cart
Monday-Thursday anytime
and after 2:00 p.m. Fri., Sat., Sun.
Eagle Golf Club

STATS

Post Scoreline (local scores only) 820-1570
Dial Sports from The Post 1-900-370-1551
75 cents/minute for national scores, updates

TENNIS

U.S. OPEN
At New York
MEN'S SINGLES
Quarterfinals

Michael Chang (4), Placentia, Calif., def. Wayne Ferreira (12), South Africa, 7-5, 2-6, 6-3, 6-7 (4-7), 6-1.

MEN'S DOUBLES
Semifinals

Jim Grabb, Tucson, and Richey Reneberg, Palm Desert, Calif. (2), def. John McEnroe, New York, and Michael Stich, Germany (6), 3-6, 7-5, 7-6 (7-2), 4-6, 6-2.

WOMEN'S DOUBLES
Semifinals

Gigi Fernandez, Aspen, and Natalia Zvereva, Belarus (3), def. Arantxa Sanchez Vicario, Spain, and Helena Sukova, Czechoslovakia (2), 6-1, 6-3.

MASTERS
Men's singles
Quarterfinals

Hank Pfister (1), Bakersfield, Calif., def. Bob Lutz, San Clemente, Calif., 6-1, 2-0, retired.

Wojtek Fibak, Poland, def. Tomas Smid, Czechoslovakia, 6-4, 6-4.

Gene Mayer (4), Woodmere, N.Y., def. Ilie Nastase, Romania, 6-1, 6-1.

Peter Fleming, Glen Cove, N.Y., def. Tom Gullikson (2), Palm Coast, Fla., 7-6 (7-5), 6-2.

Women's doubles
Championship

Wendy Turnbull, Australia, and Virginia Wade, Britain (2), def. JoAnne Russell-Longdon, Naples, Fla., and Sharon Walsh, San Rafael, Calif., 6-3, 6-4.

TODAY'S FEATURED MATCHES,
All times MDT
STADIUM
9 a.m.
MEN'S DOUBLES
Championship

Jim Grabb, Tucson, and Richey Reneberg, Palm Desert, Calif. (2), vs. Kelly Jones, San Diego, and Rick Leach, Laguna Beach, Calif.

WOMEN'S SINGLES
Semifinals

Arantxa Sanchez Vicario (5), Spain, vs. Manuela Maleeva-Fragniere (9), Switzerland

Monica Seles (1), Yugoslavia, vs. Mary Joe Fernandez (7), Miami

WOMEN'S DOUBLES
Semifinal

Jana Novotna, Czechoslovakia, and Larisa Savchenko-Neiland, Latvia (1), vs. **Martina Navratilova, Aspen,** and Pam Shriver, Baltimore (4)

GRANDSTAND
9 a.m.
MIXED DOUBLES
Championship

Helena Sukova, Czechoslovakia, and Tom Nijssen, Netherlands (5), vs. Nicole Provis and Mark Woodforde, Australia (6)

MASTERS
Men's singles
Semifinals

Hank Pfister (1), Bakersfield, Calif., vs. Gene Mayer (4), Woodmere, N.Y.

Wojtek Fibak, Poland, vs. Peter Fleming, Glen Cove, N.Y.

STATE SENIOR OPEN
At Denver Tennis Club
MEN'S SINGLES

35 (second round) — Randy Stein def. Rick Garth, 7-5, 6-3.

40 (first round) — Tom McCroskey def. Mike Fryman, 6-3, 7-5.

50 (second round) — Sy Moskowitz def. Carlos Olivares, 6-0, 6-1.

60 (quarterfinals) — Sy Schutzer def. Keith Roe, 6-2, 6-2; Alvie Willis def. Tom Keach, 6-2, 6-2; Mac Dunlap def. Hal Kepner, 6-4, 6-1; Jim O'Connor def. Jack Whitcomb, 6-4 6-7 (6-8), 6-2.

65 (quarterfinals) — George Covington def. Ray Ristow, 6-1, 6-2; Ken Hobbie def. Andy Fay, 2-6, 6-2, 6-3; Herb Delaney def. Ed Young, 6-0, 6-2.

70 (quarterfinals) — Bill Greenzweight def. Jack Hallowell, by default; Ned Crow def. Glenn Leonard, 6-2, 6-1; Stewart Scales def. Peter Trostorff, 6-3, 6-4; Dave Wilhelm def. Stephen Tanner, 6-4, 6-0.

WOMEN'S SINGLES

35 (quarterfinal) — Judy Ray def. Joyce Lewis, 7-6 (7-0), 6-2.

40 (quarterfinal) — Sandi Ogin def. Cheryl Bishop, 6-3, 6-1.

45 (quarterfinals) — Sheila Rutledge def. Gayle Louis, by default; Laura Miles def. Eileen Hyatt, 6-0, 6-3; Bette Mulholland def. Molly Orr, 6-2, 6-0.

55 (final) — Helly Wood def. Jean Waitman, 6-7 (3-7), 6-4, 6-4.

MEN'S DOUBLES

30 (semifinal) — Quincy Howard-Jim Mease def. Dave McMillan-Mike Gugliotto, 6-3, 6-2.

35 (quarterfinal) — Randy Stein-Bruce Schnelle def. Keith Carpenter-Steve Henson, 6-3, 4-6 6-1.

40 (quarterfinals) — Larry Gabler-Howard Noble def. Bob Snyder-Rich Handelman, 6-2, 6-1; Dick Layshock-Mike Fryman def. Bill Gauditz-Mike Geppner, 6-1, 6-2; Tom McCroskey-Robert Johnson def. Randy Sontheimer-Andy Harrison, 3-6, 6-1,6-4; Mike Connelly-Leon Marks def. Paul Vaccaro-Frank Fulton, 6-0, 6-2.

45 (quarterfinals) — Sam Bell-Wayne Schell def. Don Simpson-Jim Poppleton, 7-6 (7-5), 6-4; Joe Martin-Tariq Abdulhamid def. Rich Boddicker-Milt Kohn, 6-1, 6-0; John Meck-Jack Lewis def. Rick Schrah-Jack McTavish, 6-2, 4-6, 7-6 (7-2).

55 (quarterfinals) — Charles Henry-Charlie Brown def. Dave Brictson-Tom Lowe, 6-4, 6-3; Tom Jorgensen-Bob Neff def. Mac Dunlap-Dixie Baines, 6-4, 2-6, 7-6 (7-2); Carl Scheer-Pete Gunderson def. Jack Soder-Phil Heinschel, 6-2, 6-4; Mat Tribelhorn-Phil Pittz def. Bill Hahn-Alvie Willis, 7-5, 6-22.

75 (round robin) — Gerry Japha-Jake Warden def. Bob Hadley-Mac Shwayder, 4-6, 6-1, 6-2. Japha-Warden finish second.

WOMEN'S DOUBLES

50 (round robin) — Bonnie Gray-Boots O'Brien def. Fleischauer-Oda, 3-6, 6-4, 6-3.

70 (round robin) — Carolyn Byrne-Dot Henderson def. Betty Bloom-Sally Huff, 6-0, 6-0.

MIXED DOUBLES

35 (quarterfinals) — Carol Baily-Mark Moyle def. Diane Selke-Warrick Jones, 6-3, 6-7 (5-7), 6-4; Gay West-Randy Ross def. Gail Kilker-Dave Hornbecker, 6-1, 6-4; Sue Dillinger-Dave McMillan def. Nicole Yorkey-Mike Yorkey, 6-3, 6-3.

45 (semifinal) — Thera Dickson-Jon Ellis def. Pat Nance-Nick Nance, 6-4, 6-3.

TRANSACTIONS

BASEBALL
American League

BOSTON RED SOX — Named **Hoard McCullough** East Coast supervisor of scouting, **Sonny Bowers** midwest supervisor of scouting, and **Mike Rizzo** scout.

KANSAS CITY ROYALS — Recalled **Dennis Moeller,** pitcher, from Omaha of the American Association. Purchased the contract of **Dennis Rasmussen,** pitcher, from Omaha. Placed Boddicker, pitcher, on the 60-day disabled list.

SPORTS ON THE AIR

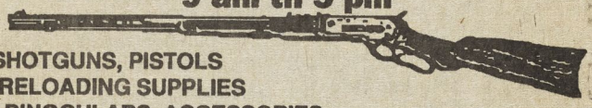
TELEVISION

AUTO RACING	5:30 p.m.	NASCAR Autolite Platinum 200	PSN
BASEBALL	5:30 p.m.	Milwaukee Brewers at Baltimore Orioles	ESPN
	6 p.m.	Chicago Cubs at St. Louis Cardinals	WGN
	6:30 p.m.	Atlanta Braves at Houston Astros	TBS
	8:30 p.m.	Cincinnati Reds at San Diego Padres	ESPN
GOLF	2 p.m.	Canadian Open, second round	ESPN
TENNIS	9 a.m.	U.S. Open, women's singles semifinals	Ch. 7
	11 p.m.	U.S. Open highlights	Ch. 7

RADIO

BASEBALL	5:15 p.m.	K.C. Royals at N.Y. Yankees on KLMO	1060 AM
	6 p.m.	Chicago Cubs at St. Louis Cardinals on KYBG	1090 AM
	8 p.m.	Cincinnati Reds at San Diego Padres on KFKA	1310 AM
FOOTBALL	7:30 p.m.	High school: Boulder at Bear Creek on KBOL	1490 AM
TALK SHOWS	10 a.m.	Sandy Clough and Steve Harms on KYBG	1090 AM
	2 p.m.	Gil Whiteley on KDEN	1340 AM
	2 p.m.	Irv Brown and Joe Williams on KYBG	1090 AM
	6 p.m.	Dave Logan on KOA	850 AM

THIS WEEKEND
CROSSROADS of the WEST
GUN SHOW
I-70 & Chambers Rd. at the Holiday Inn Center
SEPTEMBER 12 - 13
9 am til 5 pm



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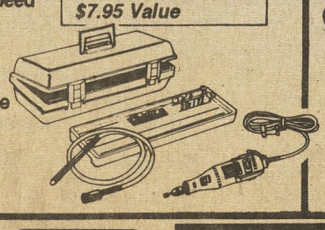

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LAMAR TRI-STATE
DAILY NEWS

FEB 17 1971

COLORADO PRESS CLIPPING SERVICE
DENVER, COLORADO 8

(photo by Mills)

Record 'Brook Trout' Is a Record Splake

FORT COLLINS — What was thought to be a state and national record brook trout caught in Island Lake on Grand Mesa by C. E. Rose of Palisade last month has turned out to be a state record splake. In addition, it is very possibly a national and world record fish.

The fish caught by Rose, which weighed 12 pounds, seven ounces and measured 28¾ inches in length, was at first identified as a brook trout. However, some markings similar to a mackinaw were noted, and to be sure, the fish was sent to Dr. Robert J. Behnke of the Colorado Cooperative Fisheries Unit at Colorado State University. Dr. Behnke is known as one of the more knowledgeable men in this country in trout research.

Dr. Behnke reported that identification of the fish as a splake was made from its well developed teeth on the brasibranchial plate, spot markings on the fins instead of wavy markings and a study of the scales.

Colorado's record splake was caught by Paul Patton of Kansas City, Mo., in 1967 and was taken from the same Island Lake on Grand Mesa. Patton's fish weighed six pounds, 12 ounces and measured 24 inches. Rose's record fish is almost twice as heavy.

So the splake caught by C. E. Rose of Palisade is the Colorado record by quite a bit, is probably a national record and may be a world record. Dr. Behnke is contacting Canadian authorities to see if they have records of any larger splake taken from waters north of the U. S.-Canadian border.

A splake is the result of cross mating of a makinaw (lake trout) with a brook trout.

CRAIG TAMPA VALLEY FLASHES

COLORADO PRESS CLIPPING SERVICE
DENVER, COLORADO 8020

Glenwood Springs Sage Quinquennial

No Record Brook But Record Set

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Record brook trout it's not

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TRANSLATED

Since its publication in the early 1600's Miguel de Cervantes's masterpiece Don Quixote has been more widely translated than any other book except the Bible, the National Geographic Society says in its new book, **The Renaissance.**

Outdoor Empire

Ancient Trout Species Found

By Bob Saile

HUNDREDS OF centuries before the white man ever set foot in the territory that is now Colorado, a beautiful fish with a dark-spotted, greenish-golden body and red slash marks under its jaw was the only trout that swam in the pure waters of the region. Later, man was to give him three commonly used names: Greenback trout, cutthroat trout and, technically, Salmo clarki stomias.

This once ubiquitous trout was found throughout three major river drainages in Colorado—the Colorado, the Arkansas and the Rio Grande. Today, modern versions of the cutthroat are found in a relatively few redoubts in the high country, his range usurped by the coming of people and his trout cousins. The rainbow trout was brought here from the Pacific Coast about 1880, the eastern brook trout from the East Coast about the same time, and the brown trout from Europe in about 1890.

ROBERT BEHNKE

Salmo clarki stomias didn't compete well with humans and other trout. The cutthroats that Colorado has in 1970 are mostly imported versions—beautiful fish, but not the original greenback.

It is, therefore, a minor miracle of nature that a population of apparently pure greenbacks has been discovered in a tiny mountain stream no more than 40 miles from the smog-shrouded spires of downtown Denver.

Robert J. Behnke, an assistant professor of fishery biology at Colorado State University, has scientifically identified the fragile inhabitants of this stream as original cutthroats. The stream, which has no name, is near Nederland, Colo., not far from a highway. It's a tributary of North Boulder Creek and lies in Roosevelt National Forest.

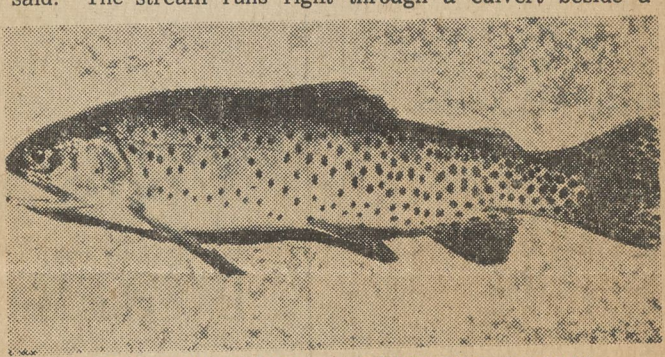
Trout Examined at CSU

Acting on a tip, Behnke and an assistant, Gary Wernsman, went to the stream in September of last year and collected several trout by electro-fishing.

Back at Fort Collins, Behnke, assistant unit leader of the Colorado Cooperative Fishery Unit at CSU, painstakingly examined the trout. It's impossible to identify accurately a trout as a native greenback by simply looking at it. One of the keys to identification is the number of vertebral segments in the fish's bone structure.

The counts from the specimens ranged from 59 to 61 segments. This is a characteristic of a greenback—counts on subspecies of cutthroats are typically 61 to 62; counts on rainbow trout are typically 63 to 64.

"This creek is so small you'd hardly notice it," Behnke said. "The stream runs right through a culvert beside a



GREENBACK TROUT—A COLORADO NATIVE

Forest Service road, and I guess it's so small nobody bothers to fish it."

How does he account for the existence of these lonely throwbacks to history?

"Well, there are no lakes or ponds at the head of this stream, and that's probably the reason it has never been stocked with other trout," said Behnke. "Another reason there are no other kinds of trout in it is the fact that the stream drops 500 feet in a distance of a half-mile before joining North Boulder Creek. No other fish can get upstream."

Some Greenbacks Transplanted

A few days ago, Behnke cooperated with biologists of the National Park Service in an effort to transplant some of the stream's greenbacks to a small stream in Rocky Mountain National Park.

About 50 of the cutthroats were placed in a tank and driven to the Stanley Hotel at Estes Park, where a helicopter hired by the Park Service picked them up and ferried them to a small tributary in the Big Thompson River drainage, in the northwestern section of the park. There were no other trout in this unnamed stream, which can be reached overland only by several miles of trail.

The helicopter landed and the trout were planted by hand.

The cutthroat project, Behnke said, is part of the Park Service's commitment to perpetuating and re-establishing indigenous species of plants and animals in the country's national parks.

Previous efforts have been made to re-establish greenbacks in Black Hollow Creek, a tributary of the Poudre River in Larimer County. The first try, in a cooperative effort with the Forest Service and other agencies, was in 1968, when 10 greenbacks from Albion Creek (another North Boulder Creek tributary) were transplanted to Black Hollow Creek. (Behnke believes the Albion Creek greenbacks by now are extinct.)

Two surveys of Black Hollow Creek in 1969 failed to turn up any sign of the transplants or evidence of reproduction. Last April, 52 greenbacks were taken from the small stream near Nederland to be stocked in Black Hollow, but they died from a fungi disease before they could be transplanted.

In June, 42 more greenbacks from the Nederland area stream were transplanted to Black Hollow Creek. The results of that transplant aren't known yet.

Behnke knows of two other spots on the Eastern Slope where almost pure greenbacks exist. One is in Rocky Mountain National Park and the other is on the North Boulder Creek drainage.

He says the greenback is his "sentimental favorite" of all fish. "It's a beautiful fish," he said, "and I guess I have a sympathy for the underdog."

PIRING

n Hearts of Fo

there are two seniors, five freshmen (given special eligi-

man and his staff have taken ght it a new, simpler offense more grit than proficiency. ut back here for the time the back of his head. "We forward now."

hat it means to Wichita lies iving coaches and players. It an in the locker room just

ke every ounce of strength layers. Later he said it took up.

egrams from his pocket and players one from the parents ohnson, who perished in the u must continue—that's what u, and so is Ron."

Then Seaman, in his first g asked his players for a silent p teammates before he led them i

Before Wichita took the fie Plain, Kan., which suffered seric the crash, hobbled to the cente for the toss of the coin. A sym about 40,000 cheered.

Arkansas Coach Frank Bro would try to be as much of "This is the type of game you cipline. We will play it by ear."

Many Arkansas fans also Wichita's comeback efforts. Co day night to the Wichita funds s $250,000 in expenses facing th tragedy.

Defensive Coach Fred Conti men who were going against A games as high school gridders.

Win String to Seven

n the NBA Midwest Division nd dropped the SuperSonics, ow 3-3, into a three-way tie ith San Francisco and Los Aneles for the lead in the Pacific Division.

Virginia cruised to its sixth victory—and consigned Memphis to its third defeat in four games—on the strength of George Carter's 26 points and 4 by Charlie Scott. Jimmy Jones, who tied Wendell Ladner or Memphis scoring honors with 18, became the seventh BA player to pass the ,000-point career mark.

In another development, the New York Nets of the ABA announced that superforward Rick Barry, who reinjured his right oot last Friday, will be sidelined for about five weeks with what physicians called a "fatigue fracture."

Royals Top Hawks

ATLANTA	G	F	T	CINCINNATI	G	F	T
Bridges	6	0-2	12	Varsdle	6	6-10	18
Hudson	10	8-12	28	Paulk	6	1-2	13
Bellamy	5	3-11	13	Imhoff	2	0-1	4
Hazzard	8	-2-2	18	Archbld	9	4-5	22
Marvch	4	8-9	16	VanLier	2	2-4	6
Chmbrs	1	2-3	4	Green	11	8-11	30
Davis	4	1-3	9	Lacey	9	0-1	18
Chrstn	1	2-2	4	Arnzen	2	3-4	7
White	1	0-0	2	Barr	2	2-3	6
Vallely	0	1-1	1	Hyder	1	0-0	2
Totals .	40	27-45	107	Totals	50	26-41	126

Atlanta ..... 27 28 26 26—107
Cincinnati ..... 32 37 28 29—126
Fouled out—None
Total fouls—Atlanta 32, Cincinnati 32.
A—2,278
V1110ped Oct. 26

Pistons Rip Sonics

SEATTLE	G	F	T	DETROIT	G	F	T
Black	5	0-0	10	Bing	16	3-3	35
Clemens	2	1-2	5	Dischngr	8	2-2	16
Cross	3	3-7	9	Driscoll	4	2-2	10
Herd	0	2-2	2	Hewitt	3	2-3	8
Kojis	5	5-5	15	Komives	6	0-0	12
Meschry	3	2-3	8	Lanier	6	1-2	13
Smith	6	7-9	19	Marlatt	1	1-1	3
Snyder	2	2-2	6	Mix	5	1-2	11
Thorn	4	1-3	9	Moore	3	0-0	6
Wilkens	4	4-5	12	Mueller	0	0-0	0
Winfield	7	2-6	16	Quick	4	1-2	9
				Walker	6	5-5	17
Totals	41	29-44	111	Totals	62	18-22	142

Seattle ..... 24 24 30 33—111
Detroit ..... 39 36 36 31—142
Fouled out — None.
Total fouls — Seattle 22, Detroit 30.
Attendance — 2,835.

Squires Rap Pros

VIRGINIA	G	F	T	MEMPHIS	G	F	T
Moe	6	0-1	12	Govan	5	2-2	12
Carter	9	8-10	26	Ladner	8	2-3	18
R.Scott	10	0-1	20	Cueto	0	0-0	0
Johnson	3	1-1	7	W.Jones	3	0-0	6
Card	2	1-1	5	Raymnd	6	4-5	16
Eakins	5	0-1	10	Davis	3	0-0	6
Brown	2	5-5	9	J.Jones	4	10-13	18
C.Scott	8	5-6	24	S.Jones	3	1-2	7
Taylor	1	1-2	3	Warren	2	0-0	4
Barrett	2	0-0	4	Swift	6	4-4	16
Totals	48	21-28	128	Totals	40	23-29	103

Virginia ..... 28 32 37 33—120
Memphis ..... 26 26 29 22—103
Three-point goals—C. Scott.
Fouled out—Virginia, C. Scott, Barrett.
Total fouls—Virginia 27, Memphis 27
A—1,189.
am1147pes Oct 26

Denver Host To Memphis Five Tonight

CONTINUED

Keye had a ligament operation during the off-season after missing most of the 1969-70 playoffs and is still hampered by the knee.

The Pros (last year's New Orleans' Bucs) feature the Jones boys, Steve, Jimmy, Wilbert and Billy. The latter, who averaged 56.3 per cent accuracy in field-goal attempts during his career at Louisiana State College, was signed to the Memphis team by its coach and general manager, Babe McCarthy. The six-foot-8 Jones, 21, is a native of Dyersburg, Tenn., and grew up in Pineville, La.

McCarthy's team is 1-3 with successive losses to tough Virginia and the Rockets (2-4) could stay ahead of the Pros in the Western Division with a victory Tuesday.—RALPH MOORE

Pro Basketball Standings

NBA

EASTERN CONFERENCE
ATLANTIC DIVISION

	W	L	Pct.	GB
New York	5	2	.712	..
Philadelphia	5	2	.712	..
Boston	3	4	.429	2
Buffalo	1	3	.250	2½

CENTRAL DIVISION

	W	L	Pct.	GB
Baltimore	4	2	.667	..
Atlanta	1	4	.200	2½
Cincinnati	1	5	.167	2
Cleveland	0	7	.000	4½

WESTERN CONFERENCE
MIDWEST DIVISION

	W	L	Pct.	GB
Detroit	8	0	1.000	..
Milawukee	3	1	.750	3
Chicago	3	2	.600	3½
Phoenix	3	3	.500	4

PACIFIC DIVISION

	W	L	Pct.	GB
Seattle	3	3	.500	..
San Francisco	3	3	.500	..
Los Angeles	3	3	.500	..
San Diego	4	4	.500	1
Portland	2	4	.333	1

MONAY'S RESULTS
Cincinnati 126, Atlanta 107.
Detroit 142, Seattle 111.
Only games scheduled.

TUESDAY'S GAMES
San Diego at Milwaukee.
Seattle at New York.
Buffalo at Portland.
Only games scheduled.

ABA

WEST DIVISION

	W	L	Pct.	GB
Utah	3	0	1.000	..
Indiana	6	2	.750	..
DENVER	2	4	.333	3
Memphis	1	3	.250	3
Texas	0	3	.000	3½

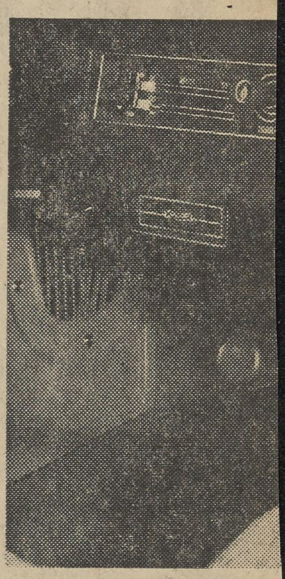
EAST DIVISION

	W	L	Pct.	GB
Virginia	6	0	1.000	..
Florida	4	2	.667	2
New York	4	3	.571	2½
Kentucky	3	4	.429	3½
Pittsburgh	2	5	.286	4½
Carolina	0	5	.000	5½

MONDAY'S RESULTS
Virginia 120, Memphis 103.

TUESDAY'S GAMES
Memphis at DENVER.
New York vs. Texas at Fort Worth.
Virginia at Pittsburgh.

Vega &
Mark
are rea



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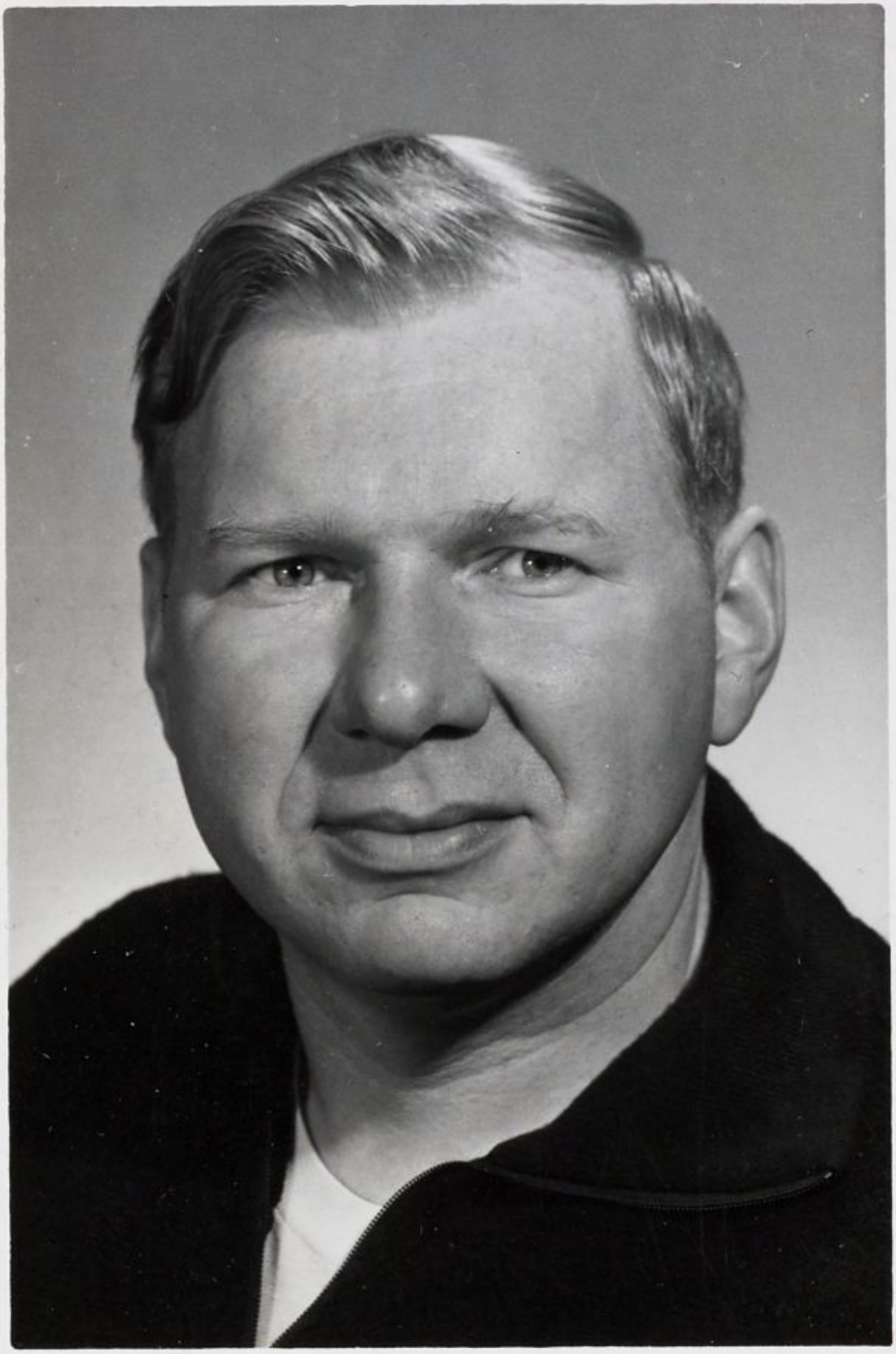

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GRAND JUNCTION
DAILY SENTINEL
FEB 14 1971

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Record Trout Turns Out To Be Splake

FORT COLLINS — What was thought to be a state and national record brook trout caught in Island Lake on Grand Mesa by Mr. C. C. Rose of Palisade last month has turned out to be a state record splake.

In addition, it is very possibly a national and world record fish.

The fish caught by Mr. Rose, which weighed 12 pounds, 7 ounces and measured 28¾ inches in length, was at first identified as a brook trout. However, some markings similar to a mackinaw were noted, and to be sure, the fish was sent to Dr. Robert J. Behnke of the Colorado Cooperative Fisheries Unit at Colorado State University. Dr. Behnke is known as one of the more knowledgeable men in this country in trout research.

Dr. Behnke reported that identification of the fish as a splake was made from its well developed teeth on the brasibranchial plate, spot markings on the fins instead of wavy markings and a study of the scales.

Colorado's record splake was caught by Paul Patton of Kansas City, Missouri in 1967 and was taken from the same Island Lake on Grand Mesa. Patton's fish weighed 6 pounds, 12 ounces and measured 24 inches. Rose's record fish is almost twice as heavy.

So the splake caught by C. E. Rose of Palisade is the Colorado record by quite a bit, is probably a national record and may be a world record. Dr. Behnke is contacting Canadian authorities to see if they have records of any larger splake taken from the waters north of the U.S.-Canadian border.

A splake is the result of cross mating of a mackinaw (lake trout) with a brook trout.

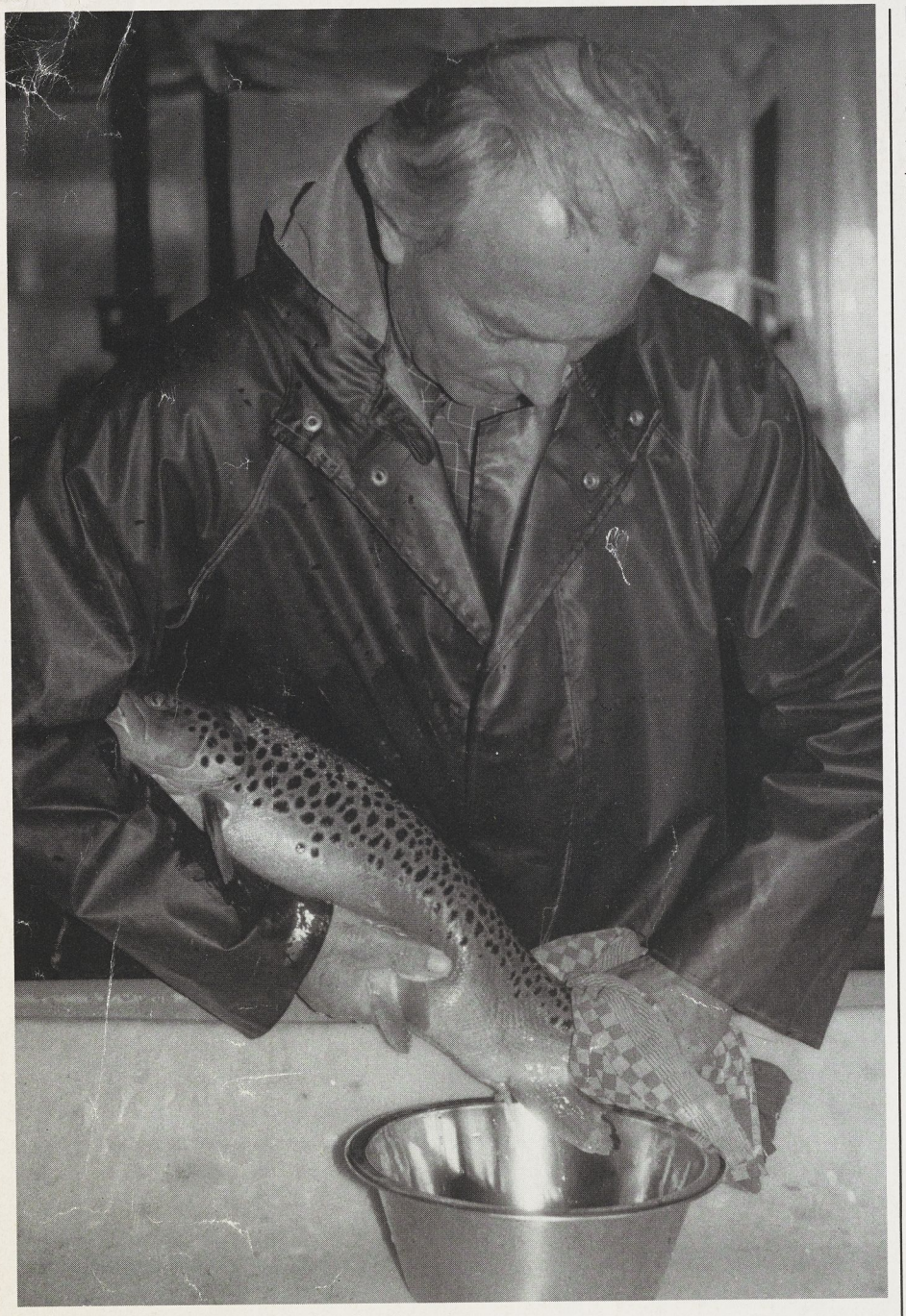

Abbildung 3: Streifen eines Seeforellenrogners

1985). Da ein ziemlich starker Hechtbestand im See vorhanden war, mußten 2sömmerige Seeforellen mit einem Stückgewicht von 300 bis 400 g ausgesetzt werden (Abbildung 3). Im letzten Herbst konnten die ersten Seeforellen beim Laichen in der Schlierach im nahen Bereich des Seelaufs beobachtet werden. Bei einem hoffentlich sicheren Brutaufkommen dürfte diese Wiedereinbürgerungsmaßnahme erfolgreich abgeschlossen werden können.

Einige Details über die Wiedereinbürgerung der Seeforelle in den im Bayerischen Nationalpark befindlichen Königssee werden in einem der nachfolgenden Beiträge (NEGELE und LEUNER) beschrieben.

Auch der Erstbesatz mit 2sömmerigen Seeforellen des vor Jahren wieder neubespannten Titisees/Schwarzwald verläuft sehr erfolgversprechend.

Seesaibling (Salvelinus alpinus)

Mit aus dem zunehmend eutropher werdenden Walchensee stammenden Seesaiblingslaicherbestand wurden wiederum Bestandsstützungen im Walchensee vorgenommen.

Ein aus den schlecht wachsenden Königsseer Schwarzreuthern mit einem Stückgewicht von 80 bis 120 g in vier bis acht Jahren nachgezogener Laicherstamm beeindruckt bereits nach 2 Jahren mit durchschnittlichen Stückgewichten um 300 g.

Flußkrebse u. a.

Über Ergebnisse eines vom Bayerischen Staatsministeriums für Landesentwicklung und Umweltfragen finanzierten umfangreichen Forschungsprojektes über die einheimischen Flußkrebse wird noch berichtet. In dieses Projekt sind zusätzlich die vergesellschafteten Kleinfischarten eingebunden.

Als weitere begonnene Arbeit ist die natürliche Vermehrung des Schlammpeitzgers (Misgurnus fossilis) unter verschiedenen Biotopstrukturen zu nennen.

Die in bescheidenem Umfang angefangenen Untersuchungen zur Biologie der europäischen Sumpfschildkröte (Emys orbicularis) mußten vorerst mangels Materials eingestellt werden.

Im Juli 1986 konnten in einem Bereich der Donau stromabwärts von Regensburg 5000 Jungsterlets aus Szazhalombatta/Ungarn als erste größere Wiedereinbürgerungsaktion ausgesetzt werden, die ebenfalls von der vorgesetzten Dienstbehörde finanziell gefördert wurde. Der Aufbau eines Laichfischbestandes an Sterlets (Acipenser ruthenus) in der Wielenbacher Versuchsanlage darf als abgeschlossen gelten (Abbildung 4).

Indirekte Schutzarbeiten

In den Komplex des fischereilichen Artenschutzes gehört auch die kritische Auseinandersetzung und konstruktive Zusammenarbeit mit der Freizeitfischerei (BOHL, 1971; 1975; 1981; 1986). Neben den vielen positiven intensiven Gewässerschutz- und -pflegemaßnahmen müssen jedoch die von vielen Vereinen mit guter Absicht und oft großem finanziellen Aufwand betriebenen Besatzaktionen mit Vertretern bedrohter Fischarten kritisch hinterfragt werden; denn: Ist ohne genauere Erforschung der Ursache der Bestandsbedrohung bzw. des Aussterbens, ohne Biotopsanierung und Ermittlung der Erfolgschance ein Besatz überhaupt zu verantworten?

Auch dem Drange von Anglerkreisen nach Einbürgerung nichteinheimischer Fischarten muß entgegengesteuert werden. Die Verlockungen sind groß, doch die Störung des biologischen Gleichgewichts bzw. Zerstörung der angestammten Biozönose im Besatzgewässer kann unabsehbare Folgen zeitigen. Nicht ohne Grund ist deshalb der Aussatz nichteinheimischer aquatischer Organismen verboten.

Wegbereiterdienste leisten mitunter Teichwirtschaften. Nachdem fremdländische Fischarten zu Produktions-

bürgerung gemäß den ,,Empfehlungen für die Wiedereinbürgerung gefährdeter Tiere'' (N. N., 1982) vorgenommen werden. In einigen Fällen können aus intakten gesunden Fischpopulationen nach fachmännischer Kontrolle Besatzfische für oben erwähnte Vorhaben entnommen werden – ohne diesen Bestand zu gefährden. Besatzfische sind den Umständen entsprechend vorteilhafterweise aus Wildfischen nachzuziehen. Wo es nicht oder kaum möglich ist, wie beim Huchen oder bei massiver Gefahr der Einschleppung von Seuchenerregern, empfiehlt es sich, einen Laichfischbestand im Teich aufzubauen. Die mit Seesaiblings- und Seeforelleneiern aus dem Walchensee in die Versuchsanlage eingeschleppten Erreger (Renibacterium salmoninarum) der bakteriellen Nierenkrankheit konnten nur mit kostspieligem therapeutischem und hygienischem Aufwand erfolgreich bekämpft werden.

Nach Entstehung von Gewässern, wie Baggerseen, sind für den Gewässertyp geeignete Fischarten als gezielte Neuansiedlung einzubringen. Bei Stauseen sind möglichst nur solche Arten anzusiedeln, die in dem Gewässersystem vorkommen, soweit sie für den neuen Gewässertyp ökologisch vertretbar sind.

Von einer Einbürgerung nichteinheimischer Arten ist grundsätzlich Abstand zu nehmen.

Neben einer Bestandshege und -überwachung sind als flankierende Maßnahmen alle die der Fortentwicklung des Besatzes zweckdienlichen Förderungen zu verwirklichen, wie sie u. a. in den bereits erwähnten ,,Empfehlungen für die Wiedereinbürgerung gefährdeter Tiere'' enthalten sind. Hierzu gehört auch die Einbindung des Umfeldes in die Gesamtbetrachtung, welches auch schon bei der Biotopanalyse und bei der Ermittlung der Gefährdungsursache zu geschehen hat.

Zwecks besserer Übersicht sind die genannten Punkte in Abbildung 2 als mögliches Verfahrenskonzept (BOHL, 1985b erweitert; partiell nach E. BOHL) zusammengestellt.

Wielenbacher Beiträge

Durch die laufenden Um- und Ausbaumaßnahmen in der Versuchsanlage konnten in der zurückliegenden Zeit nur in beschränktem Umfang Untersuchungen durchgeführt werden, wie:

Zur Bestandserhaltung der Huchen (Hucho hucho)

Da zu Beginn der 70er Jahre kaum noch Hucheneier auf dem Markt zu erhalten waren, die Eilieferungen aus Jugoslawien und der CSSR nach 1973 gänzlich eingestellt wurden und die Unabwägbarkeiten des Fanges von laichreifen Huchen auf dem ,,Bruch'' keine Basis für einen gezielten Artenbschutz bilden, wurde im Jahre 1974 mit dem Aufbau eines Huchenlaichfischbestandes in der Versuchsanlage Wielenbach begonnen. Dankenswerterweise stellte uns Fischzüchter H. Heiserer, Prem, einige Tausend Stück freßfähiger Brut zur Verfügung.

Die Erfahrungen und Probleme mit der Laichfischhaltung, der Ernährung, der künstlichen Besamung, der Erbrütung, Anfütterung und Aufzucht können hier aus Raumgründen nicht weiter ausgeführt werden. Interessierte werden auf die vorhandenen Publikationen verwiesen (BOHL, 1977; 1979a; 1982b).

In nachfolgenden Flüssen wurden Bestandsstützungen bzw. Wiedereinbürgerungen des Huchens durch die Versuchsanlage oder durch Fischereivereine, die Wielenbacher Besatzhuchen bezogen, bislang vorgenommen: Ammer, Amper, Donau, Inn, Isar, Lech, Loisach, Salzach, Schwarzer Regen.

Der nach sehr schwierigen Unterfangen aufgebaute Trockenfutter-Huchenlaicherstamm der kostengünstigeres Besatzmaterial für sogenannte Kunstbiotope, wie die aneinandergereihten Lechstaustufen, liefern sollte, wurde wieder aufgelassen. Die Gefahr, daß er auch in ökologisch intakte Gewässer gelangt, war letztlich nicht auszuschließen, zumal durch das scharfe Selektionsverfahren genetisches Potential, z. B. hinsichtlich des Nahrungsspektrums, verlorengegangen sein könnte.

Nunmehr wird die kostspielige Huchenlaichfischhaltung überwiegend zur Abgabe beäugter Eier an interessierte Fischzüchter fortgeführt. Seit Ende der 70er Jahre wurden nahezu alljährlich 100000 bis 300000 Stück verkauft.

Seeforellen (Salmo trutta forma lacustris)

Mit diesem Ökotyp bzw. der Standortvariante oder gar Rasse der Bachforelle befaßt sich die Versuchsanlage seit Ende der 70er Jahre. Die Herkunft des aufgebauten Laicherstammes geht auf den Walchenseebestand zurück.

Nachdem sich die Wasserqualität des Schliersees durch die Ringkanalisation und Umwälzung derartig gebessert hat, daß im Jahre 1983 bereits ganzjährig die Sauerstoffverhältnisse bis in Tiefen von 15 bis 20 m (STEINBERG, 1983) stabil waren, wurde im Frühjahr 1984 die Wiedereinbürgerung der Seeforelle gestartet. In guter Zusammenarbeit mit den Freizeitfischern der ansässigen Fischereivereine Schliersee und dem Bezirksfischereiverein Miesbach-Tegernsee sowie dem Berufsfischer wurde die Aktion mit begleitenden flankierenden Maßnahmen nochmals in den beiden darauffolgenden Jahren wiederholt (BOHL, 1984; SCHÖBERL,

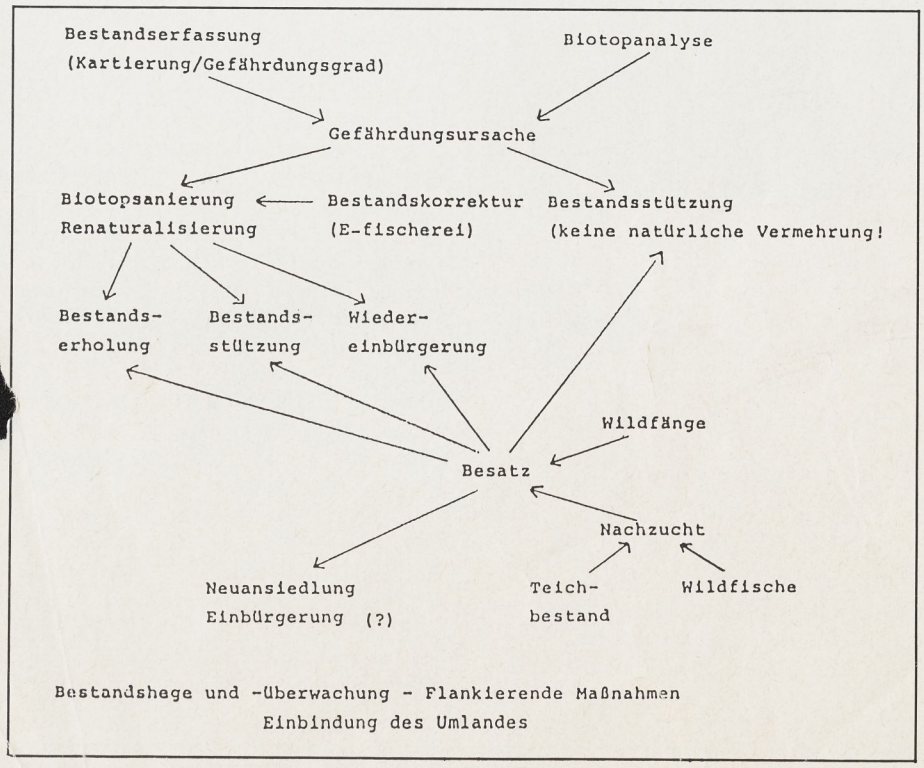

Abbildung 2: Verfahrenskonzept fischereilichen Artenschutzes

For Bob Behnke

The return of the natives

Landowners, DOW cooperate to give cutthroat trout new lease on life

By DAVE BUCHANAN
The Daily Sentinel

DE BEQUE — Less than 100 yards from the cabin in which he was born 67 years ago, Max Altenbern gave another native Coloradan a new lease on life.

Altenbern, a life-long rancher on Carr Creek northwest of De Beque, actually helped 150 native cutthroat trout, olive-and-gold with orange jaws and large black spots, fish needing protection from the multiple dangers of extinction.

The fish, a singular species of Colorado River cutthroat that has evolved to thrive in the lower elevations of western Colorado, were moved last week from the upper reaches of Roan Creek into the tightly-protected portion of Carr Creek running through Altenbern's family ranch.

"It's good to have them back in here," Altenbern said as he slowly dumped a net full of cutthroats into the transparent waters curling through a narrow cut between waist-high meadow grasses. "For a long time we wanted the native fish back in here."

The final step in the re-stocking of Carr Creek with cutthroat trout was the culmination of more than three years of effort on the part of the state Division of Wildlife, the U.S. Bureau of Land Management and the all-important cooperation of landowners John LaMicq, from whose Roan Creek stretch the cutthroats came, and Altenbern, who offered the refuge for a fish that once grew to more than 2 pounds in Carr Creek.

Altenbern said that while he was growing up, Roan Creek held only cutthroat trout. Then, as now, ranchers hadn't much time to fish, but when they did, he recalled seeing some cutthroats topping out at more than 2½ pounds.

And this from a creek less than 10 feet wide, one that would dry up in some stretches in late summer.

"Then, in 1934, the head of the creek burned out," recalled Altenbern, vaguely waving a hand toward the pinyon-juniper mesas east of Douglas Pass, where the headwaters of Carr Creek are hidden. "In 1937, a cloudburst came and washed down all the ashes and burnt trees and covered the stream and all the fish were killed."

"In about 1938 the Game and Fish came in and planted brook trout, even though we were hoping for the natives to come back," Altenbern said as more cutthroats were carried in five-gallon buckets to the stream. "And boy, they multiplied."

Brook trout can out-compete and out-breed other fish species, and being fall spawners gives them another advantage over spring-spawning fish such as cutthroats. Not only did the brook trout have to be removed before the cutthroats were restored, but barriers had to be built downstream to prevent them and other non-native fish from moving upstream and repopulating the cutthroat trout waters.

Division of Wildlife fisheries biologist Bill Elmblad said it took three and sometimes more treatments with the poison rotenone to get rid of all the brook trout.

"We treated about nine river miles of this creek for three years, one time a year starting in 1996, except for one stretch we had to treat five times in order to get all the brookies," Elmblad said. "The Altenberns built a huge barrier, maybe 30 feet high, years ago on the lower end of their property to raise the creek level, and that's perfect for our needs."

The fish for Carr Creek came out of some private stretches of Roan Creek where they were protected from fishing pressure.

During tests for genetic purity the Roan Creek cutthroat were compared to the benchmark Colorado River cutthroats in Nanita and Bench lakes in Rocky Mountain National Park. The Roan Creek fish graded A-minus, one step below genetic purity and more than adequate for Carr Creek.

In fact, it might be whatever genetic impurities the Roan Creek fish have are what allows them to survive in tiny creeks where late-summer water temperatures can reach 70 degrees or more.

"We call these our subtropical cutthroats," said district wildlife manager Joe Gumber of De Beque. "You really wouldn't think cutthroats could survive in water this warm, but these fish seem to be doing just fine."

Biologists from the Division of Wildlife and the U.S. Bureau of Land Management last week electroshocked 150 cutthroats from Roan Creek, put them in truck-mounted water tanks, and hustled the fish to Carr Creek. A six-person crew, including Altenbern, spread the fish along a mile or so of creek just downstream from the cabin in which Altenbern was born in 1931.

"We were lucky to be able to go to the next drainage to get these fish," Elmblad said as he released a half-dozen cutthroats into their new home. "I wanted to get these fish in here before the fall. When we electroshocked the creek, we found clouds of insects. I want the fish to get through the winter in good shape and then get off a good spawn next spring."

As if in response, one of the cutthroats rose to the surface and sucked down an unseen bug.

"Can you believe that?" asked Elmblad. "They've been in the water for less than five minutes and already they're feeding. I think these fish are going to do just fine."

Other native fish found in Carr Creek include mottled sculpins, bluehead suckers and speckled dace.

Elmblad said re-establishing the Carr Creek population will ensure another source of Colorado River cutthroats in case something happens to the Roan Creek fish.

Also, the state is actively seeking to restore native cutthroat trout populations, including the Colorado River, greenback and Rio Grande species, in response to grumblings coming from the U.S. Fish and Wildlife Service about listing the fish as threatened species.

The greenback has recovered to the point where limited catch-and-release fishing is allowed on certain waters.

"This is the first time I'm aware of that we've had a Colorado River recovery program from start to finish," Elmblad said.

For Altenbern, it is enough the creek is back to where it had been threescore years before.

"I've wanted to see the brook trout taken out of here and the native fish put back in for many, many years," said Altenbern, watching the shimmering tones of gold and orange fin gently in the current. "Now, it's back the way it was. That makes me happy."

DAVE BUCHANAN/The Daily Sentinel

BIOLOGIST BILL ELMBLAD of the Division of Wildlife releases a netful of Colorado River cutthroat trout into Carr Creek while landowner Max Altenbern reflects on restoring the fish to their historic home drainage.

DAVE BUCHANAN/The Daily Sentinel

COLORADO RIVER CUTTHROAT trout are distinctive for their large black spots.

DAVE BUCHANAN/The Daily Sentinel

RANCHER MAX ALTENBERN takes a turn releasing Colorado River cutthroat trout into Carr Creek. DOW officials said the project to restore the native trout hinged on the cooperation given by local landowners.

Isolation caused trout's fall to near-extinction

By DAVE BUCHANAN
The Daily Sentinel

Because they evolved in virtual isolation, Colorado River cutthroat trout proved extremely susceptible to genetic dilution and hybridization with rainbow trout and from competition by brook and brown trout.

One example cited in Robert Behnke's monograph "Native Trout of Western North America" was the Gunnison River, where rainbow trout fry were introduced in 1888 for the first time. Ten years later, the native trout had disappeared while the Gunnison had become a river famous for its rainbow trout fishery.

The genetic purity rating system from A (pure) to F (obvious hybrids) was developed in 1977 by N.A. Binns of the Wyoming Game and Fish Department.

In 1988, Anita Martinez of the Colorado Division of Wildlife modified the Binns system to rank cutthroat subspecies found in Colorado.

That year, Martinez reported 12 of the 36 populations monitored in the last decade showed signs of hybridization with two populations being replaced by brook trout.

Even the once-pure strains of Trappers Lake cutthroats were hybridized sometime after 1977 when rainbow trout somehow gained access to Trappers Lake.

The current stocks of pure Colorado River cutthroat trout are offspring of fish raised from Trappers Lake fish shipped to California in 1931, where they were planted in Williamson Lakes. In the early 1980s, after it was feared the Colorado River cutthroat strain was lost, the fish were "discovered" in Williamson Lakes.

Parks, DOW begin evaluations

By DAVE BUCHANAN
The Daily Sentinel

More than a dozen state-owned properties, including Corn Lake and Highline Lake state parks, face changes in ownership and management under a plan adopted last week by the state divisions of wildlife and state parks.

An agreement between the Colorado Wildlife Commission, which oversees the Division of Wildlife, and the Colorado State Parks board marks the beginning of extensive appraisals, property exchanges and management decisions aimed at preventing the loss of $10 million the state receives each year from federal sportfish and wildlife management aid programs.

Under the agreement, the wildlife and parks divisions will evaluate 16 properties that originally were purchased with federal wildlife monies but currently are being managed by Colorado State Parks, possibly splitting some of the properties between wildlife habitat and recreation areas while exchanging ownership of other properties.

Seven properties have been designated for transfer from the DOW to State Parks. They include: Corn and Highline lakes in Mesa County; Rifle Falls in Garfield County; Jackson Lake in Morgan County; Sylvan Lake in Eagle County; Steamboat and Pearl lakes in Routt County.

The lands lost by the Division of Wildlife will be replaced with equivalent lands from properties currently owned by State Parks or purchased by State Parks.

Several areas jointly owned by the two agencies will be divided into distinct parcels of separate ownership. The plan calls for areas with the most recreational facilities, such as picnic tables and campgrounds, to become state parks while lesser-developed areas will revert to state wildlife areas.

Those properties include Golden Gate, Lory, Mueller, North Sterling and San Luis Lakes state parks.

Two areas — Barbour Ponds and Sawhill Ponds — will be operated by the state parks under management contracts from the Division of Wildlife.

The issue arose earlier this year when the U.S. Fish and Wildlife Service questioned whether 16,000 acres bought with money generated from federal excise taxes on hunting and fishing equipment was being managed only for wildlife. The federal agency objected to the parks department managing the sites while state officials have protested what they consider a narrow interpretation of the limits put on wildlife funds.

State officials have said the DOW/Parks arrangement works best for the wildlife areas and for visitors. But wildlife managers said federal grants make up about 15 percent of the division's budget, and losing the money would be a big blow.

Wade Buchanan, acting executive director of the Department of Natural Resources, said the state "continues to disagree with the audit" of recreational activities at these state parks "because the majority of visitors to these areas engage in fishing and other wildlife-related recreation."

He did not say why the agreement comes nearly eight months after the audit was released.

Outdoor Notes

SENTINEL STAFF AND WIRE REPORTS

Animas River on TU program

A trip on the Durango to Silverton narrow gauge train with stops to fish the Animas River will highlight the Sept. 16 meeting of the Grand Valley Anglers Chapter of Trout Unlimited.

The meeting will start at 6:30 p.m. at the Far East Restaurant, 1530 North Ave.

Local angler Bill Haggerty joined Geoff Tischbein of Montrose to spend several days last month exploring the fishing along the Animas River, with transportation courtesy of the Durango & Silverton Narrow Gauge Railroad. Early reports said fishing was surprisingly good.

The meeting is open to the public.

Information: Bill Baird, 858-3989.

Fishing report a day late

Due to the Labor Day holiday, the state fishing conditions report compiled weekly by the Colorado Division of Wildlife will be published Thursday this week only.

The fishing report will be on the sports Scoreboard page.

THE DAILY SENTINEL
PREP, COLLEGE, PROS
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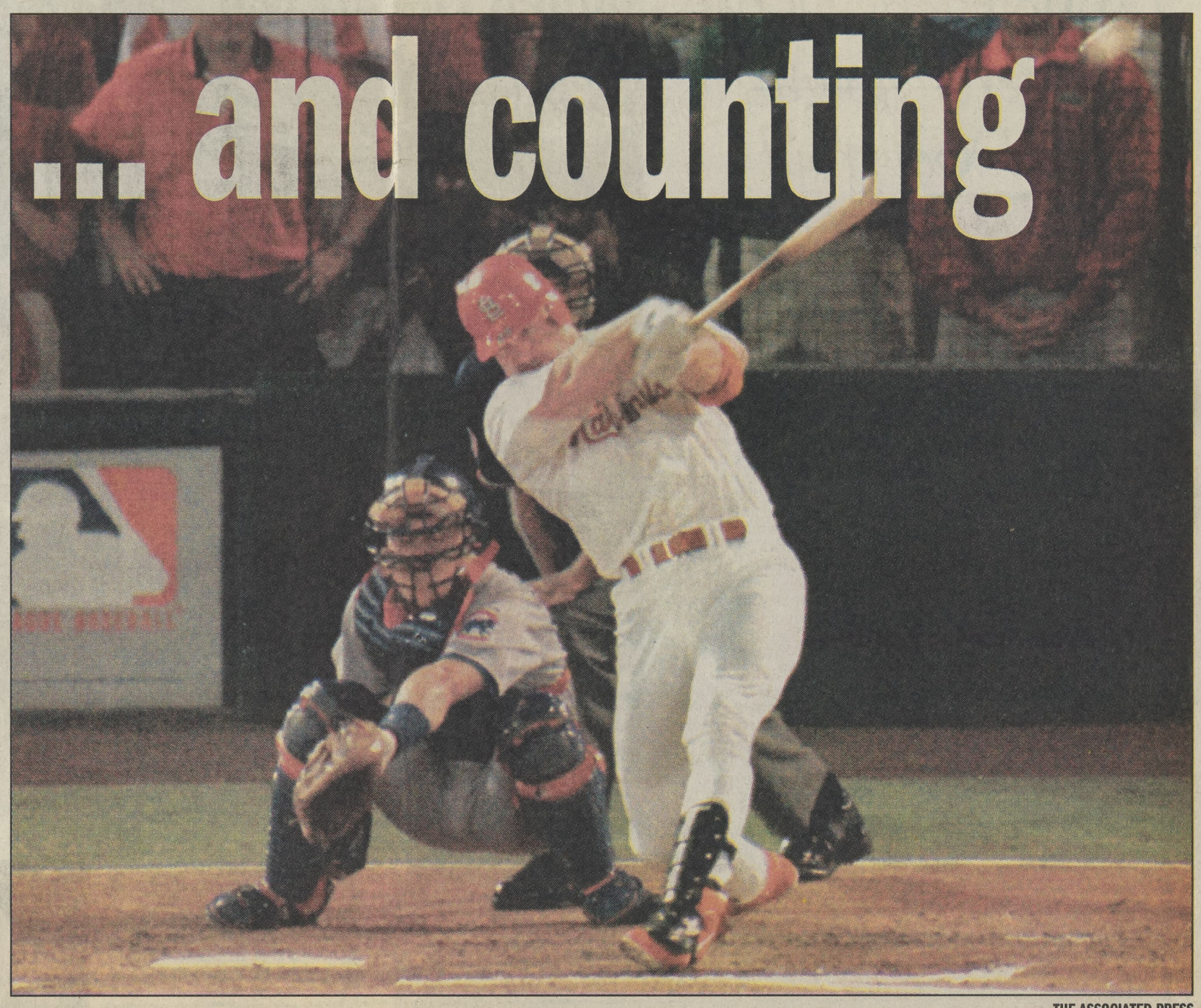
SPORTS

WEDNESDAY, SEPTEMBER 9, 1998

SECTION D

62



... and counting

THE ASSOCIATED PRESS

ST. LOUIS SLUGGER MARK McGWIRE hits home run number 62 against the Chicago Cubs in St. Louis Tuesday. The ball, seen at upper right, was pitched by the Chicago Cubs' Steve Trachsel and just cleared the left-field wall traveling 341 feet.

Shortest homer of Mac's magical season makes history

By THE ASSOCIATED PRESS

ST. LOUIS — History wasn't made with one of his magical moonshots or majestic arcs.

Mark McGwire simply lined a laser to left — his shortest home run of the season at 341 feet — and the biggest, most glamorous record in sports was his.

Homer No. 62 came Tuesday night and barely cleared the wall. But no matter. His mighty swing won the race to break Roger Maris' 37-year-old record — without a doubt or an asterisk, and with plenty of games to spare.

"I tell you what, I was so shocked because I didn't think the ball had enough to get out," McGwire said. "It's an absolutely incredible feeling. I can honestly say I did it."

McGwire connected with two outs in the fourth inning off the Chicago Cubs' Steve Trachsel for the historic homer, punctuating the chase that reinvigorated the game and captivated the nation.

McGwire was so caught up in the moment that he missed first base as he rounded the bag and had to return to touch it, pulled back by coach Dave McKay.

From there, McGwire got handshakes from every Chicago infielder as he trotted home to history and a hug from catcher Scott Servais. Cubs right fielder Sammy Sosa, who has 58 home runs, ran in from right field to hug McGwire and give his rival a high-five.

McGwire was mobbed by his teammates at home plate, where he hoisted his 10-year-old batboy son Matt high into the air. McGwire then ran into the seats to hug the family of Maris, whose record he had just broken.

Before the game, which the Cardinals won 6-3, McGwire held the bat that Maris used to hit his 61st and rubbed it against his chest.

"Roger, I hope you're with me tonight," McGwire said.

He was, indeed.

As the ball cleared the left-field fence, there was no scramble to retrieve it because it landed in an area where no fan could get it.

Tim Forneris, a ground-crew worker, picked it up and said he would give it to McGwire.

"Right when it hit off the bat, I knew it was going out and it went right over the sign," he said. "There was a bunch of ground-crew guys on the wall. But I was right on the edge and I said, 'That ball is mine.'"

After McGwire finished celebrating with his teammates and the Maris family, he grabbed a microphone to address the sellout crowd of 43,688, which was still standing and cheering.

"To all my family, my son, the Cubs, Sammy Sosa. It's unbelievable," McGwire said. "Thank you, St. Louis."

McGwire, who appeared anxious in grounding out on a 3-0 pitch in the first inning, hit his solo shot on the first pitch. It triggered an 11-minute delay, baseball's biggest midgame celebration since Cal Ripken broke Lou Gehrig's consecutive games record in 1995.

The 34-year-old slugger also did it at home, just like he wanted.

THE BALL returned courtesy of employee

By THE ASSOCIATED PRESS

ST. LOUIS — When homer No. 62 finally came, the whole affair proved far easier than anybody thought.

The talk had flowed everywhere for weeks. Who'd catch it? Should they keep it? Would the IRS come calling?

And the most pressing question: Give it back gratis or take Mark McGwire and the Cardinals for as much cash and cool stuff as possible?

Unlike so many of McGwire's home runs, this one didn't make it into the left-field stands. Instead, the line drive shot over the left field fence, where Tim Forneris ran it down and picked it up — Tim Forneris, part of the Busch Stadium grounds crew.

He promptly returned the specially and secretly marked, individually numbered ball to The Man Of The Hour.

THE ASSOCIATED PRESS

MARK McGWIRE LIFTS HIS SON Matthew at home plate after hitting his record-setting home run off Chicago Cubs pitcher Steve Trachsel in the fourth inning Tuesday night.

Ooops! *McGwire nearly forgets to touch 'em all*

By THE ASSOCIATED PRESS

ST. LOUIS — No. 62 was so un-McGwire.

When the specially marked ball departed from Mark McGwire's bat like a laser at 7:18 p.m. MDT, he couldn't slip into his home-run trot right away.

Big Mac ran out of the batter's box like a sprinter from the blocks, the eyes which appeared sleepy in his first at-bat squinting intently toward left field.

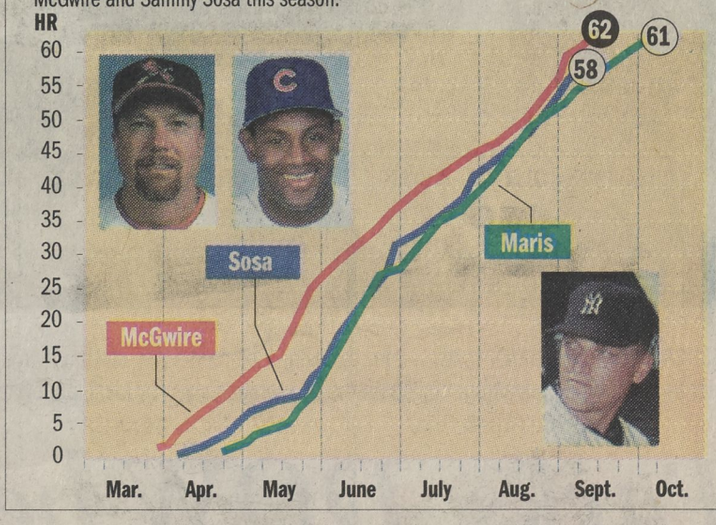
Usually, the St. Louis Cardinals' slugger knows right away whether he's slapped the ball far enough to put it over the fence, but this time his eyes betrayed a sense of doubt.

Glenallen Hill, playing left for the Chicago Cubs, sprinted toward the dark corner at Busch Stadium, ready to retrieve the ball and pitch it back to the infield.

See **TROT**, page 5D ➤

Making history

A month-by-month account of the home runs hit by Roger Maris in 1961 and Mark McGwire and Sammy Sosa this season:



AP

Mesa Hall of Honor inductee inspires many stories

By PHIL CASTLE
The Daily Sentinel

They're still telling stories about Bob Tucker nearly 50 years after his playing heydays at what was then Mesa Junior College.

There's the story about how Tucker pulled in an errant pass during a football game by swinging around a goal post with one hand while catching the ball with the other. Then there's the one about how Tucker went out for the baseball team and made all-conference even though he'd never played the sport before.

It's that kind of natural, Jim Thorpe-like talent that made Tucker an all-conference selection in four sports at Mesa between 1950 and 1952 and earned him awards not only as the top athlete at the college, but one of the best in the nation.

The stories don't end there, either, because Tucker went on to devote his life to sports. He returned to his home town in northwest Colorado and became one of the winningest coaches in the history of Meeker High School.

Tucker, now 68, enjoys retirement. But his accomplishments continue this week when he will be inducted into the Swire Coca-Cola Hall of Honor at Mesa State College.

Tucker is one of three inductees who will be honored at a banquet scheduled to begin at 7 p.m. Friday at Liff Auditorium at Mesa State. Kathy Holthus-Daniels, a former Mesa State volleyball standout, also will be inducted. Clarence "Ed" Tooker, another Maverick football star who went on to coach wrestling and track at Mesa State, will be honored posthumously.

Ernie Buescher, former owner of the Pepsi Cola company in Grand Junction, will receive a special citation for his contributions to the Mesa State athletic program.

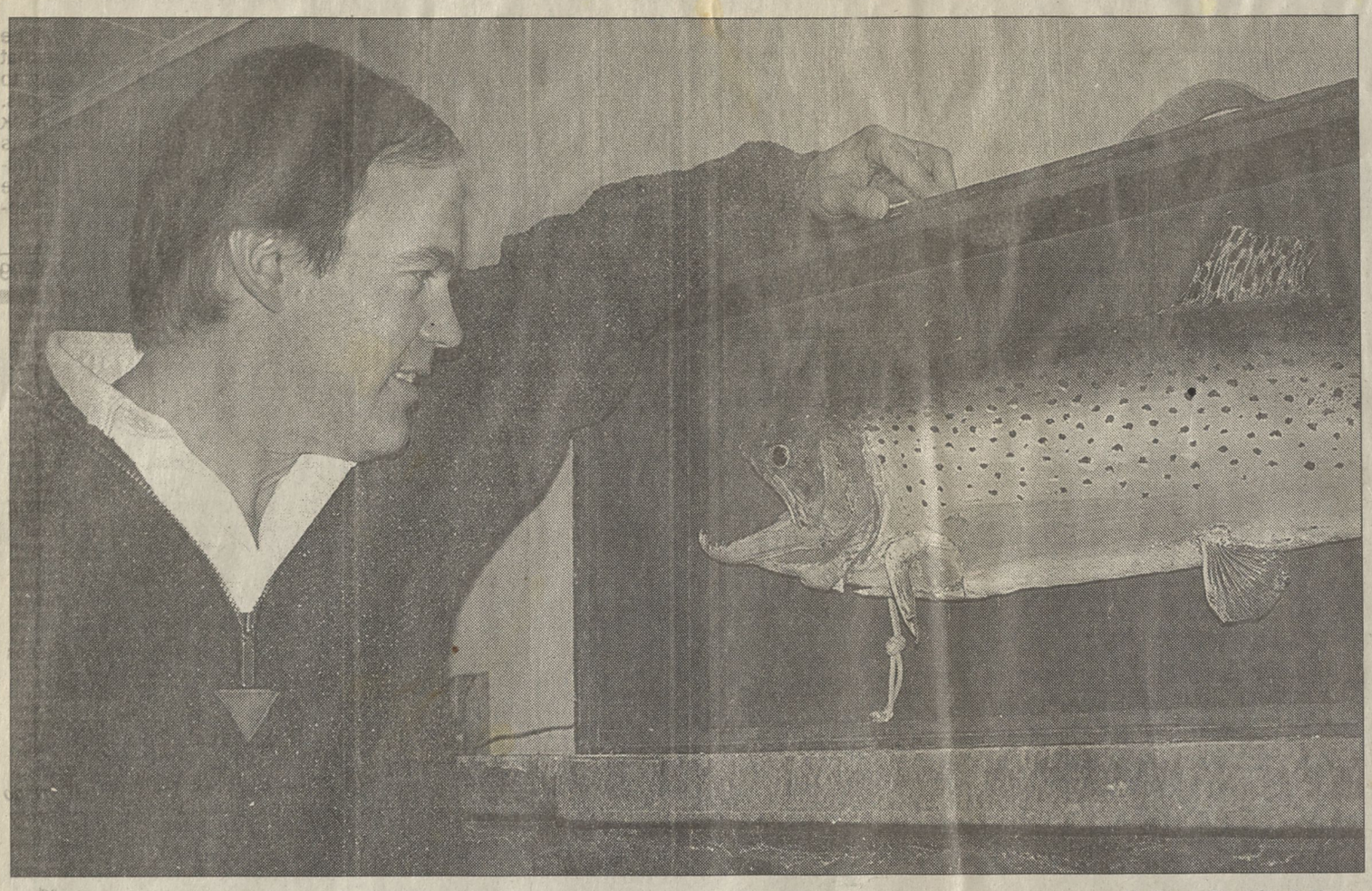
Tucker has earned a lot of recognition during his life. He was the first Colorado athlete selected to an All-American junior college football team and was named coach of the year three times. There's even a street in Meeker named after him.

But Tucker said his induction into the hall of honor ranks among his most prized tributes. "When I first heard about it, it makes a guy speechless. This is a once-in-a-lifetime situation and it's kind of hard to believe even now. It's a great honor and I'll treasure it the rest of my life."

Tucker grew up in Meeker. And as far back as he can remember, he was interested in sports. When he was a teen-ager and friends were tinkering with cars, Tucker said he had other priorities. "I could care less about a car ... I had a ball in my hand."

Tucker's prowess as a three-sport athlete at Meeker High School earned him a scholarship at Mesa. He still remembers when he first talked with Mesa coaches Walter "Bus" Bergman and Jay Tolman about playing for the Mavericks. "After talking with them for a little bit, I really felt that Mesa would be the place to go."

See **TUCKER**, page 5D ➤



The Denver Post / Charlie Meyers

Don Proebstel is intrigued by this tattered mount of a 17-pound cutthroat taken from North Lake, near Trinidad, in 1917.

Extinct fish may stop being belly up

With spiked teeth and the cold glint of a reptilian eye, a creature long extinct lunges to seize its victim.

A tyrannosaurus rex off on another jailbreak at "Jurassic Park"?

Not even close. This monster appearing soon at a lake near you could be the yellowfin cutthroat trout, a large and toothy native species that disappeared from the earth at least 80 years, possibly 100 years ago.

Charlie Meyers

Outdoors

The yellowfin, indigenous to the upper Arkansas River system, might return to life — and the end of your line — through the modern marvel of genetic engineering and DNA experimentation. Don Proebstel intends to make it happen.

A Colorado State University doctoral candidate and prime protege of noted taxonomist Dr. Robert J. Behnke, Proebstel is director of the World Salmonid Research Institute (www.doctortrout.com), a Nederland-based organization devoted to the research and conservation of salmonid fishes worldwide.

In the eight years the institute has functioned, Proebstel and his associates have performed meaningful work on Colorado's greenback cutthroat and Russia's lenok. But it is the notion of restoring the yellowfin — or a reasonable facsimile thereof — that intrigues anyone who even can imagine such a thing.

In a takeoff on Michael Crichton's Jurassic dinosaurs, Proebstel plans to meld DNA from a 110-year-old taxidermy specimen at the Smithsonian Institute with live embryos to produce a copy of the original.

"The bottom line is that the yellowfin is genetically extinct. We can't bring it back without a time machine. But we can create a fish that acts the same and looks the same," Proebstel said.

To understand why someone might go to such pains, we need only roll the clock back past the turn of the century, when yellowfin proliferated in Twin Lakes and other waters of the upper Arkansas near Leadville. Although it occupied the same habitat as the greenback, the yellowfin kept a separate spawning schedule and coloration.

Moreover, it grew substantially larger, often into double digits in weight, using its impressive dentures to forage on other fish.

"We can develop a 10-pound fish that has the same scale count, same number of gill rakers and the same spotting characteristics as the original," said Proebstel, who maintains an element of mystery around the project.

"I'm not going to tell you how because someone else could come in and do the same thing. But I know that Bob Behnke and I can do it," said Proebstel, 46.

Apparently, they'll get the chance. Doug Krieger, principal biologist for the Colorado Division of Wildlife's Southeast Region, is intrigued by the idea, receptive to a test.

"I'm definitely interested in how it might function in the system, particularly in light of the historic perspective," Krieger said. "I can imagine anglers would be very receptive."

Working from a hideaway research center near Rollinsville, Proebstel aspires, through a number of global projects, to perpetuate the taxonomic research of Behnke, a CSU professor who is the world's foremost authority on trout and salmon. He first went to Russia as Behnke's understudy in 1991 and has returned each year for further research.

The institute maintains a "living gene bank" of threatened greenback cutthroat — eastern Colorado's native trout — at its Rollinsville lake, both a genetic reserve and subject of DNA research. Proebstel presently is performing DNA tests on a population of greenbacks recently discovered on the North Slope of Pikes Peak. If they prove out, as he believes they will, these trout will become the sixth source of pure greenbacks discovered in the wild.

As for the yellowfin project, Proebstel believes that, provided his nonprofit instituted acquires funding, he can have a fish in the water in five years. You may want to watch your toes.

Special to The Denver Post

Don Proebstel, right, and Dr. Sergey Alexeev of the Russian Academy of Sciences show specimens of lenok from Lake Baikal.

Ohio State foul blow to Huskies

COLLEGE FOOTBALL

By Tom Kensler
Denver Post Sports Writer

Unintentionally, Ohio State is putting pressure on the University of Washington to come down hard on Rick Neuheisel's Huskies football program for violating NCAA rules.

Neuheisel, who resigned from Colorado on Jan. 9, has acknowledged that five Washington assistants visited a total of eight recruits on Jan. 31. That's the Sunday before national signing day, which is an NCAA-designated "quiet period" when personal contact is prohibited.

Two Ohio State assistants violated the same NCAA rule by each meeting with a recruit in Florida on Jan. 31. The Columbus (Ohio) Dispatch reported that Ohio State recommended recruiting coordinator Bill Conley and assistant coach Shawn Simms not be allowed to make off-campus recruiting contacts until after next year's signing day. The NCAA apparently accepted the recommendation.

When Ohio State athletic director Andy Geiger was asked his reasons for recommending such a stiff penalty for what is generally viewed as a minor violation, Gieger told the Columbus Dispatch: "I think it's important that a leadership program lead. And the rules are not mysterious."

Neuheisel said he and his staff were unaware of the "quiet period" rule, which was instituted in 1996. Washington has self-reported its violation of the rule to the Pacific-10 Conference.

The usual procedure when dealing with minor violations is to report them to the conference, which then sends a report to the NCAA with a recommended penalty. Ohio State apparently went straight to the NCAA.

Meanwhile, Colorado said it plans to send more specific evidence to Washington regarding CU's allegation that Neuheisel potentially tampered with at least one of his former players during a phone conversation. Neuheisel has acknowledged that he made several calls but insists he only wanted to give personal goodbyes to his former players.

Colorado compliance director Karen Morrison has said there is evidence that Neuheisel mentioned transferring to at least one player. In any case, Morrison said it is an NCAA violation for Neuheisel to call players of another program without first contacting that program's athletic director.

Morrison sent a letter to Washington two weeks ago complaining of Neuheisel's contacts with Colorado players. CU received a return letter asking for more specific information.

Also, Neuheisel apparently violated another NCAA recruiting rule. The Seattle Post-Intelligencer reported that the Pac-10 will investigate Neuheisel's participation in an informal basketball game of 3-point shooting with cornerback Domynic Shaw of Oakland's Skyline High School. The activity reportedly took place in Washington's Hec Edmundson Pavilion during Shaw's recruiting visit to the Seattle campus last month.

Shaw told the Oakland Tribune recently: "It was a little game. If I won, I wouldn't have to choose Washington, period. If I didn't win, I'd have to choose Washington, period. It was a little joke."

Such activities, even when they involve participation in a different sport, are usually considered "tryouts" under NCAA rules. Shaw was declared ineligible by the Pac-10 last week, pending a conference investigation, along with the four other recruits who were visited by UW assistant coaches on Jan. 31.

Huskies athletic director Barbara Hedges told the Post-Intelligencer: "Rick, on his own, told me about this. He wanted to make sure there aren't any issues. At the time (Neuheisel) shot with Domynic Shaw, there was no intent on his part to violate the tryout rule. He was not doing it with the purpose of evaluating's Domynic's athletic ability. Again, we're going to take any violation of rules seriously."

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Wallace hopes to capture that Earnhardt feeling

By The Associated Press

DAYTONA BEACH, Fla. — At least a dozen drivers have staked their claim to the Daytona 500.

The problem, of course, is that just one can win.

That could be Rusty Wallace, who will start 10th in the 43-car field today in NASCAR's richest and most prestigious event.

He's confident he can get his first victory in 17 tries in the season-opening Winston Cup race at Daytona International Speedway.

"This race would mean everything to me because I think that any good racer that hasn't won the Daytona 500 would feel like there's a void in his career," Wallace said. "I know I surely would.

"That's maybe one of the reasons I'm so persistent about wanting to get the cars right. I don't feel like I'm running out of time, but enough's enough."

Dale Earnhardt went through the same frustration for 20 years before he finally won the big one last February. The relief was overwhelming.

"Sure, I had some tears in my eyes," said the man who has built his racing career on tough, aggressive driving. "I'd wanted to win this race for an awful long time, and it's such a tough race to win."

Since a lot of other drivers in the lineup feel the same way, the 135,000 spectators who turn out for the $8 million race can expect a shootout.

"It's going to be wild," said Kyle Petty, who's looking for his first win in his 18th start. His father, Richard, won the Daytona 500 seven times.

Asked what he thinks it will take to win today, the younger Petty said: "Patience. But nobody's got any."

Daytona is one of two tracks where NASCAR requires carburetor restrictor plates to slow the cars for the safety of drivers and fans.

But the plates also sap horsepower and keep the field unnaturally even, bunching up the cars and making wrecks a virtual certainty.

"You've got no horsepower to speak of, compared to what we used to have," Wallace said. "Our engines right now in Winston Cup racing are approaching 800 horsepower and, right now, at Daytona we're sitting here with 400 or 450 horsepower.

"So, it's all how air works and momentum works. If you don't have the right amount of momentum when you make a commitment to pass a car, you probably won't get past him."

That's why patience is such a virtue. If a driver steps out of one of the long freight trains of cars at Daytona without another car to help, he's just as likely to wind up losing 15 or 20 positions as moving forward.

"Everybody is looking to make deals here," two-time Daytona winner Dale Jarrett said. "And, certainly, during the course of the race you do work together with other drivers. But when it comes right down to it, there are no deals out here. If you believe there are, you're in trouble."

Earnhardt, who will start today's race from fourth — the same place he started last year — showed he's one of the favorites by dominating his 125-mile qualifying race on Thursday, just as he did in 1998.

The "Great American Race"

Today

DAYTONA 500

The race

Track: 2.5-mile trioval; 40 feet wide with 12- to 30-foot apron
Distance: 200 laps and 500 miles
Car speed: up to 200 mph in draft, 185-195 mph in turns

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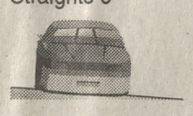


Start-finish line 18°

Turns 31°

Race records

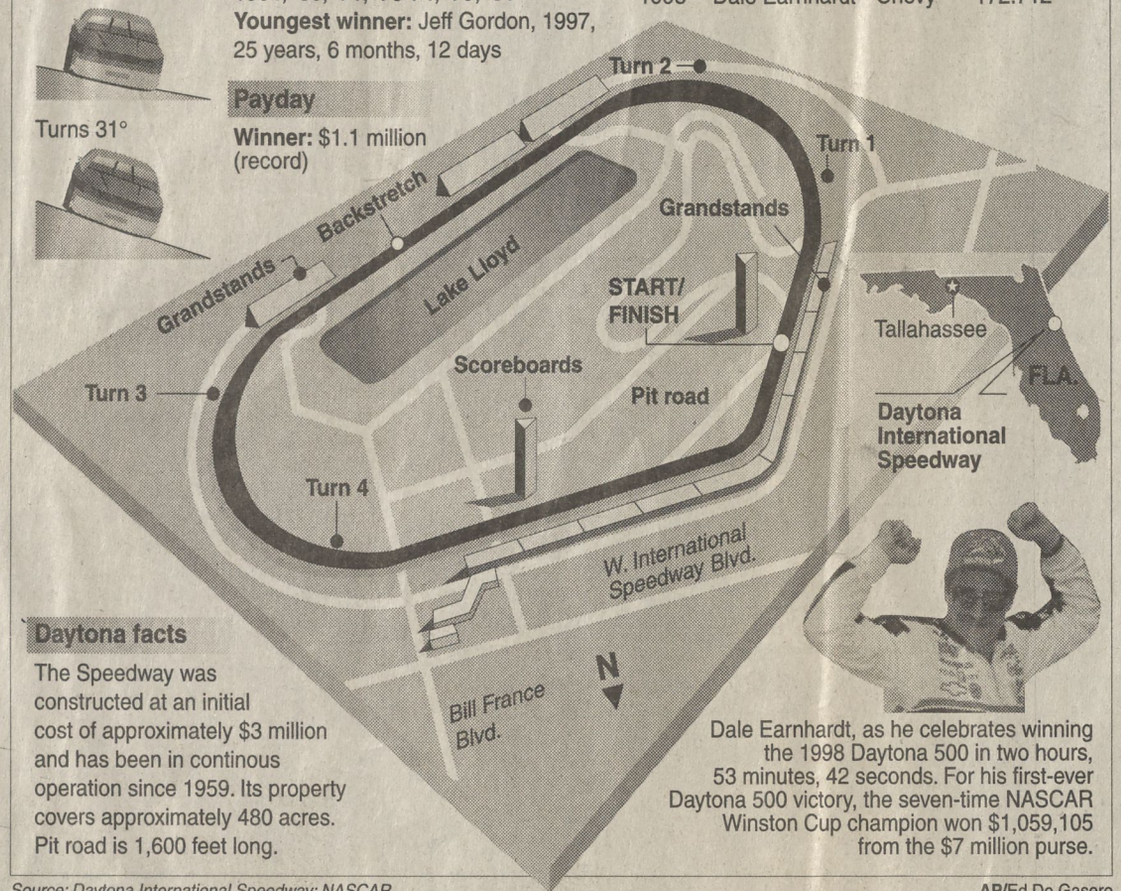
Fastest race: Buddy Baker, 177.602 mph, 1980
Slowest race: Junior Johnson, 124.740, 1960
Most victories: Richard Petty (7), 1964, '66, '71, '73-74, '79, '81
Youngest winner: Jeff Gordon, 1997, 25 years, 6 months, 12 days

Payday

Winner: $1.1 million (record)

Past winners

Year	Driver	Car	Avg. speed
1994	Sterling Marlin	Chevy	156.931
1995	Sterling Marlin	Chevy	141.710
1996	Dale Jarrett	Ford	154.308
1997	Jeff Gordon	Chevy	148.295
1998	Dale Earnhardt	Chevy	172.712



Daytona facts

The Speedway was constructed at an initial cost of approximately $3 million and has been in continous operation since 1959. Its property covers approximately 480 acres. Pit road is 1,600 feet long.

Dale Earnhardt, as he celebrates winning the 1998 Daytona 500 in two hours, 53 minutes, 42 seconds. For his first-ever Daytona 500 victory, the seven-time NASCAR Winston Cup champion won $1,059,105 from the $7 million purse.

Source: Daytona International Speedway; NASCAR

AP/Ed De Gasero

Mastering drafting the key to victory lane

By The Associated Press

DAYTONA BEACH, Fla. — The art of drafting, not speed, will determine today's Daytona 500 champion.

Just ask Jeff Gordon: Being behind at the right time can be even more important than being ahead in the 200-lap race.

"If you don't play the draft right, it doesn't matter how much speed you have," said Gordon, the 1997 Daytona winner who'll start from the pole today.

Drafting is perhaps the least-understood technique in stock-car racing. A driver hugs the bumper of the car ahead of him — sometimes getting within inches — and uses the airflow over and around it for momentum.

That allows him to get into position to make a move around the lead car and eventually take the checkered flag.

"There's going to be some shuffling going on and there's certain times in the race when that stuff's OK," Gordon said, "but after you get past the halfway point of the race, you want to get the lead and keep it."

That strategy puts a premium on good pit stops, something that Gordon usually gets from his Hendrick Motorsports crew. If it does keep him out front, Gordon needs to use his ability in the draft to stay there.

"You've got to work hard to stay in front of those guys and not let them get a run on you," the two-time defending Winston Cup champion said.

In what could be a preview of the 43-car main event, Gordon was out front for 38 laps in his qualifying race on Thursday. Then Bobby Labonte and Ken Schrader ganged up on him and roared past high up on the banking of the 2½-mile oval.

Gordon managed to regain second place a few laps later, but it was Labonte, another favorite in today's race, who held on for the victory in the 50-lap preliminary.

"There really wasn't anything I could do when those guys went together, and that's what you have to worry about in these races," Gordon said. "You try to move around and keep them from getting a good run at you, but sometimes you just can't hold them up."

But trying to pass in the draft can be a disaster if you don't get some help from another car.

"If you don't have the right amount of momentum and some help when you make a commitment to pass a car, you probably won't get past him," said Rusty Wallace, who'll start 10th today. "Then those guys will line up behind the void that you left and freight-train right on past you. You've got to make real sure when you make that commitment that you can get the job done."

That puts a premium on patience, a virtue not often attributed to race drivers.

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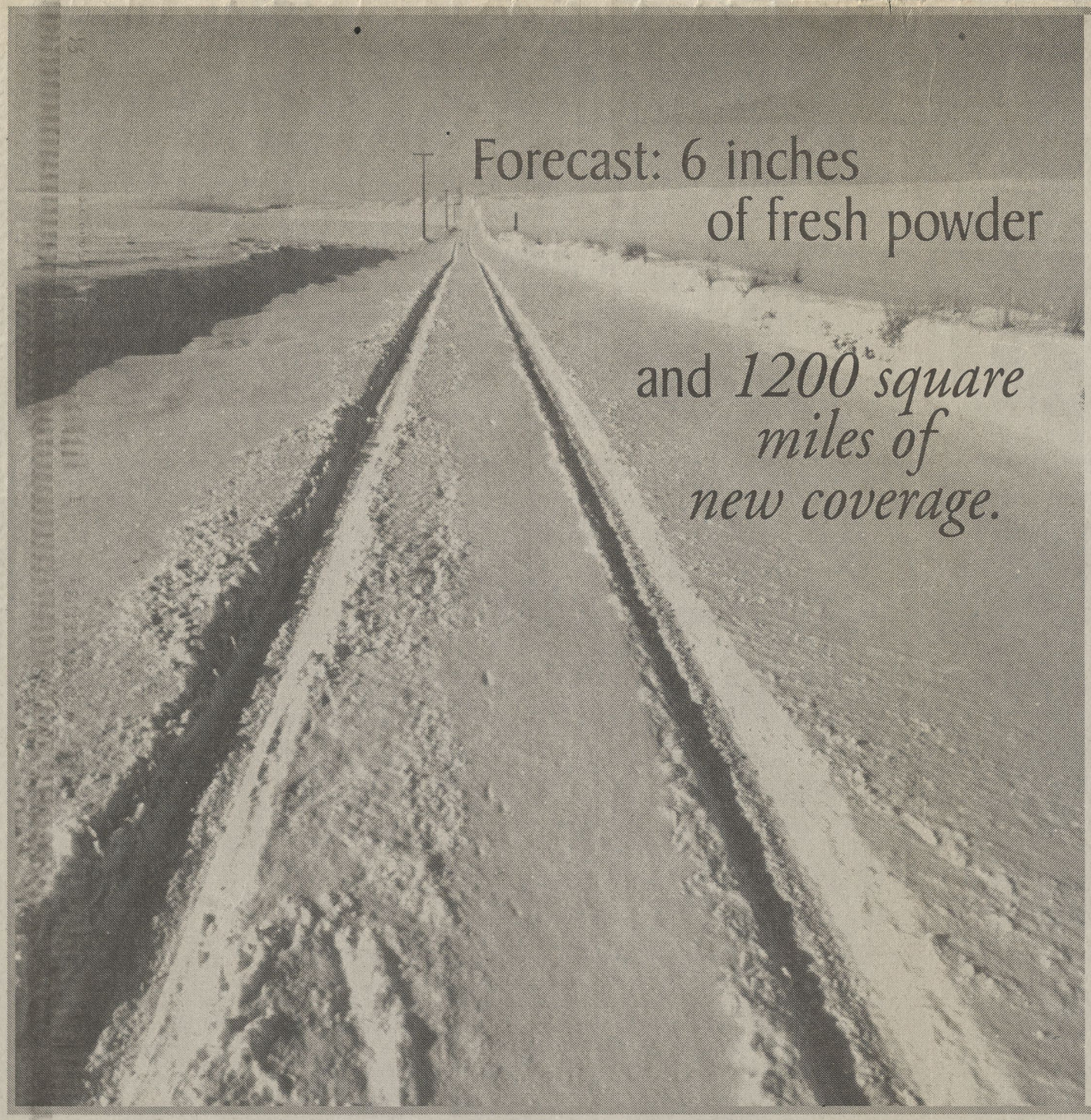

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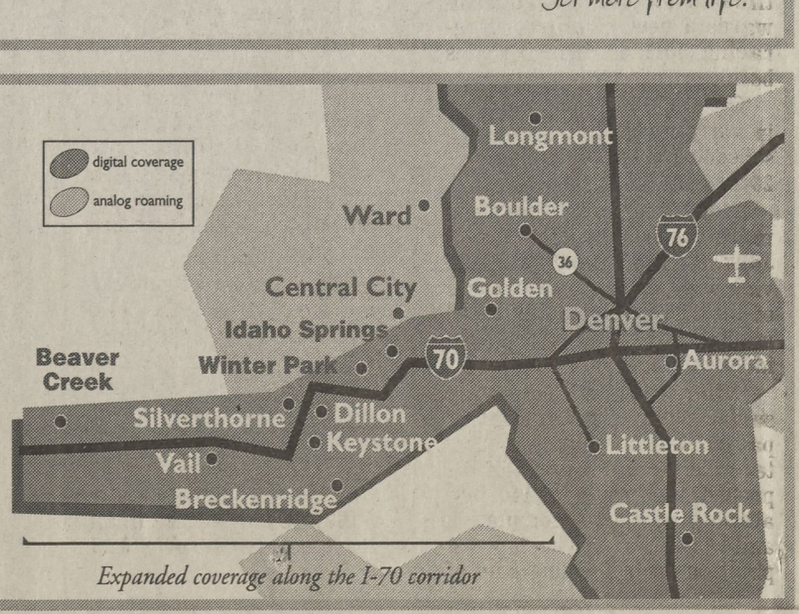

Expanded coverage along the I-70 corridor

NHL: *Colorado Avalanche*

Roy's efforts at Pond keep Avs above water

By Rick Sadowski
News Staff Writer

LOS ANGELES — In hockey parlance, it's called stealing a point. That's what goalie Patrick Roy did Friday night down the freeway from here when the Colorado Avalanche and Mighty Ducks of Anaheim played to a 3-3 tie.

"It could have been 7-0 if it wasn't for Patrick," said center Chris Drury, who knows the Avalanche will have to play a lot better today against a surly Los Angeles Kings bunch at the Staples Center.

The Ducks outshot the passive Avalanche 19-1 during the final 20 minutes (counting overtime), 38-15 for the game and got a goal from Teemu Selanne with 1:40 remaining to force the extra period.

It seemed as if the ice was slanted in the Avalanche end for most of the night, and this was against a Ducks team that boasts two superstars in Selanne and Paul Kariya but has scored 22 fewer goals than the Kings.

"I thought they deserved to win that game," said Roy, who has allowed only 14 goals during a personal 5-0-3 streak. "I mean, we could have won without playing a very good game, but we could not get the puck out of our zone. It seemed like they were storming in our end and we couldn't get the puck out. We should not be happy with the game, but we took a point away from them."

If the Avalanche plays like that today, it could get smoked.

The Kings are in a 4-11-1-1 slump but won't be a soft touch. They've had the Avalanche's number at home — a combined a 6-3-2 record in meetings at the Great Western Forum and Staples Center — and should be in a nasty mood.

First-year coach Andy Murray put the Kings through a grueling practice session following a lackluster 5-2 loss to Dallas on Thursday that extended their winless streak against the Stars to 21 games.

"I was mad at them," Murray said.

Avalanche coach Bob Hartley wasn't angry after the Ducks game, just disappointed. After all, the team is unbeaten in six games (4-0-2) and has gone 8-1-3 in the past 12.

"As a team, we definitely didn't play well enough to get out of there with two points," he said. "In order to win on the road, you definitely need more than 15 shots."

The game was a complete reversal from Thursday's scoreless tie with San Jose, when the Avalanche outshot the Sharks 39-15.

"It was a rough game for us and not the way we wanted to start our trip," Drury said. "I guess you could say it was good to come away with a point. Lack of effort, lack of concentration . . . we've been playing pretty good hockey and they just took it to us. Patrick played unbelievable. He kept us in the game."

At least Drury finally managed to score a goal. He leads the Avalanche in scoring with 40 points in 48 games but had gone his season-worst five games without a goal.

"It definitely felt pretty good," said Drury, who converted rookie Alex Tanguay's return pass for a 3-2 Avalanche lead late in the second period. "I've been getting chances. Sometimes they go in, sometimes they don't. I haven't really been worrying too much because we've been winning. Maybe if we'd been losing it would have been a bigger deal."

That's been the case with the Kings, who began the season on a roll but now are battling for a playoff spot. It's why Murray conducted a practice that resembled a clinic for speed skaters.

"It's taking medicine," Kings center Bryan Smolinski said. "You take it and go from there. Hopefully, we got the message."

Contact Rick Sadowski at (303) 892-2587 or sports@RockyMountainNews.com.

AVALANCHE AT KINGS

When — 1:30 p.m. MST today.
Where — Staples Center, Los Angeles.
TV/radio — No TV; KKFN-AM (950).
Leading scorers — Colorado (24-17-7-1, 56 points): C Chris Drury (13 goals, 27 assists, 40 points); RW Milan Hejduk (21 goals, 18 assists, 39 points); C Joe Sakic (nine goals, 29 assists, 38 points); D Sandis Ozolinsh (12 goals, 24 assists, 36 points). Los Angeles (19-19-7-3, 48 points): RW Ziggy Palffy (16 goals, 24 assists, 40 points); C Bryan Smolinski (12 goals, 28 assists, 40 points); LW Luc Robitaille (20 goals, 14 assists, 34 points); RW Glen Murray (14 goals, 20 assists, 34 points).
Injuries — Colorado: None. Los Angeles: D Philippe Boucher (foot surgery) is out; RW Donald Audette (sprained ankle), Murray (bruised chest) and C Jozef Stumpel (bruised knee) are day to day.
Sidelight — The Avalanche opened its practice facility at Family Sports Center about this time last year, and now the Kings are moving into a new practice home in El Segundo, Calif.
Notes — The Avalanche has tied two games in a row and is unbeaten in the past six games (4-0-2), but is winless in the past three road games (0-2-1) . . . The team has killed 26 of 27 penalties over six games . . . LW Peter Forsberg has recorded points in 13 of past 14 games . . . The Kings have gone 4-11-1-1 in their past 16 games.

FRIDAY'S LATE SUMMARY

Colorado	1	2	0	0	— 3
Anaheim	1	1	1	0	— 3

First Period — 1, Anaheim, Tverdovsky 5 (McInnis, Kariya), 11:56. 2, Colorado, Forsberg 8 (Deadmarsh, Hejduk), 17:52 (pp). Penalties — Skoula, Col (interference), 5:52; de Vries, Col (high-sticking), 13:11; Trepanier, Ana (roughing), 13:11; Drury, Col (elbowing), 14:53; Olausson, Ana (hooking), 15:54; Yelle, Col (tripping), 18:51.

Second Period — 3, Anaheim, Kariya 23 (Tverdovsky, Cullen), 4:43 (pp). 4, Colorado, Sakic 9 (Forsberg, Deadmarsh), 8:12. 5, Colorado, Drury 13 (Tanguay, Ozolinsh), 18:41. Penalties — Reid, Col (goalie interference), 3:49; Marshall, Ana (elbowing), 11:00; Forsberg, Col (holding), 11:36.

Third Period — 6, Anaheim, Selanne 17 (Kariya, Olausson), 18:20. Penalty — Rolston, Col (hooking), 4:50.

Overtime — None. Penalties — None.

Shots on goal — Colorado 5-5-5-0 — 15. Anaheim 10-8-15-5 — 38. Power-play Opportunities — Colorado 1 of 2; Anaheim 1 of 6. Goalies — Colorado, Roy 17-13-5 (38 shots-35 saves). Anaheim, Hebert 15-19-4 (15-12). A — 17,174 (17,174). Referees — Mark Faucette, Don Van Massenhoven. Linesmen — Wayne Bonney, Troy Sartison.

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NHL

Carolina ends skid, breaks Sabres 4-1

Associated Press

RALEIGH, N.C. — In tough times, hockey teams often lean on their captain.

Ron Francis provided more than the intangibles Saturday, scoring the game's first goal and assisting on the second as the Carolina Hurricanes snapped their season-worst five-game losing streak with a 4-1 victory over the Buffalo Sabres.

"That's the difference between very good players and guys who will be in the Hall of Fame," Carolina coach Paul Maurice said of Francis.

Francis and Sami Kapanen scored power play goals 1:31 apart in the second period to help Carolina snap its worst skid since losing the final five games of the 1997-98 season.

The victory in front of 16,345 — the second largest home crowd of the season — inched Carolina one point in front of Buffalo, which fell to 1-4-1 in its last six games.

"This goes a long way," Maurice said of the win. "We feel like we're back in the (playoff) fight again."

A pair of Gary Roberts goals midway through the third period sealed it for Carolina. It was Roberts' first multi-goal game since netting two against Toronto more than a year ago.

"This is one of these games where everybody goes home feeling good about contributing and now we just have to continue this way," Roberts said.

Buffalo	**0**	**0**	**1**	**—1**
Carolina	**0**	**2**	**2**	**—4**

First Period — No scoring. Penalty — Kovalenko, Car (hooking), 13:39.

Second Period — 1, Car, Francis 13 (Kovalenko, Kapanen), 12:34 (pp). 2, Car, Kapanen 18 (Francis, Kovalenko), 14:15 (pp). Penalties — Grosek, Buf (tripping), 1:18; McKee, Buf (holding), 6:00; Rasmussen, Buf (boarding), 10:50; Warrener, Buf (hooking), 13:49; Irbe, Car, served by Roberts (goalie interference), 14:38; Pratt, Car (cross-checking), 19:36.

Third Period — 3, Car, Roberts 10 (Halko, Kron), 7:53. 4, Car, Roberts 11 (O'Neill, Kron), 11:13 (pp). 5, Buf, Peca 7 (Ward, Rasmussen), 18:42. Penalties — Smehlik, Buf (cross-checking), 9:38; Westlund, Car (tripping), 14:16.

Shots on goal — Buf 5-9-8 — 22. Car 4-6-7 — 17. Power-play Opportunities — Buf 0 of 4; Car 3 of 5. Goalies — Buf, Biron 16-13-2 (17 shots-13 saves). Car, Irbe 15-17-7 (22-21). A — 16,345 (18,730). Referee — Dan Marouelli, Brad Watson. Linesmen — Pierre Champoux, Brad Kovachik.

NHL STANDINGS

EASTERN CONFERENCE

ATLANTIC DIVISION	W	L	T	RT	Pts	GF	GA	Home	Away	Div
New Jersey	30	13	5	3	68	154	115	20-4-2	10-9-3	8-3-1
Philadelphia	25	14	7	1	58	137	105	15-5-4	10-9-3	6-3-0
N.Y. Rangers	19	20	7	3	48	125	126	12-10-2	7-10-5	2-5-2
Pittsburgh	19	23	3	5	46	142	134	13-6-2	6-17-1	4-3-0
N.Y. Islanders	11	30	6	1	29	98	153	6-16-3	5-14-3	2-8-1
NORTHEAST DIVISION	**W**	**L**	**T**	**RT**	**Pts**	**GF**	**GA**	**Home**	**Away**	**Div**
Toronto	27	16	5	3	62	145	122	18-5-3	9-11-2	7-4-0
Ottawa	24	16	7	2	57	128	115	12-7-4	12-9-3	7-1-2
Boston	16	20	13	2	47	127	138	7-9-8	9-11-5	2-5-3
Buffalo	18	24	6	1	43	124	133	11-10-3	7-14-3	3-6-2
Montreal	16	24	6	1	39	103	116	8-11-4	8-13-2	2-5-3
SOUTHEAST DIVISION	**W**	**L**	**T**	**RT**	**Pts**	**GF**	**GA**	**Home**	**Away**	**Div**
Florida	28	15	4	3	63	151	114	17-4-2	11-11-2	8-3-2
Washington	20	17	8	1	49	122	119	11-4-6	9-13-2	6-4-1
Carolina	18	22	8	0	44	120	133	10-9-3	8-13-5	5-2-2
Tampa Bay	11	28	6	4	32	122	164	8-11-3	3-17-3	1-9-2
Atlanta	11	29	6	3	31	105	167	8-13-2	3-16-4	5-7-3

WESTERN CONFERENCE

CENTRAL DIVISION	W	L	T	RT	Pts	GF	GA	Home	Away	Div
Detroit	28	14	6	1	63	165	126	18-5-2	10-9-4	6-4-1
St. Louis	28	14	6	0	62	142	103	15-6-4	13-8-2	6-3-1
Nashville	16	25	6	4	42	127	144	9-11-3	7-14-3	4-6-2
Chicago	16	26	6	2	40	134	151	8-13-3	8-13-3	3-6-2
NORTHWEST DIVISION	**W**	**L**	**T**	**RT**	**Pts**	**GF**	**GA**	**Home**	**Away**	**Div**
COLORADO	**24**	**17**	**7**	**1**	**56**	**135**	**119**	**15-5-2**	**9-12-5**	**6-1-2**
Calgary	22	20	5	1	50	113	133	15-6-3	7-14-2	5-4-1
Edmonton	15	19	12	6	48	122	121	11-5-8	4-14-4	3-2-1
Vancouver	14	22	9	5	42	117	136	7-13-4	7-9-5	1-8-2
PACIFIC DIVISION	**W**	**L**	**T**	**RT**	**Pts**	**GF**	**GA**	**Home**	**Away**	**Div**
Phoenix	25	16	6	0	56	144	125	13-7-2	12-9-4	9-4-0
Dallas	24	18	5	2	55	113	106	12-9-1	12-9-4	7-7-0
San Jose	21	22	6	4	52	133	125	12-9-2	9-13-4	6-6-0
Los Angeles	19	19	7	3	48	137	133	10-9-3	9-10-4	3-8-1
Anaheim	20	22	6	1	47	115	124	12-10-4	8-12-2	6-6-1

Overtime losses count as a loss and a regulation tie.

Friday's score
Colorado 3, Anaheim 3, tie

Saturday's scores
Carolina 4, Buffalo 1
Washington 5, Toronto 5, tie
Montreal 4, Pittsburgh 2
Detroit 3, Ottawa 2
N.Y. Islanders 2, Tampa Bay 0
Florida 4, Boston 3
N.Y. Rangers 4, St. Louis 1
Vancouver at Edmonton, (n)
Anaheim at San Jose, (n)

Today's games
Colorado at Los Angeles, 1:30 p.m.
Philadelphia at Pittsburgh, 6 p.m.
Dallas at Chicago, 6 p.m.
San Jose at Phoenix, 6 p.m.
Nashville at Vancouver, 8 p.m.

Monday's games
Calgary at Boston, 5 p.m.
Tampa Bay at Washington, 5 p.m.
Ottawa at Toronto, 5:30 p.m.
Montreal at Carolina, 5:30 p.m.
N.Y. Rangers at Atlanta, 5:30 p.m.
Nashville at Edmonton, 7 p.m.

Capitals 5, Leafs 5

At Toronto

Chris Simon scored twice as Washington extended its undefeated streak to seven games by tying Toronto.

Ulf Dahlen, Sergei Gonchar and Richard Zednik also scored for the Capitals, who have gone 8-1-3 in their past 12 games.

Tomas Kaberle scored twice for the Maple Leafs. Mats Sundin, who scored a second-period goal, beat Capitals goalie Olaf Kolzig in overtime, but his shot came a second after time had expired.

Peter Bondra, out since Jan. 4 because of a sprained knee, returned to the Caps lineup.

Washington	**2**	**1**	**2**	**0—5**
Toronto	**1**	**3**	**1**	**0—5**

First Period — 1, Washington, Dahlen 8, 4:31. 2, Washington, Simon 12 (Oates, Gonchar), 6:27 (pp). 3, Toronto, Kaberle 6 (Khristich, Korolev), 16:47 (pp). Penalties — Simon, Was (roughing), 0:51; Adams, Tor (hooking), 5:50; Johansson, Was (hooking), 8:16; Klee, Was (interference), 16:29; King, Tor (high-sticking), 17:48; Joseph, Tor, served by Valk (slashing), 19:03.

Second Period — 4, Washington, Gonchar 10, :34. 5, Toronto, Sundin 22 (Clark, McAllister), 10:52. 6, Toronto, Adams 3 (McCauley, Dempsey), 17:45. 7, Toronto, Kaberle 6 (Korolev, Khristich), 19:24 (pp). Penalties — Klee, Was (delay of game), 1:46; Sundin, Tor (hooking), 7:02; Clark, Tor (high-sticking), 10:52; Witt, Was (high-sticking), 10:52; McAllister, Tor (closing hand on puck), 13:40; Nikolishin, Was (interference), 18:45.

Third Period — 8, Washington, Simon 13 (Konowalchuk, Oates), :54. 9, Toronto, McCauley 3 (King, Adams), 7:26. 10, Washington, Zednik 13 (Gonchar), 18:18. Penalty — Valk, Tor, double minor (high-sticking), 11:43.

Overtime — None. Penalties — None.

Shots on goal — Washington 8-8-13-2 — 31. Toronto 13-9-5-1 — 28. Power-play Opportunities — Washington 1 of 7; Toronto 2 of 6. Goalies — Washington, Kolzig 17-14-8 (28 shots-23 saves). Toronto, Joseph 23-10-5 (31-26). A — 19,299 (18,800). Referees — Greg Kimmerly, Terry Gregson. Linesmen — Derek Amell, Ray Scapinello.

Canadiens 4, Penguins 2

At Montreal

Dainius Zubrus scored two power-play goals and added an assist in Montreal's victory over Pittsburgh.

Patrick Poulin and Arron Asham also scored for Montreal, which is unbeaten in a season-high five in a row (4-0-1). Shayne Corson added two assists for the Canadiens.

Rob Brown and Jan Hrdina scored for the Penguins, who had just 15 shots.

Zubrus opened the scoring early in the second period when he took a loose puck at the side of the net, spun around and beat Tom Barrasso with a low shot between the legs at 2:42.

Pittsburgh coach Herb Brooks was back behind the bench after serving a two-game suspension for pushing a Colorado Avalanche announcer last week.

Pittsburgh	**0**	**1**	**1**	**—2**
Montreal	**0**	**3**	**1**	**—4**

First Period — None. Penalties — Morozov, Pit (ob.-hooking), 4:27; Hrdina, Pit (holding), 14:50; Corson, Mon (cross-checking), 19:25.

Second Period — 1, Montreal, Zubrus 10 (Asham, Corson), 2:42 (pp). 2, Pittsburgh, Brown 4 (Jonsson, Lang), 5:50 (pp). 3, Montreal, Poulin 6 (Darby), 10:33. 4, Montreal, Zubrus 11 (Rucinsky, Dykhuis), 18:31 (pp). Penalties — Straka, Pit (tripping), 1:22; Ulanov, Mon (tripping), 5:04; Barnaby, Pit (high-sticking), 16:46.

Third Period — 5, Montreal, Asham 4 (Zubrus, Corson), 7:09. 6, Pittsburgh, Hrdina 9 (Chorske, Slegr), 7:49. Penalties — Barnaby, Pit (roughing), 2:49; Ward, Mon (roughing), 2:49; Rozsival, Pit (high-sticking), 3:23.

Shots on goal — Pittsburgh 3-6-6 — 15. Montreal 4-16-5 — 25. Power-play Opportunities — Pittsburgh 1 of 2; Montreal 2 of 5. Goalies — Pittsburgh, Barrasso 4-6-0 (25 shots-21 saves). Montreal, Theodore 9-8-2 (15-13). A — 20,815 (21,273). Referee — Richard Trottier. Linesmen — Jean Morin, Lyle Seitz.

Red Wings 3, Senators 2

At Kanata, Ontario

Niklas Lidstrom scored twice as Detroit beat Ottawa to snap a five-game winless streak.

Pat Verbeek scored the winning goal early in the third period, and Steve Duchesne had two assists. Detroit entered the game 0-3-2 in its past five and had just two victories in its previous 10.

Jason York and Patrick Traverse scored for Ottawa.

Verbeek scored the winner at 3:22 of the third, taking a pass from Steve Yzerman and beating goalie Ron Tugnutt with a high backhand shot on a breakaway.

Lidstrom opened the scoring with a power-play goal at 2:46 of the first period.

York then beat Osgood with a shot at 5:43, and Traverse gave Ottawa the lead 22 seconds later.

Detroit	**1**	**1**	**1**	**—3**
Ottawa	**2**	**0**	**0**	**—2**

First Period — 1, Detroit, Lidstrom 10 (Shanahan, Duchesne), 2:46 (pp). 2, Ottawa, York 4 (Bonk, Redden), 5:43. 3, Ottawa, Traverse 4 (Juneau, Dackell), 6:05. Penalties — Prospal, Ott (hooking), 1:55; Yzerman, Det (hooking), 10:00; Kravchuk, Ott (holding), 15:42; Draper, Det (slashing), 19:06.

Second Period — 4, Detroit, Lidstrom 11 (Larionov, Kozlov), 8:35. Penalties — York, Ott (holding), 3:38; Fischer, Det (tripping), 13:14; Duchesne, Det (holding), 18:37.

Third Period — 5, Detroit, Verbeek 12 (Yzerman, Duchesne), 3:22. Penalties — Laukkanen, Ott (boarding), 3:55; Shanahan, Det (ob.-hooking), 8:50; McEachern, Ott (cross-checking), 10:28.

Shots on goal — Detroit 8-12-5 — 25. Ottawa 12-4-15 — 31. Power-play Opportunities — Detroit 1 of 5; Ottawa 0 of 5. Goalies — Detroit, Osgood 13-7-5 (31 shots-29 saves). Ottawa, Tugnutt 12-8-5 (25-22). A — 18,500 (18,500). Referee — Stephen Walkom. Linesmen — Greg Devorski, Francois Gagnon.

Islanders 2, Lightning 0

At Uniondale, N.Y.

Kevin Weekes made 28 saves as the New York Islanders snapped a six-game losing streak with a victory over Tampa Bay.

The shutout was Weekes' second this season — and second of his career — as the Islanders won for just the second time in their past 14.

Gino Odjick and Jorgen Jonsson scored for the Islanders, who won at home for the first time since beating Boston 3-0 on Dec. 27.

The loss was the fourth in a row for the Lightning, who have gone 1-14-2-2 in their past 19. Their last win was Jan. 13, a 4-2 victory against the Islanders.

Tampa Bay	**0**	**0**	**0**	**—0**
N.Y. Islanders	**1**	**1**	**0**	**—2**

First Period — 1, New York, Odjick 4 (Lapointe, Connolly), 7:48. Penalties — Green, NY (cross-checking), :58; Gardiner, TB (holding), 3:50; Hodson, TB, served by Guolla (delay of game), 18:28.

Second Period — 2, New York, J.Jonsson 9 (Czerkawski, K.Jonsson), 17:45 (pp). Penalties — Lapointe, NY (slashing), :13; Gratton, TB, major (fighting), 12:27; Scatchard, NY, major (fighting), 12:27; Muir, TB (hooking), 12:57; Tucker, TB (hooking), 16:11; Martins, TB (roughing), 16:58; Odjick, NY (roughing), 16:58; Heward, NY (high-sticking), 18:05.

Third Period — None. Penalties — Svejkovsky, TB (roughing), 4:32; Jokinen, NY (roughing), 4:32; Isbister, NY (boarding), 5:22; Lapointe, NY (hooking), 16:36; Tucker, TB (roughing), 20:00; Jokinen, NY (roughing), 20:00.

Shots on goal — Tampa Bay 7-10-11 — 28. New York 6-7-3 — 16. Power-play Opportunities — Tampa Bay 0 of 5; New York 1 of 4. Goalies — Tampa Bay, Hodson 2-6-4 (16 shots-14 saves), Parent (16:36 third, 0-0). New York, Weekes 9-14-5 (28-28). A — 8,399 (16,297). Referee — Bernard DeGrace. Linesmen — Gerard Gauthier, Anthony Sericolo.

Panthers 4, Bruins 3

At Sunrise, Fla.

Pavel Bure scored the 300th goal of his career and added his 301st in overtime as Florida beat Boston.

Bure, whose 34 goals ties him with Pittsburgh's Jaromir Jagr for the NHL lead, converted a pass from Viktor Kozlov 1:31 into overtime to become the seventh-fastest player in NHL history to score 300 goals.

Florida, 6-1-1 in its past eight, ended a two-game winless streak and stopped Boston's five-game unbeaten streak.

Bure's 34 goals set a team single-season record for goals, breaking a tie with Ray Whitney (1997-98) and Scott Mellanby (1995-96).

Boston	**0**	**3**	**0**	**0**	**—3**
Florida	**1**	**2**	**0**	**1**	**—4**

First Period — 1, Florida, Whitney 20 (Bure, Simpson), 16:12. Penalties — Gill, Bos (interference), 11:09; Hedican, Fla (interference), 13:58.

Second Period — 2, Boston, McSorley 2 (Samsonov), 2:45. 3, Florida, Bure 33 (Kozlov), 3:47. 4, Boston, Heinze 9 (Murphy, Savage), 4:19. 5, Boston, Wilson 1 (Samsonov, Carter), 4:44. 6, Florida, Parrish 17 (Whitney, Johnson), 12:19. Penalties — Gill, Bos (high-sticking), 6:30; Wilson, Bos, major (fighting), 13:44; Simpson, Fla, major (fighting), 13:44; Spacek, Fla (tripping), 17:05.

Third Period — None. Penalties — Sweeney, Bos (interference), 2:57; Whitney, Fla (ob.-tripping), 4:19; Svehla, Fla (high-sticking), 17:18.

Overtime — 7, Florida, Bure 34 (Kozlov, Svehla), 1:31. Penalties — None.

Shots on goal — Boston 12-16-10-1 — 39. Florida 8-9-9-2 — 28. Power-play Opportunities — Boston 0 of 4; Florida 0 of 3. Goalies — Boston, Dafoe 11-12-8 (28 shots-24 saves). Florida, Vernon 12-7-1 (39-36). A — 18,423 (19,088). Referees — Blaine Angus, Paul Stewart. Linesmen — Stephane Provost, Pierre Racicot.

Rangers 4, Blues 1

At St. Louis

Jan Hlavac, awarded a goal while he was in the dressing room, scored twice in the New York Rangers' victory over St. Louis.

Radek Dvorak added a goal and an assist.

Hlavac scored his first goal with 51.7 seconds left in the first period by poking a rebound of Petr Nedved's shot past Blues goalie Roman Turek. The goal wasn't awarded immediately.

However, because there had not been a stoppage before the end of period, officials reviewed the play during intermission.

When the teams came out for the second period, it was announced that Hlavac's shot crossed the line. The game was restarted from that point.

NY Rangers	**2**	**1**	**1**	**—4**
St. Louis	**0**	**0**	**1**	**—1**

First Period — 1, New York, Dvorak 9 (Nedved, Hatcher), 16:21 (pp). 2, New York, Hlavac 8 (Nedved, Dvorak), 19:08. Penalties — Knuble, NY (interference), 1:16; Persson, StL (roughing), 6:32; Hatcher, NY (hooking), 13:16; Finley, StL (hooking), 15:46.

Second Period — 3, New York, Hlavac 9 (Quintal, Nedved), 1:37. Penalties — Kamensky, NY (unsportsmanlike conduct), 2:49; Reirden, StL (slashing), 14:25; Schneider, NY (tripping), 15:20.

Third Period — 4, St. Louis, Turgeon 23 (Demitra, Bergevin), 13:45. 5, New York, Taylor 8 (Hatcher), 19:30 (en). Penalties — Nedved, NY (high-sticking), 4:30; Nedved, NY (slashing), 12:14; Schneider, NY (cross-checking), 12:14; Nash, StL (slashing), 12:14; Persson, StL (cross-checking), 12:14.

Shots on goal — New York 6-5-4 — 15. St. Louis 0-12-18 — 30. Power-play Opportunities — New York 1 of 3; St. Louis 0 of 5. Goalies — New York, Richter 15-16-7 (30 shots-29 saves). St. Louis, Turek 23-11-5 (14-11). A — 20,237 (19,260). Referee — Dennis LaRue. Linesmen — Andy McElman, Mark Pare.

Outmanned Dallas needs All-Star break to regroup

New York Times News Service

DALLAS — Stars defenseman Sergei Zubov says he can't wait for the All-Star break.

And not because he's playing in the Feb. 6 game. It's because the All-Star break is the time the Stars are expected to get some of their injured players — namely veteran defensemen Derian Hatcher and Shawn Chambers — back in the lineup.

A lot of responsibility for holding on the six games before the break falls to defensemen Zubov, Darryl Sydor and Richard Matvichuk.

How important are they?

"You can see by the minutes," Stars assistant coach Rick Wilson said. "It's not by accident."

Sydor played 30 minutes, 27 seconds against Anaheim on Wednesday and 23:25 against Los Angeles on Thursday. Matvichuk played 29:11 and 30:08.

Zubov played a game-high 34:28 against Anaheim and 30:58 against L.A.

"I was really tired," Zubov admitted. "The first couple of shifts you struggle and fight it, but this is the way it is right now."

Sabres oppose Hasek stint in All-Star Game

News wire services

Buffalo coach Lindy Ruff said it would be "ludicrous" for goalie Dominik Hasek to play in the All-Star Game without having tested his injured groin in a Sabres game, but admits he probably has no control over the situation.

There's more than ego involved in Hasek's desire to play in Toronto Feb. 6. He will earn a fat bonus from a Louisville equipment firm if he debuts a new line of gear.

The Sabres don't want Hasek to worsen an injury in a meaningless game.

Meanwhile, even if Hasek doesn't play in the All-Star Game, his would-be replacement wants no part of it. St. Louis goalie Roman Turek was snubbed for the World team because the NHL prefers to have one participant from each team. It chose Edmonton's Tommy Salo and Washington's Olaf Kolzig.

"When they named three goalies and my name was not there, that's it for me," Turek said. "If they call me next week or the week after and say, 'Hey, Dominik is not coming,' I'm not going. I'll spend the time with my family."

HIGH SCHOOLS

SCORES, SCHEDULES, SUMMARIES

from previous page

Totals 22 4-8 50.

Three-point goals — G, Dutro 2. **Assists** — G, James 3. **Steals** — G, Stum 10.

AGUILAR 42, MOUNTAIN VALLEY 37

Aguilar ..... 8 17 10 7 — 42
Mountain Valley ..... 4 3 13 17 — 37

A — No stats available.

MOU — Hoody 6 1-4 14, Grell 3 0-0 7, Flickinger 1 2-2 4, Hutchinson 2 0-2 4, Wilson 0 4-7 4, S. Boaz 1 1-2 3, Lewis 0 1-4 1. Totals 13 9-21 37.

Three-point goals — MOU, Hoody, Grell. **Assists** — MOU, Lewis 3. **Steals** — MOU, Hoody 7, S. Boaz 4. **Fouled out** — MOU, Lewis.

ELBERT 54, DEER TRAIL 36

Deer Trail ..... 7 10 12 7 — 36
Elbert ..... 17 11 16 10 — 54

D — J. Turecek 6 1-4 13, Brumage 5 0-0 10, Monks 3 1-2 7, Eastwood 0 2-4 2, Kitzman 1 0-0 2, Wulf 1 0-0 2. Totals 16 4-10 36.

E — Smith 10 0-0 20, Lambrecht 6 3-6 15, Ferguson 3 0-0 6, Stewart 2 0-2 4, Norvell 1 1-2 3, Ban 1 0-0 2, Crowley 1 0-0 2, Miller 1 0-0 2. Totals 25 4-10 54.

Fouled out — E, Ferguson.

MIAMI-YODER 49, HANOVER 21

Hanover ..... 3 6 6 6 — 21
Miami-Yoder ..... 11 14 12 12 — 49

H — Prother 2 2-2 6, Sverdgard 1 2-4 4, Dunahoo 1 1-2 3, Griffin 1 1-1 3, Shotley 1 1-5 3, Fisher 1 0-0 2, Gerlock 0 0-2 0. Totals 7 7-16 21.

M — Badge 12 1-1 25, To. Brown 5 0-0 10, Chess 2 0-0 4, Myers 2 0-2 4, Ta. Brown 1 0-0 2, Dole 1 0-2 2, Sanchez 1 0-1 2. Totals 24 1-6 49.

Friday's late summaries

AIR ACADEMY 43, WASSON 39

Wasson ..... 6 10 13 10 — 39
Air Academy ..... 11 9 9 14 — 43

R — Heald 6 2-5 14, Sagiao 3 2-2 8, Stansberry 1 4-4 6, Anglebrandt 2 0-0 4, Wright 2 0-0 4, Farquar 1 1-1 3, C. Villareal 0 0-0 0. Totals 15 9-12 39.

A — M. Higgins 3 3-7 10, Schwarz 4 2-3 10, Johnson 4 0-2 8, Bell 2 0-0 4, S. Higgins 1 1-2 4, LaMourey 1 0-0 3, Englebretson 1 0-0 2, Gieck 0 2-4 2. Totals 16 8-18 43.

HIGHLANDS RANCH 77, LITTLETON 51

Highlands Ranch ..... 24 23 20 10 — 77
Littleton ..... 11 17 13 10 — 51

H — Espinoza 9 2-2 21, Flecky 8 2-3 18, Gibb 7 0-0 15, McGrew 4 1-2 11, Studdard 2 3-6 7, Boren 1 0-0 3, Gallegos 1 0-0 2. Totals 32 8-13 77.

L — Neville 5 0-0 11, Goldberg 4 0-0 10, Troupe 4 2-2 10, C. Mitchell 2 3-6 8, T. Mitchell 2 0-0 5, Ross 2 0-0 4, Faro 0 2-2 2, VanderPloeg 0 1-2 1, Ladwig 0 0-1 0. Totals 19 8-13 51.

Three-point goals — H, McGrew 2, Espinoza, Gibb, Boren. L, Goldberg 2, Neville, C. Mitchell, T. Mitchell.

CHATFIELD 71, GREEN MOUNTAIN 36

Green Mountain ..... 9 5 6 16 — 36
Chatfield ..... 16 17 19 19 — 71

G — Quast 1 5-8 8, Zinsli 3 0-0 8, Lively 2 3-4 7, Fields 2 1-1 6, Schaefer 1 1-2 3, Mitchell 1 0-0 2, Szynakiewicz 1 0-0 2, Brinkerhoft 0 0-7 0. Totals 11 10-22 36.

C — Law 8 2-2 19, McDonald 7 0-0 18, Gander 5 0-0 10, Verschoor 4 1-1 9, Hill 3 0-0 6, Calandra 2 0-2 4, Heinel 1 0-0 3, Angel 1 0-0 2, Anderson 0 0-0 0. Totals 31 3-5 71.

Three-point goals — G, Zinsli 2, Quast, Fields. C, McDonald 4, Law, Heinel. **Assists** — C, Law 5. **Steals** — C, Law 5, McDonald 4.

CENTAURI 72, MONTE VISTA 36

Monte Vista ..... 17 4 7 8 — 36
Centauri ..... 19 15 19 19 — 72

M — Howard 2 4-4 8, Lonseth 3 1-2 7, Schmeir 2 3-6 7, Sims 2 0-1 6, Schaefer 2 0-2 4, Moncy 1 0-0 2, Kelso 0 1-3 1, Martinez 0 1-2 1, Javalera 0 0-0 0. Totals 12 10-20 36.

C — C. McCarroll 11 3-5 26, N. Espinoza 6 1-2 13, H. McCarroll 5 1-4 13, E. McCarroll 4 1-2 9, M. McCarroll 2 1-2 5, Bond 2 0-0 4, Richardson 0 1-3 1, Rogers 0 1-3 1, Y. Espinoza 0 0-0 0. Totals 30 9-21 72.

THUNDERRIDGE 54, CHAPARRAL 38

Chaparral ..... 9 12 7 10 — 38
ThunderRidge ..... 9 11 16 18 — 54

CH — Bull 4 4-6 12, B. Snoy 4 3-5 11, Roberts 2 1-2 5, Godsey 1 2-2 4, Koch 1 2-2 4, McCormick 0 2-2 2. Totals 12 14-19 38.

T — Watson 5 8-9 18, Quinn 4 1-2 11, Barbour 1 6-9 8, Carroll 1 3-6 5, Keller 2 0-1 4, Waner 0 4-6 4, Cramm 1 0-0 2, Willett 0 2-2 2, Burton 0 0-1 0, Pitman 0 0-2 0. Totals 14 24-38 54.

Three-point goals — T, Quinn 2.

Wrestling

THOMPSON VALLEY 45, ADAMS CITY 21

103 — Jesser, T, dec. Sammy Vigil, 5-4. **112** — Gerrard, T, pinned Eddie Hendrixson, 5:50. **119** — Martinez, T, pinned R.J. Quintana, 4:43. **125** — Nester Pino, A, dec. Thigpen, 8-2. **130** — Trujillo, T, dec. Rudy Pino, 14-0. **135** — Branch, T, pinned Mike Garcia, 1:40. **140** — Schumann, T, dec. Armenta, 12-2. **145** — Jared Deaguero, A, pinned Beck, 1:15. **152** — Pharris, T, won by forfeit. **160** — Greer, T, dec. Wiley Kuenzler, 14-6. **171** — Waterhouse, A, won by forfeit. **189** — Jenks, T, dec. David Gutierrez, 12-3. **215** — Frei, A, pinned West, 3:21. **275** — Velasquez, T, pinned Josh Martinez, 0:24.

HINKLEY T-BIRD INVITATIONAL

Team scores — Valley 256, Palisade 138.5, ThunderRidge 124, Aurora Central 81.5, Monarch 72.5, Hinkley 56.5, Thomas Jefferson 55, Denver South 46, Brush 10.

CHAMPIONSHIP MATCHES

103 — Meisner, Valley, dec. B. Ochoa, Denver South 10-5. **112** — Nix, Valley, pinned Patten, Monarch 3:49. **119** — Neumeyer, ThunderRidge, dec. S. Mungmee, Aurora Central 8-6. **125** — Personeous, Palisade, pinned O'Donnell, Valley 3:43. **130** — Rizzi, Monarch, dec. Liftin, Valley 5-3. **135** — Jenkins, Valley, dec. Bisbee ThunderRidge 9-2 **140** — Heinle, Valley, dec. Gartner, Hinkley 19-4. **145** — Gable, Valley, dec. Darby, Monarch 5-0. **152** — Rodriguez, Valley, dec. Davis, Palisade 17-4. **160** — E. Wright, Valley, pinned Craven, Thomas Jefferson 2:24. **171** — Rodgers, Aurora Central, pinned J. Wright, Valley 0:57. **189** — Schulze, Valley, dec. Gordon, Aurora Central 16-4. **215** — Voelker, ThunderRidge, dec. Chacon, Valley 10-6. **275** — Reck, Valley, pinned Smith, ThunderRidge 1:52.

POUDRE INVITATIONAL

Team scores — Greeley Central 169, Poudre 168, Windsor 146, Greeley West 117, Sterling 87, Regis 81, Berthoud 63, Highland 17

CHAMPIONSHIP MATCHES

103 — Lopez, Sterling, dec. Matinez, Windsor 4-2. **112** — Walker, Windsorr, dec. Gonzales, Greeley Central 4-2. **119** — Broughton, Greeley Central, tech. fall, Garcia, Greeley Central 17-1. **125** — Aragon, Greeley Central, pin, Subia, Windsor 2:41. **130** — Gonzales, Greeley Central, dec., Degroot, Poudre 7-5. **135** — Jiminez, Poudre, dec., Smith, Widsor 14-6 **140** — Brown, Berthoud, pin, Wadsworth, Windsor 3:13. **145** — Camacho, Greeley Central, dec., Solano, Poudre 5-3. **152** — Hubbard, Poudre, pin, Whalen, Greeley West 0:47 **160** — Wickom, Greeley Central, dec., Magdelino, Greeley West 11-6. **171** — Farrelo, Regis, dec., Sweigard, Greeley West 8-7. **189** — Green, Greeley Central, dec., Bock, Regis 3-1. **215** — Hall, Poudre, pin, Cramer, Scott, Sterling 1:18. **275** — Martinez, Greeley West, pin, Shubert, Windsor 0:22.

WESTMINSTER INVITATIONAL

Team scores — Arvada 136, Brush 132.5, Palmer 132, Skyline 126, Yuma 126, Westminster 108, Arapahoe 70, Skyview 33.

CHAMPIONSHIP MATCHES

103 — Samples, Brush, dec. Seavers, Skyline 19-2. **112** — Oestman, Yuma, dec. Kaspari, Arvada 7-2. **119** — Montour, Westminster, dec. Decker, Brush 12-6. **125** — Rentz, Skyline, pinned Houtcelus, Brush 3:08. **130** — Stolzmann, Palmer, pinned Bailek, Skyview 2:58. **135** — Lucero, Westminster, dec. Wriser, Skyline 6-1. **140** — Bauke, Yuma, pinned Bahrini, Arvada 5:03. **145** — Ernest, Yuma dec. Oliver, Palmer 2-0. **152** — Hunt, Palmer, dec. Gonzales, Arvada 10-1. **160** — Sexton, Arvada, pinned Mitchell, Skyview 0:33. **171** — DelPonte, Arapahoe, dec. Tuell, Yuma 12-4. **189** — Weil, Palmer, dec. Smith, Yuma 8-4. **215** — Herr, Arvada, pinned Bradburg, Arapahoe 0:37. **275** — Ross, Westminster, injury default Sheppie, Arvada.

FR-MONUMENT 48, THOMPSON VLY 26

103 — Armondo Romero, F, dec. Jesser, 15-1. **112** — Gerrard, T, pinned Tim Richardson, 5:49. **119** — Martinez, T, dec. Terry Klunker, 13-4. **125** — Brooke Stockert, F, dec. Thigpen, 7-1. **130** — Daniel Herrera, F, dec. Trujillo, 9-5. **135** — Branch, T, dec. Bryan Bernal, 6-2. **140** — Schumann, T, dec. David Willaims, 4-2. **145** — Cody Haller, F, dec. Beck, 5-4. **152** — Tyler Robinson, F, dec. Pharris, 7-4. **160** — Wacey Clark, F, dec. Greer, 7-5. **171** — Andy Christensen, F, dec. T. Sarazen, 18-1. **189** — Jenks, T, dec. Tom Vertiz, 8-3. **215** — West, T, pinned Meno Padillo, 4:22. **275** — Velasquez, T, pinned Dean O'Conner, 2:46.

HERITAGE 45, FORT COLLINS 29

103 — Dan Chapman, H, pinned Jaggie, 0:54. **112** — Caleb Hicks, H, won by forfeit. **119** — Trimbath, F, dec. David Holguin, 10-0. **125** — Simon Engelbert, H, pinned Lewis, 4:28. **130** — Zach Schroeder, F, dec. Dan Chapman, 17-7. **135** — Richard Miskimins, F, pinned Tim Wakimura, 1:49. **140** — Matt Cala, F, pinned Adam Pacheco, 3:12. **145** — Dan Alley, H, dec. Ander Schumann, 11-4. **152** — Jacob Bernatow, F, pinned Travis Gohl, 2:55. **160** — Doug Chapman, H, pinned Trujillo, 1:07. **171** — B. Rivera, H, pinned Jeff Bailey, 1:50. **189** — Sam Gaare, H, won by forfeit. **215** — Nathan Bernatow, F, dec. Nat Hansen, 3-1. **275** — Jacobson, H, won by forfeit.

FRUITA-MONUMENT 48, NORTHGLENN 26

103 — A. Romero, N, pinned Armondo Romero, 3:30. **112** — B. Romero, N, dec. Tim Richardson, 6-0. **119** — Terry Klunker, F, pinned Herrera, 1:59. **125** — Brooke Stockert, F, dec. Turco, 7-1. **130** — Daniel Herrera, F, pinned Temple, 3:56. **135** — Bryan Bernal, F, dec. Meyer, 10-0. **140** — Keel, N, dec. David Willaims, 5-0. **145** — Cody Haller, F, pinned Deal, 1:13. **152** — Tyler Robinson, F, pinned Christopher, 4:36. **160** — Wacey Clark, F, pinned Taylor Davis, 0:39. **171** — Andy Christensen, F, dec. Sarazen, 18-1. **189** — Wood, N, pinned Tom Vertiz, 0:48. **215** —Scott, N, pinned Meno Padillo, 0:49. **275** — Dean O'Conner, F, pinned Anderson, 3:15.

NORTHGLENN 49, FORT COLLINS 26

103 — A. Romero, N, pinned Jaggie, 1:03. **112** — B. Romero, N, won by forfeit. **119** — Trimbath, F, dec. Herrera, 13-6. **125** — Turco, N, dec. Lewis, 15-5. **130** — Zach Schroeder, F, pinned Temple, 2:40. **135** — Richard Miskimins, F, pinned Meyer, 2:54. **140** — Keel, N, dec. Matt Cala, 13-2. **145** — Ander Schumann, F, pinned Deal, 4:58. **152** — Jacob Bernatow, F, dec. Christopher, 5-0. **160** — Taylor Davis, N, pinned Trujillo, 4:37. **171** — Sarazen, N, pinned Jeff Bailey, 0:34. **189** — Wood, N, won by forfeit. **215** — Scott, N, pinned Nathan Bernatow, 0:29. **275** — Anderson, N, won by forfeit.

WIDEFIELD 45, OVERLAND 27

103 — Jacob Huffine, O, dec. Garibaui, 7-5. **112** — R. Vigil, W, dec. Josh Robinson, 10-6. **119** — An Ngo, O, pinned J. Palmer, 3:13. **125** — A. Mota, W, pinned M. Appleton, 1:40. **130** — M. Shea, W, dec. Adam Fivehouse, 19-12. **135** — M. Cotton, W, won by forfeit. **140** —S. Williams, W, pinned J. Tracy, 4:45. **145** — Mike Stott, O, pinned B. Burghardt, 1:40. **152** — Jono Scott, O, pinned J. Ellsworth, 3:20. **160** — Johnson, W, pinned Farazandeh, 3:54. **171** — K. Huskin, W, pinned J. Perkins, 3:29. **189** — Keller, W, pinned A. Davis, 0:45. **215** — S. Paddack, W, dec. A. Hawkins, 1-1. **275** — Curtis Grantham, O, pinned A. Herrington, 1:00.

THOMPSON VALLEY 56, OVERLAND 14

103 — Jesser, T, dec. Jacob Huffine, 5-0. **112** — Gerrard, T, won by forfeit. **119** — An Ngo, O, dec. Martinez, 10-8. **125** — Thigpen, T, pinned M. Appleton, 4:12. **130** — Trujillo, T, pinned Adam Fivehouse, 5:18. **135** — Branch, T, won by forfeit. **140** — Schumann, T, pinned J. Tracy, 1:33. **145** — Mike Stott, O, dec. Beck, 6-3. **152** — Jono Scott, O, dec. Pharris, 9-7. **160** — Greer, T, pinned Farazandeh, 1:05. **171** — Ben Michaels, O, inj. default J. Miller. **189** — Jenks, T, pinned A. Davis, 1:51. **215** — West, T, dec. Gene Strange, 7-3. **275** — Velasquez, T, pinned Curtis Grantham, 1:46.

FORT COLLINS 43, OVERLAND 36

103 — Jacob Huffine, O, pinned Jaggie, 1:35. **112** — Josh Robinson, O, won by forfeit. **119** — Trimbath, F, won by forfeit. **125** — Lewis, F, pinned M. Appleton, 1:00. **130** — Zach Schroeder, F, dec. Adam Fivehouse, 16-6. **135** — Richard Miskimins, F, won by forfeit. **140** —Matt Cala, F, pinned J. Tracy, 2:38. **145** — Ander Schumann, F, won by forfeit. **152** — Jacob Bernatow, F, pinned R. Vaynstein, 2:20. **160** — Farazandeh, O, pinned Trujillo, 5:12. **171** — Ben Michaels, O, pinned Jeff Bailey, 1:50. **189** — A. Davis, O, won by forfeit. **215** — Nathan Bernatow, F, dec. Gene Strange, 5-4. **275** — Hawkins, F, won by forfeit.

FRUITA-MONUMENT 46, WIDEFIELD 27

103 — M. Cool, W, pinned Armondo Romero, 1:32. **112** — R. Vigil, W, pinned Tim Richardson, 2:26. **119** — Terry Klunker, F, dec. J. Palmer, 11-1. **125** — Brooke Stockert, F, dec. A. Mota, 9-2. **130** — Daniel Herrera, F, pinned M. Shea, 1:27. **135** — Bryan Bernal, F, pinned M. Cotton, 1:34. **140** — S. Williams, W, dec. David Willaims, 15-12. **145** — Cody Haller, F, pinned B. Burghardt, 1:36. **152** — Tyler Robinson, F, pinned J. Ellsworth, 3:44. **160** — Wacey Clark, F, pinned Johnson, 3:44. **171** — Andy Christensen, F, dec. K. Huskin, 2-1. **189** — Keller, W, pinned Tom Vertiz, 3:08. **215** — S. Paddack, W, pinned M. Paddack, 3:55. **275** — Dean O'Conner, F, pinned A. Herrington, 1:17.

WIDEFIELD 42, HERITAGE 19

103 — Dan Chapman, H, dec. M. Cool, 5-4. **112** — R. Vigil, W, pinned Caleb Hicks, 1:04. **119** — Mellars, W, dec. David Holguin, 10-4. **125** — A. Mota, W, dec. Simon Engelbert, 7-4. **130** — Dan Chapman, H, dec. M. Shea, 7-5. **135** — Gilday, W, dec. Tim Wakimura, 15-11. **140** — Ramirez, H, dec. S. Williams, 12-7. **145** — Dan Alley, H, pinned B. Burghardt, 2:56. **152** — J. Ellsworth, W, pinned Dan Chapman, 2:19. **160** — Johnson, W, pinned Travis Gohl, 3:36. **171** — K. Huskin, W, dec. B. Rivera, 9-3. **189** — Keller, W, pinned Sam Gaare, 1:08. **215** — Nat Hansen, H, dec. S. Paddack, 12-1. **275** — A. Herrington, W, pinned David Holguin, 2:52.

Friday's late summaries

HERITAGE 57, AURORA CENTRAL 21

103 — Dan Chapman, H, pinned R. Mungmee, 1:46. **112** — Tim Baker, H, won by forfeit. **119** — S. Mungmee, AC, pinned David Holguin, 4:43. **125** — Simon Engelbert, H, dec. Pemberton, 10-4. **130** — K. Pogue, AC, inj. default Caleb Hicks. **135** — 135 — Tim Wakimura, H, pinned Brocas, 5:36. **140** — Ramirez, H, won by forfeit. **145** — Dan Alley, H, won by forfeit. **152** — Doug Chapman, H, won by forfeit. **160** — Travis Gohl, H, won by forfeit. **171** — Rodgers, AC, pinned B. Rivera, 1:59. **189** — Gordon, AC, dec. Sam Gaare, 7-4. **215** — Nat Hansen, H, won by forfeit. **275** — Jacobson, H, pinned Mitchell, 1:48.

DOUGLAS CO. 58, HIGHLANDS RANCH 12

103 — Robinson, D, dec. Hall, 7-3. **112** — Nunley, D, dec. Julian, 7-0. **119** — Ehrlich, D, dec. Stricker, 6-3. **125** — Taylor, D, won by forfeit. **130** — Joslin, D, pinned Oeschger, 4:54. **135** — Stewart, D, pinned Nebel, 3:12. **140** — Fell, D, won by forfeit. **145** — Kohtz, D, pinned Humberson, 1:10. **152** — Davis, D, pinned Debelkes, 3:29. **160** — Chris Gordon, D, pinned Tardiff, 1:39. **171** — Heath, H, pinned Driscoll, 2:15. **189** — Cottrell, D, dec. Tipton, 7-2. **215** — Koppenhafer, D, dec. Newman, 19-2. **275** — Forbush, H, pinned Eckhardt, 1:31.

Girls swimming

INTRA STATE "8"
AT ENGLEWOOD HIGH SCHOOL

Team scores — Kennedy/Lincoln 101, Englewood 82, Platte Canyon 75, Skyview 74.5, Rangeview 65.5, Gateway 60, Summit 55, District 50 31.

200 medley relay — 1. Platte Canyon, 2:10.48; 2. Platte Canyon 2:13.12; 3. Skyview 2:19.56. **200 freestyle** — 1. VanGundy, Summit, 2:06.13 (sq); 2. Werner, Englewood, 2:28.68; 3, Campbell, Kennedy/Lincoln, 2:30.68. **200 individual medley** — 1. Holzmann, Englewood, 2:23.37 (sq); 2. Vecchl, Kennedy/Lincoln, 2:25.63; 3. Dixon, Skyview, 2:27.36. **50 freestyle** — 1. Keefover, Englewood, 27:23; 2. Loyd, Kennedy/Lincoln, 27:70; 3. Nol, Rangeview, 29:24. **Diving (6 events)** — 1. Gaurmer, District 50, 174.80; 2. Hayes, Rangeview, 168.60; 3. Johnson, Englewood, 142.55. **100 butterfly** — 1. VanGundy, Summit, 1:04.16 (sq); 2. Balderman, Rangeview, 1:41.11; 3. Keppler, Platte Canyon, 1:15.64. **100 freestyle** — 1. Keefover, Englewood, 1:00.16; 2. Loyd, Kennedy/Lincoln, 1:03.24; 3. Romero, Skyview, 1:05.92. **500 freestyle** — 1. Holzmann, Englewood, 5:43.35 (sq); 2. Lascano, Gateway, 6:03.28; 3. Keppler, Platte Canyon, 6:43.80. **200 freestyle relay** — 1. Kennedy/Lincoln, 1:55.11; 2. Gateway, 2:01.59; 3. Skyview, 2:03.35. **100 backstroke** — 1. Behn, Summit, 1:13.50; 2. Potlick, Platte Canyon, 1:18.13; 3. Romero, Kennedy/Lincoln, 1:20.40. **100 breaststroke** — 1. Vecchi, Kennedy/Lincoln, 1:11.48 (sq); 2. Romero, Skyview, 1:15.82; 3. Gottlob, Platte Canyon, 1:17.70. **400 freestyle relay** — 1. Englewood, 4:16.60; 2. Skyview, 1:15.82; 3. Kennedy/Lincoln, 4:27.61.

COLLEGE HOCKEY: *Denver*

RockyMountainNews.com/college

Colorado College sweeps DU season series with 6-4 victory

By Alan Pearce
News Staff Writer

COLORADO SPRINGS — Already having received the Gold Pan Trophy for winning its season series against the University of Denver, Colorado College gave something to the Pioneers on Saturday night.

The broom.

The Tigers belted DU 6-4 in front of a sellout crowd of 7,364 at World Arena. That made four in a row this season over the Pioneers, a series sweep in a rivalry that dates back to 1949.

Colorado College also did the job in a most heartbreaking way, spotting DU a 4-1 lead early in the third period and then bombing Pioneers goaltender Stephen Wagner for five goals in 8 minutes, 13 seconds.

CC (13-11-1 overall, 10-7-1 league) received two-goal performances from senior right wing K.J. Voorhees and junior right wing Justin Morrison.

Toby Petersen, the Tigers' leading scorer this season, chipped in with four-point performance.

The Pioneers (9-16-1, 5-13-0) suffered through a nearly complete collapse in the third period. DU had been shut out by the Tigers 2-0 Friday on its home ice, marking only the second time since 1956 the Tigers had whitewashed DU.

DU has lost four consecutive games and still has not won in the World Arena. Colorado College is playing its third season in the 7,343-seat facility.

The Pioneers were inept offensively in the early going, at times failing in transition to carry the puck to center ice, even without opposition from CC.

That problem cropped up again in the third period, as turnovers in the Pioneers' own zone gave CC repeated possessions and opportunities to put the puck on Wagner.

Colorado College struck first, with Morrison taking a cross-ice pass from Petersen at the DU blue line and beating Wagner. Pioneers defenseman Bryan Vines seemed to be in position to prevent Morrison from taking a shot, but the junior still got off a good one.

DU turned opportunistic later, with Jon Newman putting two shots past Tigers goalie Jeff Sanger.

Newman's first score equalized the game at 14:13 of the first period, and he struck again early in the second period.

On that play, defenseman Jesse Cook appeared to take a shot, but it actually was a pass to Newman, planted just outside the left portion of the crease.

The Pioneers opened the scoring in the third period, with a goal from Bjorn Engstrom. But Peterson, Voorhees, Tom Preissing answered in a brief span. Then Morrison struck for the game-winnner.

Contact Alan Pearce at (303) 892-5352 or at sports@RockyMountainNews.com

Around the WCHA — Derek Derow scored twice, Colin Anderson had the go-ahead goal and Jeff Scissons had four assists Saturday night as Minnesota-Duluth nipped Michigan Tech 5-4 and split a weekend WCHA series **in Houghton, Mich.** . . . Nate DiCasmirro scored two goals as St. Cloud State breezed past Alaska-Anchorage 8-2 in Duluth, Minn., for a sweep. The Huskies won 5-4 on Friday, but scored five consecutive goals after spotting Anchorage 1-0 lead on Saturday.

Denver ..... 1 2 1 — 4
Colorado College ..... 1 0 5 — 6

First period — 1, CC, Morrison 4 (T. Petersen 14, B. Vorhees 5) 6:55. 2, DU, Newman 7 (Popadynetz 14, Rycroft 6) 6:55. Penalties — Newman, DU (roughing) 7:29; Stauss, DU (cross checking) 11:35; Cullen, CC (tripping) 13:00.

Second period — 1, DU, Newman 8 (Cook 8, Popadynetz 14) 5:50. 2, DU, Ritson 16 (Engstrom 8, Paradise 11) 19:01 (pp). Penalties — Paradise, DU (slashing) 7:07; Vines, DU (high-sticking) 16:10; Jozsa, CC (tripping) 18:37.

Third period — 1, DU, Engstrom 8 (Ritson 14, Rycroft 6) 2:34. 2, CC, T. Petersen 12 (Clarke 12, Morrison 16) 5:47. 3, CC, K.J. Voorhees 11, 6:48.

4, CC, Cullen 9 (Preissing 9, Manning 13) 10:43 (pp). 5, CC, Morrison 5 (T. Petersen 14, Clarke 13) 13:19. 6, CC, K.J. Voorhees 12 (Karpan 2, I. Petersen 3) 14:13. Penalties — Popadynetz, DU (hooking) 6:48; Karpan, CC (slashing) 15:48.

Shots on goal — DU 12-6-9 27; CC 11-11-12 34. Power play opportunities — DU 2 of 3; CC 1 of 5. Goalies — DU, Wagner 10-11-7 28 (34 shots, 28 saves). CC, Sanger 11-4-8 23 (27 shots, 23 saves). A — 7,364.

WCHA standings

	W	L	T	Pts	GF	GA
Wisconsin	14	4	0	28	68	50
N. Dakota	11	5	2	24	70	47
Colorado Coll.	**10**	**7**	**1**	**21**	**59**	**42**
Alaska-Anchorage	9	8	1	19	46	53
St. Cloud Stat	9	6	1	19	65	43
Minn.-Mankato	8	7	1	17	52	50
Minnesota	7	7	2	16	51	45
Minn.-Duluth	7	9	0	14	38	55
Denver	**5**	**13**	**0**	**10**	**57**	**74**
Michigan Tech	2	16	0	4	35	82

OVERALL RECORDS: Wisconsin 19-6-1, North Dakota 16-6-2, Alaska-Anchorage 11-10-1, **Colorado College 13-11-1**, Minn.-Mankato 12-10-2, St. Cloud State 13-8-1, Minnesota 11-11-2, Minn.-Duluth 11-11-0, **Denver 9-16-1**, Michigan Tech 4-22-0.

Friday's scores
Colorado College 2, Denver 0
St. Cloud State 5, Alaska-Anchorage 4
North Dakota 1, Minnesota 0
Michigan Tech 2, Minn.-Duluth 1
Wisconsin 5, Minn.-Mankato 2

Today's games
Colorado College 6, Denver 4
St. Cloud St. 8, Alaska-Anchorage 2
Minnesota 5, North Dakota 2
Minn.-Duluth 5, Michigan Tech 4
Minn.-Mankato 3, Wisconsin 0

RODEO: *National Western results*

Saturday Morning

RESULTS THROUGH 21ST PERFORMANCE

Bareback Riding — 1, Kyle Bowers, Lubbock, Texas, 78 points on Vegas Bound. 2, Gary Burgener, Jr., Douglas, Wyo., 77. 3, Donal Miller, Raleigh, N.D., 59. 4, James Thompson, Killdeer, N.D., 57.

Steer Wrestling — 1/2, Doug Houston, Sutter, Calif., and Guy Yarbrough, Balch Springs, Texs, 5.8. 3, Brad Loesch, Weatherford, Texas, 14.7. 4, Jim Banister, Dublin, Calif., 18.4.

Calf Roping — 1, Brett Fleming, Broadus, Mont., 7.7. 2/3, Bruce Tackett, Bluff Dale, Texas, and Blair Burk, Durant, Okla., 9.7. 4, Shane Eberline, Dillon, Mont., 10.7.

Team Roping — (only three qualified times) 1, Brian Winn, Annabella, Utah and Brian Roundy, Richfield, Utah, 7.6. 2, Shawn Shirley, Loop, Ariz., and Steve Sherewood, Queen Creek, Ariz., 9.6. 3, Blair and Barry Burk, Durant, Okla., 12.2.

Saddle Bronc Riding — 1, Tom Reeves, Eagle Butte, S.D., 78 points on T Box. 2, Mike Outhier, Weatherford, Okla., 76. 3, T.C. Holloway, Eagle Butte, S.D., 73. 3/4, Adam Joens, Midland, S.D., and Casey Joens, Eagle Butte, S.D., 71.

Women's Barrel Race — 1, Maren Luedemann, Buffalo, Minn., 15.12. 2, Sheri Stanley, Fort Worth, Texas, 15.21. 3, Jymmy Kay Davis, Gonzales, Texas, 15.24. 4, Evelyn Hohn, Sioux Falls, S.D., 15.25.

Bull Riding — 1, Adam Mace, Markesan, Wis., 75. 2/3, Everett Erickson, Hornitos, Calif., and Melvin Zebroski, Gillette, Wyo., 69. 3, C.W. Wegele, Cheyenne, 68.

Saturday afternoon

Bareback bronc riding — 1, Neal Dillahunt, Hereford, Ariz., 82 points on Miss Milly. 2, Scott Chesarek, Billings, Mont., 76.3, John Stewart, Malta, Mont., 72. 4, Scott Lund, Bozeman, Mont., 71.

Steer Wrestling — 1, Jim Banister, Dublin, Calif., 4.0. 2, Brad Loesch, Weatherford, Texas, 4.3. **3, Johnathan Joseph, Denver, 8.7.** 4, Doug Houston, Sutter, Calif., 11.0.

Calf Roping — 1, Clyde Himes, Stanton, Texas, 9.2. 2, Don Ed Eddleman, Santa Anna, Texas, 9.4. 3/4, Shane Eberline, Dillon, Mont., and Blair Burk, Durant, Okla., 9.6.

Team Roping — (only two qualified times) 1, Bret Boatright, Mulhall, Okla., and Shain Sproul, Arlee, Mont., 5.7. **2, Kyle Polich, Cortez, and Joe Roderick, Loma, 19.8.**

Women's Barrel Race — 1, Charmayne James, Gustine, Texas, 15.23. 2, Kenna Squires, Carnegie, Okla., 15.30. 3, Shirlee Panini, Billings, Mont., 15.39. 4, Lori Sanders, Marshall, Wisc., 15.46.

Bull Riding — (only three qualified rides) 1, Shane Drury, Weatherford, Okla., 89 points on Shiver Me Timbers. 2, Johnny Chavez, Bosque, N.M., 77. 3, Blade Young, Tyvan, Saskatchewan, 67.

Friday matinee

Bareback Riding: 1, Darren Clarke, Weatherford, Texas, 81 points on Three Forks. 2, J.D. Garrett, Jre., Newell, S.D., 76. 3/4, Larry Sandvick, Kaycee, Wyo., and Pete Hawkins, Weatherford, Texas, 75.

Steer Wrestling: 1, Rope Myers, Van, Texas, 3.5. 2, Vince Walker, Oakdale, Calif., 4.2. 3, Trav Caldwell, Oakdale, Calif., 4.5. 5, Cash Myers, Athens, Texas, 4.8.

Calf Roping: 1, Todd Gould, Livingston, Ala., 9.0. 2, Garrett Nokes, McCook, Neb., 9.8. 3, Rod Mills, St. John, Wash., 10.2. 3, Kyle Whitaker, Chambers, Neb., 10.3.

Team Roping: 1, Cody Cowden, Merced, Calif., and Matt Zancanella, Rock Springs, Wyo., 5.3. 2/3, Wade Wheatley, Hughson, Calif., and Kyle Lockett, Ivanhoe, Calif.; and Christopher Roseberry, Ramona, Calif., and Wes Goodrich, Madera, Calif., 5.5. 4, Chance Kelton, Mayer, Ariz., and Brent Lockett, Ivanhoe, Calif., 9.9.

Saddle Bronc Riding: 1, Josh Reynolds, Corvallis, Mont., 74. 2, Bill Harris, Circle, Mont., 68. 3, Justen Miller, Lance Creek, Wyo., 66. **4, Justin Powell, Lafayette, 65.**

Women's Barrel Race: 1, Tona Wright, Moriarty, N.M., 14.97. 2, Talina Bird, Pots, Texas, 15.14. 3, Cindy Woods, Sherwood, Ore., 15.19. 4, June Holeman, Arcadia, Neb., 15.36.

Bull Riding: (only three qualified rides) **1. Mike Moore, Wellington, 77 points on Undertaker.** 2, Francis Wilson, Sidney, Neb., 70. 3, Garth Idfield, Milo, Alberta, 63.

Friday evening

Bareback Riding: 1. Sean Culver, Grandview, Wash., 80 points on Brown Bomber. 2. Scott Johnston, Deleon, Texas, 79. 3. Dustin Reeves, Wasta, S.D., 77. **4. Bob Logue, Greeley, 73.**

Steer Wrestling: (only one qualified time) 1. Herbert Theriot, Poplarville, Miss., 9.0.

Calf Roping: 1. Cody Ohl, Orchard, Texas, 8.2. 2. Shawn Franklin, Wetumka, Okla., 8.9. 3. Shane Scott, Poplarville, Miss., 10.0. 4. Wayne Warkentin, 14.7.

Team Roping: (only two qualified times) 1. Jose Soares and Lincoln Figueirdo, Huntsville, Texas, 5.8. 2. Bobby Hurley, Ceres, Calif., and Monty Joe Petska, Turlock, Calif., 11.0.

Saddle Bronc Riding: (only three qualified rides) 1. Paul Sandal, Faith, S.D., 75 points on Sweet Betsy. 2. Trey Griffin, Cody, Wyo., 66. **3. Bryan Costner, Toponas, 50.**

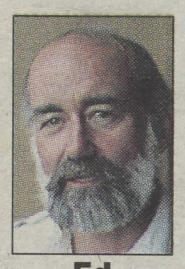
Women's Barrel Race: 1. Darlene Kasper, Von Ormy, Texas, 15.28. 2. Deb Renger, Okotoks, Alberta, 15.39. 3. Maren Luedemann, Bufflo, Minn., 15.40. 4. (tie) Jymmy Kay Davis, Gonzales, Texas, Evelyn Hohn, Sioux Falls, S.D., 15.44.

Bull Riding: 1. Tyler Fowler, Theodore, Ala., 88 points on Cujo. 2. Marty Staneart, Sanger, Calif., 83. **3. Charles Schwartz, Bennett

WESTERN ADVENTURE

LIVING LARGE

Sportsmen's show's behemoths illustrate trips worth the effort



Ed Dentry

The mounted fish, huge and gleaming under the lights of the Colorado Convention Center, are the lure. Even if a bored, winterized angler weren't shopping for a dream trip, these behemoths would be impossible to ignore.

In fact, they are meant to reel you in.

These are the enticements that exhibitors at the Denver Sportsmen's Show are offering to anglers who have had it with staring down a hole in the ice, staring at walls — or worse, deep-spooning walleyes that fight like old shoes: arctic char the color of sunsets; king salmon built like tree trunks; fanged African tigerfish; people-eating catfish; Atlantic salmon of steel; largemouth bass that live up to the nickname "bucketmouth."

They swim in places far removed from road rage and brown clouds, lovely places about which the man in the booth with the big stuffed fish wants you to stop dreaming.

If you are shopping for angling adventure, let Ramiro Cardenas and his colleagues from the corners of the world bend your ear.

"Any cast could be the cast of a lifetime," said Cardenas, a guide from the famous 95,000-acre Lake Guerrero, Mexico, 165 miles south of the Texas border. Cardenas owns the Set Hook guide service. He's the man behind the 17-pound, 2-ounce bass with the belly of a corn-fed shoat.

"We strongly encourage catch-and-release," he said. "But bass like her are pretty much near the end of their life cycle, so we let people take them in."

He will be honest. You can catch 2-to 6-pound bass until your arm aches, especially during prime time — January through April. Or you might hook only one bass — but the biggest one of your life. The bottom line: Bring 20-pound test line, minimum, to avoid breaking off hawgs in the stickups. And some liniment for that arm.

At another booth, Jim Burton was hooking anglers who prefer to dream of cooler climes and the romance of fly-fishing for arctic char, Atlantic salmon and trophy-sized brook trout in northern Labrador.

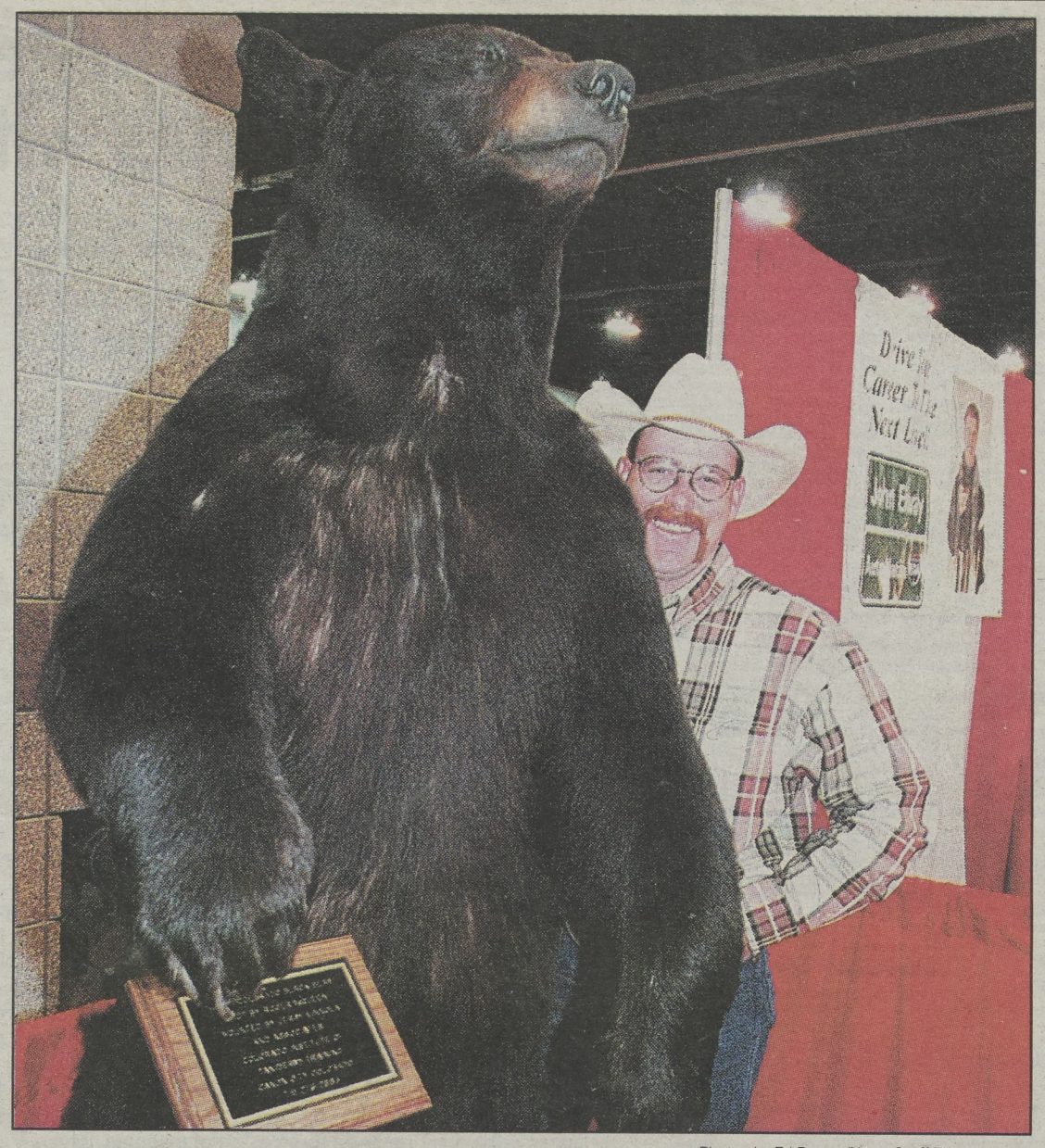
"We have a lot of first-time fly-fisher people who come, and a lot of women, and they all come out with 15-or 16-pound salmon," Burton said.

Burton operates Flowers River Lodge Ltd. on the Flowers River, where the salmon can run to 20 pounds or more. His brother, Vince Burton, runs trips for trophy brook trout at Igloo Lake Lodge, where the lake record brookie weighed 10 pounds, 8 ounces.

Of course there's no shortage of fishing lodges from Alaska represented at the show. Take your pick. Evelyn Thomas, who won the Best Small Business in Alaska Award for a native Alaskan in 1999, suggests that a dream tripper can't do better than to fish at Crooked Creek for all five species of Pacific salmon, plus rainbow trout, arctic grayling, Dolly Varden and sheefish.

"We really do have the dream trip. We'll even do your laundry for you," said Thomas, who, with husband Dennis, owns Thomas Trading Post and Fishing Lodge at Crooked Creek, Alaska.

At the show, the Thomases are the ones standing under the 55-pound king salmon Joe Cashik of Denver caught in 1998. Said Dennis: "You can also catch 50 to 60 silver salmon each day."



Photos by Ed Dentry/News Staff Photographer

Roger McQueen of Westcliffe killed this 575-pound black bear — it was the largest known taken in Colorado — in September in the Sangre de Cristo foothills. The bear, which is on display at the Denver Sportsmen's Show, had been raiding homes near Westcliffe.

Fishing guide Ramiro Cardenas of Lake Guerrero, Mexico, shows a 17-pound, 2-ounce largemouth bass he caught in Lake Guerrero.

One of the most exciting new venues for fly anglers is across the pond from Alaska, on Russia's Kamchatka peninsula. All five Pacific salmon species run there, said William Blair, a partner in Kamchatka Expeditions, which has an office in Glenwood Springs. But he preferred to rhapsodize about the best rainbow trout river in the world.

"It gives me goose bumps," Blair said. "It's almost all dry fly-fishing, and we often use big mouse patterns, because those fish eat a lot of lemmings and mice."

He said the wild rainbows routinely run 22 to 25 inches, often up to 30 inches, and sometimes longer. Fishing is catch-and-release only for the rainbows, which Blair said are so eager that one 25-incher beached itself trying to nab a big caddis he was skittering ashore.

You will have to go there to learn the name of the river. Blair winces when asked: "We're trying to keep it quiet."

Capt. Jake Jordan, who lives in Marathon, Fla., wears several dream-trip hats, running fly-fishing classes and trips for tarpon in the Florida Keys, billfish and tuna off Guatemala and bonefish on the flats of Exuma in the Bahamas.

"I've spent my whole life finding the best fishing spots," said Jordan, who said his Guatemala visitors average 14 sailfish per day, or more than six sailfish per day if they fish with flies.

Any of these angling outfitters and others exhibiting at the Denver Sportsmen's Show can be reached through the show's manager, O'Loughlin Trade Shows, at (800) 343-6973. They will be happy to distract you from that hole in the ice.

Contact Ed Dentry at (303) 892-5481 or sports@RockyMountainNews.com.

OUTDOORS WATCH

Wyoming seeks fee increase to pay higher wildlife bills

Colorado is not the only state having difficulty paying for its wildlife programs. The Wyoming Game and Fish Department wants to raise some license fees to help pay its bills, and director John Baughman said the state must find alternative ways of funding wildlife beyond hunting and fishing license fees.

Proposed legislation would allow Game and Fish to raise nonresident deer hunting licenses by $25, to $210. Nonresident daily licenses for small game would rise from $10 to $15. Nonresident daily fishing licenses would go from $6 to $10. Residents also would pay $3 more — or $25 — for a deer license.

Baughman said heavier public demands and higher costs of wildlife programs require that people other than hunters and anglers pitch in to pay for wildlife conservation in the 21st century.

Biologists take 157 pike from the Yampa River

Colorado State University biologists working for the Upper Colorado River Recovery Program captured 157 northern pike from the Yampa River last year, relocating 80 of the pike to ponds at the Yampa State Wildlife Area and releasing the others back into the river.

The pike were relocated to help reduce predation on endangered native fish in the Yampa. The pike averaged 22 inches, and the largest was 38 inches. They were collected from backwaters near Hayden and between Craig and Dinosaur National Monument.

Ducks Unlimited steps up efforts to save habitat

Ducks Unlimited says it will redouble its efforts to conserve waterfowl habitat in the face of one of the most formidable challenges — human population growth — that wildlife in North America faces in the 21st century.

The U.S. population is projected to grow from 227.8 million this year to 332.5 million in 2025. Ducks Unlimited says urban sprawl will become a greater threat to waterfowl habitat, and cities will place heavier demands on freshwater supplies.

Ducks Unlimited is updating its conservation plans for the U.S., Canada and Mexico to emphasize the need for federal land plans such as the Conservation Reserve Program. It also wants to expand the use of conservation easements to preserve habitat.

SOLUNAR TABLE

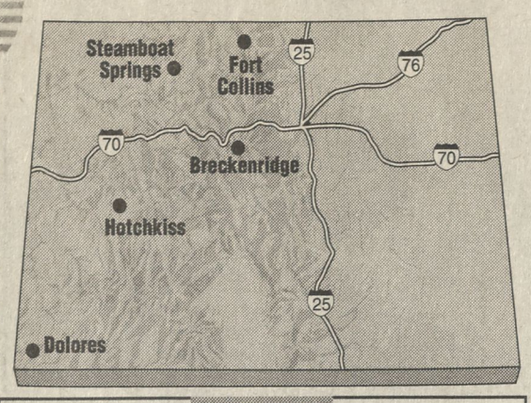
■ This schedule of Solunar Periods has been taken from Mrs. Richard Alden Knight's Solunar Tables. Plan your days so you will be fishing or hunting in good territory during these times for best results. The Major Periods last 1½-2 hours. The Minor Periods are shorter.

		A.M.		P.M.	
Date	Day	Minor	Major	Minor	Major
1-23	Today	6:40	12:30	7:35	1:20
1-24	Monday	7:50	1:45	8:05	2:25
1-25	Tuesday	8:40	2:55	9:35	3:20
1-26	Wednesday	9:50	3:40	10:25	4:10
1-27	Thursday	10:50	4:40	11:10	4:55
1-28	Friday	11:35	5:25	11:50	5:35
1-29	Saturday	—	6:15	12:25	6:50
1-30	Sunday	1:00	7:00	1:20	7:20

COLORADO

An eye on ...

These are among the cities and towns covered in today's Colorado page:



WESTERN EMPIRE

FRONT RANGE

Teen charged in fatal crash

FORT COLLINS — The Larimer County district attorney on Thursday charged a 17-year-old Fort Collins driver with vehicular homicide and four other crimes in connection with a car crash that killed another teen.

Augustine Stanley was charged as an adult, meaning he faces stiffer punishment if convicted of the crimes. Stanley is accused of driving a stolen Honda Accord under the influence of alcohol on Nov. 20 and crashing the car into an Acura Vigor in which four other teens were riding.

Monika Tamaski, 17, was killed in the late-night collision on South Timberline Road.

Stanley and his female passenger were seriously injured in the crash. His arrest and formal charging were delayed until he was discharged from Poudre Valley Hospital in Fort Collins.

Blaze kills 2-year-old

COLORADO SPRINGS — A 2-year-old girl died Thursday in a fire that was believed to have been started by her 5-year-old brother.

The boy was playing with a cigarette lighter and a piece of paper about 11 a.m. while he was supposed to be taking a nap in his bunk bed, said Lt. Neil Luehring of the Colorado Springs Fire Department. The boy's sister was in the other bunk. She was pronounced dead at the scene.

The child's mother, Batrice McGhee, 20, and a 6-month-old girl also were in the home on El Camino Drive.

The boy, mother and baby were taken to a hospital for possible smoke inhalation. A hospital spokeswoman said the three were released.

There was no estimate of damage Thursday evening.

MOUNTAINS

Friends recall skier

BRECKENRIDGE — Friends on Thursday recalled Breckenridge resident Charles Dorfeld as a great person and an excellent skier.

Known as Charlie, the 29-year-old had recently become engaged and returned to Summit County from an extended trip to India. He died after colliding with a permanent snow fence Wednesday on an intermediate run at Breckenridge.

"I don't think you can find anybody who has anything bad to say about that guy," said Tom Bauder, owner of the Saint Bernard restaurant, where Dorfeld worked on and off over several years.

Dorfeld was the third person to die on Colorado ski slopes this season; he was not wearing a helmet. Snow conditions and crowds were not believed to be factors in the crash.

An autopsy was performed Thursday, but it could be weeks before results are available, said county Coroner Dave Joslin.

Cross-country skier dies

STEAMBOAT SPRINGS — A cross-country skier died Wednesday on Rabbit Ears Pass after getting separated from his companion.

Routt County Sheriff John Warner said the Canadian man in his early 60s was out on a trail on the west side of the summit with his wife and another couple Wednesday. The two men got separated from the women, who were on snowshoes, and went ahead.

The wives, who arrived back in town about 5:30 p.m., alerted the Routt County Search and Rescue team to their missing husbands.

The searchers discovered the surviving skier, who pointed them in the direction of his deceased companion. Both skiers were well prepared for the cold weather, and hypothermia is not suspected as a cause of death. An autopsy was being performed Thursday.

NEW MEXICO

Slaying trial delayed

CARLSBAD — A judge on Thursday postponed the trial of a Massachusetts man accused of stabbing his friend to death during a hiking trip in Carlsbad Caverns National Park. Raffi Kodikian, 25, of Boston had been scheduled for trial Jan. 3 on a first-degree murder charge in the death of David Coughlin, 26, of Millis, Mass.

The judge postponed the trial on a motion by defense attorney Gary Mitchell because reports needed for a possible insanity defense were not yet available, Deputy District Attorney Les Williams said. No new trial date was set.

Kodikian entered an innocent plea by mail in September and is free on $50,000 bond. He is living with his parents in suburban Philadelphia.

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Battered river gets new shape

Bulldozers to create meandering route

By Nancy Lofholm
Denver Post Western Slope Bureau

Many decades ago, this stretch of the North Fork of the Gunnison River near Hotchkiss looped through meadows and farm fields. Today, parts of it flow as straight as a storm sewer.

But a unique partnership of nine landowners and 24 agencies and foundations plans to undo the damage and overstraightening caused by humans trying to contain this river. With bulldozers, blueprints and massive piles of rocks, they started putting the curves back in the North Fork this week. They're also putting back the pools for fish, rapids for rafters, better diversions for irrigators, wetlands for wildlife and bank stability for landowners.

"We're putting the fun back in the river," said project engineer Jeff Crane, who has been working for three years to plan this river makeover. "We're trying to enable the river to do what it naturally does and still be able to sustain all its traditional uses."

Other rivers near Pagosa Springs and Alamosa have undergone similar reclamation efforts, but this one is different because of who came together to make it possible. The North Fork River Improvement Association includes gravel miners, environmentalists, ranchers, recreational groups and irrigation companies — entities with some deep differences when it comes to rivers. It also includes landowners who for years have been digging in or blocking off sections of the river to protect their land — oftentimes to the detriment of other landowners downstream.

Special to The Denver Post / **Mickey Krakowski**

Frank Edge of Sickles Construction works on restoring the original circuitous route of the North Fork of the Gunnison River near Hotchkiss on Thursday.

"When one of us digs in the river a little, the river moves the gravel down and piles it up on someone else's property," explained landowner Paul Reed as he pointed to rocks littering land that was once usable farm ground.

The problems that turned this section of the North Fork into a land-eroding, ditchlike river began before the turn of the century when settlers began carving channels for irrigation. The real damage came in the late 1940s when Delta County received a war surplus bulldozer from the government. Bulldozing the river became an annual activity.

Because of the way modern irrigation systems are located on the river, that bulldozing has had to continue in places to this day.

"The river has been in chaos," said Dan Geolfoss, a ditch rider and secretary/treasurer for the Smith McKnight Ditch Co. that channels irrigation water from the North Fork.

Help for the river project has come from many disparate corners, including the Colorado Department of Transportation and Mesa State College in Grand Junction.

HOTCHKISS

> "We're putting the fun back in the river."
>
> **Jeff Crane**
> project engineer

The river association raised $180,000 for the project but Crane said the project has drawn about twice that much in donated services.

The transportation department gave the association boulders and Delta County donated trucks and loaders so project workers would collect rock from farm fields to use in the river. Several local mining companies pitched in with equipment and technical support.

Mesa State College and Delta High School are helping by giving students credit for planting willows and other natural vegetation along the river banks under the tutelage of a soil bioengineer.

The project is expected to be completed in April. Crane said he will then spend the next five years monitoring the river to see which techniques worked and which didn't.

"This river is still a river," Crane said. "It won't be perfect. I don't expect that."

Forest Service may lose ballpark

Allard's plan lets Dolores regain field

By Electa Draper
Denver Post Four Corners Bureau

The U.S. Forest Service may lose what is probably its only ballpark.

U.S. Sen. Wayne Allard, R-Colo., has introduced legislation that would give Joe Rowell Park back to the town of Dolores.

"It simply does not make sense for the Forest Service to have a lighted softball field in its inventory, and likewise for the town of Dolores to have to get permission from the Forest Service to change a light bulb at the park," Allard said Wednesday.

Neither were the town's park planners looking forward to environmental-impact studies to build a tennis court. The 24-acre area was purchased in the early 1980s from the town of Dolores and handful of homeowners by the U.S. Bureau of Reclamation as part of the floodplain for the McPhee Dam and Reservoir project. The bureau later transferred the park to the Forest Service, which in turn allowed the town to manage the park under a special-use permit.

In 1985, the town started putting some money into the park, at first adding a sprinkler system and landscaping. The park now boasts two lit softball fields, a soccer field, basketball and volleyball courts, a concession stand, restrooms and river trails. Improvements have cost the town about $300,000, said Marianne Mate of the Dolores Park Planning Committee. That's many times what the $43,000 town got when it sold the land to the government.

DOLORES

The Denver Post / **Shaun Stanley**

Shirley Powell, mayor of Dolores, stands on the outskirts of town overlooking Joe Rowell Park. She is pleased that the town may get control of the ballpark, which had been spruced up with municipal funds.

The park was named in 1988 for Dolores resident Joe Rowell, now deceased, who spearheaded fund-raising and improvement projects that turned the riverside park, one of two in town, into a central focus of the community, Mate said.

Dolores officials requested the legislation giving it ownership of the park after spending two years trying to resolve management issues with the local Forest Service office, Allard's office said.

Under Allard's bill, ownership of the park would revert to the Forest Service if town officials ever attempt to sell or transfer title to any portion of the park, said Allard spokesman Sean Conway.

Once the town owns the park, it can begin planning more improvements, Mate said. A little more than a fourth of the park is still in weeds.

Mate anticipates that Allard's bill could become law in the first or second congressional session of 2000.

"(Allard's) help has meant so much to the town," Mayor Shirley Powell said.

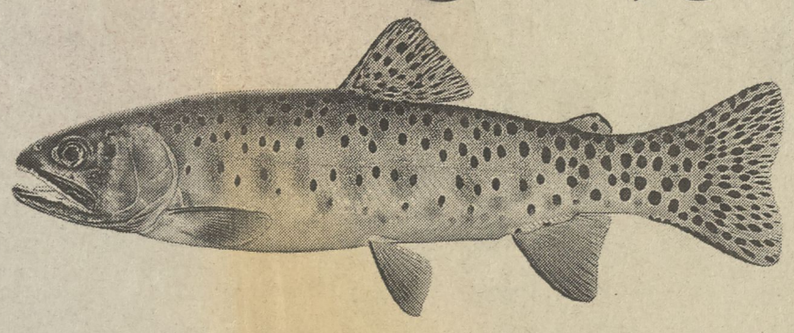
Cutthroat trout endangered, groups claim

By Mark Eddy
Denver Post Environment Writer

The Colorado River cutthroat trout is in trouble, and it needs protection under the federal Endangered Species Act if the colorful fish is to survive, a coalition of seven environmental groups said Thursday.

"Like nearly all native trout in the West, the Colorado River cutthroat trout has been decimated by the thoughtless destruction of streams and stocking of nonnative species," said Noah Greenwald, ecologist for the Center for Biological Diversity, one of the seven groups that filed a formal petition with the U.S. Fish and Wildlife Service asking that the fish be added to the list of endangered species.

The agency has one year to decide if the Colorado River cutthroat trout, which has been chased from 95 percent of its historical habitat, should be added to the list.



Colorado River cutthroat trout were historically found west of the Continental Divide in Colorado, Wyoming, eastern Utah and northwestern New Mexico, said Jasper Carlton of the Biodiversity Legal Foundation, one of the groups that signed the petition.

But introduction of nonnative species, livestock grazing, logging, mining and water-diversion projects have reduced its habitat to only 5 percent of what it once was, he said.

The trout has suffered dramatic loss of habitat, but state efforts to restore the species are working, and federal intervention isn't needed, said Todd Malmsbury, spokesman for the Colorado Division of Wildlife.

"We do not believe that this species is warranted for listing (because) both the number and the distribution of the Colorado River cutthroat trout is increasing, not decreasing," he said.

Efforts to ensure water quality, minimum stream flows, prevention of overfishing and isolation from disease have been effective, Malmsbury said. The Colorado River cutthroat is found in 87 streams and nine lakes in Colorado, and the goal is to increase that to 111 streams and 15 lakes.

It would be impossible to restore the fish to its historic habitat because of the introduction of brook and rainbow trout in the past century, Malmsbury said. But on smaller streams where nonnative species can be killed and then dams or waterfalls built to prevent their return, the Colorado River cutthroat can be brought back.

But state efforts aren't enough, said Jeff Kessler of Biodiversity Associates, another signatory to the petition.

"Because most habitats and populations occur on federal lands, protection for the Colorado River cutthroat trout at the federal level is absolutely required," he said.

Bowlen commissions works

STADIUM from Page 1B

"We were pleasantly surprised by the gift, but we had to make sure it would fit with the other projects we will do," said Carol Siple, committee chairwoman.

Through an interpreter, Benvenuti agreed to suggested changes by board members. That cooperation brought a unanimous recommendation from the advisory board to accept the artwork.

"Let's not look a gift horse in the mouth . . . (let's) accept that recommendation," district board member Norm Early said.

Most new NFL stadiums have little — if any — public art outside of the facilities. For example, the Carolina Panthers have two sculptures of panthers and the Jacksonville Jaguars have one sculpture of a jaguar.

"Denver will be the first stadium to have artwork that doesn't just reflect the team but the community," Ellis said.

Bowlen's gift is the first part of the stadium's overall art program. The advisory board will begin taking applications from artists Jan. 7 for proposals. Unlike the process at Coors Field, the applications won't be limited to Colorado artists but open to artists nationwide.

The number of artworks commissioned at the football stadium will depend on how much money the district can raise. Officials plan to seek grants and sponsorships from major businesses.

"It is a significant challenge to have this kind of art," said Kelly Leid, director of operations for the district. "That's why we are starting the effort now."

The district began its fund-raising this month by opening its "Stadium Store" on its Web site: www.mfsd.com. Initially, the district began selling framed blueprints of the new stadium for $599 and $299, but reduced the costs to $299 and $199 after fans said the price was too high. So far, about a dozen blueprints have been ordered, Leid said.

Other fund-raisers will include selling names for bricks on new walkways, as was done at Coors Field.

Residents get say in stadium

Mile High moniker may be replaced

By Cindy Brovsky
Denver Post Staff Writer

The decision on whether to sell the naming rights to the new Denver Broncos stadium should be made by April, and residents will be able to comment about giving up the Mile High name through public meetings and possibly a poll.

The value of the naming rights also is expected to increase because the Metropolitan Stadium Football District has decided to team up with the Denver Broncos and include advertising inside the stadium as part of the package. The district could decide to sell naming rights for the stadium or keep the Mile High name and sell ad space at the four entrances.

Who is willing to pay

The district, which is overseeing construction of the $364.2 million facility, agreed Thursday to have the meetings in February. The staff will gather information about how much companies would be willing to pay for the naming rights.

"What it really boils down to is that this board has a fiduciary responsibility to the taxpayers to explore that area," said Jefferson County Sheriff John Stone, who sits on the nine-member board.

Board member Norm Early, who represents Denver, requested meetings in Adams, Arapahoe, Boulder, Denver, Douglas and Jefferson counties. Residents in those counties are paying the sales tax that is building the new stadium.

"The sentiments in each county may vary," Early said. "We have to give everyone a fair shot to comment."

Still under discussion is whether the public review would include poll listing what companies would be willing to pay.

"We've seen a lot of polls, but the question simply asked people if they want to keep the Mile High name," said Craig Umbaugh, the board's acting executive director. "We want this poll to give people more information and see if there's a threshold where they would be willing to sell the naming rights."

The board would review the public comments in March, and a decision on whether to pursue a buyer should be made by April.

Millions of dollars at stake

Other NFL cities have garnered $10 million to $105 million, paid over 10 years to 20 years, for naming rights.

Sports marketing experts have said the naming rights for the Broncos stadium could garner $40 million to $60 million, but that didn't include advertising inside the stadium, which is controlled by the Broncos.

The legislation that created the six-county sales tax — a penny for every $10 purchased — said the naming-rights revenue for the stadium would be used to reduce the taxpayers' $289 million debt. The Broncos, which are paying the costs above $289 million, will keep the revenue from the advertising inside the stadium.

"It's in the best interests of the stadium district and the Broncos to work together on the naming rights," said Kelly Leid, director of operations for the stadium district.

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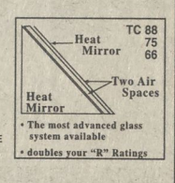

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CHARLIE MEYERS, OUTDOOR EDITOR • Call 303-820-1609

Crystal: cathedral in the high country

Colorado state fish the main attraction here

By Charlie Meyers
Denver Post Outdoor Editor

ROCKY MOUNTAIN NATIONAL PARK — If anyone required special inspiration for the march up the long and winding trail to Crystal Lake, he or she needn't look hard, or far.

Meadows lush with wildflowers flashed a kaleidoscope of color beneath a sun sliding through the sky like a white coin.

Deer with white-spotted fawns seemed to pop up everywhere. Then they melted into the forest like scenery at a ballet. Farther downslope, a buck sporting velvet horns crashed nervously through underbrush, and then stopped abruptly as if to pose for a photograph.

Where krummholz faded into tundra, a freshly minted family of ptarmigans picked idly at insects, seemingly oblivious to a human only a few feet away.

Whistle pigs by the dozens shrilled down from rocky perches, a marmot tabernacle choir.

Then there was the trail itself, wandering like the path of a worm through soft wood, sometimes down a forest tunnel so dense and dark a hiker half expected to find a gnome perched on a rock.

All this, of course, was beside the point. Everyone knew the real reason they had come. We were here for the trout, more specifically, the greenback cutthroat trout. Colorado's state fish. The one that, in almost biblical fashion, once was lost but now is found.

The beautiful one.

Crystal, perched at the top of the Roaring River drainage near the northern rim of the park, is one of the showcases for the greenback recovery program, one of the nation's conservation success stories.

Once thought extinct, the greenback has been revived to something resembling robust status through the cooperative efforts of the U.S. Fish and Wildlife Service and the Colorado Division of Wildlife. Crystal, a 25-acre gem anchored in the cliff cirque of 13,502-foot Fairchild Mountain, is among several places where it is legal to fish for (but not possess) this native fish of Colorado's Eastern Slope.

What makes Crystal special is that these cutthroats are uncommonly large. Last stocked in 1989, these fish had ample time to grow. Most range from 15 to 18 inches, an encouraging size for trout living above timberline. But when an excited angler scrambled down the shore to announce he had landed a specimen estimated at 4½ pounds, interest increased considerably.

These Crystal fish are particularly compelling for their role in an experiment to determine whether greenbacks can reproduce at high elevation. In the cold shadow of the Continental Divide, two-thirds of the park lakes are fishless.

"We wanted to find the upper limit at which they could reproduce," said Bruce Rosenlund, a project leader with the U.S. Fish and Wildlife Service's Colorado office and a former head of the greenback recovery team. "Crystal may be pushing it. Most years, the water doesn't stay warm enough for eggs to hatch."

Before park officials suspended general fish stocking in 1968, Crystal received plants of exotics, mostly Yellowstone cutthroats.

"Back then, the philosophy was that a cutthroat is a cutthroat is a cutthroat," said Rosenlund, who later spearheaded the return of the native. Rosenlund isn't certain whether the Crystal plants, now discontinued, were made with completely pure greenbacks. For official purposes, he counts only that part of the drainage below Crystal's barrier falls as part of the recovery project.

The Roaring River drainage plays a pivotal role in a recovery program that keeps spreading through the greater South Platte River watershed. Rosenlund's choice of the river proved a bold one in the wake of the 1982 flood that washed out the lower drainage and caused extensive damage downstream in Estes Park.

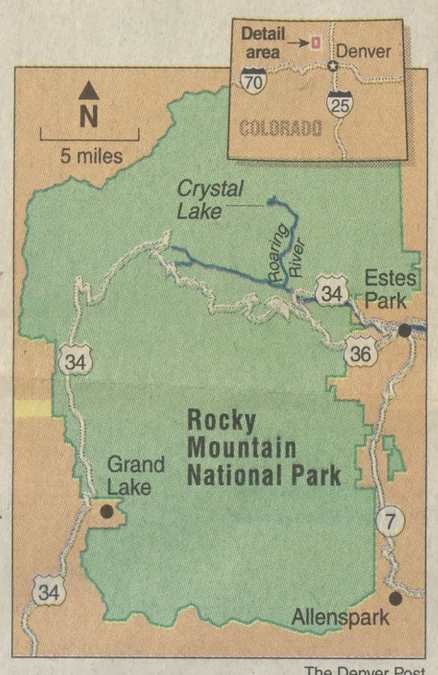
The mishap occurred when the man-made dam at Lawn Lake, 6 miles upstream from the Fall River confluence, crumbled, unleashing a torrent of water, boulders and trees. Now, nearly two decades later, officials are removing the dam completely as part of a continuing effort to eliminate all the water storage projects that predate the park.

Lawn Lake, with its bathtub ring, will remain a viable fishery containing greenbacks of varied sizes. But anglers who stop here miss the visual drama of the Crystal cirque and, of course, larger fish.

The hike is a long one, nearly 15.5 miles round trip on a trail whose difficulty fluctuates from easy to generally moderate to occasionally steep. Anglers should skirt the smaller and barren Little Crystal Lake for the larger lake a few yards farther on. And they should bring lots of film.

The Denver Post / Charlie Meyers

A lake in the clouds in Rocky Mountain National Park, Crystal is a link in the greenback cutthroat recovery program.



The Denver Post

The Denver Post / Charlie Meyers

Wildflower meadows and sweeping vistas help make the long hike to Crystal worthwhile.

The Denver Post / Charlie Meyers

Fishing on the run, Doug Mihoover leads a nice cutt to the shallows.

QUICK HITS

PRIME TIMES FORECAST

The following table of fish-and-game feeding activity cycles has been prepared by Prime Times Forecast. "Prime" periods generally last 1½ to 3½ hours; "short" periods 45 minutes to 1½ hours. (Asterisks indicate periods of exceptional activity, with the more asterisks, the more intense and longer the activity.)

JULY

Date	Day	A.M. Short	A.M. Prime	P.M. Short	P.M. Prime
26	Wed.	1:55	7:17	2:22	7:46
27	Thur.	2:46	8:05	3:14	*8:35
28	Fri.	3:42	8:57	4:13	9:28
29	Sat.	*4:40	*9:52	*5:12	*10:24
30	Sun.	***5:40	**10:47	**6:11	**11:19
31	Mon.	***6:41	***11:43	***7:11	—

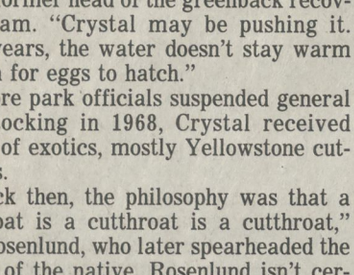
AUGUST

Date	Day	A.M. Short	A.M. Prime	P.M. Short	P.M. Prime
1	Tue.	*7:45	**12:20	**8:14	*12:50
2	Wed.	*8:46	*1:27	**9:13	*1:54

CALENDAR

■ **Aug. 26**: Ducks Unlimited, Loveland Chapter, golf event, call Steve Peyton 970-663-1427.

DRAG



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Rapids' Brown returns to goal tonight

Rapids goalkeeper Adin Brown, expected to start for the U.S. Olympic soccer team in Sydney, plans to start in goal for the first time since his knee operation as Colorado faces the Colorado Comets in an exhibition match tonight at 7 o'clock at Wembley Park.

Brown underwent an arthroscopic procedure to clean up his right meniscus June 30. He has not played for the Rapids since June 24, but was on the bench as the backup in Friday's 1-1 tie with Chicago. Since the injury, David Kramer has assumed goalkeeping duties and recorded a 3-1-2 record with Brown sidelined.

Also, Brown and Rapids midfielder Joey DiGiamarino were among 19 players named to a pre-Olympic exhibition team that will play the Bolton Wanderers, a British First Division team, Sunday in Indianapolis.

DATELINE ROCKIES

Jose Maria Olazabal, a two-time winner at the Masters, and Mark O'Meara, the 1998 Masters champion, have entered to play in next week's International at Castle Pines Golf Club. Also entered were Gary Nicklaus and Tom Byrum.

"The field continues to shape up nicely," International executive director Larry Thiel said. "And we're not done yet."

Olazabal, who won at Castle Pines in 1991, will be playing in his eighth International.

O'Meara, making his ninth appearance, tied for 13th last year.

This is Byrum's eighth trip to the International, with his last participation here coming in 1995.

Nicklaus is in his rookie year on the PGA Tour.

A team from Northern California leads after the first round of the 2000 Girls' Junior Americas Cup Team Matches at the Eisenhower Golf Club Blue Course.

Northern California (226) holds a one-stroke lead over defending champion Mexico.

Colorado is in eighth place at 241. Lynette Duran paced Colorado with a 2-over-par 74. Lindsay Hulwick shot an 83 for Colorado, while Nicole Jordan and Aimee Tjelmeland shot 84s.

Three Colorado Rush soccer teams from Lakewood began round-robin play at the U.S. Youth Soccer National Championships in Lake Buena Vista, Fla.

The under-19 girls team defeated a team from Northport, N.Y., 2-1, while the under-19 boys team lost to West Chester, Pa., 4-2. The under-18 girls team beat Weston, Conn., 1-0.

The Western Collegiate Hockey Association announced that the league's Final Five tournament will be played at the Xcel Energy Center in St. Paul, Minn., for the next three years beginning in 2001.

The past two years the Final Five was held at the Target Center in Minneapolis.

Ruben Sierra hit a two-run homer as Oklahoma rallied for three runs in the seventh inning to take a 6-4 victory over visiting Colorado Springs in a Pacific Coast League game Monday night.

Doug Linton fell to 6-10, scattering nine hits and six runs over seven innings for the Sky Sox.

— Compiled by Matt Gerhart

TRACK AND FIELD

BARCELONA MEET
At Barcelona, Spain
Results from the Barcelona La Ciutat meet (all race distances in meters):
MEN

200 — 1, Patrick Stevens, Belgium, 20.62 seconds. 2, Joseph Batangdon, Cameroon, 20.63. 3, Matt Shirvington, Australia, 20.74. 4, Julian Golding, UK, 20.84. 5, Vitor Jorge, Portugal, 20.95.

400 — 1, Patrick Dwyer, Australia, 45.25. 2, Hamdam al Bishi, Saudi Arabia, 45.41. 3, Jude Monye, Nigeria, 45.54. 4, David Canal, Spain, 46.06. 5, Adrian Fernandez, Spain, 46.94.

800 — 1, Jose Antonio Redolat, Spain, 1:45.39. 2, William Yiampoi, Kenya, 1:45.70. 3, Trinity Townsend, United States, 1:45.78. 4, Bram Som, Holland, 1:45.88. 5, Patrick Nduwimana, Burundi, 1:45.97.

1,500 — 1, Rui Silva, Portugal, 3:35.19. 2, Andres Diaz, Spain, 3:35.66. 3, Anthony Whiteman, Britain, 3:36.39. 4, Juan Carlos Higuero, Spain, 3:36.63. 5, James Nolan, Ireland, 3:36.80.

3,000 — 1, Alberto Garcia, Spain, 7:40.82. 2, Fabian Roncero, Spain, 7:41.48. 3, Jose Rios, Spain, 7:42.51. 4, Ahmed Ibrahim, Qatar, 7:43.00. 5, Enrique Molina, Spain, 7:43.41.

400 hurdles — 1, Hadj Souan, Saudi Arabia, 48.87. 2, Dinsdale Morgan, Jamaica, 49.11. 3, Rohan Robinson, Australia, 50.16. 4, Mustapha Sdad, Morocco, 50.17. 5, Jaime Juan, Spain, 50.55.

Pole vault — 1, Danny Ecker, Germany, 19 feet, ½ inch. 2, Lars Borgerling, Germany, 18-8½. 3, Gregory Yegorov, Kazakhstan, 18-4½. 4, Nuno Fernandes, Portugal, 18-0½. 5, Massimo Allevi, Italy, 18-0½.

WOMEN

100 — 1, Glorie Alozie, Nigeria, 12.80. 2, Keturah Anderson, Canada, 12.97. 3, Linda Ferga, France, 13.03. 4, Olena Krasovskaya, Ukraine, 13.05. 5, Nedezhda Bodrova, Ukraine, 13.18.

200 — 1, Lauren Hewitt, Australia, 22.72. 2, Katherine Merry, UK, 22.76. 3, Muriel Hurtis, France, 22.91. 4, Rose Mar Coelho, Brazil, 23.35. 5, Joan Ekah, Nigeria, 23.63.

400 — 1, Grit Breuer, Germany, 51.10. 2, Maicel Malone, United States, 51.55. 3, Norfalia Carabali, Spain, 51.77. 4. Suziann Reid, United States, 52.38. 5, Elena Corcoles, Spain, 54.06.

800 — 1, Ivonne Teichmann, Germany, 2:00.89. 2, Yelena Buzhenko, Ukraine, 2:01.42. 3, Gladys Wamayu, Kenya, 2:01.57. 4, Maria Martinez, Spain, 2:01.65. 5, Fabianne dos Santos, Brazil, 2:01.70.

1,500 — 1, Svetlana Masterkova, Russia, 4:02.78. 2, Helen Pattinson, UK, 4:04.82. 3, Sinead Delahunty, Ireland, 4:05.28. 4, Marta Dominguez, Spain, 4:06.08. 5, Nuria Fernandez, Spain, 4:06.37.

400 hurdles — 1, Ulrike Urbansky, Germany, 45.57. 2, Heike Meisner, Germany, 54.84. 3, Susan Walsh, Ireland, 55.69. 4, Monika Niederstatter, Italy, 55.78. 5, Patrina Allen, Jamaica, 56.14.

High jump — 1, Hestrie Storbeck-Cloete, South Africa, 6-4. 2, Zuzana Hlavonova, Czech Republic, 6-2¾. 3, Marta Mendia, Spain, 6-0¾. 3, Nele Zilinskiene. Lithuania, 6-0¾. 5, Svetlana Zalevskaya, Kazakstan, 6-0¾. 5, Irina Milalchenko, Ukraine, 6-0¾.

Pole vault — 1, Emma George, Australia, 14-1¾. 2, Tatiana Grigorieva, Australia, 13-9¾. 3, Tanya Koleva, Bulgaria, 13-7¾. 4, Paula Fernandez, Spain, 13-3¾. 5, Mar Sanchez, Spain, 12-11¾.

Long jump — 1, Inessa Kravets, Ukraine, 23-3½. 2, Niurka Montalvo, Spain, 22-5¼. 3, Shron Jaklofsky, Holland, 21-0¾. 4, Concepcion Montaner, Spain, 20-7¼. 5, Marta Godinho, Portugal, 20-5¼.

Javelin — 1, Felicia Tilea, Romania, 196-9. 2, Rita Ramanauskaite, Lithuania, 193-0. 3, Ana Mirela Termure, Romania, 179-2. 4, Idoia Mariezkurrena, Spain, 175-9. 5, Mercedes Chilla, Spain, 167-5.

SOCCER

MLS STANDINGS
Western Division

	W	L	T	Pts	GF	GA
Kansas City	12	5	5	41	33	17
Los Angeles	10	7	7	37	34	30
Colorado	**10**	**10**	**3**	**33**	**30**	**42**
San Jose	5	10	8	23	27	34
Central Division						
Tampa Bay	12	9	2	38	44	33
Chicago	10	8	5	35	46	39
Columbus	9	11	4	31	36	41
Dallas	9	11	4	31	40	40
Eastern Division						
N.Y.-N.J.	13	7	2	41	39	29
New England	9	9	5	32	35	36
Miami	7	11	5	26	32	41
D.C.	5	13	6	21	34	48

Saturday's game
All-Star Game at Columbus, 1:30 p.m.

MLS All-STAR ROSTER
EAST

Jeff Agoos, D, D.C. United; Mike Ammann, G, New York-New Jersey; Ted Chronopoulos, M, New England; Mark Chung, M, New York-New Jersey; Mamadou Diallo, F, Tampa Bay; Marco Etcheverry, M, D.C. United; Scott Garlick, G, Tampa Bay; John Harkes, M, New England; Jay Heaps, D, Miami; Daniel Hernandez, D, New York-New Jersey; Clint Mathis, M, New York-New Jersey; Lothar Matthaus, D, New York-New Jersey; Brian McBride, F, Columbus; Jaime Moreno, D.C. United; Mike Petke, D, New York-New Jersey; Eddie Pope, D, D.C. United; Steve Ralston, M, Tampa Bay; Carlos Valderrama, Tampa Bay; Adolfo Valencia, F, New York-New Jersey; Dante Washington, F, Columbus.

WEST

Chris Armas, M, Chicago; Khodadad Azizi, M, San Jose; **Marcelo Balboa, D, Colorado Rapids**; Dario Brose, M, San Jose; Mauricio Cienfuegos, M, Los Angeles; Robin Fraser, D, Los Angeles; Ariel Graziani, F, Dallas; Kevin Hartman, G, Los Angeles; Chris Henderson, M, Kansas City; Luis Hernandez, F, Los Angeles; Cobi Jones, F, Los Angeles; Jason Kreis, F, Dallas; **Anders Limpar, M, Colorado**; Matt McKeon, M, Kansas City; Tony Meola, G, Kansas City; Peter Nowak, M, Chicago; Preki, M, Kansas City; Ante Razov, F, Chicago; Greg Vanney, D, Los Angeles; Peter Vermes, D, Kansas City.

WORLD CUP QUALIFYING
SOUTH AMERICA
Top four teams qualify
Fifth-place team advances to playoff against Oceania champion

	W	L	T	GF	GA	PTS
Argentina	5	0	0	14	2	15
Uruguay	3	1	1	7	4	10
Colombia	2	1	3	6	4	9
Paraguay	3	2	0	7	7	9
Brazil	2	1	2	6	5	8
Ecuador	2	3	1	7	9	7
Peru	1	3	1	4	5	4
Chile	1	3	1	6	9	4
Bolivia	1	3	1	4	7	4
Venezuela	1	4	0	5	14	3

Tuesday's results
At Quito, Ecuador
Ecuador 0, Colombia 0, tie
At San Cristobal, Venezuela
Chile at Venezuela, (n)
At Montevideo, Uruguay
Peru at Uruguay, (n)
Today's game
At Sao Paulo, Brazil
Argentina at Brazil, 6:40 p.m.
Thursday's game
At La Paz, Bolivia
Paraguay at Bolivia, 2 p.m.
Tuesday, Aug. 15
At Bogota, Colombia
Uruguay at Colombia, 7:30 p.m.

BASKETBALL

WNBA STANDINGS
WESTERN CONFERENCE

	W	L	Pct	GB
Los Angeles	21	3	.875	—
Houston	21	4	.840	½
Phoenix	15	9	.625	6
Sacramento	15	10	.600	6½
Utah	13	12	.520	8½
Minnesota	11	13	.458	10
Portland	8	16	.333	13
Seattle	4	19	.174	16½
EASTERN CONFERENCE				
	W	L	Pct	GB
New York	15	10	.600	—
Orlando	14	10	.583	½
Cleveland	13	10	.565	1
Washington	11	13	.458	3½
Detroit	10	13	.434	4
Miami	9	15	.375	5½
Indiana	6	17	.273	8
Charlotte	6	18	.217	8½

Monday's results
New York 78, Washington 64
Charlotte 82, Indiana 78
Portland 61, Detroit 57
Phoenix 67, Cleveland 57

Tuesday's results
Seattle at Houston, (n)
Orlando at Los Angeles, (n)

Today's games
Washington at Charlotte, 5:30 p.m.
Miami at Detroit, 5:30 p.m.
Cleveland at Utah, 7 p.m.
Indiana at Phoenix, 8 p.m.
Sacramento at Portland, 8 p.m.

MINOR LEAGUE BASEBALL

PACIFIC COAST LEAGUE
American Conference
Central Division

	W	L	Pct.	GB
Albuquerque (Dodgers)	59	45	.567	—
Col.Springs (Rockies)	**51**	**50**	**.505**	**6½**
Omaha (Royals)	46	55	.455	11½
Iowa (Cubs)	41	63	.394	18
Eastern Division				
Memphis (Cardinals)	61	42	.592	—
Oklahoma (Rangers)	51	49	.510	8½
New Orleans (Astros)	50	52	.490	10½
Nashville (Pirates)	49	52	.488	11
Pacific Conference				
Southern Division				
Sacramento (Athletics)	62	42	.595	—
Las Vegas (Padres)	54	46	.543	6
Tucson (Diamondbacks)	49	53	.480	12
Fresno (Giants)	39	64	.373	22½
Northern Division				
	W	L	Pct.	GB
Salt Lake (Twins)	62	41	.608	—
Tacoma (Mariners)	55	48	.531	7
Edmonton (Angels)	48	51	.485	12
Calgary (Marlins)	40	64	.385	22½

Monday's results
Oklahoma 6, **Colorado Springs 4**
New Orleans 5, Edmonton 0
Albuquerque 10, Salt Lake 9
Fresno 11, Calgary 9
Omaha 5, Iowa 3
Memphis 9, Tucson 8
Sacramento 7, Nashville 6
Tacoma 11, Las Vegas 8

Tuesday's results
Colorado Springs at Oklahoma, (n)
Edmonton at New Orleans, (n)
Nashville at Omaha, (n)
Tucson at Memphis, (n)

Wednesday's games
Colorado Springs at Tucson
Albuquerque at Tacoma
Calgary at New Orleans
Fresno at Edmonton
Iowa at Sacramento
Las Vegas at Salt Lake
Nashville at Omaha
Oklahoma at Memphis

ROCKIES' ORGANIZATION
Monday's results
AA: **Carolina 5**,Tennessee 4
A: Greensboro at **Asheville**, ppd., rain
A: **Salem 1**, Kinston 0
A: **Portland** at Yakima, (n)

Tuesday's results
AA: Carolina at Tennessee
A: Greensboro at **Asheville**
A: **Salem** at Kinston
A: **Portland** is not scheduled

Wednesday's games
AA: **Carolina** at Tennessee
A: **Asheville** is not scheduled
A: **Salem** at Kinston
A: Spokane at **Portland**

MONDAY

REDHAWKS 6, SKY SOX 4

Colorado Springs	AB	R	H	BI		Oklahoma	AB	R	H	BI
Latham cf	4	0	2	0		Butler cf	4	1	1	0
Ledesma 1b	4	0	0	0		Brumbaugh rf	3	2	2	1
Melhuse lf	4	0	1	0		Valdes dh	3	0	1	1
Hiatt dh	4	0	0	0		Sierra lf	3	2	1	3
McClain 3b	4	1	1	0		Shave 1b	4	0	1	0
Cox c	3	1	1	1		Waszgis c	3	0	0	0
Carpenter rf	3	2	1	0		Knorr c	1	0	0	0
Butler 2b	3	0	1	1		Dransfeldt ss	3	0	2	1
Sosa ss	3	0	1	2		Garcia 3b	4	0	0	0
						Demetral 2b	2	1	1	0
Totals	**32**	**4**	**8**	**4**		**Totals**	**30**	**6**	**9**	**6**
Colo. Springs					000	020	200	—		**4**
Oklahoma					102	000	300	—		**6**

E — McClain, Linton. DP — Colorado Springs 2, Oklahoma 1. **LOB** — Colorado Springs 4, Oklahoma 5. **2B** — McClain (22), Carpenter (7), Dransfeldt 2 (12). **HR** — Brumbaugh (5), Sierra (12). **SH** — Brumbaugh. **SF** — Cox, Valdes. **CS** — Butler.

Colorado Springs	IP	H	R	ER	BB	SO
Linton L, 6-10	7	9	6	6	3	1
House	1	0	0	0	0	2
Oklahoma	**IP**	**H**	**R**	**ER**	**BB**	**SO**
Sikorski W, 9-9	7	6	4	4	2	7
Mitchell	2	2	0	0	0	1

A — 4,887

MAJOR LEAGUE BASEBALL

MARINERS 6, ATHLETICS 4

Oakland	AB	R	H	BI	BB	SO	Avg.
Christenson cf	3	0	1	2	0	0	.289
Long ph-cf	2	0	1	1	0	0	.279
Velarde 1b	5	1	0	0	0	2	.308
Ja.Giambi 1b	5	0	2	0	0	1	.335
Saenz dh	4	0	1	1	0	2	.303
Grieve lf	3	0	1	0	0	0	.290
Piatt 3b	4	1	1	0	0	0	.347
Stairs rf	4	0	0	0	0	0	.221
Tejada ss	2	2	2	0	2	0	.265
RaHernandez c	2	0	0	0	1	0	.233
Chavez ph	1	0	0	0	0	1	.273
Totals	**35**	**4**	**9**	**4**	**4**	**6**	
Seattle	**AB**	**R**	**H**	**BI**	**BB**	**SO**	**Avg.**
Henderson lf	3	1	2	0	2	0	.243
Guillen ss	3	1	0	1	2	0	.235
Martinez dh	4	2	2	1	1	1	.355
Olerud 1b	4	0	1	1	1	1	.297
Javier rf	2	0	1	1	0	0	.271
Ibanez rf	3	0	1	0	0	1	.218
Cameron cf	5	1	2	0	0	1	.266
Bell 3b	4	0	1	2	0	0	.232
Oliver c	5	0	0	0	0	2	.264
McLemore 2b	2	1	1	0	2	0	.232
Totals	**35**	**6**	**11**	**6**	**8**	**6**	

Oakland .....000 120 001 — 4 9 0
Seattle .....220 100 01x — 6 11 1

E — D. Bell (9). **LOB** — Oakland 8, Seattle 14. **2B** — Henderson (5). **HR** — Martinez (25). **GIDP** — Grieve, Ra. Hernandez. **SB** — Cameron (8).

Runners moved up — Ra. Hernandez, Guillen.

DP — Seattle 2 (Guillen, McLemore and Olerud; McLemore, Guillen and Olerud).

Oakland	IP	H	R	ER	BB	SO	NP	ERA
Appier L, 8-8	6	9	5	5	6	5	128	4.72
Prieto	2	2	1	1	2	1	45	5.14
Seattle	**IP**	**H**	**R**	**ER**	**BB**	**SO**	**NP**	**ERA**
Moyer W, 11-3	6⅓	6	3	2	2	2	89	4.00
Paniagua	0	0	0	0	1	0	5	4.20
Rhodes	1⅔	2	0	0	0	1	19	2.51
Sasaki S, 24	1	1	1	1	1	3	29	3.49

HBP — by Appier (D.Bell). **Umpires** — Home, Cederstrom; First, Scott; Second, Lamplugh; Third, Hudson. **T** — 3:31. **A** — 44,880

ANGELS 6, RANGERS 5

Anaheim	AB	R	H	BI	BB	SO	Avg.
Erstad lf-1b-lf	6	1	2	0	1	0	.380
Stocker ss	5	0	2	1	1	1	.245
MVaughn dh	4	0	0	0	1	2	.298
OPalmeiro pr-dh	1	0	0	0	0	0	.324
Salmon rf	6	2	3	2	0	0	.266
GAnderson cf	6	0	1	0	0	1	.259
Glaus 3b	3	0	0	0	2	2	.281
Molina c	5	1	1	1	0	0	.287
Spiezio 1b-lf-1b	5	1	1	2	0	1	.245
Baughman 2b	3	0	0	0	0	0	.267
a-Kennedy ph-2b	2	1	1	0	0	0	.274
Totals	**46**	**6**	**11**	**6**	**4**	**8**	
Texas	**AB**	**R**	**H**	**BI**	**BB**	**SO**	**Avg.**
Alicea 2b-ss	5	0	2	1	1	0	.309
Greer lf	4	1	1	0	2	0	.274
RPalmeiro 1b	5	1	1	2	1	1	.279
IRodriguez c	0	0	0	0	0	0	.347
Haselman c	4	0	1	0	0	0	.250
b-Catalanotto ph-2b	2	0	0	0	0	0	.375
Segui dh	4	1	1	1	1	0	.341
ScGreen pr-dh	1	0	0	0	0	1	.191
DaMartinez rf	6	0	1	0	0	0	.268
Kapler cf	6	1	2	1	0	1	.263
Lamb 3b	5	1	1	0	1	0	.293
RClayton ss	4	0	1	0	1	0	.292
Sheldon c	0	0	0	0	0	0	.283
Totals	**46**	**5**	**11**	**5**	**6**	**4**	

Anaheim .....100 100 003 001 — 6 11 0
Texas .....200 102 000 000 — 5 11 1

E — Lamb. **LOB** — Anaheim, Texas. **2B** — Erstad (29), B. Molina (10); Da. Martinez (7). **HR** — Salmon (19), Spiezio (10); Palmeiro (25), Kapler (6), Segui (11) **RBI** — Stocker (14), Salmon 2 (52), B. Molina (49), Spiezio 2 (29); R. Palmeiro 2 (76), Kapler (21), Segui (57), Alicea (45). **GIDP** — Glaus, Palmeiro.

Anaheim	IP	H	R	ER	BB	SO	NP	ERA
Bottenfield	5⅔	8	5	5	3	2	104	5.61
Holtz	⅔	0	0	0	0	1	7	3.47
Petkovsek	1⅔	0	0	0	0	0	18	4.50
Hasgw W, 7-2	3	2	0	0	3	0	54	4.06
Percival S, 23	1	1	0	0	0	1	11	4.04
Texas	**IP**	**H**	**R**	**ER**	**BB**	**SO**	**NP**	**ERA**
Rogers	7	5	2	2	2	3	109	4.19
Venafro	1	0	0	0	0	1	10	3.86
Wetteland	1	3	3	3	0	1	30	4.35
Zimmerman	2	1	0	0	1	3	27	5.70
Crabtree L, 1-6	1	2	1	1	1	0	24	5.76

T — 4:13. **A** — 33,201.

BOXING

FIGHT SCHEDULE
National TV in parentheses
Friday

At Freeman Coliseum, San Antonio (ESPN2), Tony Ayala, San Antonio, vs. Yori Boy Campas, Mexico, 10, middleweights; James Coker, San Antonio, vs. Tito Mendoza, Panama, 10, middleweights.

Saturday

At Grand Casino Tunica (Miss.), David Izon, Pensacola, Fla., vs. Rocky Phillips, Dayton, Ohio, 10, heavyweights; Michael Stewart, New Castle, Del., vs. David Armstrong, Cape Coral, Fla., 10, junior welterweights.

At Phoenix, Kostya Tszyu, Russia, vs. Julio Cesar Chavez, Mexico, 12, for Tszyu's WBC super lightweight title.

Aug. 4

At the Hard Rock Hotel and Casino, Las Vegas (ESPN2), Hasim Rahman, Baltimore, vs. Frankie Swindell, Nashville, Tenn., 10, heavyweights; Daniel Lynem, Corona, Calif., vs. Humberto Zubia, Odessa, Texas, 10, super lightweights.

Aug. 5

At Mohegan Sun, Uncasville, Conn. (SHO), Zab Judah, Brooklyn, N.Y., vs. Terronn Millett, Colorado Springs, 12, for Judah's IBF junior wleterweight title; Juan Lazcano, Sacramento, Calif., vs. James Leija, San Antonio, 10, lightweights.

At Wisconsin (Madison) Field House (HBO), Sornpichai Pisnurachank, Thailand, vs. Eric Morel, Madison, Wis., 12, for Pisnurachank's WBA flyweight title; Clarence Adams, Henderson, Ky., vs. Andres Fernandez, Albuquerque, 12, for Adams' WBA super bantamweight title.

At Silver Star Casino, Philadelphia, Miss., Alex Trujillo, Puerto Rico, vs. Mark Suarez, Riverside, Calif., 12, lightweights; Jorge Luis Gonzalez, Cuba, vs. Cliff Couser, St. Louis, Mo., 10 heavyweights.

Aug. 11

At Tropicana Showroom, Atlantic City, N.J. (ESPN2), Ivan Robinson, Philadelphia, vs. Vivian Harris, New York, 10, lightweights; Johnny Molnar, Middletown, N.J., vs. Nick Acevedo, New York, 10, welterweights.

Aug. 12

At the Paris Las Vegas Casino Resort (SHO), Evander Holyfield, Atlanta, vs. John Ruiz, Chelsea, Mass., 12, for the vacant WBA heavyweight title; James Page, Pittsburg, Calif., vs. Andrew Lewis, Guyana, 12, for Page's WBA welterweight title.

Aug. 13

At Peppermill Casino, Reno, Nev. (UNI), Jorge Lacierva, Mexico, vs. David Vazquez, Blythe, Calif., 12, for Lacierva's IBA bantamweight title.

Aug. 19

At Foxwoods, Ledyard, Conn. (HBO), Prince Naseem Hamed, Britain, vs. Augie Sanchez, Las Vegas, 12, for Hamed's WBO featherweight title; Antonio Diaz, Coachella, Calif., vs. Mickey Ward, Lowell, Mass., 10, super lightweights.

Sept. 2

At Don Haskins Center, El Paso, Texas (HBO), Diego Corrales, Sacramento, Calif., vs. Angel Manfredy, Hobart, Ind., IBF junior lightweight title.

At TBA (HBO), Guty Espandas, Mexico, vs. Erik Morales, Mexico, 12, for Espadas' WBC featherweight title.

Sept. 9

At Manchester, England, Michael Brodie, Britain, vs. Willie Jorrin, 12, for the vacant WBC super bantamweight title.

At the New Orleans Arena (TVKO), Roy Jones, Jr., Pensacola, Fla., vs. Eric Harding, Hartford, Conn., 12, for Jones' World light heavyweight title.

At the New Orleans Arena (TVKO), Roy Jones, Jr., Pensacola, Fla., vs. Eric Harding, Hartford, Conn., 12, for Jones' World light heavyweight title.

Sept. 15

At the Pepsi Center, Denver (ESPN), Jose Luis Castillo, Mexico, vs. Stevie Johnston, Denver, 12, for Castillo's WBC lightweight title.

GOLF

THE INTERNATIONAL
List of players announced for the 2000 International presented by Qwest as of Tuesday:

Fulton Allem, Stephen Ames, Billy Andrade, Tommy Armour III, Woody Austin, Craig Barlow, Doug Barron, Rich Beem, Ronnie Black, Eric Booker, Mike Brisky, Mark Brooks, Olin Browne, Tom Byrum, Angel Cabrera, Mark Calcavecchia, Jim Carter, Greg Chalmers, Brandel Chamblee, Barry Cheesman, Stewart Cink, John Cook, Robert Damron, Jay Delsing, Chris DiMarco, Trevor Dodds, Bob Estes, Nick Faldo, Brad Faxon, Steve Flesch, Dan Forsman, Harrison Frazar, Sergio Garcia, David Gossett, Paul Goydos, Ken Green, Scott Gump, Hunter Haas, Jay Haas, Gary Hallberg, J.P. Hayes, Brian Henninger, Gabriel Hjerstedt, Kazuhiko Hosokawa, Charles Howell, Bradley Hughes, Mike Hulbert, Peter Jacobsen, Brant Jobe, Steve Jones, Jonathan Kaye, Skip Kendall, Hank Kuehne, Franklin Langham, Paul Lawrie, Tom Lehman, Justin Leonard, J.L. Lewis, Frank Lickliter, Steve Lowery, Andrew Magee, Jeff Maggert, Billy Mayfair, Scott McCarron, Rocco Mediate, Phil Mickelson, Larry Mize, Gary Nicklaus, Frank Nobilo, Jose Maria Olazabal, Mark O'Meara, Craig Parry, Steve Pate, Carl Paulson, Tom Pernice, Chris Perry, Tom Purtzer, Charles Raulerson, Mike Reid, Chris Riley, Eduardo Romero, Clarence Rose, Tom Scherrer, Adam Scott, Joey Sindelar, Vijay Singh, Craid Stadler, Paul Stankowski, David Sutherland, Kevin Sutherland, Dave Stockton Jr., Esteban Toledo, David Toms, Kirk Triplett, Ted Tryba, Bob Tway, Jean Van de Velde, Grant Waite, Duffy Waldorf, Kevin Wentworth, Mark Wiebe.

SAS INVITATIONAL
At Oslo, Norway
Results of the SAS Invitational between the Nordic All Stars and the Rest of the World, played on the par-72 Oslo Golfklubb course:
Medal match play, team

Paul Lawrie, Scotland (Rest of the World) def. Anssi Kankkonen, Finland (Nordics) 67-71.

Mark O'Meara, United States (Rest of the World) halved with Thomas Bjorn, Denmark (Nordics) 70-70.

Patrik Sjoland, Sweden (Nordics) halved with Retief Goosen, South Africa (Rest of the World) 68-68.

Bernhard Langer, Germany (Rest of the World), def. Jesper Parnevik, Sweden (Nordics) 67-69.

Carlos Franco, Paraguay (Rest of the World), def. Robert Karlsson, Sweden (Nordics) 65-68.

Sergio Garcia, Spain (Rest of the World) halved with Per Haugsrud, Norway (Nordics) 68-68.

BETSY RAWLS GIRLS NATIONAL CHAMPIONSHIP
At Wilmington, Del.
Results after the first round of the McDonald's Betsy Rawls Girls National Championship conducted by the American Junior Golf Association at the par-71 (35-36), 6,087-yard DuPont Country Club:

Lani Elston, Spokane, Wash., 35-34—69; Virada Nirapathpongporn, Bangkok, Thailand, 34-35—69; Leigh Anne Hardin, Martinsville, Ind., 34-35—69.

Catherine Cartwright, Bonita Springs, Fla., 35-35—70; Elizabeth Janangelo, West Hartford, Conn., 35-37—72; Whitney Wade, Glasgow, Ky., 35-37—72.

Mallory Code, Tampa, Fla., 36-37—73; Courtney Wood, Brentwood, Tenn., 34-39—73; Nicole Melton, San Antonio, 38-35—73; Jayme Langford, Shawnee, Kan., 37-36—73; Gina Umeck, Redlands, Calif., 35-38—73.

Courtney Jones, Lake Quivira, Kan., 35-39—74; Kristin Thompson, Napa, Calif., 38-36—74; Dayna Burleigh, Horsham, Pa., 37-37—74.

Others
Tessa Gillam, Englewood, 39-44—83.

AUTO RACING

NASCAR LEADERS
NASCAR Winston Cup driver standings and money leaders through July 23:

Points

1, Bobby Labonte, 2,825. 2, Dale Jarrett, 2,772. 3, Dale Earnhardt, 2,718. 4, Jeff Burton, 2,624. 5, Rusty Wallace, 2,557. 6, Tony Stewart, 2,540. 7, Ward Burton, 2,535. 8, Jeff Gordon, 2,518. 9, Mark Martin, 2,487. 10, Ricky Rudd, 2,468.

11, Mike Skinner, 2,236. 12, Matt Kenseth, 2,228. 13, Terry Labonte, 2,082. 14, Dale Earnhardt, Jr, 2,068. 15, Jeremy Mayfield, 2,030.

Money

1, Dale Jarrett, $4,075,864. 2, Jeff Burton, $3,692,924. 3, Dale Earnhardt, Jr, $1,882,491. 4, Bobby Labonte, $1,864,371. 5, Rusty Wallace, $1,820,081. 6, Tony Stewart, $1,765,096. 7, Mark Martin, $1,709,261. 8, Bill Elliott, $1,678,833. 9, Jeff Gordon, $1,562,961. 10, Dale Earnhardt, $1,559,706.

TRANSACTIONS

BASEBALL
Major League Baseball

MLB — Suspended Tampa Bay manager **Larry Rothschild** for two games and fined him an undisclosed amount for making contact with an umpire and excessive arguing in a game against Atlanta on July 18.

American League

BOSTON RED SOX — Activated OF **Trot Nixon** from the 15-day disabled list. Designated INF **Sean Berry** for assignment.

CLEVELAND INDIANS — Acquired RHP **Jake Westbrook** and RHP **Zach Day** from the New York Yankees to complete the trade for OF **David Justice**.

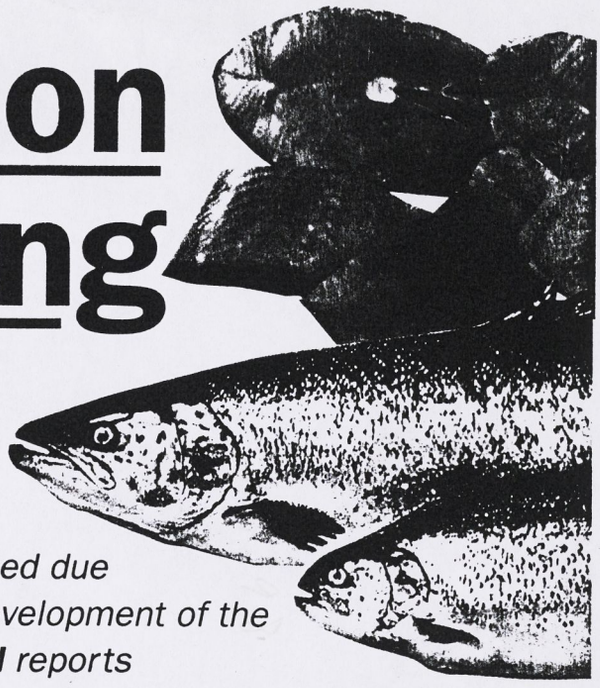
International League

INDIANAPOLIS INDIANS — Acquired C **Kevin Brown** from Syracuse for OF **Alvin Morrow**.

Atlantic League

NASHUA PRIDE — Announced the New

Is the salmon boom coming to an end?



While salmon supplies have significantly increased due to aquaculture during the past decade, the development of the market is falling behind. ***Erik Hempel*** *reports*

The most important salmon fishing nations are the USA and Canada. These two countries alone landed 434,000 tonnes of Pacific salmon in 1996.

Russian catches are also considerable, and although less is known about the utilization of this catch, it is known that a fair volume is exported to Japan.

But wild catches of salmon have been declining for the past 10 years for various reasons. Capture statistics for 1995 and 1996 show there was a decline in landings for the USA of 11 per cent and 39 per cent for Canada. According to observers, there may be a further decline in 1997. For the USA, a further 14 per cent decline is expected.

Future landings of salmon will of course continue to vary from year to year, but it is not expected that landings will increase significantly in the foreseeable future.

Aquaculture

While world catches of wild salmon are declining, farmed salmon production is continuing to grow. Figures for 1996 show that world farmed salmon production reached 618,000 tonnes, of which Norway accounted for 46 per cent, or 285,000 tonnes.

The strongest growth is found in Chile, however, and in 1996 it produced 25,000 tonnes of salmon. Estimates for 1997 indicate that world production of farmed salmon, both Atlantic and Pacific, will grow to about 708,000 tonnes.

While aquaculture has significantly increased the total production of salmon, and of trout, it has also contributed to an important market expansion for both species.

Although Norway has been the leading producer of farmed salmon for decades, its share of the total production is declining. Chile came into salmon farming late, but is now growing fast as a producer. Conditions in southern Chile are ideal for salmon production, and there is room for expansion.

However, the infrastructure in this part of Chile is not well developed; Norway's basic infrastructure, on the other hand, is excellent.

Scotland has increased its production considerably in recent years, but is probably nearing its potential and not much more growth is envisaged.

The USA and Canada have some growth potential, but performance has been disappointing. In the USA, salmon farming is competing with a number of other uses of the coastline, such as sports fishing. In Alaska, which would have a considerable potential for salmon farming, it is forbidden by law because of the strong influence of the salmon fishing community.

Ocean ranching, that is the setting out of smolts or fingerlings in rivers and the sea in order to increase the wild stocks, may become an important factor in the future. Experience from Japan and Russia has shown that this activity can, under certain conditions, be a profitable proposition.

According to the Russian press bureau, Interfax, as much as 15–20 per cent of the 200,000 tonnes of salmon caught off the Pacific coast of Russia started its life in Russian hatcheries. Recovery rates have been much improved during the last few years and are up from 0.5 per cent to 7–8 per cent.

The Russian fisheries company Dalryba, which is behind this activity, is reported to be making $120–150 million a year on this fishery, twice the amount originally invested in the hatcheries. The hatcheries produce 520-530 million smolts per year.

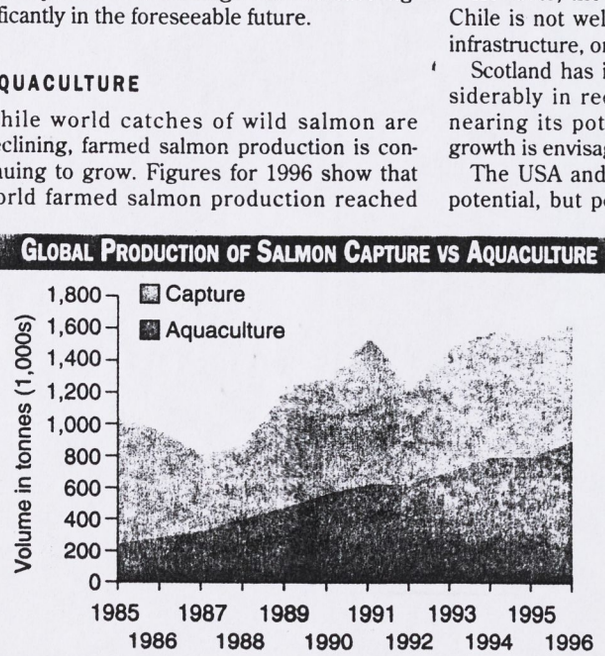
The Atlantic salmon (*Salmo salar*) has been the most important and most successful species in salmon farming. There is every reason to believe that it will continue to be dominant in the future, too. Much breeding work has been done on the species, and the strains being farmed today are very well suited for farming.

Several species of Pacific salmon have been tried in aquaculture. For example, there has been commercial farming of Masu (*Oncorhynchus masou*) and Sockeye (*Oncorhynchus nerka*), but these efforts have not been successful, judging by the production statistics. Chinook (*Oncorhynchus tshawytscha*), on the other hand, and especially Coho (*Oncorhynchus kisutch*) have been much more successful.

In 1995, production of these two species amounted to 11,747 tonnes and 58,383 tonnes respectively. Coho has had the strongest growth in recent years.

Trout has become more popular in recent years as a substitute for salmon. While there has been considerable production of farmed trout on a global basis, the large trout, which competes with salmon in the market, has been farmed in moderate quantities.

Global Production of Salmon Capture vs Aquaculture



Source: FAO Fisheries Circular 815 (Rev 9)

However, Norwegian farmers of large trout have found a keen market for their fish (*Salmo trutta* and *Oncorhynchus mykiss*) in Japan, where the brighter colour and the high fat content is much appreciated.

It is expected that these trout species will take a larger share of the 'salmon' market.

Most experts today agree that the production of farmed salmon will continue to grow. What worries many of these experts is whether the market will be able to absorb the production increases.

Production forecasts for farmed salmon until 2005 conclude that a total production of 1.2-1.5 million tonnes can be expected. Norway is expected to increase production to about 600,000 tonnes, while Chile is expected to produce some 340,000 tonnes, Scotland approximately 100,000 tonnes, Ireland 40,000 tonnes and Canada 50,000 tonnes.

Total farmed salmon production in Europe (excluding Norway) is not expected to exceed 200,000 tonnes.

At the same time, catches of wild salmon are not expected to increase significantly and will fluctuate around 800,000 tonnes per year.

The total supply of salmon by 2005 is therefore expected to be at, or in excess of, 2 million tonnes.

PACIFIC SALMON LANDINGS IN THE USA AND CANADA (VOLUME IN 1,000 TONNES)

	1991	1992	1993	1994	1995	1996
USA						
Sockeye	122	157	179	138	159	139
Pink	165	92	156	166	198	147
Chum	35	41	41	61	66	91
Coho	25	26	19	36	23	21
Chinook	9	8	9	9	6	4
Total USA	**356**	**324**	**403**	**408**	**452**	**402**
Canada						
Sockeye	25	21	42	31	10	15
Pink	34	15	15	3	19	8
Chum	10	18	17	20	18	5
Coho	9	7	7	8	4	4
Chinook	4	5	4	4	1	0
Total Canada	**81**	**66**	**85**	**66**	**52**	**32**
Total USA+Canada	**437**	**390**	**488**	**474**	**504**	**434**

Source: GLOBEFISH 1997

THE MARKET

There are presently three main markets for salmon: Japan, the USA and Europe. While Japan is by far the largest market, most of the salmon consumed in that country is wild caught, while most of the salmon consumed in Europe is farmed.

In the USA, most of the salmon consumed is canned, based on the Alaska fishery.

The three main factors limiting future production are environmental concerns, supplies of feed and the market.

Much good work is presently going into solving the environmental impact of salmon farming, and important advances have been made in the production of formulated feeds although supplies of raw materials for feed production may be a problem in the future.

In the next 5-10 years the focus will be on market expansion which, based on past experience, is largely dependent on the size of the investment in marketing.

Norway, in particular, has understood this and is pouring very large amounts of money into what has proved to be effective marketing in both old and new markets. Without the massive amounts of money spent on the European market, Europe would be eating much less salmon today.

The promise now is with the 'new' markets, particularly in Asia. At the moment, Norway is in the middle of a major campaign promoting Norwegian salmon in China.

Although salmon is largely unknown to the Chinese consumer, imports have risen dra-

matically this year: Norwegian exports of salmon to China so far this year are up by 500 per cent compared with last year.

The Future

Salmon as a product has changed dramatically during the years. Thirty years ago, salmon was a luxury product, available only in certain parts of the world and only during the season. Consequently, it was expensive.

Salmon farming, with a total production of more than 700,000 tonnes a year, has changed all that. Salmon is now abundantly available all over the world, 12 months a year. It is no longer an exclusive luxury product, but a major fisheries commodity. The industry will have to face this fact and act accordingly in its marketing.

During the past three years, the price of salmon has continued to decline. It appears, though, that this trend has been temporarily halted following the agreement between Norway and the EU in mid-1997.

But as advances in production technology continue to reduce production costs, the market price of salmon will continue to decline, albeit slowly.

By the end of the EU-Norway agreement period, that is in 2002, the CIF import price of salmon is expected to be below $3.00 per kg in most markets.

This may be a problem for producers in the UK and in the USA, but both Chile and Norway will be able to live with these prices.

The salmon industry today is much more mature than it was 10 years ago, and is characterized by professional management which focuses on marginal improvements and relatively slim profit margins. These characteristics will continue to dominate the industry for the next 5-10 years.

The structural changes seen in parts of the industry, in terms of concentration of ownership and the development of large production and marketing groups, will continue. The large operators will become larger and the smaller will disappear.

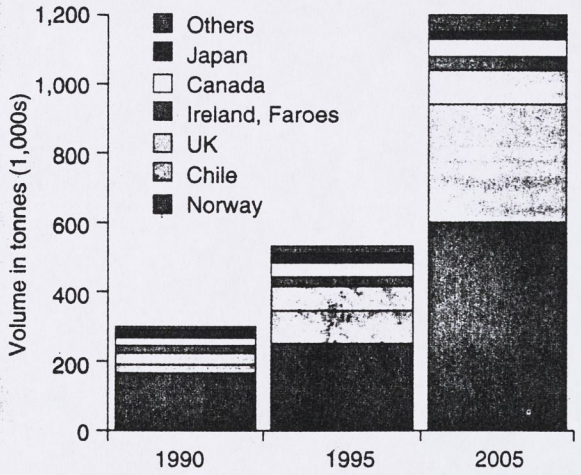
Vertical integration is expected to become more common in the industry, as it has been, for example, in Chile.

This also means that the industry will become more international in that the large companies will be active in several producing countries. It is also expected that these companies will engage in farming other species because much of the advanced salmon farming technology is transferable.

The salmon industry is not finished, neither is it fully developed. Production will continue to grow, and efforts will now focus on intensified marketing. New markets will be opened, particularly in Asia.

It is also expected that there will be considerable advances in product development and diversification. ●

Estimated Global Production of Farmed Salmon 1990-2005



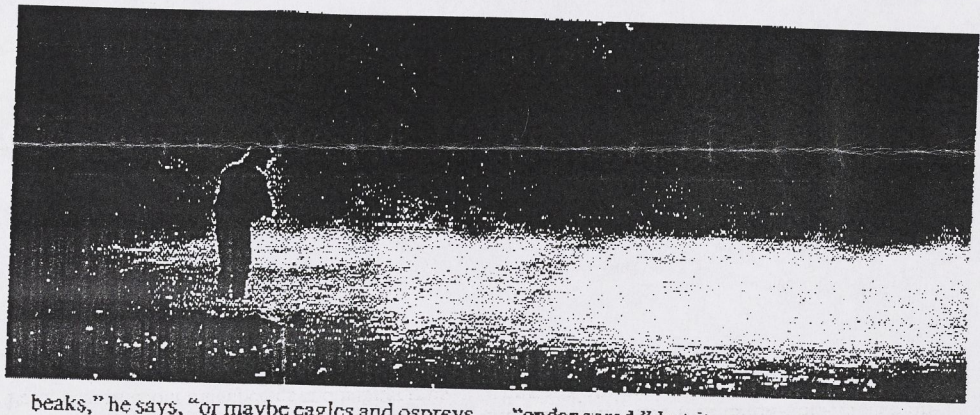
Source: FAO Fishery Statistics 1994 (Vol 78) and FAO Aquaculture Statistics 1994 (Rev 8). Estimates for 1995 and 1996 by E Hempel. The figures include sea trout and rainbow trout in addition to salmon (see Appendix 2: World farmed production of salmonids).
Forecast by Kontali Analyse AS and E Hempel.

RIVER

Catch and Release or Kill and Grill?

By Ted Kerasote

9 FEB 99
JIM: THOUGHT THIS WOULD BE OF INTEREST CHANGING TIMES.
BOB



WM Mac Deen

Darkness descended. I left the river and walked to the distant road. Another angler approached from down the bank. Through the long dusk, each of us had been playing trout almost constantly, and I had to agree with the one-word summation he sent my way—"Unbelievable"—though I added one hedge: "Too bad we couldn't keep one for dinner."

Checking his stride and giving me a reproachful look, he said, "I haven't killed a fish in twelve years."

Our conversation would hardly have been noteworthy—two anglers disagreeing in passing—except that it illuminates a larger debate within the fishing community. The politically correct catechism says that wild trout ought to be caught and released, *even where they can be legally kept*. Dissenters say that it's okay if some of these fish are hooked and cooked, not merely to keep fishing tied to its authentic food-gathering roots, but also because it is a delusion that catch-and-release angling is a harmless way to interact with wildlife.

Numerous studies have shown that even when trout are played quickly on barbless hooks and released well, one to ten percent of them subsequently die. An average figure quoted for post-release death in salmonidae is four percent. If people are inexperienced or the water temperature is over 70 degrees, that percentage can rise. John Varley, director of the Yellowstone Center for Resources, claims fourteen percent succumb to this so-called "incidental mortality."

Even careful anglers can accumulate a significant toll over the years. Say the catch-and-release angler with whom I spoke fishes about 30 days a year and catches an average of 10 fish per day. Over the twelve years in which he had claimed to have never killed a fish, he probably killed about 140. Had he been a hunter, and had the species been deer or ducks, he could—on ethical as well as legal grounds—be accused of waste.

This is the point Jack Turner—the author of *The Abstract Wild* and one of the principal guides at the Exum School of Mountaineering—is trying to make as we stand on the town square of Jackson, Wyoming, one of the most fabled fly-fishing destinations in the world. A former angler and an active hunter, Turner says, "Imagine using worms and flies to catch mountain bluebirds or pine grosbeaks," he says, "or maybe eagles and ospreys, and hauling them around on fifty feet of line while they tried to get away. Then when you landed them, you'd release them. No one would tolerate that sort of thing with birds. But we will for fish because they're underwater and out of sight."

Turner is not alone in his scrutiny of catch-and-release angling. Other fishers, myself included, have begun to wonder if the great freedom of the pastime—angling without limits—is ethically sound. In short, if fish, like other animals, feel pain (and the evidence suggests they do), what does the catch-and-release angler do with that knowledge, especially when numerous arguments that support catch-and-release fishing point out its great benefits to other forms of wildlife as well as to the economic health of human communities?

The Utilitarian Argument

Ted Williams, the conservation editor for *Fly Rod and Reel* and a take-on-anyone columnist for *Audubon*, doesn't hesitate to acknowledge that fish feel pain, but says that "worrying about *unavoidable* pain caused by fishing amounts to contemplating our navels." (For those who want to catch and release fish with the least amount of damage, he offers the following advice: "Land fish quickly; handle them gently; wet your hands so as not to remove their protective slime; and return them swiftly.")

Expending energy on "needless guilt," Williams tells me, obscures the enormous ecological benefits catch-and-release fishing has produced. Citing the story of the threatened greenback cutthroat trout living in Rocky Mountain National Park, he points out that species and habitat preservation is the real issue to consider. The greenback cutthroat trout was originally listed as "endangered," but its recovery program "went nowhere because no one could fish for it."

Downlisting the trout to "threatened," and allowing catch-and-release fishing for it, created a constituency. Money poured in, funding the removal of exotic brook trout and the transplanting of greenbacks. Natives increased.

This story has now become a classic and powerful ecological justification for catch-and-release fishing. It doesn't stand by itself. After catch-and-release regulations were instituted on Yellowstone Lake and its feeder streams in 1973, cutthroat trout numbers increased as much as fourteen times in some of the creeks, creating profound ripple effects.

In 1975, grizzly bears fished for cutthroats in 19 percent of the lake's feeder streams; by 1980, the bears were using 61 percent of the streams, an increase that can be attributed directly to catch-and-release regulations. When I talked with John Varley at park headquarters, he said, "If eagles and ospreys and grizzly bears and otters were going to vote on catch-and-release as opposed to catch-and-kill, we would get unanimous support for the former."

Most of the human community echoes the sentiment. Catch-and-release maintains fish populations and pleases anglers, who buy fishing licences and help keep fish and game departments in business. They also buy tackle and clothing, stay in motels, and eat in restaurants. There isn't a chamber of commerce in the land that weighs an individual fish's pain against its community's annual revenues, inflated as they are by the open access to streams and lakes that catch-and-release angling maintains.

You have to seek out someone like Jack Turner to see the crack in this utilitarian armor.

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"We don't have to give everyone unlimited fishing opportunities," he says and goes on to suggest going back to catch-and-kill fishing but raising the cost of licenses, which would reduce the number of anglers and the subsequent mortality.

When I point out to Turner that this would turn America into Europe, where only the wealthy get to fish for trout and salmon (and where both are killed and eaten), he simply sighs. His calling is principles, not politics.

Scarcity

Turner has a point, nonetheless, that can't be ignored. When scarcity finally knocks, we sometimes respond by limiting ourselves. On the Smith River in Montana, floaters, many of them anglers, opted for more privacy rather than ready access, bringing into play a lottery system that provides a less crowded and more memorable experience on the water. In the hunting world, access to scarce resources has been even more severely regulated. It can take up to 20 years, even a lifetime, to draw a bighorn sheep permit in the lower 48 states. The difference between hunting and fishing is that once an animal is shot it can be enjoyed by no one else. Fish, on the other hand, can be recycled. What is often ignored in the process is how both the fish and the experience of catching them become degraded.

Fish who are caught many times each season have scarred lips and may be missing a mandible or an eye. Their girth is narrower and their color not as bright as fish that haven't been repeatedly stressed. And, frequently, they no longer fight as well.

Tom Montgomery, an international fishing guide and a longtime photographic contributor to *Sports Afield*, maintains that in heavily used catch-and-release waters, "We are breeding a type of trout that lets you stand on top of them. They're adjusted to the presence of the man." When you hook them, "they know what is going on and shake their heads and come in." None of this even begins to mention how, in heavily used fisheries, redds are damaged when anglers wade across them.

Given this impoverishment of what was once a wild, vital fishery, some anglers have begun to suggest going back to limits. Mike Lawson, who owns Henry's Fork Anglers on the famous Harriman Park stretch of the Idaho River, notes that some outfitters advertise 75 to 100-fish days. "How many is enough?" he asks rhetorically and suggests that the time has come "to impose some self-imposed limits."

More Rigorous Standards

For hunters, that time came over a hundred years ago when Theodore Roosevelt and George Bird Grinnell began to promulgate the ethics of fair chase. "Of course, that's because animals are different from fish," is an immediate and frequently heard response. When you remind your interlocutor that fish also happen to be animals, you often get a "yes, but" answer, an equivocation that underscores our entire culture's perception that fish belong to a different biological kingdom.

This is well documented. In a 1994 study, *Attitudes of the Uncommitted Public Toward Wildlife Management*, the public said in a variety of ways that "fish in a bucket were less upsetting than a deer in the back of a pickup." They were cold-blooded, everyone agreed, and therefore easier to kill than warm-blooded animals and birds. As one person from New Jersey put it, "You can't look a fish in the eyes."

Because you can look a deer or a mallard or a raccoon in the eye, hunting has been forced to come up with ever stricter ways to treat animals respectfully even while killing them. Numerous hunting credos instruct hunters to use enough gun to insure quick kills, not to unduly harass animals before dispatching them, and, most important, that all the meat be utilized. In fact, it is against the law in most places to kill a game animal for its horns or hide alone.

This is not merely a legal sanction but a moral one. If a life is to be taken, our culture holds that it ought to be done for nontrivial ends. Converting animals into food, even if done in small doses and at symbolic occasions, the fall hunt, is seen as nontrivial. By this standard, harassing fish when the end is only the angler's amusement is trivial, especially when four percent of the fish die.

Consequently, many anglers in the United Kingdom, consider salmon and trout game animals, like grouse or red deer, and catch, kill, and eat their fish. This is both a matter of tradition as well as respect. As the British angler Colin McKelvie emphatically states, "The fly-fisher is a hunter." He goes on to call catch-and-release angling, "sophisticated self-gratification at the expense of another sentient creature's suffering," and concludes that, "if you do not intend to keep and eat your fish, abandon the hook altogether." Strong words, ones that if everyone in the United States followed, deciding to catch and kill fish would mean a vast lottery system and far less fishing for all of us, not to mention the loss of jobs to those in the fishing industry, and significant economic downturns for many communities.

Yet, there is nothing to say that each of us cannot elect to treat our fishing more like hunting—catching our limit where permitted and eating it, or, in those places where slot limits exist, actually keeping the size fish allowed by law and then stopping to enjoy the river and the scenery. It is the ethic I have returned to after 25 years of catch-and-release fishing, the last ten of those years spent in long reflection about its merits and defects and why I initially adopted catch-and-release fishing with such eagerness. It wasn't merely because catch-and-release was a sound ecological practice or it let me spend more time on the water. I adopted it because I liked the fish's fight—otherwise I would have used those flies tied on only a straight shank, allowing the fish to strike without being hooked.

I haven't used hookless hooks, nor does one angler in ten thousand use them. The hook allows us to control and exert power over fish, over one of the most beautiful and seductive forms of nature, and then, because we're nice to the fish, releasing them "unharmed," we can receive an ecological blessing, the kind steward leaving food for bears and eagles, as well as a psychic dispensation, as we attempt to touch our predatory roots without getting blood on our hands. Playing geese or elk in this way has never crossed my mind, for their pain is too obvious to discount.

Ironically, hunting with its graphic but authentic mortality of killing for food, has sat easier in my soul than catch-and-release fishing. When I came to the realization that it was participation in the life-and-death cycles of nature that I was after, not quantity or simple amusement, it wasn't that difficult to once again treat fish like game—hookin' 'em and cookin' 'em.

–R

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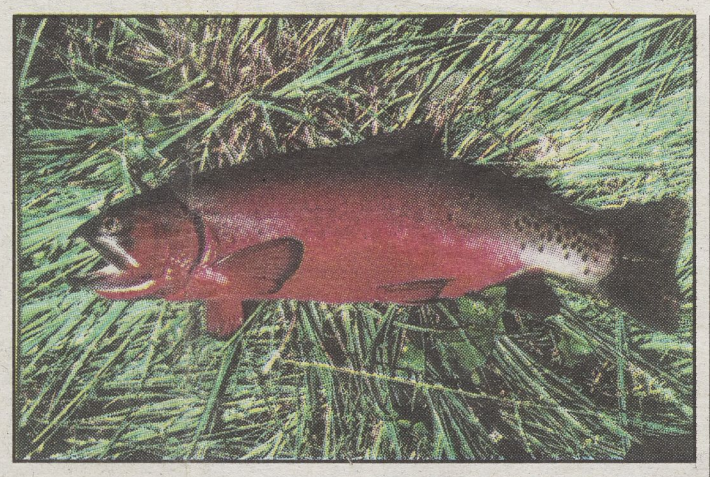
WESTERN ADVENTURE

One that *didn't* get away



Photos by Hugh Garnder/Special to the News

Male greenbacks can develop brilliant coloring when spawning, especially when raised in lakes where they can eat crustaceans.

Greenback cutthroat is alive and well, but recovery isn't certain

By Hugh Gardner
Special to the News

Greenback cutthroats, the original native trout of Colorado's Front Range, were thought to be extinct by the 1930s, wiped out by overharvest, pollution, and habitat destruction brought about by the early settlement of the state.

Their death knell was the introduction of non-native trout to replace them.

Greenbacks were tough enough to evolve from a Pacific Ocean species and cross the Continental Divide to get here. But they couldn't withstand the non-natives, which outbred them (eastern brookies), interbred with them (western rainbows), or ate them (European browns).

Then two small populations were discovered in the 1960s and 1970s, in remote headwaters where competing trout species couldn't get to them.

These findings, and their discoverer, Robert Behnke of Colorado State University, helped secure passage of the Endangered Species Act in 1978.

That set off a flurry of greenback projects, which soon allowed upgrading the status of the trout species from "endangered" to "threatened."

By the early 1990s, greenback recovery had almost reached the goal of 20 self-sustaining populations in their two home watersheds, the South Platte and Arkansas.

The achievement was hailed as one of the great success stories of the Endangered Species Act, on a par with the recovery of populations of eagles and wolves.

In 1994, Trout Unlimited persuaded the Colorado legislature to make greenbacks the official state fish.

It was widely assumed greenbacks soon would be "delisted" — removed from the list of threatened species — and returned to mainstream sports fishing.

It hasn't happened.

Instead, the 1990s for greenbacks became a long, dark tunnel of unforeseen setbacks from which the species has yet to emerge.

Despite gallant efforts by government biologists, many projects were invaded again by competing trout, some probably by sabotage.

Recovery goals have been met for the South Platte drainage, but populations have fallen short in the Arkansas drainage.

Greenbacks are closer than before to being delisted and returned to mainstream fishing, but they still are not there, and still are years away.

Above all other problems, the biggest has been money.

The closer greenbacks got to recovery, the more agency budgets were trimmed or reallocated to more pressing needs.

Greenbacks became, in effect, victims of their own success.

"It's sad but true," said Colorado Division of Wildlife cutthroat specialist Tom Nesler, who now leads the greenback recovery team.

"The better job you do of recovering a species, the more likely you are to run out of money to complete it. With all the demands on wildlife management today, it's hard to make that final push to get a threatened species delisted. This is an ironic flaw in the (Endangered Species Act) process. It tends to trap a species like greenbacks in limbo while more urgent problems get the attention."

It's now largely up to the Division of Wildlife to breed and restore wild populations of greenbacks, a commitment embodied in the agency's newly rewritten policies.

"We all agree these fish are important and belong here," Nesler said. "Every one of our district biologists has a native cutthroat project going today. Our program of stocking them in high mountain lakes has been a big hit with anglers. Our main problem is the damage that whirling disease did to our brood stock and hatchery system.

"We can still only raise about half the clean greenbacks requested by our recovery people. This has slowed down our sport fishing program, too, because high lakes can only be stocked with fish which pass the strictest, most conservative tests for purity."

According to Division of Wildlife hatcheries supervisor Eric Hughes, "We basically have a production bottleneck for all coldwater species until (whirling disease) cleanup is finished by 2003. In the meantime, we've greatly increased the resources we devote to native cutthroats.

"We've sought out new sources of clean water, created backup brood stocks, and next year our first greenback isolation unit will come on line near Salida. Progress has been agonizingly slow, it's true, but we can see the light at the end of the tunnel."

Perhaps no one has agonized more about the slow pace of greenback recovery than U.S. Fish and Wildlife Service biologist Bruce Rosenlund, who has worked on the species for more than 20 years. Despite good cause for burnout, he is upbeat about the future.

"Greenbacks are not an impediment to development, so they're not a front-burner issue like jumping mice or pike minnows," Rosenlund said. "Congress only gives us so much money to deal with an ever-increasing list of species in trouble, and not all recovery plans are necessarily funded, so priorities have to be set.

"We should be thankful for the white knights that kept us going, like the Park Service, Fort Carson, the Air Force Academy. The Forest Service, (Bureau of Land Management) and (Trout Unlimited) had key roles, too. And without Dr. Behnke doing what he did, we wouldn't even be talking about this. So let's be glad this beautiful fish is still around. Delisting won't take much longer now."

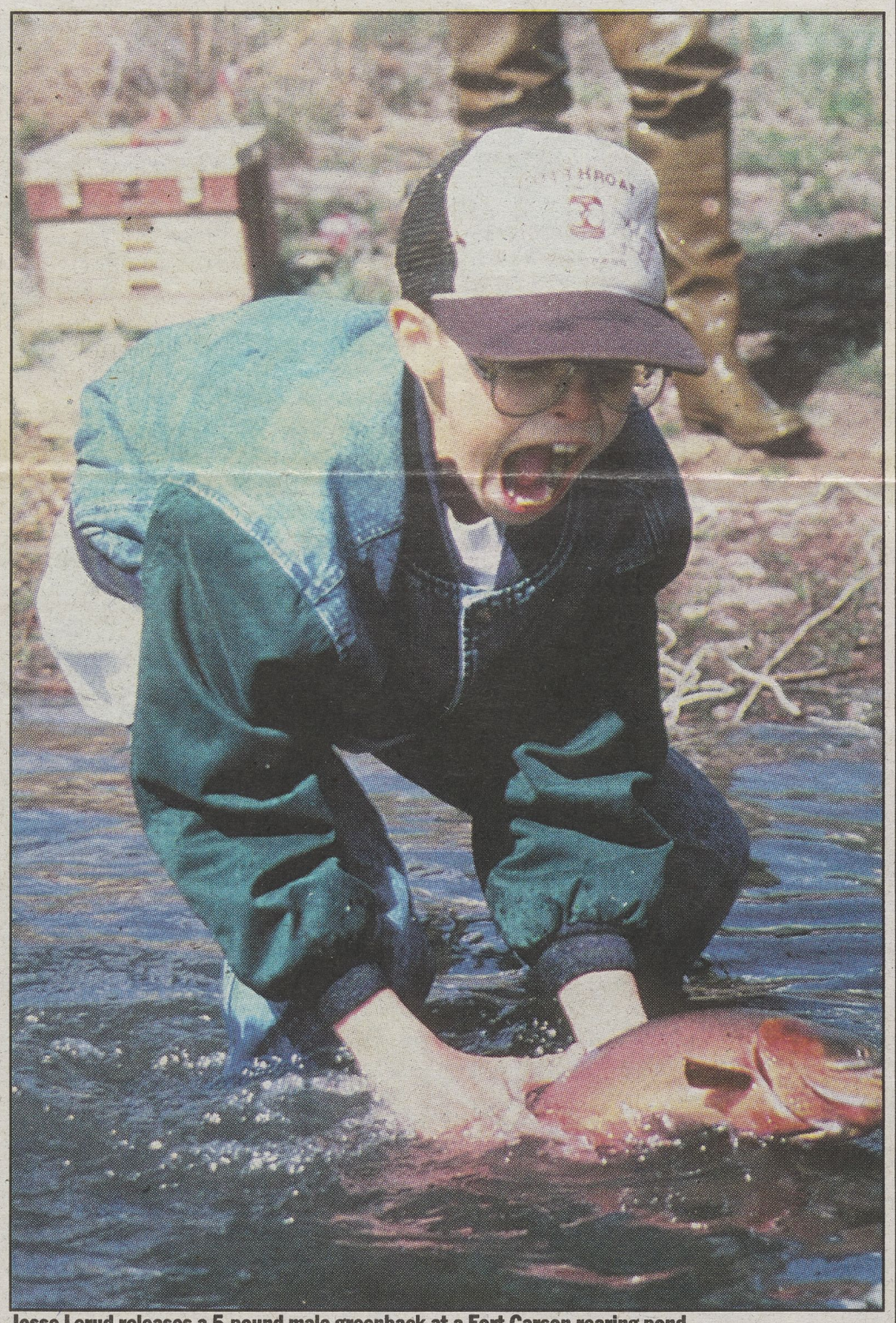
"The agencies deserve a lot of credit for doing a great job under tough conditions," Colorado Trout Unlimited director Dave Nickum said.

"What we're afraid of is what happens *after* greenbacks are delisted, because there's a big difference between technical recovery and true restoration. Will they just be maintained as a few isolated museum specimens up on the Continental Divide?

"We want to see the agencies expand greenback recovery by establishing metapopulations, where feasible, as well as expand their use in sports fishing so that more anglers have a chance to enjoy this fish, even those who can't hike 5 miles in to a high lake or stream."

In the end it comes back to money.

Greenbacks appear to be safe for now — just barely. But if these beleaguered trout ever get over the hump, it will still take more greenbacks of the other sort to keep them there.



Jesse Lerud releases a 5-pound male greenback at a Fort Carson rearing pond.

HOW TO HELP THE GREENBACKS

How can the public help restore greenbacks?

■ Write a letter to senators or the governor, asking them to increase budgets earmarked for native trout.

■ Donate to Trout Unlimited's Bring Back the Natives fund, or ask for brochures explaining the restoration effort and telling where to fish for greenbacks.

■ For copies of an award-winning TV documentary about greenbacks or a full-color art poster, send $17.95 for each to the Colorado Wildlife Heritage Foundation, 6060 Broadway, Denver, CO, 80219, or donate to its Native Trout Education Project.

SOLUNAR TABLE

■ This schedule of Solunar Periods has been taken from Mrs. Richard Alden Knight's Solunar Tables. For best results, plan your days so you will be fishing or hunting in good territory during these times. The Major Periods last 1½ to 2 hours. The Minor Periods are shorter.

		A.M.		P.M.	
Date	Day	Minor	Major	Minor	Major
8-20	Today	10:40	4:30	11:10	4:55
8-21	Monday	11:20	5:10	—	5:50
8-22	Tuesday	12:05	6:00	12:10	6:40
8-23	Wednesday	12:55	7:05	1:15	7:40
8-24	Thursday	1:55	8:10	2:20	8:30
8-25	Friday	2:45	8:55	3:05	9:30
8-26	Saturday	3:45	9:40	3:50	10:30
8-27	Sunday	4:15	10:55	5:50	11:20

THE LINEUP

SPORTS CALENDAR

	Today	Mon	Tue	Wed	Thu	Fri	Sat
Broncos football						@SanFran. 7 p.m.	
Rockies baseball	Florida 1:05 p.m.	Atlanta 7:05 p.m.	Atlanta 7:05 p.m.	Atlanta 1:05 p.m.		@Pitt. 5:05 p.m.	@Pitt. 11:15 a.m.
Rapids soccer	@N.Y.-N.J. 1 p.m.						Kan. City 7 p.m.
Sky Sox baseball	@Memphs 1:05 p.m.	@Memphs 6:05 p.m.	@Memphs 6:05 p.m.		Albuq. 7:05 p.m.	Albuq. 7:05 p.m.	Albuq. 1:35 p.m.
Arapahoe Pk. horses	1 p.m.						
Mile High dogs		12:30 p.m.	7:30 p.m.	12:30 p.m.	7:30 p.m.	12:30 p.m. 7:30 p.m.	12:30 p.m. 7:30 p.m.

TODAY'S TV/RADIO HIGHLIGHTS

Event	TV	Radio	Time
BASEBALL			
Florida at Rockies	Ch. 2	850 AM	1 p.m.
Chicago Cubs at Arizona	WGN		2:30 p.m.
Little League World Series	ESPN2		3 p.m.
Texas at Boston	ESPN	950 AM	6 p.m.
Little League World Series	ESPN2		6 p.m.
WNBA PLAYOFFS			
Cleveland at New York	Ch. 9		Noon
Houston at Los Angeles	LIFE		2 p.m.
BOXING			
Naseem Hamed vs. Augie Sanchez (tape)	HBO2		6:30 a.m.
Toughman World Championship (tape)	FX		3 p.m.
Naseem Hamed vs. Augie Sanchez (tape)	HBO2		3:30 p.m.
Paea Wolfgramm vs. Elecer Castillo	FSN		8 p.m.
ARENA FOOTBALL			
ArenaBowl '00: Nashville at Orlando	Ch. 7		11 a.m.
NFL PRESEASON			
Tampa Bay at New England	Ch. 31		2 p.m.
GOLF			
PGA Championship final round	TNT		8:30 a.m.
PGA Championship final round	Ch. 4		11:30 a.m.
Senior PGA Utah Showdown final round	ESPN		3:30 p.m.
GYMNASTICS			
U.S. Olympic trials	Ch. 9		10 a.m.
U.S. Olympic trials	Ch. 9		6 p.m.
MOTORSPORTS			
NASCAR: Pepsi 400 qualifying (tape)	ESPN2		7 a.m.
NASCAR: Pepsi 400	ESPN	950 AM	11 a.m.
AMA: 600cc Supersport	TNN		1 p.m.
CART: Havoline 200	Ch. 7		2 p.m.
NHRA: Colonel's Truck Nationals (tape)	TNN		2:30 p.m.
IHRA: Summit Drag Racing (tape)	TNN		8:30 p.m.
World of Outlaws: Kings Royal (tape)	TNN		10 p.m.
SOCCER			
English: Manchester United vs. Newcastle	PPV1		9 a.m.
Guadalajara vs. Leon (Spanish)	Ch. 50		11 a.m.
MLS: Rapids at New York-New Jersey	Ch. 20		1 p.m.
MLS: Rapids at N.Y.-New Jersey (Spanish)		1090 AM	1 p.m.
Women: U.S. vs. Canada	ESPN2		1 p.m.
Teams TBA (Spanish)	TELE		5 p.m.
English Premier: Teams TBA (tape)	FSN		4 p.m.
TENNIS			
ATP: RCA Championships	Ch. 9		2 p.m.
ATP: Legg Mason Classic	FSN		2 p.m.
WTA: du Maurier Open (tape)	ESPN2		10 p.m.
ATP: Legg Mason Classic (tape)	FSN		1 a.m.
VOLLEYBALL			
BVA: Women's Series (tape)	FSN		1 p.m.
X GAMES			
Bicycle stunt, freestyle moto-X (tape)	ESPN		2 p.m.
Bicycle stunt, skateboarding (tape)	ESPN2		8 p.m.

TICKETS

Major sports events and appearances in Denver and along the Front Range:

ARAPAHOE PARK HORSE RACING — Live racing today, East Quincy and Gun Club Road. Post time: 1 p.m. Tickets: $10 clubhouse, $1 general admission, seniors 55-over 50 cents, children under 12 free. Information: (303) 690-2400.

COLORADO RAPIDS — Home games for Major League Soccer team at Mile High Stadium (all at 7 p.m. unless noted): Saturday, Kansas City; Aug. 30, Miami; Sept. 8, Los Angeles, 7 p.m. Tickets: $13-$22. Information: (303) 299-1599.

COLORADO ROCKIES — Home games at Coors Field (all at 1:05 p.m. unless noted): Today, Florida; Monday-Tuesday, Atlanta, 7:05 p.m.; Wednesday, Atlanta; Sept. 1, Milwaukee, 7:05 p.m.; Sept. 2-3, Milwaukee; Sept. 4, Chicago; Sept. 5, Chicago, 7:05 p.m.; Sept. 6, Chicago; Sept. 8, Los Angeles, 7:05 p.m.; Sept. 9-10, Los Angeles. Available tickets: $4-$30. Information: (800) 388-ROCK (7625).

MILE HIGH GREYHOUND RACING — Live racing through Feb. 3, 6200 Dahlia, Commerce City. Post times: 12:30 p.m. Monday, Wednesday, Friday and Saturday, 7:30 p.m. Tuesday, Thursday, Friday, Saturday. Tickets: $5 Wembley Club, $3 clubhouse, $1 general admission every day. Information: (303) 288-1591.

THE LINE

Home team all CAPS

College Football
Saturday

Favorite	Open	Today	Underdog
Kansas St.	27	28½	Iowa-x
Florida St.	24	25	BYU-y
TEXAS TECH	15	15	New Mexico

x-at KANSAS CITY, Mo.
y-at JACKSONVILLE, Fla.

Aug. 27

Favorite	Open	Today	Underdog
Penn St.	3½	3½	Southern Cal-z

VIRGINIA TECH	15½	16)	Georgia Tech

z-at EAST Rutherford, N.J.

NFL Preseason
Today

Favorite	Open	Today	Over/ Under	Underdog
NEW ENGLAND	Pick	Pick	(34)	Tampa Bay

Monday

MIAMI	3	3	Over/ (37½)	Green Bay

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FINISH LINE

PRO FOOTBALL

Late Friday NFL summaries

Eagles 34, Titans 32

Tennessee	3	3	13	13	— 32
Philadelphia	7	14	3	10	— 34

First quarter

Ten — FG Del Greco 40, 7:53. Phi — Martin 9 pass from McNabb (Akers kick), 3:12.

Second quarter

Ten — FG Del Greco 48, 14:37. Phi — C.Johnson 46 pass from McNabb (Akers kick), 9:17. Phi — Staley 5 pass from McNabb (Akers kick), :16.

Third quarter

Ten — Green 2 run (Del Greco kick), 13:04. Phi — FG Maston 44, 4:46. Ten — Leach 1 pass from Volek (pass failed), 1:37.

Fourth quarter

Phi — Pinkston 35 pass from Powlus (Akers kick), 9:28. Ten — Sanders 35 pass from Volek (Del Greco kick), 7:00. Ten — Green 4 run (pass failed), 1:38. Phi — FG Akers 48, :00.

A — 56,169.

	Ten	Phi
First downs	20	23
Rushes-yards	29-99	30-176
Passing	206	264
Punt Returns	1-0	1-2
Kickoff Returns	5-131	6-106
Interceptions Ret.	0-0	2-10
Comp-Att-Int	19-32-2	27-46-0
Sacked-Yards Lost	2-13	2-11
Punts	6-39.2	6-37.0
Fumbles-Lost	0-0	2-2
Penalties-Yards	6-53	12-90
Time of Possession	29:15	30:45

INDIVIDUAL STATISTICS

RUSHING — Tennessee, Thomas 8-42, Green 17-41, Daft 2-9, J.Johnson 2-7. Philadelphia, Pritchett 9-45, McNabb 3-43, Autry 5-38, Staley 8-30, Hamner 4-13, Mitchell 1-7.

PASSING — Tennessee, Volek 14-18-1-190, Daft 1-8-1-8, O'Donnell 4-6-0-21. Philadelphia, McNabb 15-23-0-163, Powlus 7-12-0-82, Pederson 4-7-0-13, Detmer 1-4-0-17.

RECEIVING — Tennessee, Kinney 5-50, Green 3-24, Leach 3-20, Sanders 2-48, Byrd 2-42, Gould 1-18, Dyson 1-11, Roan 1-5, Neal 1-1. Philadelphia, Staley 5-35, Douglas 4-30, C.Johnson 3-78, Small 3-11, Pinkston 2-36, Van Dyke 2-24, Broughton 2-22, Martin 2-12, Lewis 1-23, Autry 1-2, Reader 1-1, Weaver 1-1.

Ravens 24, Panthers 13

Baltimore	0	7	14	3	— 24
Carolina	7	3	3	0	— 13

First quarter

Car — Muhammad 7 pass from Beuerlein (Cunningham kick), 9:28.

Second quarter

Bal — Kyanbadejo 3 run (Stover kick), 10:42. Car — FG Cunningham 30, 1:08.

Third quarter

Bal — B.Davis 17 pass from Dilfer (Stover kick), 8:38. Car — FG Cunningham 43, 6:37. Bal — Brookins 4 run (Stover kick), 2:15.

Fourth quarter

Bal — FG Stover 44, 3:39.

A — 72,551.

	Bal	Car
First downs	18	13
Rushes-yards	31-115	25-128
Passing	200	61
Punt Returns	4-12	5-13
Kickoff Returns	4-108	4-104
Interceptions Ret.	1-12	2-16
Comp-Att-Int	15-36-2	16-34-1
Sacked-Yards Lost	3-24	7-50
Punts	7-39.6	8-44.9
Fumbles-Lost	3-1	2-2
Penalties-Yards	6-45	5-26
Time of Possession	32:13	27:47

INDIVIDUAL STATISTICS

RUSHING — Baltimore, Dilfer 2-54, Brookins 10-43, Holmes 7-12, Arnaud 3-7, Ayanbadejo 3-7, Gash 1-3, Redman 1-3, Robinson 3-(minus 5), Stokley 1-(minus 9). Carolina, Kane 6-65, Biakabutuka 6-25, Craig 3-15, Bates 2-11, Beuerlein 1-10, J.Lewis 3-5, Johnson 4-(minus 3).

PASSING — Bal, Banks 7-12-1-116, Redman 6-12-0-87, Dilfer 2-10-1-21, Robinson 0-2-0-0. Car, Lewis 7-17-0-58, Craig 4-10-1-30, Beuerlein 5-7-0-23.

RECEIVING — Baltimore, Sharpe 3-54, Ismail 3-47, Taylor 2-39, Brookins 2-13, J.Lewis 1-24, B.Davis 1-17, Holmes 1-15, G.Thompson 1-11, Collins 1-4. Carolina, Mangum 3-33, Burks 2-11, Hood 2-11, Floyd 2-10, Muhammad 2-10, Crawford 1-13, Foreman 1-12, Turner 1-8, Biakabutuka 1-3, Hoover 1-0.

Raiders 23, Lions 17

Detroit	0	14	0	3	— 17
Oakland	7	6	10	0	— 23

First quarter

Oak — Jordan 1 run (Janikowski kick), 5:24.

Second quarter

Oak — FG Janikowski 38, 14:23. Oak — FG Janikowski 39, 10:05. Det — Stewart 32 pass from Case (Hanson kick), 4:09. Det — Stewart 12 run (Hanson kick), 0:49.

Third quarter

Oak — FG Janikowski 41, 8:39. Oak — Hoying 4 run (Janikowski kick), 3:20.

Fourth quarter

Det — FG Hanson 46, 2:46.

A — 32,365.

	Det	Oak
First downs	14	18
Rushes-yards	27-78	35-140
Passing	142	125
Punt Returns	3-27	4-46
Kickoff Returns	5-105	4-65
Interceptions Ret.	0-0	1-7
Comp-Att-Int	15-31-1	16-26-0
Sacked-Yards Lost	1-1	4-24
Punts	8-35.1	4-48.3
Fumbles-Lost	0-0	2-2
Penalties-Yards	13-152	9-104
Time of Possession	28:44	31:16

INDIVIDUAL STATISTICS

RUSHING — Detroit, Irvin 11-37, Stewart 9-32, Case 2-7, Tomczak 1-3, Schlesinger 4-(minus 1). Oakland, Moore 8-36, Gannon 3-35, Wheatley 4-22, Jordan 4-20, Hoying 7-16, White 4-7, Kaufman 4-2, Peete 1-2.

PASSING — Detroit, Case 6-12-0-75, Tomczak 6-12-0-37, Sauter 3-7-1-31. Oakland, Gannon 6-10-0-32, Hoying 6-9-0-87, Peete 4-7-0-30.

RECEIVING — Detroit, Rone 4-44, Stewart 3-39, Moore 2-22, Schlesinger 2-6, Irvin 1-18, Crowell 1-6, Morton 1-4, Rasby 1-4. Oakland, Dudley 4-22, Porter 3-59, Dunn 2-31, Knight 2-12, Crockett 1-8, Fontenot 1-8, Wheatley 1-6, Brown 1-4, Jordan 1-(minus 1).

Canadian Football League

EASTERN DIVISION

	W	L	T	OTL	Pts	PF	PA
Hamilton	5	2	0	1	11	193	170
Montreal	5	2	0	0	10	252	136
Winnipeg	1	5	1	1	4	228	258
Toronto	1	5	1	0	3	147	251
West Division							
	W	L	T	OTL	Pts	PF	PA
Calgary	6	0	1	0	13	295	173
Edmonton	5	2	0	0	10	196	173
B.C.	3	4	0	0	6	156	222
Saskatchewan	0	6	1	0	1	194	277

Note: Two points for a regulation or overtime win and one point for a tie or overtime loss.

Weekend scores

Calgary 37, Winnipeg 16
British Columbia 36, Toronto 26
Hamilton 37, Montreal 26
Edmonton 28, Saskatchewan 22

Thursday's game

British Columbia at Toronto, 5:30 p.m.

Friday's games

Calgary at Montreal, 5:30 p.m.
Hamilton at Winnipeg, 6:30 p.m.
Saskatchewan at Edmonton, 7:30 p.m.

Arena Football playoffs

TODAY'S ARENABOWL XIV
Seeds in parentheses

Nashville (6) at Orlando (2), 11 a.m. (Ch. 7)

HORSE RACING

Sunday's Arapahoe Park entries

Post time 1 p.m.

FIRST — Purse $5,800, 3-yrs-up, 118/122, Claiming $10,000, 350 yds.
1 Jetaways Wonder ..... P Robson, 118 10
2 Passive Princess ..... L Chavez, 122 8
3 Mr Rocktober ..... T Green, 119 5-2
4 Spot Me Im Class ..... J Petersen, 120 12
5 Redhot Scot ..... R Finch, 118 7-2
6 Venture De Kas ..... N Madrid, 119 9-2
7 Jks Cash Bar ..... T Guymon, 118 20
8 Super Yeah ..... S Pollard, 122 3

SECOND — Purse $8,600, 3-yrs-up, 118/122, Claiming, $10,000, 1 1/16 mile.
1 Red Rock Ridge ..... R Houghton, 122 5-2
2 Mason's Fool ..... J Petersen, 120 15
3 Palm Voyage ..... D Montoya, 115 9-2
4 Mr Bulldog ..... J Black, 118 8
5 My Carr ..... T Green, 122 7-2
6 Wells Draw ..... R Vicchrilli, 122 3
7 Fleet Ruhlmann ..... Q Bui, 118 6

THIRD — Purse $8,600, 3-yrs-up, 118/122, 550 yds.
1 Bux To Royalty ..... Fr Martinez, 122 7-2
2 Redneck Cowgirl ..... L Chavez, 120 20
3 I Say It Special ..... N Madrid, 118 9-2
4 Sueno Six ..... Lisa Nuell, 115 8
5 Wr Fuel ..... R Vicchrilli, 122 12
6 Fol Returns ..... J Petersen, 119 3
7 Blushing Katie ..... F Rojas, 122 10
8 Leo Beau Dash ..... T Green, 118 5-2

FOURTH — Purse $6,500, 3-yrs, 118/122, 550 yds
1 Streakin Love Sign ..... S Pollard, 118 8
2 Cash To The Lady ..... J Petersen, 118 20
3 Dollys Eye ..... N Madrid, 118 12
4 Famous High ..... L Chavez, 122 5-2
5 Run The Gauntlet ..... R Vicchrilli, 118 3
6 Kwik Darling ..... F Rojas, 118 10
7 Raz Ta Tac ..... Ja Ortega, 122 7-2
8 Jets Be Kas ..... J Hunterson, 115 9-2

FIFTH — Purse $4,500, 3-yrs-up, 118/122, Claiming $3,200, 1 mile.
1 Ringing True ..... D Gutierrez, 113 12
2 Racine Bandito ..... B Theriot, 117 10
3 Ocean Moon ..... J Hunterson, 120 15
4 Sportruk ..... T Green, 118 5-2
5 Fly Murriah ..... D Frazier, 118 7-2
6 Intolerance ..... A Romero, 118 25
7 Walk The Plank ..... P Robson, 118 20
8 Heartchanger ..... J Petersen, 118 5
9 Earnest Money ..... R Houghton, 118 8
10 Change Tables ..... Q Bui, 118 9-2

SIXTH — Purse $10,000, 3-yrs-up, 118/122, Claiming, $15,000, 7 furlongs.
1 Mr Ammo ..... D Montoya, 118 6
2 Cherokee Raider ..... R Houghton, 122 5-2
3 Polka Coyote ..... Ja Ortega, 118 4
4 Seven Mag ..... N Madrid, 118 8
5 Mighty Fine Wine ..... J Black, 122 20
6 My Special Ego ..... T Green, 122 7-2
7 La Junta ..... J Hunterson, 115 12
8 Scuba Doo ..... Q Bui, 122 10
9 Young ..... D Frazier, 118 10
10 Patience No. Two ..... P Whetstone, 118 20
11 Ready For The Show ..... F Rojas, 118 15

SEVENTH — Purse $7,500. 3-yrs-up, 118/122, Claiming $3,200, 1¾ mile.
1 Elegant Beau ..... K Heim, 119 15
2 El Carinoso ..... T Green, 122 8
3 Standing Ovation ..... L Quinonez, 115 15
4 Matador De Gallina ..... Q Bui, 122 5
5 Corporal Tyree ..... A Romero, 122 6-5
6 Naldo ..... R Houghton, 119 3
7 Advice ..... J Petersen, 119 12
8 Bold Sundance ..... D Montoya, 118 10

EIGHTH — Purse $30,000, 3-yrs, Derby, 11/16 mile.
1 Proceedings ..... R Vicchrilli, 119 30
8 Reprise ..... R Vicchrilli, 119 30
2 Getaway In Style ..... J Black, 119 5
3 Rainbow Parcel ..... J Hunterson, 119 15
4 Tyforyou ..... J Petersen, 119 12
5 Lonesome Cowboy ..... R Houghton, 119 10
6 Candy Factor ..... D Frazier, 119 8
7 Iwinski ..... A Romero, 119 20
9 Moonlight Maverick ..... D Montoya, 119 2-5
10 Mr Short Cut ..... N Madrid, 119 15

NINTH — Purse $111,070, 2-yrs, Futurity, 122, 400 yds
4 4 Mr Casady Nova ..... J Hunterson, 122 9-2
8 Denim Darling ..... B Theriot, 122 9-2
1 Strawflypie ..... S Pollard, 122 5-2
2 Easy Dashin Chick ..... J Petersen, 122 12
3 Daisy N Eye ..... H Collins, 122 5
5 Build A Fortune ..... J Williams, 122 15
6 The Hot Corner ..... T Green, 122 8
7 Baquero ..... A Baldillez, 122 10
9 Country Form ..... R Vicchrilli, 122 7-2
10 Do Ya Dash ..... L Chavez, 122 20

10TH — Purse $100,000, 2-yrs, Futurity, 120, 6 furlongs.
5 Reality Play ..... Ja Ortega, 120 7-5
6 Silver Set ..... B Theriot, 120 7-5
1 Mom N Donna ..... P Whetstone, 116 20
2 Mack Be Quick ..... J Hunterson, 120 15
3 Risen Ruler ..... D Montoya, 120 10
4 Future Time ..... Ch Giles, 116 12
7 Zynastry ..... L Quinonez, 116 8
8 Lucky Chip ..... T Green, 120 8-5
9 Nerv E Go ..... D Frazier, 120 6

11TH — Purse $15,000, 3-yrs-up, 118/122, 5½ furlongs.
1 Well Planned ..... R Vicchrilli, 115 15
2 Don't Walk At Nite ..... B Theriot, 122 6-5
3 Panzon ..... A Romero, 122 8
4 Scott's Dream ..... D Frazier, 118 12
5 S W Legion ..... F Rojas, 119 15
6 My Kinda Gold ..... D Montoya, 119 3
7 Western Spirit ..... J Hunterson, 122 10
8 Speed Dial ..... T Green, 118 5

12TH — Purse $5,500, 3-yrs-up, 118/122, Claiming $4,000, 1 mile.
1 Loganville ..... D Frazier, 122 10
2 My Tony Boy ..... Lisa Nuell, 118 5-2
3 Shellerton ..... T Green, 120 20
4 Crackerjax Max ..... R Vicchrilli, 122 7-2
5 Gliders Fast Rebel ..... F Rojas, 117 5
6 Kangaroo Dawn ..... P Whetstone, 118 25
7 Nedgo ..... N Madrid, 119 15
8 Ski Black Diamond ..... R Houghton, 122 12
9 Imanativeruler ..... J Black, 118 9-2

Saturday's Arapahoe results

FIRST — Purse $4,200. 2-yrs, Maiden, 120, 350 yards, Time: 0:18.59.
2 Merrie Larkett, L Chavez 11.40 $5.80 $4.20
10 Oh High Sun, S Smith 10.60 $4.40
8 Christines Dance, R Houghton $2.80
Q (2-10) $59.60; T (2-10-8) $451.40. **Also ran (in order)** — Frequent Flying, Highly Hexed, Little Bita Doo Da, Big Pardon, Shiney Austin Duncan, Tarasfirstvalentine

SECOND — Purse $5,700. 3,4&5yo Maiden, F&M 118/122, 1 M, Time: 1:49.00
9 Littlecalendargirl, Q Bui 17.60 $4.80 $3.40
8 Callies Masquerade, D Montoya $2.80 $2.20
3 Enchantress, G Lowry $2.80
E (9-8) $68.20. Q (8-9) $26; T (9-8-3) $233. DD (2-9) $61.60. **Also ran (in order)** — Bella Grand Slam, Titan Treasure, Onalear, Sweet Nellie Vee, Meraly, Bel's A Ringing, Dead Give Away

THIRD — Purse $15,000. Est. 3-yrs-up, Time: 2:07.40
4 Cash Onthe Spot, D Montoya $5.80 $3.40 $3.00
2 Dashing Zell, A Romero $5.20 $5.80
1 Cv First Star, J Black $4.80
E (4-2) $23.40. Q (2-4) $17.40; T (4-2-1) $85.20. **Also ran (in order)** — Mackies Emerald, Preciouss Moment, Cv Sweet Dal, Duchess Ma, Molli Maloan

FOURTH — Purse $8,600. 3-yrs-up, 118/122, 330 yards, Time: 0:17.35
1 Special Influence, J Petersen $6.40 $5.20 $4.00
6 Coaly Bar Dash, L Chavez $6.00 $3.80
8 Dontgetexcited, N Madrid $5.00
E (1-6) $17. Q (1-6) $9.20. T (1-6-8) $85.80. **Also ran (in order)** — Dolls Prodigy, Wcr Lacy Lu, Raptor Man, Runaway Windham

FIFTH — Purse $4,500. 3,4&5YO Maiden, 118/122, Claiming $6250, 1m+1/16, Time: 1:54.20
1 Huggabear, P Robson 51.20 39.40 $5.80
7 Genuine Hollywood, R Houghton $5.00 $4.40
5 Seattle Boogie, D Montoya $5.60
E (1-7) $1115.20 Q (1-7) $133.40; T (1-7-ALL) $455. SUP (1-7-ALL-ALL) $1398. **Also ran (in order)** — Silent Diplomacy, I B Cruisin, Fuzzam, Charmednbetwitched

SIXTH — Purse $5,400. 3-yrs-up, 118/122, Claiming $6250, 6 furlongs, Time: 1:14.60
6 Trans Market, P Whetstone $8.80 $3.80 $3.60
3 Foggy Song, F Rojas $3.80 $3.00
2 Vuelo Brass, S Smith $4.20
E (6-3) $48.20. Q (3-6) $32.80; T (6-3-2) $516.80. **Also ran (in order)** — Frosty Guy, Paddyhannon, American Class, Mr Showmethemoney, Chief's Pride

SEVENTH — Purse $8,200. 3-yrs-up, 118/122, Claiming $10000, 5½ furlongs, Time: 1:07.
2 Absolutely Nothing, Q Bui 21.20 10.00 $9.20
4 Native Lance, Ja Ortega $4.40 $3.80
3 Prospector's Rock P Whetstone $9.00
E (2-4) $267.20. Q (2-4) $58.40. T (2-4-3) $3055.40. **Also ran (in order)** — Dark Fool, Fool Hearted Man, Time Of The Lepus, Wickster, Charming Rubi, Red Mountain Garth

EIGHTH — Purse $30,000. 2-yrs, 6 furlongs, Time: 1:16.0
9 Just React, Ja Ortega $3.60 $2.60 $2.20
7 Summer Aly, A Romero $4.40 $2.60
5 Dancing With Julie, P Whetstone $2.40
E (9-7) $15.40. Q (7-9) $14.40. T (9-7-5) $30.80. **Also ran (in order)** — Go Gracefully, Reminds Me Of You, Heavenly Grace, Bubbling Back

NINTH — Purse $53,880. 3-year-olds, 122, 400 yards, Time: 0:20.87
1 Galapin Winner, R Finch 45.80 17.20 15.60
3 Prowl, R Vicchrilli $3.20 $2.60
8 She Aut To Go, N Madrid $5.80
E (1-3) $138.60. Q (1-3) $48. T (1-3-8) $888.40. PK3 (2/2-6-9/1) $729.60. **Also ran (in order)** — Sky Seraph, Ee Na Ee, Star From Texas, Suddenly Gone, Snafols Cash Trip, Madis Blue Dash.

10TH — Purse $55,200.Added. 3-yrs-up, Sub $100, 1M+1/8, Time: 1:56.80
2B Accomodator, T Green 23.20 $6.20 $3.40
4 Darn Tootin, D Frazier $6.60 $3.20
5 Personal Beau, D Montoya $2.20
E (2-4) $212.80. Q (2-4) $79.20. T (2-4-5) $393.20. **Also ran (in order)** — Moro Grande, Majesty's Storm, Verzy Man, Holly's Locket, Krisi My Girl, Hot Wheels

11TH — Purse $8,200. 3-yrs-up, F&M 118/122, 5½ furlongs, Claiming $ 10,000, Time: 1:08.60
2 Robyns Valentine, T Green $4.80 $3.20 $3.20
10 Miss Ski Mo, D Montoya $5.80 $3.80
8 Zee Greatest, F Rojas $4.20
E (2-10) $45. Q (2-10) $18.40. T (2-10-8) $212.40. DD 2-2: $116. **Also ran (in order)** — Dee Lance Affinity, Bar Harbor Express, Figerene, Belle Etoile, Great Riot

12TH — Purse $5,400. 3,4&5YO Maiden, 118/122, 6 furlongs, Time: 1:14.40
8 Pragmatic, R Vicchrilli $6.40 $2.80 $2.60
3 Halo Nell, D Frazier $3.00 $3.00
4 Sandhill Storm, J Hunterson $4.20
E (8-3) $16.20. Q (3-8) $6.80. SUP (8-3-4-1) $299.40.
Also ran (in order) — Shift Quick, Sapphire Sunny, Tamerice, C J's Moment, Jacquesstormcloud, Bee Smart, Aye Aye Captain, Nikki's Cricket
Attendance: 1535 Handle: $164,173.

MOTOTORCYCLING

Czech Grand Prix

BRNO, Czech Republic — Qualifying results Saturday from the Czech Grand Prix on the 3.358-mile Brno circuit:

250cc

1. Olivier Jacque, France, Yamaha, 2 minutes, 3.673 seconds. 2. Tohru Ukawa, Japan, Honda, 2:04.019. 3. Shinya Nakano, Japan, Yamaha, 2:04.022. 4. Marco Melandri, Italy, Aprilia, 2:04.041. 5. Franco Battaini, Italy, Aprilia, 2:04.850.

6. Ralf Waldmann, Germany, Aprilia, 2:04.973. 7. Daijiro Katoh, Japan, Honda, 2:05.323. 8. Jason Vincent, Britain, Aprilia, 2:05.478. 9. Sebastian Porto, Argentina,Yamaha, 2:05.637. 10. Naoki Matsudo, Japan, Yamaha, 2:06.086.

500cc

1. Max Biaggi, Italy, Yamaha, 2 minutes, 1.291 seconds. 2. Loris Capirossi, Italy, Honda, 2:01.675. 3. Garry McCoy, Australia, Yamaha, 2:01.936. 4. ValentinoRossi , Italy, Honda, 2:02.096. 5. Kenny Roberts, United States, Suzuki, 2:02.117.

6. Alex Criville, Spain, Honda, 2:02.208. 7. Norick Abe , Japan, Yamaha, 2:02.481. 8. Harada Tetsuya, Japan, Aprilia, 2:02.631. 9. Jeremy McWilliams, United Kingdom, Aprilia, 2:02.641. 10. Jurgen van der Goorbergh, Netherlands, Honda, 2:02.894.

125cc

1. Roberto Locatelli, Italy, Aprilia, 2 minutes, 10.003 seconds. 2. Youichi Ui , Japan, Derbi, 2:10.048. 3. Noboru Ueda , Japan, Honda, 2:10.323. 4. Emilio Alzamora , Spain, Honda, 2:10.543. 5. Steve Jenkner , Germany, Honda, 2:11.046.

6. Gianluigi Scalvini , Italy, Aprilia 2:11.321. 7. Lucio Cecchinello , Italy, Honda, 2:11.322. 8. Masao Azuma , Japan, Honda, 2:11.363. 9. Mirko Giansanti , Italy, Honda, 2:11.366. 10. Ivan Goi , Italy, Honda, 2:11.573.

GOLF

Shopko Great Lakes Classic

GREEN BAY, Wis. — Scores Saturday after the second round of the $500,000 ShopKo Great Lakes Classic, played on the 6,222-yard, par-72 Green Bay Country Club (a-denotes amateur):

Vicki Fergon	70-66 — 136
Dale Eggeling	70-68 — 138
Marilyn Lovander	70-69 — 139
Jane Crafter	71-69 — 140
Hollis Stacy	**70-72 — 142**
Sherri Turner	74-70 — 144
JoAnne Carner	71-74 — 145
Judy Dickinson	74-72 — 146
Jan Stephenson	73-73 — 146
Barb Moxness	76-70 — 146
Lenore Rittenhouse	76-70 — 146
Marta Figuera-Dotti	73-75 — 148
Martha Nause	74-74 — 148
Joyce Malison	74-74 — 148
Sally Little	72-77 — 149
Jane Blalock	73-77 — 150
Lori West	77-73 — 150
Mary Bryan	73-77 — 150
Kathy Whitworth	73-78 — 151
Kathy Postlewait	76-75 — 151
Myra Blackwelder	80-73 — 153
Pam Allen	80-73 — 153
Laura Baugh	77-76 — 153
Alice Ritzman	73-80 — 153
Kay Kennedy	75-79 — 154
Joann Prentice	79-76 — 155
Mary Dwyer	74-81 — 155
Sandra Palmer	79-76 — 155
Anne Marie-Palli	80-75 — 155
Connie Chillemi	82-73 — 155
Sandra Haynie	76-79 — 155
Robin Walton	78-78 — 156
Gloria Ehret	77-80 — 157
Jerilyn Britz	83-75 — 158
Susie Berning	83-75 — 158
Nancy Lopez	85-74 — 159
Carla Glasgow	79-80 — 159
Renee Powell	76-83 — 159
Mardell Wilkins	85-79 — 164
Carol Mann	86-79 — 165
Sandra Post	85-82 — 167
Murle Breer	86-82 — 168
Mary Bea Porter-King	89-80 — 169
a-Linda Horwitch	87-84 — 171
Mary Mills	97-91 — 188

TRANSACTIONS

BASEBALL
American League

ANAHEIM ANGELS — Recalled RHP Brian Cooper from Edmonton of the PCL. Activated RHP Al Levine from the 15-day disabled list. Sent INF Keith Johnson and RHP Eric Weaver to Edmonton.

KANSAS CITY ROYALS — Placed LHP Paul Spoljaric on the 15-day disabled list. Recalled RHP Jose Santiago from Omaha of the PCL. Named Brian Murphy assistant to the general manager.

TAMPA BAY DEVIL RAYS — Activated IF Bobby Smith from disabled list. Optioned OF Quinton McCracken to Class AAA Durham.

TEXAS RANGERS — Agreed to terms with C Bill Haselman on a two-year contract extension.

TORONTO BLUE JAYS — Transfered OF Raul Mondesi from 15-day disabled list to 60-day disabled list.

National League

MILWAUKEE BREWERS — Activated INF Mark Loretta from the 15-day disabled list. Optioned INF Santiago Perez to Indianapolis of the International League.

SAN FRANCISCO GIANTS — Activated RHP Joe Nathan from the 15-day disabled list. Optioned RHP Miguel Del Toro to Fresno of the PCL.

Western Baseball League

SOLANO STEELHEADS — Conditionally released OF Curtis Goodwin to the Kansas City Royals.

SONOMA COUNTY CRUSHERS — Conditionally released RHP Steve Cardona for a season-ending injury. Signed C Tim Cossins.

FOOTBALL
National Football League

ATLANTA FALCONS — Waived CB Derrick Gardner, RB Byron Hanspard, DT Ben Huff, LB Whit Marshall, G Everett McIver, TE Rod Monroe, RB Ken Oxendine, FB Jeff Paulk, CB Reggie Doster, T Ozell Powell, DE Doug Miller and G Jamie Wu.

Arena Football League

AFL — Awarded a franchise to Dallas to begin play in April 2001.

BASKETBALL
National Basketball Association

LOS ANGELES LAKERS — Signed F Andy Panko.

FOOTBALL
National Football League

CAROLINA PANTHERS — Signed K Richie Cunningham. Released K Eric Meng and DT Antonio Dingle.

HOCKEY
National Hockey League

EDMONTON OILERS — Signed D Mike Grier to a two-year contract.

East Coast Hockey League

BATON ROUGE KINGFISH — Signed F Andy Doktorchik.

FLORIDA EVERBLADES — Agreed to terms with D Hugh Hamilton on a 2000-2001 contract.

COLLEGE

DAYTON — Named Bill Comar men's assistant basketball coach and Josh Postorino coordinator of basketball operations.

UTAH — Named Beth Jerome women's assistant swimming co

dKing, Paying $45, Wins $56,

Associated Press Wirephoto

A FISH STORY WITH PROOF: George Langston holds 26-pound 2-ounce brown trout he caught Saturday just below Dale Hollow dam, near Celina, Tenn. The fish, nearly as big as Langston's son, Sidney, measured 34¾ inches long and had a girth of 23½ inches.

ph as Yankees Beat Red So

PASTRANO VICTOR IN BYGRAVES BOUT

American Uses Flicking Jab to Win Tame 10-Rounder in Leicester Ring

LEICESTER, England, April 21 (AP)—Willie Pastrano, New Orleans heavyweight, outpointed Joe Bygraves of Jamaica tonight in a fast but uneventful ten-round fight at Granby Halls.

There were no knockdowns. Neither fighter showed anything resembling a knockout punch.

Although outweighed seventeen and one-half pounds by the former British Empire champion, the American gained the undisputed decision with his clever footwork and flicking left hand. Pastrano weighed 187½ pounds. Bygraves checked in at 205.

The Associated Press scorecard gave seven rounds to the American, three to the Jamaican. It was Pastrano's third victory in a British ring in six

Redl's Heavier H Unanimous Vote

Hungarian-Born W 19th Victory in 2(Cut Over Eye in t

By WILLIAM

Stefan Redl, a Hungarian-born welterweight, packed too much punching authority for his rival as he won a unanimous decision over Charley Cummings of Philadelphia in the main bout of ten rounds at the St Nicholas Arena last night.

The 25-year-old Redl weighed 147 pounds to Cummings' 143½. Referee Mark Conn and Judges Harold Barnes and Artie Schwartz scored it 8—2. This observer had Redl in front by 8—1, with one round even.

Cummings, a carpenter when he is not fighting, was stung repeatedly by Redl's left hooks, combinations and hard rights to the jaw. There were no knockdowns.

Redl's best rounds were the

Conservation Briefs

The Fish and Game Commission has restricted importation of two Central and South American animals, the coati-mundi and the agouti, into California because of their potential threat to farm interests and to various game species on which they might prey. The coati-mundi is akin to the raccoon and the agouti is related to the guinea pig.

An unidentified, public-spirited logger removed logjams which were blocking fish passage on Knopti Creek, Del Norte County, charging only operational costs for his equipment.

A chemical treatment of Lake Hodges, San Diego County, more than two years ago to remove rough and stunted fish species paid off in spectacular fashion when the lake was reopened to fishing in April. Anglers averaged 11 fish. The 910 persons checked on opening day caught 2,022 largemouth bass, 5,407 bluegills, 2,722 white crappies, 198 brown bullheads and 15 channel catfish.

A pheasant specialist has been assigned to the San Joaquin Valley area to obtain more information on bird populations, trends, farm practices' effects on pheasants and other data.

Continuing habitat improvement experiments on the Cow Mountain public hunting area included in one recent month the crushing and disking of 55 acres of small brush plots. In addition, 11 miles of fire lane were carved out preparatory to controlled burning to improve deer range conditions.

A tag recently turned in by an angler came from a white catfish which had been at liberty for a record 2,144 days since being tagged by the department.

The warmer ocean temperatures in waters off the California coast, particularly in the south, that we've been enjoying for the last 18 months or so apparently are the main reason for the unusually good fishing for yellowtail, barracuda, bonito and several other species which normally don't visit in such continuing numbers. But there's also some evidence that the same warm waters may be responsible, at least in part, for scarcity of salmon and albacore, which prefer colder climes.

One commercial fisherman, netting rockfish southwest of Crescent City, really struck it rich with 12,000 pounds caught in one eight-minute tow.

Less than one-tenth of the jack mackerel catch delivered to Southern California canneries in April, 1957, was delivered this year in the corresponding month.

In April, alone, warden personnel attended 146 meetings of sportsmen's groups, service clubs, schools and other organizations as speakers or where needed to give or obtain information. This figure does not include similar meetings attended by members of other DFG branches, all of whom give much of their personal time to such functions.

Members of the reserve warden force, an unpaid, volunteer group, donated more than 1,200 hours of work to fish and game law enforcement in April and assisted in nearly 100 arrests. Twenty-one applicants passed a recent examination and have been added to the San Francisco Bay reserve warden unit.

Tennessee Trout Sets Record for Brownies

A new North American brown trout record catch was established at Celina, Tennessee, April 19, 1958, when George Langston landed a 26-pound, 2-ounce beauty from the Obey River below Dale Hollow Dam. The fish topped the previous record holder, a 24-pounder caught in California's Regulator Lake in 1945.

Langston's lunker was only six years old, according to scale sample readings made by biologists of the Tennessee Game and Fish Commission. The fish was 37 inches long and 23½ inches in girth. It was caught on a spin-casting rod, eight-pound monofilament line and an artificial lure of the angler's own invention.

—National Wildlife Federation

Waltons Urge More Research to Save Salmon Resources

The Izaak Walton League, one of the Nation's oldest, largest and most respected conservation groups, at its annual convention in May expressed its alarm at the decline of the king salmon fishery along the Pacific Coast.

The Waltonites called upon the state fisheries agencies of Washington, Oregon and California to join with the U. S. Fish and Wildlife Service and Canadian and Alaskan agencies in a long-range program of research and management designed to maintain king salmon on a sustained yield basis.

The convention declared that present regulations and conservation measures to date have failed to halt downward trends and voiced its concern that the resource may be destroyed if the trend continues. In a formal resolution the Ikes asked the agencies involved to inventory available spawning areas and to determine as nearly as possible "how much we can hope to retain for future use."

The league indicated it plans widespread publicity and action to enlist the aid of commercial fishermen and conservation groups in the fight to maintain and restore the king salmon resource.

Bait Fishery—

(Continued from page 5)

from Oceanside to Santa Monica and Malibu. The fishery, beginning modestly more than 40 years ago, has become a million dollar industry.

The catch in 1956 totaled more than 13,000,000 pounds and was valued at about $1,300,000. This bait was used on sportboats carrying more than 350,000 paying customers—fishermen out for a good time.

With the aid of fathometers, electric lights and mechanical net pullers, the efficiency of the Southern California bait fisherman has met the ever increasing demand.

Thus, evolving from the Japanese albacore fishermen's simple blanket net and torches of burning pitch, the bait fishery has kept pace with the increasing complexity of our electronic age.

Salton Teems With Corvina Shy of Lures

Imagine! An estimated million catchable-size fish in a body of water surrounded by land, yet until recent weeks nobody had figured out a way to catch them on hook and line.

That's the picture in California's inland ocean—the Salton Sea—where corvina are reproducing tremendously from the parent stock transplanted from the Gulf of California. The only trouble has been that the Department of Fish and Game's effort to create a unique fishery succeeded but the corvina refused to cooperate. It just wouldn't respond to standard lures and methods of fishing.

It's still too early to tell whether the best way has been found, if there is any such thing in fishing, but some Brawley fishermen at least have found a chink in the corvina's previous indifference. Darrel Ramey of Brawley is credited with being the first to take corvina consistently.

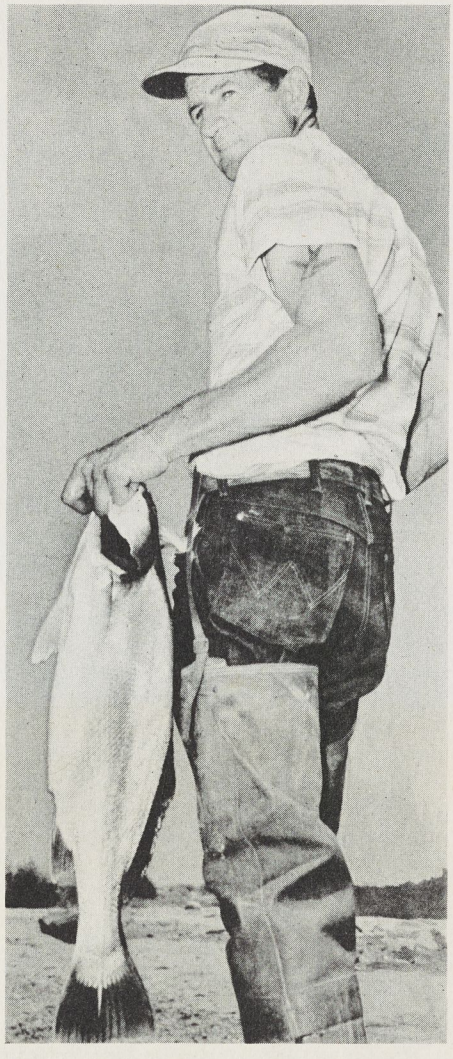
The Brawley men, fishing from shore, used a surf-type rod for casting and retrieving a heavy, red and white wobbling spoon about 2½ inches long. Most of the fish taken have weighed three to four pounds, with some up to eight pounds.

Salton Sea fishing calls for a $3 basic angling license plus a $1 license stamp. Fishing is permitted year around, 24 hours a day, but the limit on Salton Sea corvina is six fish. A close relative of the white sea bass, the corvina is a delicious food fish.

Bighorns Reappear

For the first time in about 40 years, bighorn sheep have been observed in the northern Warner Mountains.

A Lake City rancher reported he saw a band of six late last winter. Department of Fish and Game managers believe they were part of a group released the previous summer from Hart Mountain Antelope Refuge, 45 miles to the north, in an attempt to restock native southern Oregon bighorn ranges.



Those "fish stories" from the Salton Sea are true, as Joe Lewis of National City shows with this corvina weighing almost 7½ pounds. (San Diego Union photo.)

DFG Report Wins Top National Award; Other Entries Rate

A plaque signifying a first place national award has been presented to the California Department of Fish and Game for its biennial report.

The honor was given by the American Association for Conservation Information. Robert Calkins, Conservation Education Director for the department, accepted the award at the association's annual meeting in Rhinelander, Wisconsin, last month.

The report, covering the period July 1, 1954, to June 30, 1956, made extensive use of photos and a streamlined style to tell the story of the department's varied activities. It also includes charts, tables and other statistics in an Appendix section, useful as the best single source of information on the scope of work carried out by the department.

Also rated high by the judges were the California Fish and Game entries in other classes of competition—the popular pamphlet, "Trout of California," and the film, "Tomorrow's Salmon and Steelhead." The latter depicts the harmful effects of careless logging practices on many of the State's finest fishing streams in the north coastal area.

Track Census At State Line Reveals Gain

The 1958 spring state line deer track count made by game managers from both Oregon and California showed an increase of more than 1,100 over last year's figure.

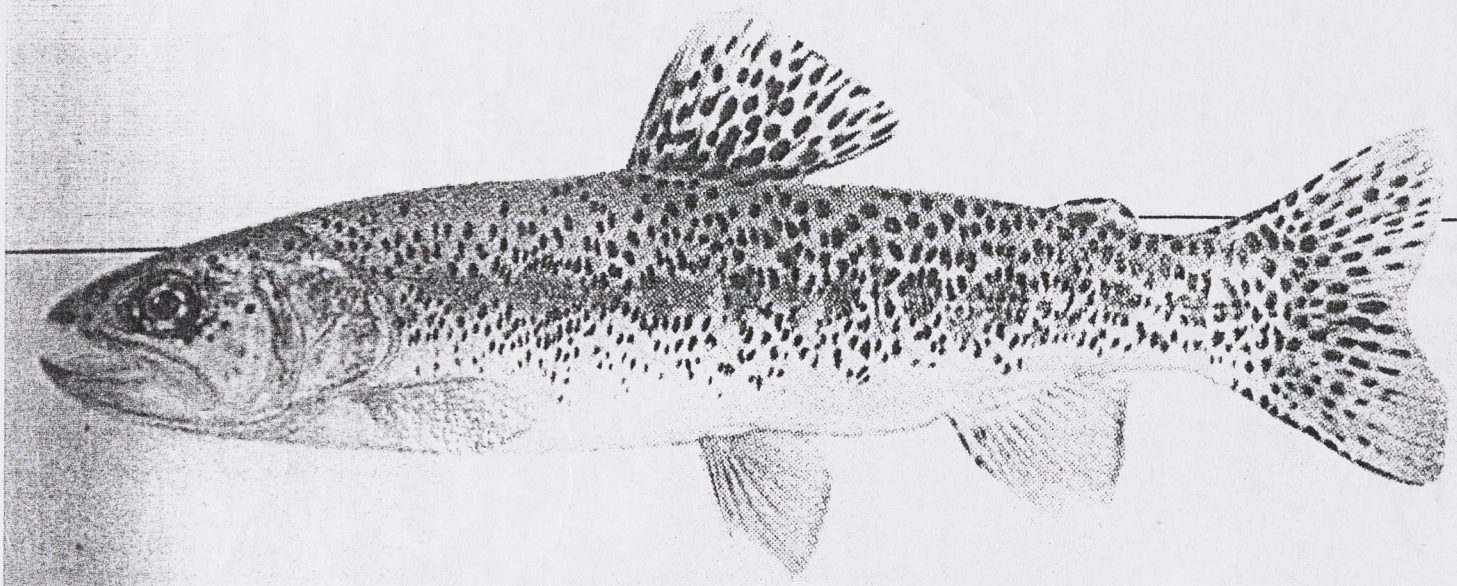
The count was conducted from March 3d to May 18th, with 12,819 sets of tracks tallied for northward migrating deer from the Devil's Garden Interstate Deer Herd. They spend the summer in the Fremont National Forest in Oregon.

Because the past fall and winter was so mild, many of the deer which normally would migrate from Oregon into Modoc County in the fall did not do so this year, game managers said. For that reason they had expected the track count to be somewhat lower rather than higher.

They explained also that the state line tally gives only a *minimum* figure of the total number of deer actually crossing, since weather conditions sometimes make the road impassable for the counters' vehicles, or snow may cover tracks before they can be counted, or other factors may occasionally interfere with the annual count.

The Devil's Garden Interstate Deer Herd is used as one indicator of relative range conditions and population trends in southern Oregon and Northern California.

A newborn bear cub is smaller than a new porcupine.



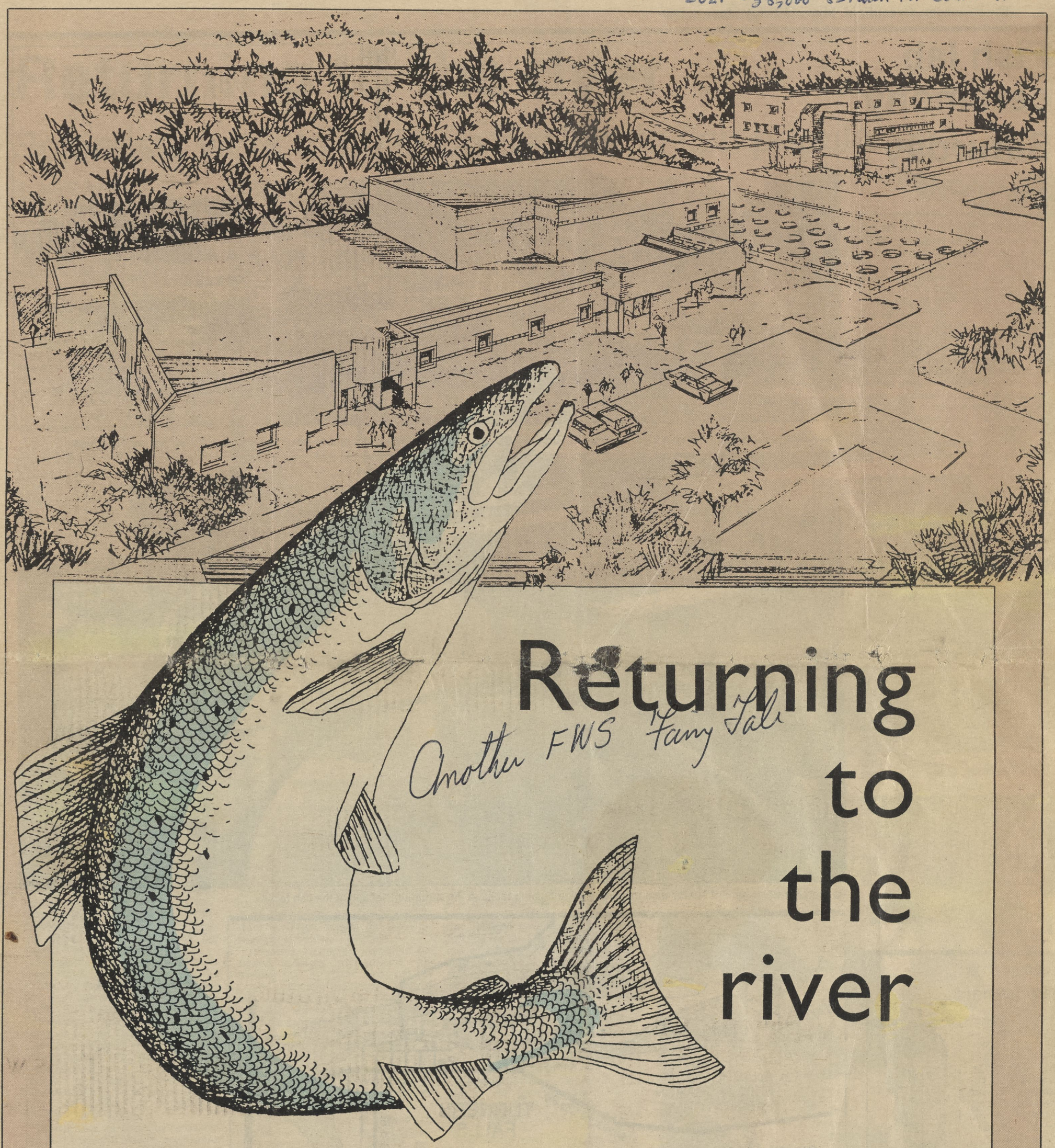
JOE TOMELLERI ILLUSTRATION

New Mexican Trout

A TEAM OF SCIENTISTS from both sides of the border will name two new species of trout found in the Sierra Madre Occidental Mountains in northern Mexico. Scientists have known for a long time that the fish existed, but have only recently finished the genetics work necessary to classify them as a species, says Buddy Jensen of the U.S. Fish and Wildlife Service. The Yaqui trout (illustrated above) live in the headwater tributaries of the Yaqui River, and the Mayo trout is found in the headwaters of the Rio Mayo. Both trout have silver-pink, black spotted sides, much like rainbows. Jensen says he is concerned about trout hatcheries along Mexican streams, where local businessmen raise rainbow trout for food. A flood or break in a hatchery wall could release fish into surrounding streams, diluting the native trout gene pool.

RON DUNGAN

computer model
2021 - 38,000 shad in Conn. R.



Returning to the river

Another FWS Fairy Tale

Turners Falls fish laboratory -
a key passage in the Northeast fish migration story

Supplement to The Recorder • June 8, 1990

Fish lab ceremony Saturday

By DAVID WEBSTER
Recorder Staff

TURNERS FALLS — The $17 million Northeast Anadromous Fish Research Laboratory here will be officially dedicated Saturday.

The public is invited to tour the facility and meet the lab's staff.

The federally funded lab is the first facility in the world completely devoted to studying anadromous fish, which are born in fresh water and swim downstream to salt water where they feed and grow before returning upstream to reproduce.

Guests will have a chance to view the facility's main building, which houses several scientific labs where research will be conducted, a library, conference room and aquarium, where scientists will set up a variety of pools and water tanks to observe fish behavior.

Visitors will also have an opportunity to tour the lab's fish passage building, a one-of-a-kind facility where scientists and engineers will simulate different river conditions to help them design new and more efficient mechanisms for passing fish by hydroelectric dams and other river obstructions. The building is 185 feet long and contains three waterways capable of holding a moving column of water 18 feet deep.

In addition, demonstrations on fly casting, and catch and release fishing techniques will be provided.

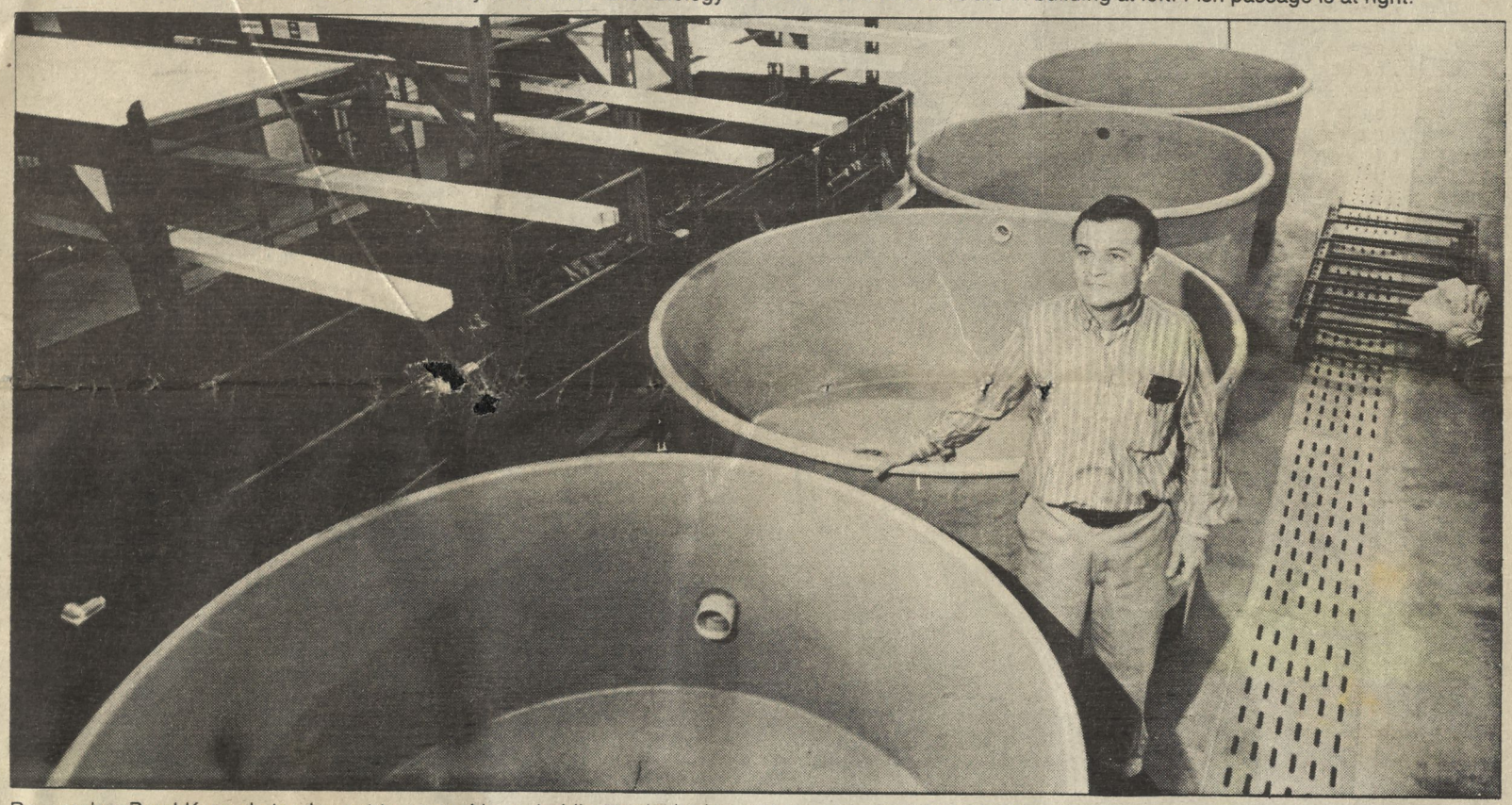
Staff from the lab will be on hand at the dedication to answer any questions visitors may have. Tours will begin every 20 minutes and will run from 1:30 to 4:30 p.m.

There will be no parking at the lab itself so the public is encouraged to use the free shuttle buses being provided by F. M. Kuzmeskus Inc. Buses will pick visitors up at five points in Turners Falls every 15 minutes between 1:30 and 4 p.m.

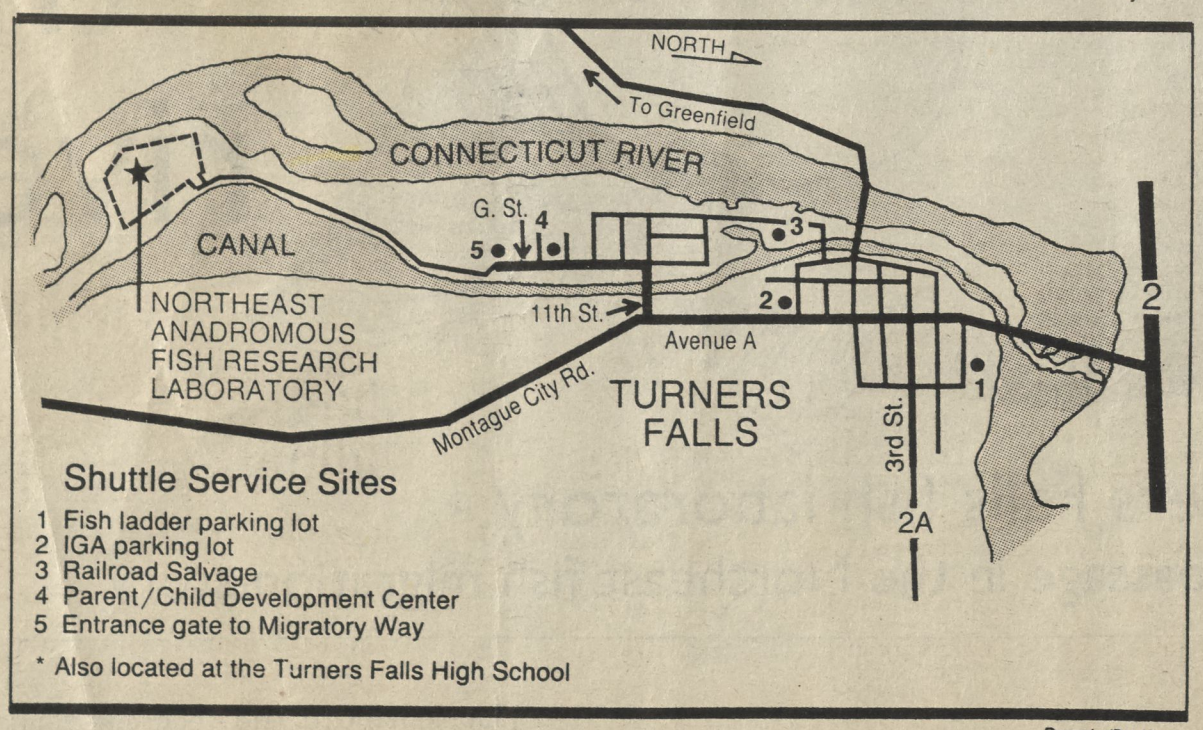
The buses will stop at Turners Falls High School, the fish ladder parking lot adjacent to the police station on First Street, Railroad Salvage on Canal Street, the IGA parking lot on Avenue A, the Parent Child Development Center on G Street and the entrance to Migratory Way at the end of G Street.

A private invitation-only ribbon cutting ceremony will be held Saturday morning.

The new $17 million anadromous fish laboratory in Turners Falls. Biology laboratories and offices are in building at left. Fish passage is at right.



Researcher Boyd Kynard stands next to several large holding tanks in the aquarium section of the fish facility.



Recorder/Pat Allen

Photos by Paul Franz

About this supplement

WEBSTER

This special supplement to The Recorder was researched and written by Montague reporter David Webster. During the past several weeks, Webster conducted scores of interviews with the staff of the Northeast Anadromous Fish Research Laboratory. He made several visits to the lab during construction and during the preparation for Saturday's dedication.

Webster hails from the North Shore fishing port of Gloucester.

Returning to the river

Scientists work to build up decline in fish populations

By DAVID WEBSTER
Recorder Staff

TURNERS FALLS — Three hundred years ago, before man interrupted the natural flow of the Connecticut River by constructing dams and other barriers, native Americans harvested vast numbers of Atlantic salmon, American shad and striped bass from the Connecticut and its tributaries.

But the Revolutionary War brought the birth of a new nation and with it an increasing human population that placed greater demands on the natural resources of the Connecticut River Valley. As communities blossomed across the valley, dams were constructed to regulate flooding along New England's longest and most imposing river, which winds 400 miles southward through four states from the Canadian border to Long Island Sound.

Those obstructions, however, became a hindrance to the indigenous fish populations, preventing them from reaching their spawning grounds in the reaches of the river basin, sometimes as far north as Lebanon, Vt., and possibly beyond.

Soon, the number of native fish found in the Connecticut River watershed began to dwindle. By the early part of the 19th century, Atlantic salmon, which once returned to the river at an estimated rate of 300,000 per year, had disappeared from the Connecticut.

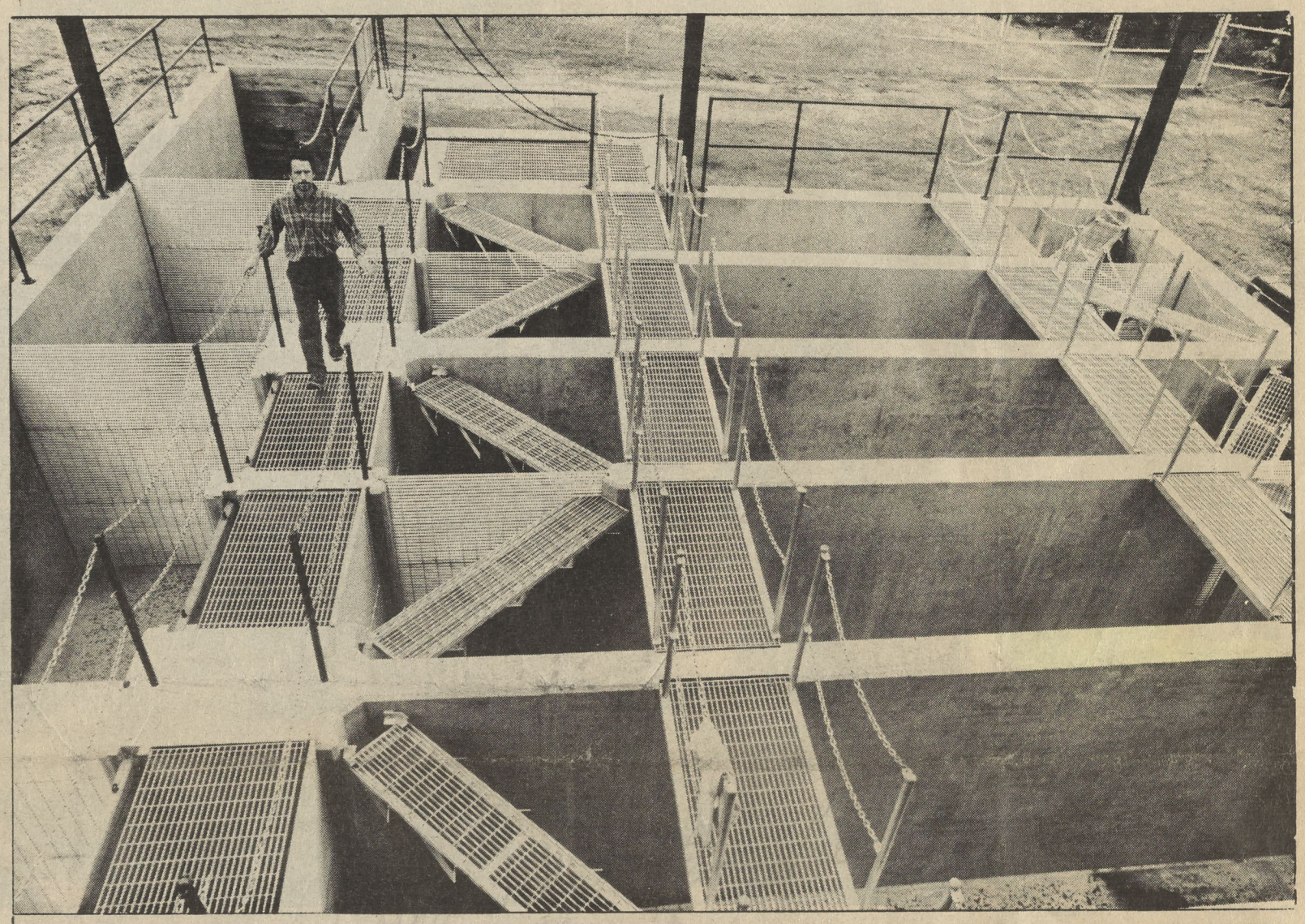
Since that time, various state and federal agencies have waged a marginally, but increasingly successful effort to restore and maintain fish populations in the river basin. The long-term goal being to re-establish populations to a point where the fish can sustain their numbers through reproduction in their natural environment while providing a vibrant sports fishery.

The new $17 million Northeast Anadromous Fish Research Laboratory in Turners Falls will be a major component in that endeavor. By providing innovative and in-depth research on the various species of anadromous fish native to the East Coast, scientists at the lab hope to develop the most effective system possible for allowing fish to pass man-made obstacles, primarily hydroelectric power dams today, during their annual migrations upstream and downstream.

Anadromous fish are hatched in fresh water spawning grounds and eventually move to salt water where they feed and mature before returning to fresh water to reproduce. The five species of anadromous fish most common to New England are American shad, Atlantic salmon, striped bass, shortnose sturgeon and blueback herring, all of which have endured a considerable decrease in numbers as man's influence on the flow and quality of rivers and streams has increased.

Information gathered by researchers at the lab will also be used in the continuing attempt to identify and protect critical feeding and spawning habitats for anadromous fish throughout the northeast United States. The lab is the only facility in the world completely dedicated to the study of anadromous fish.

"We're in a unique situation with this lab here to answer questions that nobody else has answered before," said fish biologist Boyd Kynard, who oversees one of the four areas of research at the lab.



Recorder/Paul Franz

Hydraulic research engineer John Buck stands in the lower burrows pond, a fish holding area.

"It's a most exciting position to be in."

Until now, much of the work done to restore anadromous fish populations in this region has been based purely on speculation with scientists and fisheries experts "stabbing in the dark" to reverse the declining fish populations, according to Ronald Lambertson, director of the 13-state northeast region for the U.S. Division of Fish and Wildlife.

Likewise, engineers who have designed existing mechanisms for passing fish by dams have not received sufficient input from trained fish biologists about the physiological needs and behavioral characteristics of specific fish, he said. Frequently fish are ground up in the turbines used to generate electricity at hydroelectric dams or they become confused by the unnatural flow of water surrounding the dam and simply swim about in circles, making no further progress up or down river.

"I'm really pleased to see the lab because it takes us from a hit-and-miss approach to a scientific approach," said Lamberston, who believes the integration of research with fisheries management practices will enhance the entire restoration effort.

The lab is appropriately situated in the south end of Turners Falls, just down river from where the first dam constructed on the Connecticut River was built in the late 1700s. Sandwiched between the river and the power canal and within sight of Northeast Utility's Cabot Station fish ladder, the lab provides scientists with an excellent headquarters from which they can coordinate in-house and field research.

No easy task

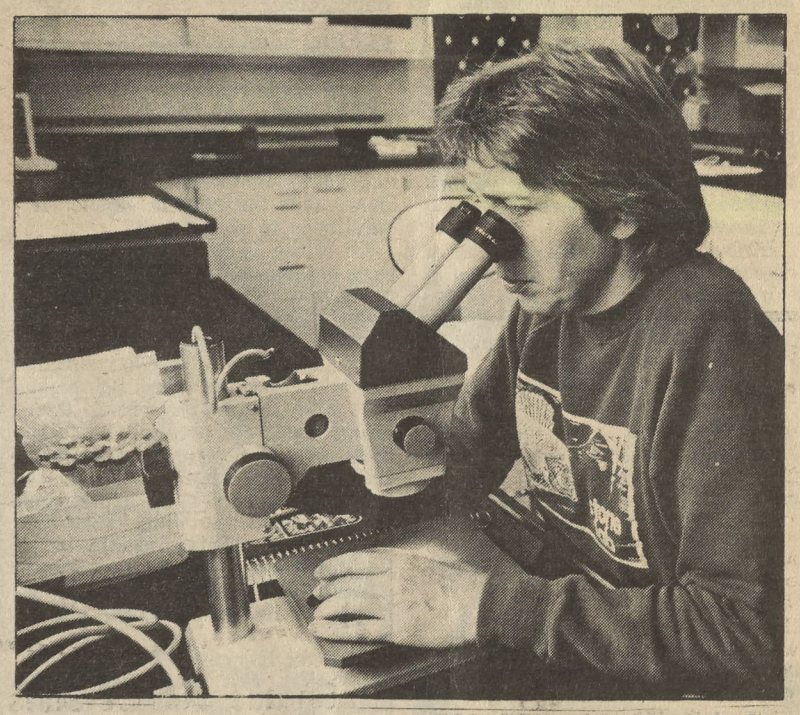
But winning congressional approval to build a lab and locate it in Turners Falls was no easy task. In 1984, the federal government approved funding for the Connecticut River Atlantic Salmon Commission, a four-state cooperative geared toward restoring a self-sustaining population of Atlantic salmon to the river.

At that time, U.S. Rep Silvio O. Conte, R-Pittsfield, initiated a battle to fund a federal fish research laboratory to compliment and enhance a network of state and federal fisheries management programs already existing in New England.

"I was all alone," said Conte, who dug in and ignored administrative resistance to his efforts. "A lot of people thought I was a little cuckoo."

During the next five years, Conte, a longtime champion of environmental causes, persuaded his fellow congressmen on the House Appropriations Committee and in the full House of Representative to commit nearly $17 million for the design, construction and equipping of a one-of-a-kind research facility in the heart of his home district.

The lab will serve as a focal point for many national and international efforts to clean up industrial rivers while restoring and protecting fish populations, said Conte, who anticipates highly qualified scientists from around the globe visiting Turners Falls to witness the unique research being conducted there.



Recorder/Paul Franz

Biologist Donna Parrish examines specimen with microscope.

"I just think the area is so conducive to a lab," he said. "If I were a fish biologist I think I'd love to work in Turners Falls."

"I'm absolutely ecstatic. I never thought when I started this project it was going to happen and now that it's come to fruition it's a miracle."

Why most salmon don't return

Experiment tests reasons many of the fish die

By DAVID WEBSTER
Recorder Staff

OLD SAYBROOK, Conn. — When scientists from the U.S. Fish and Wildlife Service released 22,000 young Atlantic salmon into Long Island Sound last month, the fish were "jumping for joy" in anticipation of their two-year sojourn in the frigid North Atlantic.

Corralled in a specially designed floating pen, the young salmon were towed 14 miles down the lower portion of the Connecticut River to a point just south of the estuary where New England's longest river flows into the Atlantic. There, under a hazy afternoon sky and the watchful eyes of several scientists and curious boaters, the fish were set free, ready to begin a journey scientists know very little about.

"These fish are ready to go into salt water. I almost think they're happy to be going into the ocean," said Robert Sousa, assistant director of the Northeast Anadromous Fish Research Laboratory in Turners Falls.

Sousa is coordinating an ongoing experiment to determine what factors cause the majority of Atlantic salmon stocked in the Connecticut River to die before they can return to their spawning grounds and reproduce.

"We know fish are dying," said Sousa. "We just don't know when, where, why or how."

To answer those questions, Sousa has designed an experiment to identify the various threats the young salmon, called smolts, encounter at various points along the river. The 22,000 smolts released in the sound and another school of the same size released 14 miles upstream from the mouth of the river are the main mechanisms for that experiment.

That 14-mile stretch of river, where saltwater and freshwater come together, is thought to be a critical area. Sousa hopes to determine if predators, disease, pollution, parasites or any other potential killers are the primary reason only three out of every 10,000 salmon stocked in the river ever return to fresh water.

Striped bass, another species of anadromous fish, are a predator of salmon and may contribute to the high mortality rate of the smolts, although that is still undetermined, Sousa said.

This year, the size and amount of striped bass feeding in the mouth of the Connecticut are particularly large, said Steve Gephard, an employee of the Connecticut Department of Environmental Protection who was present when the smolts were released.

"Are the striped bass making a significant impact?" asked Gephard, as he helped steer the 72-square-foot pen with an 18-foot Boston Whaler motorboat. "Everybody knows they eat salmon smolt. The question is, to what extent?"

All of the 44,000 salmon released were tagged with tiny strips of wire no bigger than the whisker on a man's face. In two years, when the majority of the salmon would normally be mature enough to return to the rivers and reproduce, fish biologists hope to learn more about their experience in the ocean by catching those that do return and examining their blood and other tissues.

The smolts used in the experiment were raised at the White River National Fish Hatchery in Bethel, Vt., a key institution in the effort to restore Atlantic salmon populations in the rivers of the northeastern United States.

Once the fish reached a length of 6 to 8 inches and became smolts — meaning they experienced a physiological change that prepares them to move from fresh to salt water — they were tagged and trucked to a marina in Deep River, Conn. There, half of the smolts were released directly into the river and the other half were flushed into the floating pen.

The Boston Whaler, powered by a 100-horsepower Mercury engine, towed the pen for most of the 14-mile trip, battling an upstream current much of the way that slowed the awkward tandem to a speed of only half a knot.

As the pen approached the stone breakwater marking the end of the river, the towing method was abandoned and two other crafts were used to guide the floating cage through the shipping channel, around the breakwater and out into the open sound. During the course of the 9½-hour journey, Sousa kept a keen eye on the smolts, making sure they weren't bunching up in the back of the net or suffering from too much exhaust from the engines of nearby boats.

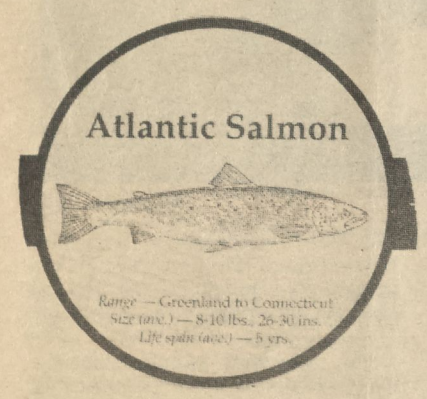
Once the pen was pushed across a narrow shoal to a point where the depth of the water dropped sharply from 25 to 90 feet, Sousa gave the order to haul back the net and liberate the smolts.

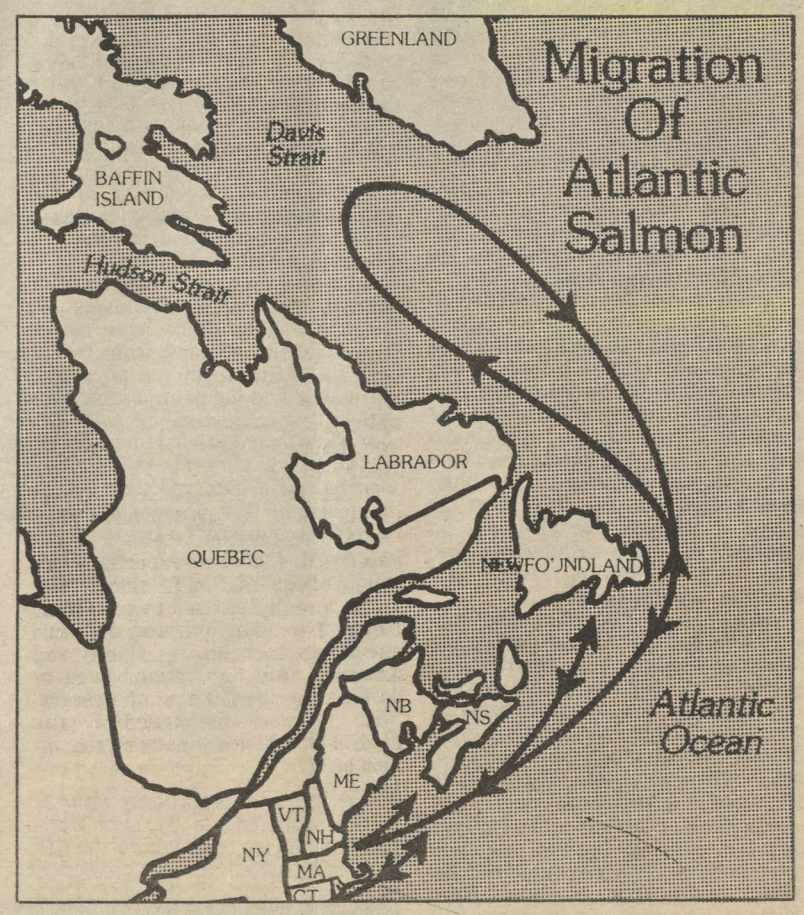
Like fisherman bringing in their catch, biologists and other interested parties along for the ride dragged in the net. Unlike fishermen, the object was to let all of the fish go. As the net came out from underneath them, the silver-and-green smolts darted downward to the safety of deeper water, disappearing into it.

"We've done our part," said Sousa, looking as proud as a mother hen — or salmon. "Now it's up to the fish."

Recorder/David Webster

Federal and Connecticut wildlife agents release salmon smolts into Long Island Sound from a floating pen that will be towed to shore by tugboat in background.





Some day, full rivers will lure anglers

By DAVID WEBSTER
Recorder Staff

TURNERS FALLS — With a little luck and a lot of work by a dedicated group of fish biologists and conservationists, fishing for Atlantic salmon in the Connecticut River could become a popular sport. Today, however, it's a crime.

Fortunately for fishing enthusiasts, research being conducted by scientists at the Northeast Anadromous Fish Research Laboratory here is intended to help increase the number of Atlantic salmon, American shad, striped bass, blueback herring and shortnose sturgeon returning to the rivers and streams of New England to reproduce.

Those five species of anadromous fish, which are native to the East Coast, have been dwindling in numbers since man-made dams were introduced on the river 200 years ago, although shad are still abundant in the Connecticut River basin.

A cooperative effort between state and federal agencies concerned with reviving the various anadromous fish populations includes an earnest attempt to enhance sport fisheries throughout the northeast United States. Sport fishermen comprise one the most active lobbying groups that pushed for the development of an anadromous fish laboratory, according Dr. Henry Booke, scientific director of the lab.

"Fishermen will benefit (from the laboratory) by the simple fact that we can create a better fishery for them," said Booke, who believes the conservation of fisheries in the northeast is key element in the overall preservation of natural resources.

In particular, biologists hope to nurture a self-sustaining population of Atlantic salmon large enough to propagate and grow while still fulfilling the sporting demands of New England anglers.

"That will be pretty exciting," said Theodore F. Meyers, Connecticut River program coordinator for the U.S. Fish and Wildlife Service. "There are a lot of fishermen who just can't wait, because the thrill of catching one of these 10 to 12 pound salmon out in a small tributary or stream just seems to get their blood boiling. And I can understand that."

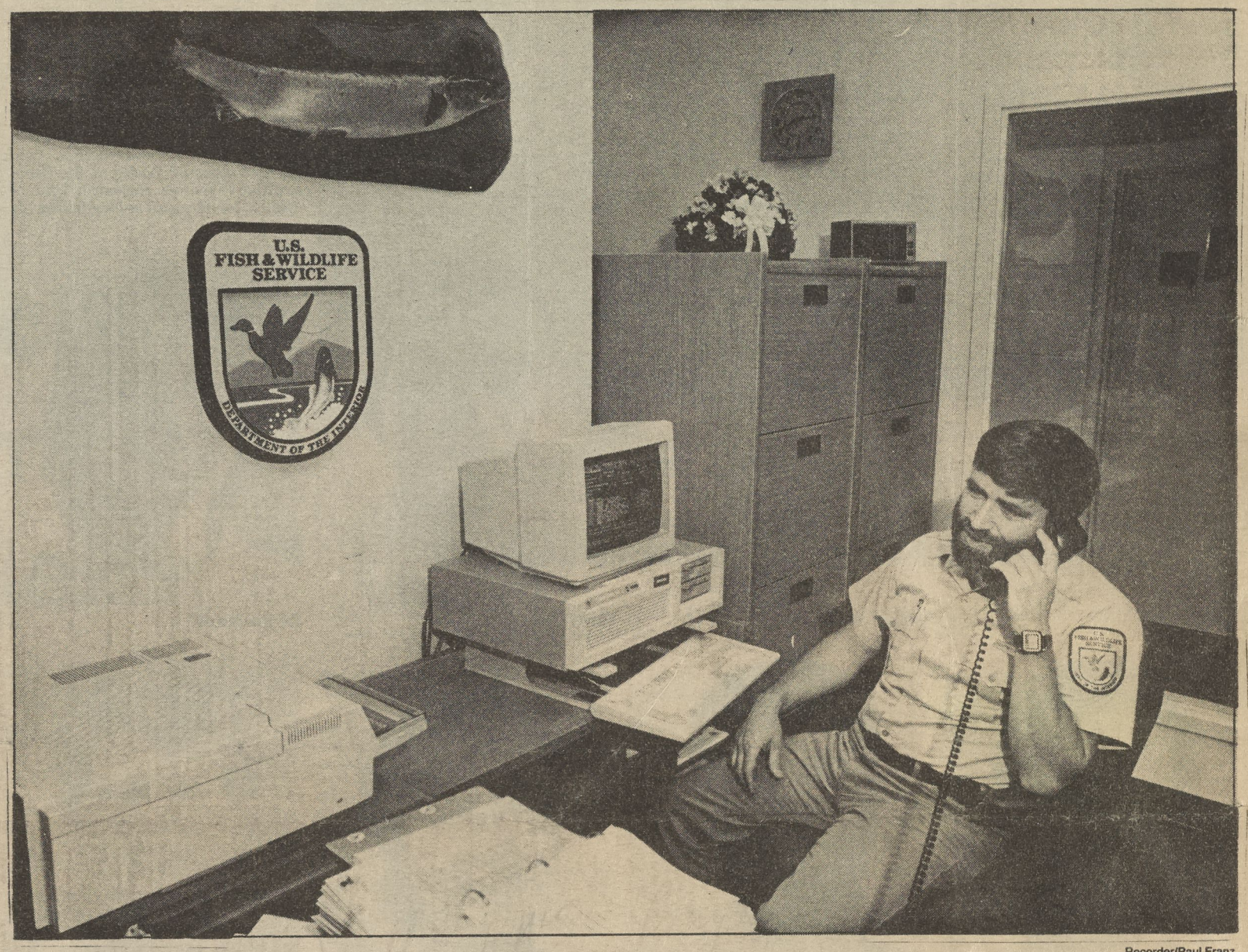
Besides overseeing various activities for the Fish and Wildlife Service, Meyers is the executive assistant for the Connecticut River Atlantic Salmon Commission, a government funded agency committed to restoring a vibrant salmon population to the Connecticut River basin.

The lab's annual operating budget is $1.5 million.

From his office at the anadromous fish laboratory in Turners Falls, Meyers tries to coordinate the specific needs of the salmon commission with the experiments undertaken by scientists at the lab.

"There's a lot of expertise out there and my job is to get all those folks pulling together in the same direction," he said.

By bolstering the restoration effort with significant data and research programs, engineers and biologists at the lab will enrich the recreational value of the anadromous fisheries. Not only fishermen, but passive users of the fisheries like photographers will gain from the lab's endeavors. Fish passage facilities with public viewing areas like the elevators in Holyoke and the fish ladders in Turners Falls are already popular attractions and should draw more visitors as anadromous fish become more visible in the river basin.



Recorder/Paul Franz

Program Coordinator Theodore Meyers, with a model of the Atlantic salmon mounted on the wall in his office in Turners Falls.

"I think (the anadromous fish laboratory) will put Turners Falls on the map with sportsmen and environmentalists all over the world," said Rep. Silvio O. Conte, who advocated construction of the lab since the idea first surfaced in 1983. "It will be sort of an anchor for people who are interested in the outdoors."

The effort to restore Atlantic salmon in the river is dependent on a chain of five state and federal hatcheries in Massachusetts, Vermont, Connecticut and New Hampshire, where adult salmon breed and produce their offspring. The juvenile salmon are eventually stocked all along the river basin as either inch-to inch-and-a-half-long fry or as larger, but not fully mature, smolts, which have experienced a physiological change preparing them for life in salt water.

So far this spring 460,000 salmon smolts about 700,000 fry have been released at various locations in the watershed. Fisheries experts, scientists, college and high school students and other volunteers from around New England spend countless hours trudging up rivers and streams carrying large buckets sloshing over with the infant salmon.

The fry are distributed by the handful at carefully determined intervals along the waterways, where they grow and feed for two years before progressing downstream and into the Atlantic. In some areas, the fry stockers use canoes to release the fish at spots in the center of broad rivers and streams.

"It's kind of a nice thing to do," said Meyers. "People feel good putting the critters out in the water."

But restoration is a slow process and the number of juvenile salmon that actually reach salt water and return to their northern spawning grounds as full-grown adults is still microscopic compared to the level scientists hope to one day achieve.

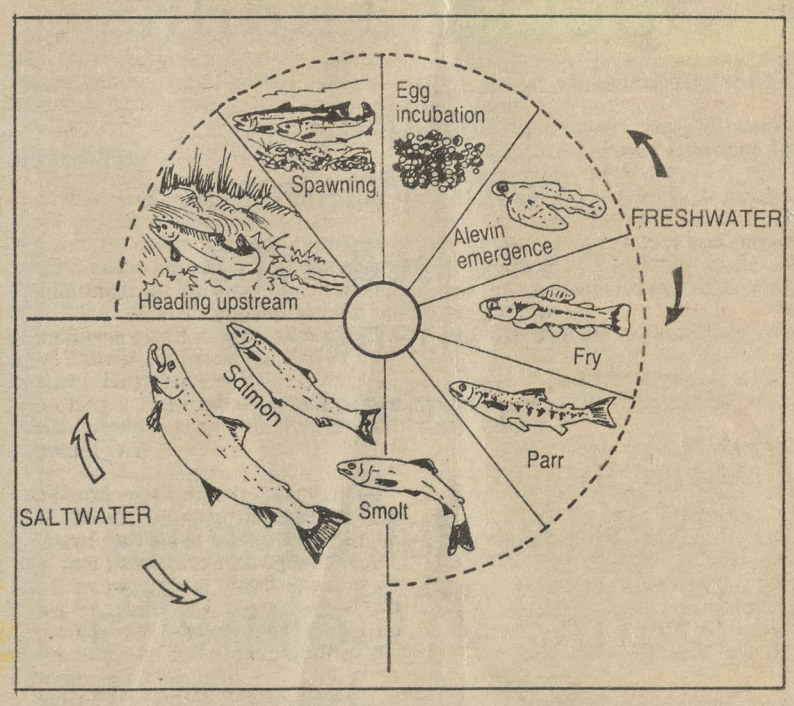
In 1989, for example, only 109 mature salmon reached the fish elevators at the most southern dam on the river in Holyoke, Meyers said. To produce those 109 adult salmon, 1.5 million fry and slightly larger fish called parr were dispersed in the river in 1985 along with 205,800 sea-ready smolts released in 1987.

The majority of the adults that journeyed back upstream were captured at Holyoke and trucked to the Richard Cronin National Salmon Station in Sunderland, where they were weighed, measured, examined, medicated and "given lots of T.L.C." before breeding in captivity in late October and early November, said Meyers, who believes a very limited Atlantic salmon sport fishery will be in place by the middle of this decade.

A computer generated model duplicating the theoretical efforts of the restoration program during the next 30 years has predicted that by the year 2021, roughly 38,000 adult salmon will return to the Connecticut River to reproduce before swimming back downstream. To perpetuate the population and meet the demands of the fishermen, a sport harvest of 4,600 salmon will be permissible at that time.

But for now, removing Atlantic salmon from the water is still illegal, although Meyers has received several reports of fishermen landing the highly prized fish. In the future though, Atlantic salmon may inhabit the river and its tributaries as densely as frogs in a lily pond.

"It's a cooperative effort," said Meyers. "That's the only way it's going to work and that can be a real challenge sometimes."



Life cycle of anadromous fish such as the Atlantic salmon, which live as adults in the ocean but begin their life in fresh water rivers.

The staff:

By DAVID WEBSTER
Recorder Staff

TURNERS FALLS — An experienced team of biologists and engineers working at the Northeast Anadromous Fish Research Laboratory has already started research they hope will one day bolster fish populations in rivers and streams throughout the northeastern United States.

There are eight people staffing the $17 million lab. Scientific Director Dr. Henry Booke plans to have 16 people working at the lab by October and eventually a full staff of 28.

Booke has studied fish extensively in the Great Lakes region and on the East Coast, teaching and conducting research at Yale University, Boston University, the University of Michigan, the University of Wisconsin and UMass. Before being hired by the U.S. Fish and Wildlife Service to head the new lab, Booke directed the Cooperative Fisheries Research Unit at UMass, a group providing information for both state and federal fish and wildlife agencies.

Assistant Scientific Director Robert Sousa left his job as a high-level administrator for the U.S. Fish and Wildlife Service in Washington, D.C., to come to Turners Falls and become more involved with actual research, he said.

"Once you get mud in your boots, it's hard to get it out," said Sousa, who comes from a family of Rhode Island fishermen.

While in Washington, Sousa was instrumental in helping pass legislation in 1984 that provided federal aid for sport fish restoration programs in all 50 states, he said. Sousa has a doctorate in biochemistry from the University of Rhode Island.

Mississippi native Boyd Kynard will lead the lab's research group studying the life cycles, behavior and ecology of anadromous fish. Kynard assisted Booke at the Cooperative Fisheries Research Unit at UMass for 12 years before taking his job at the new lab. He also headed an undergraduate fisheries program at the University of Arizona in Tucson.

"I've been trying to mesh the needs of fish and the needs of people for a long time," he said.

The leading biologist in the ecology section of Kynard's research group will be Donna Parrish, who has a doctorate in zoology from Ohio State University. Working at the anadromous fish laboratory will be "unique opportunity" to nurture and shape a research program instead of entering an existing program, she said.

The lab's operations and hydraulics engineer is John Buck, who worked for the Denver-based architectural and engineering firm that designed the Turners Falls facility before being hired by the Fish and Wildlife Service. He has a master's degree in engineering and has a strong background in hydraulics.

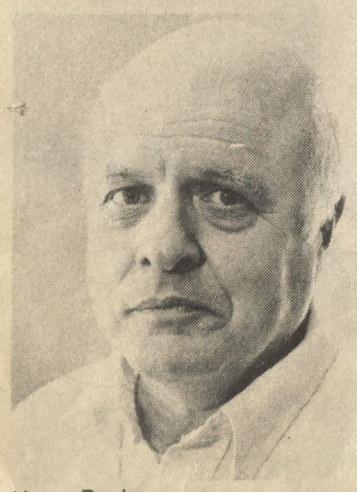
Buck's primary job is to regulate the flow of water through the lab's 185-foot-long fish passage building — an indoor, man-made flume that will help biologists study fish behavior under controlled circumstances.

Working side by side with the biologists will be Theodore F. Meyers, the Fish and Wildlife Service's program coordinator for the entire Connecticut River and executive assistant for the Connecticut River Atlantic Salmon Commission.

Meyers coordinates the needs of the commission with the experiments being conducted by biologists. Before coming to Turners Falls, Meyers spent 15 years working for the Division of National Marine Fisheries Services in Alaska. He also worked at a fish hatchery at Montpelier, Vt., and was a research biologist for the state of West Virginia.

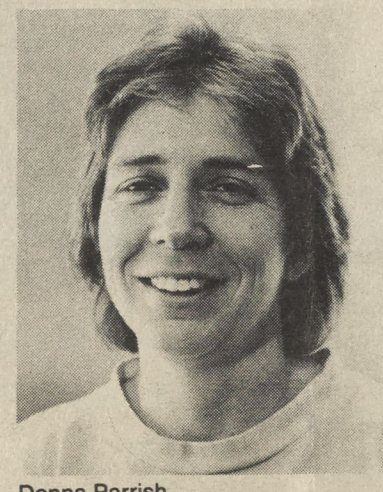
Diane Soucey organizes the Atlantic salmon commission office located at the anadromous fish lab and is a key source for information regarding fish migrations and restoration programs inside the commission's four-state jurisdiction, which includes Massachusetts, Connecticut, New Hampshire and Vermont.

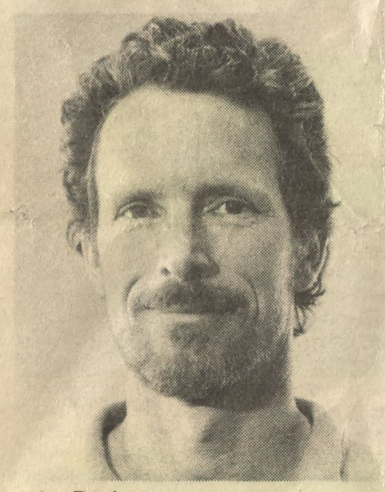
Becky Richardson is the lab's clerical worker and has done a "yeoman's job" in the hectic organizing and staffing process the lab is going through, Booke said.

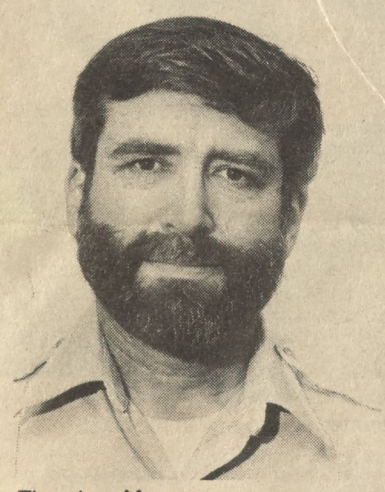

Henry Booke

Robert Sousa

Boyd Kynard


Donna Parrish


John Buck


Theodore Meyers

Diane Soucey

Becky Richardson

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The persons, agencies, and businesses herein listed have contributed many hours of their efforts to make the Northeast Anadromous Fish Research Laboratory a reality. The laboratory staff extends their thanks for these exceptional efforts during the construction and dedication phases of the project.

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Researchers probe many mysteries

Recorder/David Webster

Zoologist Donna Parrish, left, and research assistant Becky Menard capture trout in the Westfield River in Savoy by stunning them with portable electrodes.

By DAVID WEBSTER
Recorder Staff

TURNERS FALLS — Once a thriving mill village in the latter half of the 19th century and the early part of this century, Turners Falls is about to become the international center for research on anadromous fish.

A staff of fish biologists and engineers will pose and answer questions related to the upstream and downstream migration of various fish species native to the northeastern United States. Their research will help preserve and protect fisheries not only in the region, but around the world.

Anadromous fish are born in fresh water and swim downstream to feed and grow in the ocean before returning upstream to reproduce. Their existence in the Connecticut River basin and other watersheds has been threatened by pollution, over-fishing and the introduction of man-made barriers — primarily hydroelectric dams.

Two advisory groups concerned with perpetuating the fisheries will meet periodically to make recommendations about what problems related to anadromous fish need to be addressed, according to Dr. Henry Booke, scientific director of the laboratory.

The primary mission will be "to mitigate fish passage problems" around river obstructions such as dams, he said. Equally important, will be collecting enough background data on each species to establish self-sustaining populations of anadromous fish by protecting the critical habitats where the fish feed and spawn, he said.

"We don't want to repeat somebody else's research," said Assistant Scientific Director Robert J. Sousa. "The cheapest research is research that has already been conducted by somebody else."

At the laboratory, research will be conducted in four areas: the life cycles, behavior and ecology of fish; population dynamics; physiology; and the engineering of fish passage systems. Researchers in each area will conduct their own experiments, as well as teaming up with other research teams to resolve specific problems, Booke said.

A Research Advisory Panel (RAP), composed of three or four senior fish biologists from around the world, will review proposed experiments by scientists at the lab and decide if the research involved is "effective and worthwhile," said Booke.

A second group, Cooperative Advisory Research Panel (CARP), will identify existing problems related to anadromous fish in the northeast and create a "wish list" of research it would like conducted, Booke said. The panel will consist of about 25 advisers, including representatives from federal and state fish and wildlife agencies in the 13 northeastern states and the Canadian maritime provinces, members of public organizations like the Audubon Society and Trout Unlimited and employees of the various utility companies struggling to provide adequate fish passage around their facilities.

Biologists in the behavior, life cycles and ecology area at the lab will collect information about how fish act in particular environments and how that behavior relates to their passage around a dam, said Boyd Kynard, leader of that research team. Although all areas of behavior will be studied, downstream migration and downstream passage at dams will be heavily scrutinized in initial studies, he said.

Currently, adult fish swimming downstream are passing dams with limited success, but younger fish are suffering a high mortality rate in their downstream journey, he said. During the spring, utility companies sometimes have to use cranes and large bucket loaders to clear dead fish from their dams, he said.

By determining fish's preferences to light, temperature and different patterns of water flow, scientists can help design fish passage mechanisms that better meet the needs of fish, he said. Systems now in use like the ladders in Turners Falls and an elevator-like lift in Holyoke were designed without significant knowledge of fish behavior and are not necessarily the best methods for passing fish, he said.

Kynard is interested in using underwater video cameras to study fish as they travel through existing passage systems to find out where and why fish are halting their migrations. He is also experimenting with high-frequency sound as a means for guiding fish through a particular passage.

"My approach is not trying to mesh fish into existing systems," he said. "My approach is to try and understand the fish and their behavior relative to these facilities."

States all along the East Coast, as far south as South Carolina, have already appropriated money to construct fish passage systems on their rivers and streams, said Kynard, who is encouraging those states to wait until scientists are able to design more efficient fish passage systems.

In the area of ecology, biologist Donna Parrish is experimenting to determine what predators, like trout or other fish, may be feeding on the Atlantic salmon fry stocked each spring in rivers and streams from Vermont to Connecticut. Parrish also hopes to identify which insects and organisms the fry feed on for the two years they remain in fresh water before journeying out to sea.

Recently, Parrish and research assistant Becky Menard spent a day trudging through the Westfield River in Savoy, capturing live trout, sucker fish and shiners to see if they are eating the inch-long fry, most of which are raised in the Richard Cronin National Salmon Station in Sunderland.

Dressed in rubber waders, gloves and goggles, and carrying large portable electrodes to stun the fish so they are easier to catch, Parrish and Menard looked like a pair of "Ghostbusters" as they schlepped through the river. They waved the electrodes in the water, actually shocking fish with an electric impulse and scooping them up in nets.

Once the trout and other potential predators are caught, their stomachs are emptied by flushing them out with a syringe full of water. Parrish then studies the contents of their stomachs to see if any of the fry are present.

It will take several trips into the different tributaries where the fry have been stocked and several stunned trout before Parrish can assess if the trout are eating a significant number of the fry. But when she completes her experiment, her research may help fisheries managers establish more productive stocking methods that will result in a greater number of fry returning to Connecticut River basin as reproducing adult salmon.

Biologists researching the population dynamics of anadromous fish will try to determine how long certain species live and how long they are able to reproduce, said Booke, who likened the job to that of an insurance actuary. Scientists will work in the field and with computers to calculate how many fish must be retained in a population so it will continue to thrive while still providing a reasonable harvest for sport fishermen, he said.

Biologists have not yet been hired to conduct population dynamics research at the lab, but Booke said he hopes to hire a staff within the next month or two.

Physiology

In the area of physiology, biologists will attempt to identify the basic bodily needs of fish traveling around dams and other obstructions, Booke said. As an example, Booke noted that fish migrating upstream to spawn do not eat during the entire trip. The fish become extremely fatigued, and physiologists must find a way to get them past obstructions without killing or severely injuring them, he said.

In addition, physiologists can examine the physical changes fish go through as they mature and try to pinpoint the stage at which young fish are most ready to move from fresh to salt water, said Sousa. By doing so, scientists can help establish more efficient stocking methods that will produce a more robust generation of fish, he said.

Steve McCormick, who has a doctorate in zoology from the Massachusetts Institute of Technology at Woods Hole, has been hired to lead the physiology research team and is expected to begin working sometime in July, Sousa said.

Perhaps the most impressive aspect of the laboratory is the 185-foot long fish passage building, where biologists and engineers will collaborate to design and test models of fish passage mechanisms that may later be used on hydroelectric dams. The hangar-like building has a series of overhead cranes that will let engineers guide large pieces of construction materials in and out of the building with relative ease.

Water, diverted from the nearby power canal, will flood the three flumes that run through the building, creating an indoor river. The flumes can hold a depth of up to 173 feet of water, flowing at a maximum rate of 200 cubic feet per second, according to John Buck, the lab's operations engineer. Two hundred cubic feet per second is about 25 times the maximum water flow pumped by the the Town of Greenfield's pumping station during peak hours in the summer, he said. Once leaving the building, the water will flow through an underground pipe to an intermediate pool and back into the Connecticut River.

Inside the flumes, engineers will construct prototypes of fish passage systems under a variety of controlled conditions. They will experiment with tumbling and smooth water flows, various depths and different intensities of lighting to determine the ideal conditions for helping fish past dams.

Holding pens at both ends of the building will contain live fish to be used sort of like guinea pigs to determine how well the fish passage systems work.

The goal of everyone working at the lab is to design a fish passage system flexible enough to meet the physiological needs of all species of anadromous fish and effective enough to help restore fish populations all across the northeast. If that goal is met and healthy, reproducing populations of fish return to the rivers, the new lab may one day become obsolete.

For now though, the research being conducted at the lab has just begun to address the many questions surrounding the migration of anadromous fish.

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1989 when TECMIN sponsored ichthyologists associated with the Museo de Ciencias Naturales in Guanare, Venezuela (MCNG), to inventory fishes. As a result, I participated in six missions: one by helicopter to the Río Caura (29 Mar-4 April 1989) and five river-based expeditions to drainages in the upper Orinoco—the ríos Guayapo-Sipapo (12 May-7 June 1989), the Río Ventuari (17 Sept-16 Oct 1989), the ríos Atabapo-Atacavi (23 Oct-17 Nov 1989), the ríos Ocamo-Matacuni (16 Jan-16 Feb 1990) and the Río Mavaca (18 Jan-20 Feb 1991). Additional fish collections were made during other TECMIN missions by the botanist Basil Stergios (various sites, 1986-90), and by Donald Taphorn (Río Nichare, March 1989) and Aniello Barbarino (Río Siapa, April 1991), among others. All told, some 55,000 voucher specimens, representing at least 450 fish species, were collected, most deposited at MCNG. This is an account of upper Orinoco fishes and rivers based on my 1989-1991 field work. *(Session 33, Sunday June 29, HUB 209, 9:30)*

***Nielsen, Jennifer L., Fountain, Monique C., Cobble, Kevin, Campoy Favela, José R., Jensen, Buddy L.**

(JLN and MCF) USDA Forest Service PSW Hopkins Marine Station Stanford Univ. Pacific Grove, CA; (KC and BLJ) USFWS Dexter National Fish Hatchery and Technology Center Dexter, NM; (JRCF) Centro Ecologico de Sonora Hermosillo, Mexico

Molecular genetics and evolutionary status of the trout of the Sonora and Chihuahua Desert region of Mexico

We used mitochondrial control region sequence and 12 nuclear microsatellite loci to describe unclassified trout (*Oncorhynchus* ssp.) collected from the Río Yaqui, Río Mayo, and Río Casa Grandes drainages. Sixteen populations of undescribed trout collected in 1996-97 from the Sonora and Chihuahua desert regions of Mexico were compared to trout collected from the Río Fuerte drainage (previously classified as Mexican golden trout *(Oncorhynchus chrysogaster)*, relic populations of Gila (*O. gilae gilae*) and Apache trout (*O. gilae apache*) from the Colorado River drainage, coastal rainbow trout from southern California (*O. mykiss*), and the trout of the San Pedro Mártir drainage in Baja California Norte. Unprecedented genetic diversity was found in the southern trout, with unique mutation events documented in several Mexican populations. Phylogenetic inference drawn from both mtDNA and nuclear microsatellites were compared in relationship to two prevailing theories of Pleistocene radiation in trout at the southern extent of their range in areas surrounding the Sea of Cortez. *(Session 35, Sunday June 29, Kane 110, 11:30)*

***Nishikawa, Kiisa, Gray, Lucile**

Dept. of Biological Sciences, Northern Arizona Univ., Flagstaff, AZ 86011-5640

Evolution of prey capture behavior in anurans

Comparative studies of prey capture in nearly 150 species have revealed that anurans use three different mechanisms to protract their tongues during prey capture. These are: 1) mechanical pulling, in which the tongue shortens as the longitudinal fibers of the protractor muscle pull it forward during protraction; 2) inertial elongation, in which the tongue shortens initially as the longitudinal fibers of the protractor contract, but the tongue later elongates under its own momentum; and 3) hydrostatic elongation, in which the protractor muscle has a dorsoventral as well as a longitudinal component. In hydrostatic elongation, when the dorsoventral component of the protractor muscle contracts, the tongue becomes thinner and longer. Mechanical pulling is the primitive condition, inertial elongation has evolved as many as 8 times independently from mechanical pulling, and hydrostatic elongation appears to have evolved once or twice from inertial elongation. Tongue movements differ dramatically among the three protraction mechanisms. For example, acceleration of the tongue is more than 600 times faster in inertial elongation than in hydrostatic elongation. A variety of field and laboratory studies suggest that feeding performance, feeding strategies (sit-and-wait vs. active foraging) and dietary preferences are related to mechanisms of tongue protraction. *(Session 15, Saturday June 28, HUB 200, 9:00)*

***Nishimoto, Mary M.,Washburn, Libe, Love, Milton**

(MM, ML) Marine Science Institute, UC, Santa Barbara, CA 93106, ; (LW) Geography Dept., UC, Santa Barbara, CA 93106

Distributions of pelagic juvenile fishes in relation to water masses around the Santa Barbara Channel Islands, California

As part of a three-year Biological Resources Division/USGS project, we conducted a 10-day midwater trawling survey during summer 1996 in the Santa Barbara Channel Islands region. Our objective was to investigate the influence of water masses on the meso-scale distributional patterns of pelagic juvenile rockfishes and other fishes. Upwelling from the mainland was an apparently strong influence on water properties in the islands region. Water from trawling depth (30-54 m) in the northern and southwestern areas of the four-island chain exhibited temperature-salinity properties of upwelled water. Water from the eastern area was warmer and fresher and appears to originate from the south in the Southern California Bight. We found differences in the abundances of pelagic juvenile fishes in the presence of these distinct water masses. *(Session 31, Sunday June 29, Kane 210, 8:30)*

***Nislow, Keith H.; Folt, C.L.**

Dept. of Biological Sciences; Dartmouth College; Hanover, NH 03755

Supply and demand in the study of habitat suitability for first-year stream salmonids

The ability of a habitat to support first-year salmonids may best be understood as a dynamic balance between supply and demand for space and energy, which can both change dramatically over the course of a growing season. In this paper, we assess

Denver Post

Wednesday
OCTOBER 18, 2000

Cutthroat trout protection spurs suit

By Theo Stein
ENVIRONMENTAL POST WRITER

Six environmental groups have sued the U.S. Fish and Wildlife Service, claiming the agency has failed to consider federal protection for the spectacular native cutthrout trout.

Historically found in all cold-water streams of the Colorado River drainage, the colorful cutthroat has been reduced to less than 5 percent of its former range, according to the suit, filed Tuesday in Washington, D.C.

The groups want the court to order the service to complete an initial determination on whether a more formal evaluation is warranted.

Federal biologists said the listing is not needed, largely because of voluntary restoration efforts by the Colorado, Utah and Wyoming wildlife agencies under a pact called the Tri-State Agreement.

Colorado fisheries biologists have successfully reintroduced Colorado River cutthroat in more than 100 reproducing populations, said Todd Malmsbury of the Colorado Division of Wildlife.

But Dave Nickum, executive director of Colorado Trout Unlimited and regional conservation director for the group's national organization, said the Fish and Wildlife Service should act on the petition.

"I certainly think they put together some credible arguments that justify a review," said Nickum, who is nonetheless "guardedly optimistic" about the state efforts.

"As always, the ultimate question will be how well it performs," he said. "It's too early to say whether the Tri-State Agreement will take the cutthroat where they need to be."

Stocking trout in unconnected, high-elevation streams won't guarantee that the species will survive, said Noah Greenwald of the Tucson-based Center for Biological Diversity, one of the plaintiffs in the case.

"The streams are isolated, they don't support genetic interchange, and they're subject to chance natural events like debris flows and drought." Cutthroat also suffer from habitat degradation as well as competition from other introduced trout species.

But the Division of Wildlife doesn't believe that the fish would be best served by a federal listing.

"We believe that aggressive efforts at the state level are the best way to recover these species," said Malmsbury.

In the Colorado River basin, hatchery-raised native cutthroats have been restored to 123 stream locations and 28 lakes, and division biologists have no plans to stop there, he said.

Eventually, the state wants to stock nothing but native fish in high-elevation water courses, Malmsbury added.

But reliance on hatchery fish, Greenwald argued, exposes populations to pathogens such as whirling disease and often reduces the genetic variability of a species.

"We definitely feel the state's efforts are proper," he said. "But the key is it will not promote the recovery of the Colorado River cutthroat to a major portion of its range. They've completely lost the first-order streams. We'd like to see the Colorado River cutthroat restored to those large streams."

Greenwald said that would require the elimination of introduced fish in those drainages.

But Malmsbury said that after 100 years of stocking, that's not an option.

Other plaintiffs include the Biodiversity Legal Foundation in Louisville, the Center for Native Ecosystems in Boulder, Colorado Wild in Durango and Biodiversity Associated of Laramie.

THE ARIZONA REPUBLIC

SATURDAY
July 22, 2000

Big tracts urged to shield owl

5 million acres are in Arizona

13.5 MILLION ACRES TOTAL!

By Judd Slivka
The Arizona Republic

The U.S. Fish and Wildlife Service on Friday proposed designating about 5 million acres of Arizona land as critical habitat for the endangered Mexican spotted owl, a move that environmentalists hope would cripple large-scale logging in Arizona.

The proposal, part of an overall suggested designation of 13.5 million acres in the Southwest, would not affect private lands. But any project that received federal funds or required federal authorization would need to take into account the presence of the habitat.

If approved, the designation will have its greatest impact on logging operations on federal lands. Hikers and other forest users, such as ranchers, are not expected to be affected.

About 3.3 million of the acres in Arizona are on Forest Service land. Tribal lands make up an additional 846,000 acres. The National Park Service has 795,000 acres of proposed habitat; the Department of Defense has 24,000 acres and the Bureau of Land Management has about 12,000 acres.

Only Yuma County has no affected land.

"It's more defining of the areas that are protected," said Elizabeth Slown, a Fish and Wildlife Service spokeswoman.

The service admittedly used broad boundaries to define where spotted owls live.

"Not everything within that 14 million acres is spotted-owl habitat," Slown said. "The owls live mostly in steep canyons or hillsides, which don't really make for timbering. But if you want to timber, you or whoever holds your permit takes a look at what you want to do and see if it threatens the habitat."

The owl lives in canyons and in ponderosa and mixed-conifer forests from southern Utah and Colorado through Arizona, New Mexico and Texas. In 1989, it was given endangered status; the Fish and Wildlife Service cited two main threats to the owls destruction of habitat through timbering and catastrophic wildfire.

In 1993, the service set aside 4.8 million acres of critical habitat for the owl, and logging statistics in the Southwest showed a downward trend, attributed in part to the ban. In 1997, the designation was struck down when federal courts decided an environmental assessment defining the owl's habitat had been done incorrectly.

"Once the critical habitat was struck down, the logging industry started cranking up again," said Kieran Suckling, with the Tucson-based Center for Biological Diversity. "We think this designation will help send the big timber companies packing for good."

The other areas in the proposed designation include parts of Colorado, New Mexico and Utah.

Public meetings in Arizona will be held from 630 p.m. to 9 p.m. on the following days:

- Aug. 16, Louis Rich Theater, Tucson Convention Center, Tucson.
- Aug. 17, Flagstaff High School, Flagstaff.

U.S. Keeps Beavers Busy Restoring Creeks

By WILLIAM E. SCHMIDT
Special to The New York Times

ROCK SPRINGS, Wyo., Aug. 11 — Like most ranchers, the people up Currant Creek would just as soon shoot a beaver as look at it. For years, the animals had dammed the stream, flooded their hay meadows and plugged their drainage culverts with mud and sticks.

Then, two years ago, the Federal Government started trapping the beavers and setting them loose at a site below the ranches where the banks of the creek had been badly eroded.

The beavers, using timber left at streamside by Government biologists, built a series of dams that slowed the swift creek, checking the erosion that had turned the water brown with mud and had killed much of the vegetation.

The creek began to back up in shallow ponds that spilled over the banks of the old channel. Willows and grass, good forage for the cattle that use the creek banks for winter range, started to sprout amid the brittle clots of prickly greasewood. Trout returned to the creek, and songbirds nested again along the marshy banks.

Many here have changed their minds about the beaver.

"It's just a matter of letting nature take its own course," said Bruce Smith, a wildlife biologist with the Federal Bureau of Land Management and one of the men who devised the idea of using the beavers to help restore the stream. "It's a lot cheaper and makes a lot more sense that trying to artificially control the environment."

For decades, here and elsewhere, cattle and sheep stripped vegetation from the stream banks each winter. High water the next spring would tear away at the banks, weakened by the absence of roots and other vegetation that help hold the soil together. In some places, the creeks have eaten into their banks by more than 50 feet since the early part of the century.

Federal and state engineers and private landowners in the West have spent millions of dollars trying to stop erosion along the narrow creeks that weave through the arid sagebrush hills of the region. They have built dams of concrete and dams of wire mesh filled

ROBERT FRANCIS KANE. Fest Fin. Public Relations in NYC. HAPPY B-DAY, Loved Ones.— ADVT.

Continued on Page A12, Column 1

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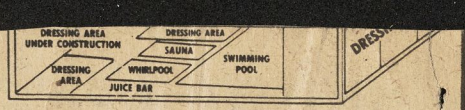

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Business

Barrick's river discharge won't start until next year

By Adella Harding

Barrick Goldstrike Mines Inc. won't discharge water into the Humboldt River from its property north of Carlin until 1997, although the state issued the permit last month, according to Dave Moody of Barrick.

Moody said Barrick wouldn't be ready until at least May to begin discharging to the river. The Nevada Division of Environmental Protection permit allows Barrick to discharge up to 70,000 gallons per minute into the Humboldt.

Meanwhile, a temporary injunction ordered by Washoe District Judge Peter Breen preventing Barrick from discharging water into Newmont Gold Co.'s TS Ranch Reservoir has been extended until February.

Moody said the extension because a new trial date in Newmont's lawsuit against Barrick won't affect mine operations, mine employment or planned production at the company's new Meikle underground gold mine.

"Fortunately, we worked far enough ahead that we have room to sit back and take care of other issues," Moody said in answer to a question by Eureka County Commission Chairman Pete Goicoechea at the Humboldt River Basin Water Authority's Aug. 16 meeting in Winnemucca.

Breen issued the injunction in April. The temporary injunction also ordered Barrick not to pump more than 8,000 gallons per minute from Betze-Post open pit mine at Goldstrike. The 8,000 gpm is for mine use only.

Moody, who is head of Barrick's water management department, told the authority Barrick now dewaters at a rate of about 6,000 to 7,000 gpm.

Originally, the injunction was to continue only until a September trial date, but Breen has since changed the date. According to the Washoe County Clerk's Office, the new nonjury trial date is Feb. 3.

Newmont's lawsuit claims Barrick caused "unnatural and unauthorized flooding and saturation" of the TS Ranch. Barrick was discharging into the reservoir under a joint agreement with Newmont.

Moody said the reservoir is now dry, and Barrick is irrigating the TS Ranch from water pumped from the mine before wells were shut down.

Springs that were flowing as high as 32,000 gpm last spring were averaging 12,000 gpms last week, "and most of this is being delivered for irrigation," Moody said.

He also estimated that the springs would run dry in four to eight years if no more water is pumped into the reservoir.

Barrick was pumping roughly 40,000 gpm just before the court action but earlier discharged as much as 70,000 gpm from the mine.

A fissure in the TS Ranch Reservoir allowed water to seep into the ground and emerge several miles away as springs, Moody said during his presentation to the authority board. Barrick infiltrated 400,000 acre feet of water into Little Boulder Basin before the injunction, he said.

Barrick increased the amount of irrigated land from 2,700 acres to 10,000 acres from 1990 to 1996 but this year is irrigating 7,000, Moody also reported.

In a related matter, State Engineer Michael Turnipseed answered authority questions about Barrick and other gold mines filing for secondary permits on their water rights.

The primary permit holder must agree to the secondary use, he said, adding that once mines shut down, their water rights and secondary rights end.

Turnipseed said Barrick sought the secondary permits mainly to use the water from the springs and seeps created by the dewatering for irrigation.

"We need the secondaries to conduct our business," Moody told the authority. "We work hand and hand with TS Ranch so all the irrigation is according to Hoyle and adequately reported."

Turnipseed reiterated his office's policy that when mining companies plan to go below the water table and must pump water out of a mine, the top priority is "putting the water back into the ground" by reinjection or infiltration.

If mines can't find a place to put the water back into the ground, his office will approve a substitute ground water use, such as irrigation, or creating a wetlands, Turnipseed said.

The final solution is discharge into the Humboldt, Turnipseed said. Secondary permits only apply to water outside the Humboldt because "once water reaches the river, it loses its identity and becomes part of the river system," he said.

"I realize that we are borrowing from future generations ... but about 90 percent of water pumped from mines is going back into the ground," Turnipseed said.

"The mines are under mandate to find other uses" rather than discharge into the Humboldt, which is why Santa Fe Pacific Gold Corp.'s Lone Tree Mine is seeking secondary permits, he said.

One of these would provide water to Sierra Pacific Power Co.'s Valmy power plant, another would provide water to the Marigold Mine nearby and another is to supply water to SFPG's Trenton Canyon project.

The tentative agreement with Sierra Pacific calls for the power company to stop pumping its own wells and use 2,500 gpm from Lone Tree, Turnipseed said.

Lone Tree Mine is permitted to discharge 41,000 gpm into the Humboldt and has applications for up to 75,000 gpm. However, the mine is currently pumping 27,000 gpm, said SFPG Assistant General Counsel Rich Haddock.

He reminded the authority that Lone Tree agreed to look for other uses of water pumped from the mine in answer to protests by the authority and Lander County Commissioners when the company filed for permits for the 75,000 gpm.

The authority is made up of Elko, Eureka, Lander, Humboldt and Pershing counties.

Baughman said this week that the authority's concerns about secondary rights stem from earlier stipulations by the mines that they wouldn't seek secondary water rights and from fears that secondary rights could go to third parties who would move water out of the river basin.

But he said explanations by the mining representatives and Turnipseed at the Aug. 16 meeting appeared to ease their worries.

Still, secondary water rights will continue to "require scrutiny," Baughman said.

Water study update to be out this fall

By Adella Harding

A progress report on a major study of water resources and mine dewatering in the Humboldt River Basin should be available this fall, according to Tom Leshendok, deputy state director of mineral resources for the U.S. Bureau of Land Management.

"We will put out an update around October," he said earlier this week. "We're making good progress."

The BLM is one of the co-sponsors of the study along with the Nevada Department of Conservation and Natural Resources and the U.S. Geological Survey, which started work on the first phase earlier this year.

The USGS is focusing on the middle Humboldt in the first three-year phase and will do as much as it can with the roughly $950,000 in available funding, said Dave Nichols, a USGS research hydrologist.

The agencies broke the 10-year study into three-year parts and estimated the total cost at $7 million. However, there is funding only for the first phase.

The funding includes $500,000 from Barrick Gold Corp., $150,000 from Santa Fe Pacific Gold Corp. and a matching $300,000 grant from the USGS.

In addition, Nichols said Newmont Gold Co. is providing funds for water monitoring north of the Humboldt River from Maggie Creek to Rock Creek. And mining companies are providing current data to the USGS, he said.

In the first three years, the focus will be on an area from Carlin to just east of Winnemucca, Nichols said.

The USGS will define the geological framework and look at changes in water levels, the sediments that fill the valley and the rainfall and snowfall that recharge the water system, he explained.

"All of this needs to be done before we can make a critical study of water resources," Nichols said.

The USGS is also trying to "assemble as much hydrologic and hydrogeologic and climatic data that's available at least for the middle part of the Humboldt," he said. "We hope to have the data assembled by the end of the calendar year."

Once the data are assembled, they will be available for others on the Internet, Nichols said.

The agencies looked to the companies mining gold in the basin to help fund the study, especially those mines pumping water from their open pits, but the study will go beyond mining impacts.

"We're looking at a lot more than mine dewatering. We're looking at all water resources in the Humboldt River Basin," Nichols said. "There has not been a lot done in 30 years."

The Humboldt is fed by 13 basins from as far away as Reese River Valley to Rock Creek and Maggie Creek north of the Humboldt, he said.

Still, Leshendok said the state and BLM are interested in the "long-term cumulative impacts of mining on the basin. ... We have a great deal of specific information on all the mines."

Nichols explained that although the focus is not just on dewatering, "we hope the data can be used to look at specific problems. We have to understand how ground water moves and what happens when mines pump ground water out."

He also said the co-sponsoring agencies are trying to keep the study to a regional scale rather than interfere with work that consulting firms normally do.

Leshendok said that despite the growing number of questions about pit lake quality, the study won't delve into pit water quality on a scale requested by Glenn Miller of the Sierra Club.

Environmental impact statements prepared for the mining projects along the Humboldt "show that the BLM and state are comfortable with the pit lakes water quality," Leshendok said.

In an article in the current issue of *Mining World News*, Miller, chairman of the Mining Committee of the Toiyabe Chapter of the Sierra Club, calls for research to develop accurate predictions of pit water quality.

He also urges investigation of possible pit lake uses, a better understanding of whether water in the pits will migrate and determining wildlife risks and how to mitigate poor pit lake water quality.

(Adella Harding/Free Press)

Irena Nikiforova came to Newmont Gold Co.'s Carlin operations from Uzbekistan for hands-on training.

U.S. 'surprises' Newmont engineer from Uzbek mine

By Adella Harding

Irena Nikiforova, an environmental engineer for the Newmont joint mining venture in Uzbekistan, is receiving hands-on training at Newmont Gold Co.'s mines north of Carlin and finding Elko a fascinating place.

"It's very exciting to know America. For the first two weeks I was surprised from morning to evening," she said this week, her third week in Nevada. "I was very surprised when people wanted to show me more of American stuff."

Nikiforova said she especially enjoyed the Ruby Mountains, Lamoille Canyon and visiting spacious homes.

"Uzbekistan is in a depression, even at a lower level" then it was before the Soviet Union broke up, she said.

The country is on the border with Afghanistan and 80 to 90 percent Moslem, said Nikiforova, who is Russian.

She said she was also surprised by the size of the Newmont operations even though she knew about the Carlin mines before coming here. "Everything is huge." And she said she is impressed with the technology.

She is just one of the people Newmont is sending to the Carlin operations from Uzbekistan, Peru and Indonesia to learn more about Newmont, said Todd White, an environmental coordinator.

"One of our goals is to bring people who work at those sites here to familiarize them with our standards," he said. "Training such as this is a high priority, and we send people from here to there." White said Newmont is committed to adhering to the same environmental standards in the other countries as the company follows in the United States.

"Expertise is still needed over there. We're helping people jump into the new world, and helping them develop environmental laws and regulations," White said.

Nikiforova, who will be in Elko for just a couple more weeks, said Uzbekistan has environmental regulations, but they are still in development. The county hopes to combine theirs with the best of others worldwide, she said.

"I'm just collecting information," she said of her visit to Newmont's Carlin mines, by observing and working with Newmont's environmental department.

The major issue at the Uzbekistan mine is air quality, especially problems with dust suppression, Nikiforova said. The mine is in a desert setting much like Nevada's, she explained.

During her visit here, Nikiforova is working with Newmont people on acid rock drainage remediation, water and air sampling, hazardous waste management, operations monitoring, reclamation plans, environmental compliance systems and installing computer data base, White said.

"We're trying to standardize software everywhere," White said, adding that software is being developed to provide translations.

Nikiforova, who graduated from the Russian Institute, is one of few women in mining who work in the field. She said women work at the mines in service, accounting and secretarial positions but not as truck drivers or environmental engineers.

"My mother and my father thought I was crazy," she said of her decision to work in mining. She has been at the Uzbekistan mine for two years and lives in the town of Zarafshan during her work week, commuting to the capital city of Tashkent on her days off to be with her parents and 5-year-old son.

Nikiforova said she needed to know English to work for the joint venture. She also speaks Russian.

(Adella Harding/Free Press)

Elko visit:

U.S. Junior Chamber of Commerce Chairman of the Board Kelly Wills stopped at the Elko Chamber of Commerce this week on his national tour to promote the Jaycees and their national programs. From left are: Wills; Jim Conner of Elko, Nevada State Jaycees president; Frank Sawyer of Elko, vice president of individual development for the state Jaycees; Dave May of Reno, on the National Resource Team for the Jaycees and heading east on the bus; Mark Souza, Elko Jaycee; Rose Conner of Elko, Nevada Jaycees secretary, treasurer, editor and first lady; Curt Chapman of Worland, Wyo., his state's Wake Up America program manager; Kathy Finlayson, secretary-treasurer of the Elko Jaycees; and her child, Heather Spencer.

Newmont buys last 25% of Tess near Rain mine

Newmont Gold Co. has purchased 25 percent interest in the Tess Joint Venture property in Elko County from Reno-based Quest U.S.A. Resources Inc. for $6.25 million to give Newmont 100 percent ownership.

Newmont held a 75 percent interest in the property adjacent to its Rain underground mine on the Carlin Trend. The Tess Joint Venture controls approximately 3.5 square miles of land, according to Newmont.

In addition to the purchase price, Newmont agreed to pay Quest a one percent net smelter royalty on gold production from the property exceeding one million ounces.

"This significant transaction fits perfectly with Quest's short-term and long-term strategies," said Thomas J. Menning, Quest's chairman of the board and chief executive officer.

Quest, which is Canadian-based but in the process of moving corporate offices to Reno, said Thursday that it continues to hold 100 percent interests in other properties on the Carlin Trend.

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Business

(Sandy Miller/Free Press)

Ribbon-cutting: Members of the Elko Chamber of Commerce recently helped cut the ribbon to the new Checker Auto Parts store at 1710 Mountain City Highway. The store is open from 7 a.m. to 9 p.m. Mondays through Saturdays and from 9 a.m. to 7 p.m. Sundays. From left are: Norma Zunino, Ms. Senior Elko County and a chamber ambassador; Elinor Furlong, chamber ambassador and a former Ms. Senior Elko County; Susan Martsolf, chamber financial adviser; Brian Pierson, Checker manager; Chad Kelly and Mona Thompson, Checker salesmen; Gary Klug, chamber ambassador; Carla Wille, chamber executive director; and Jessica James, Tammy Shaw Hayes and Tammy Staley, chamber ambassadors.

(Sandy Miller/Free Press)

Life Skills, E.T.C.: Family, friends and colleagues of Marie Cook helped celebrate the grand opening of her new business, Life Skills, E.T.C., with a luncheon and ribbon cutting. Cook, a licensed nurse and therapist, specializes in education, therapy and consulting services. Her new business is located at 930 College Ave. and she can be reached at 778-0963. Pictured, front row, from left, are Chris Powers, DawnElla Whitney, Cindy Moschetti, Margaret Johnson, Isabel Jones, Lisa Seymour, Phil Ratliff and Kathy Bohall; back row, Brian, Marie, Kristin and Tracy Cook.

EDA representative to speak to NENDA

Al Ames, regional representative for the federal Economic Development Administration, is slated to talk about the proposed Great Basin Development District at Monday's 10 a.m. meeting of the North East Nevada Development Authority.

The meeting will be held in Suite 201 at 355 Fifth St.

NENDA Executive Director Debbie Smith said Vera Baumann, executive director of the Eureka County Economic Development Commission, is also scheduled to be on hand for the discussion about the proposed district.

In addition, she said she is hoping Karen Rajala, executive director of the White Pine County Economic Diversification Council, will be at the meeting.

The proposed economic development district would include Elko, White Pine and Eureka counties, and NENDA board members decided at their last meeting they wanted more information before deciding whether to participate.

Ames, who is based in Boise, Idaho, will explain the benefits of creating the district and provide details about forming such a district, Smith said.

Also Monday, NENDA will hold a planning retreat to discuss NENDA's structure because the interlocal agreements with Elko County and the cities of Elko, Carlin, Wells and Wendover will be up for renewal in October.

Barrick increases offer for Arequipa Resources

Barrick Gold Corp. expects to know Tuesday whether Arequipa Resources Ltd. shareholders will accept its increased offer of $80 million for all the outstanding common shares of Arequipa, said Barrick spokesman Vincent Borg.

Arequipa has several exploration properties with good potential in Peru but no active mines, he said.

Arequipa's Board of Directors is recommending that the shareholders accept Barrick's offer and agreed to cooperate with Barrick to complete the transaction, Barrick reported.

Under Barrick's revised offer, Arequipa shareholders can elect to receive either $21.83 in cash, or 79 percent of a Barrick common share plus 36.3 cents cash for each Arequipa share held, subject to an overall maximum of 14.4 million Barrick common shares being issued in the transaction.

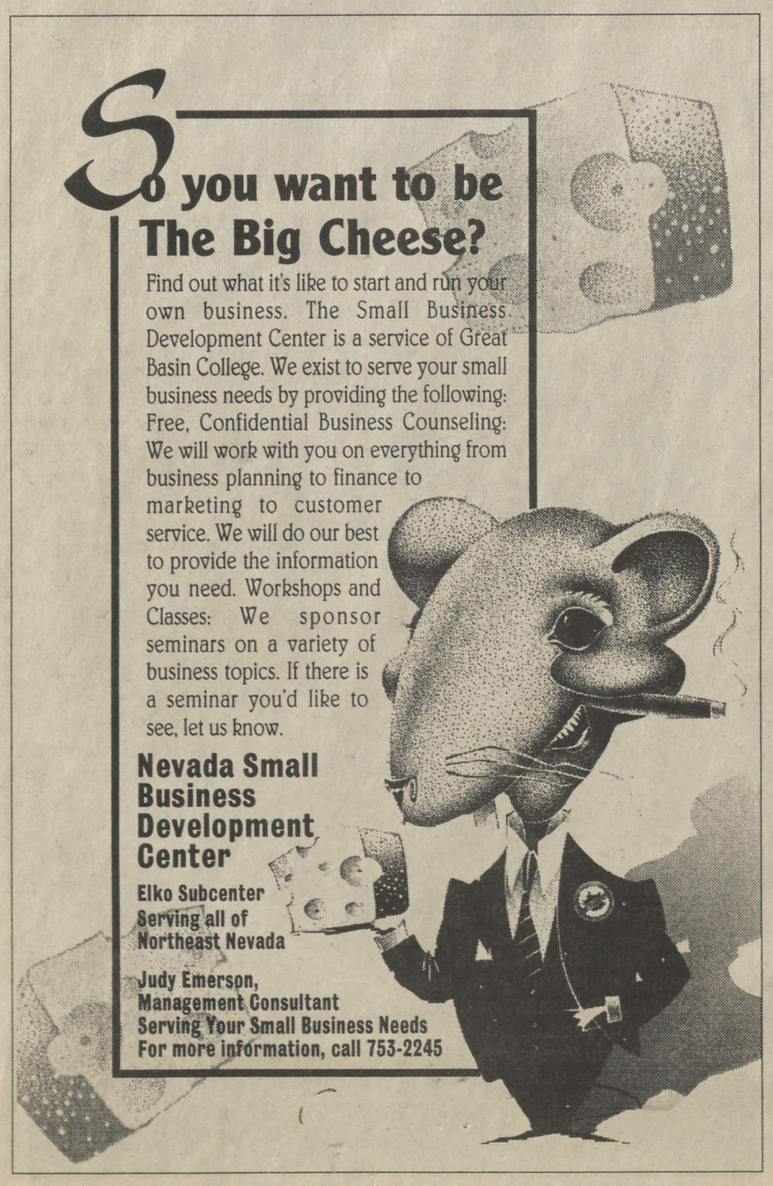
Barrick's revised offer is set to expire at 12:01 a.m. Tuesday.

Barrick stated it signed an agreement with certain shareholders and directors of Arequipa who hold approximately 23 percent of Arequipa's outstanding shares, which commits them to tender their shares to Barrick's revised offer.

J. David Lowell, chairman of the board of Arequipa, is among those who have agreed to tender their shares. He personally intends to elect to receive a substantial portion of his consideration in Barrick stock, according to a news release.

"We are delighted to have concluded a friendly transaction with Arequipa. Barrick believes that Arequipa represents an attractive investment giving it a major position in an important gold producing country," said Peter Munk, chairman and chief executive officer.

"Arequipa shareholders who take Barrick shares will have the opportunity to participate in the global operations of Barrick and will continue to have an interest in the advanced stage Pierina gold property," he added.



ELKO Business Briefs

ELISE Thorsen, owner of H&R Block in Elko and Wendover, and tax preparer Mary Catledge recently received their certificates of enrollment from the Internal Revenue Service. The certificates allow them to represent their clients before the IRS, Thorsen said. They must be renewed every three years, and Thorsen and Catledge will need to complete a number of continuing education courses during that period to continue to renew. Thorsen said they had to complete a two-day exam in Salt Lake City to qualify for the certificates. Catledge has been with the Elko office for 10 years, Thorsen said. The Elko office is located at 1042 Commercial St. The phone number is 738-4026.

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BAUR Financial Reports Inc. issued its rankings of Nevada banks effective this month, using five stars as the highest rank. The ratings for banks serving Elko include: Bank of America Nevada, four stars, same as the previous quarter based on data as of March 31; First Interstate Bank of Nevada, three and a half stars, same as last period; Great Basin Bank, five stars, same as last time; Nevada Bank & Trust Co., four stars, same as last time; Nevada State Bank, five stars, same as the prior quarter; Norwest Bank of Nevada, three stars, down from five; U.S. Bank of Nevada, four stars, same as last time. Baur, which is based in Coral Gables, Fla., uses a complex formula for its star ratings, including current capital levels, profitability, historical trends, loan delinquencies, repossessed assets, reserves, regulatory compliance and asset quality.

ATLAS Corp. reported a net loss of $2,989,000, or 15 cents per share, for the second quarter ended June 30, compared with a net loss in the same quarter of the previous year of $13,341,000, or 72 cents per share. The loss that year included an $11,419,000 writeoff in the equity investment in Granges Inc. based on revaluation after the May 1, 1995, amalgamation of Granges Inc. and Hycroft Resources and Development Corp., Atlas reported. The loss for the second quarter of 1996 includes general and administrative expenses of $1,635,000 and an equity loss on the investment in Granges Inc. of $1,026,000.

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NORWEST Corp. has awarded stock option grants for the company's more than 50,000 regular employees across the United States, Canada, the Caribbean and Central America, including the 959 Norwest employees throughout Nevada. "We've achieved eight consecutive years of record earnings. We've grown rapidly into a diversified, national financial services company. We're on the threshold this year of earning more than $1 billion in net income a year for the first time in Norwest history," said David P. Downs, president and chief executive officer of Norwest Bank Nevada. Eighty-five percent of Norwest employees own stock in the company, with a market value of more than $1 billion. Full-time employees receive a Norwest stock option grant of 100 shares; part-time employees a grant of 50 shares. The options were granted at Norwest's closing stock price on June 23, $33.125 a share. If Norwest stock reaches $60 a share, or in five years, whichever comes first, employees become vested and can exercise their grant, the company reported.

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BATTLE Mountain Gold Co. confirmed it held preliminary discussions with its 50.4 percent-owned subsidiary Niugini Mining Limited that may lead to an offer for the shares that BMG doesn't own. BMG Chairman Karl E. Elers said the talks were part of a review of its strategic alternatives regarding NML. Elers also said the company regrets recent inaccurate statements about discussions last year concerning a possible combination of BMG and Mt. Edon Gold Mines (Aust) Ltd. Those talks, which contemplated a stock-for-stock transaction, were terminated primarily as a result of a 20 percent drop in BMG's share price during the negotiation period, he clarified. No further discussions between Mt. Edon Gold and BMG are planned, he said.

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CITIZENS Utilities' Board of Directors declared a 1.6 percent third-quarter stock dividend on the company's outstanding Series A and Series B common stock, payable Sept. 30 to shareholders of record on Sept. 3. Leonard Tow, chairman, stated that the stock dividend has a cash equivalent of 18⅜ cents, representing an increase of 6 percent over the 1995 third-quarter adjusted stock dividend cash equivalent of 17⅜ cents. Tow noted that stock dividends for the first three quarters of 1996 have a cash equivalent of 55¼ cents, which is 6 percent higher than the adjusted stock dividend cash equivalent of 52¼ cents for the corresponding period in 1995. Tow also said the stock dividend rates for the first three quarters of 1996 totalled 4.8 percent, compared with 4.6 percent for the 1995 corresponding period.

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CITIZENS Utilities Vice President and Treasurer Robert J. DeSantis announced that Duff & Phelps Credit Rating Co. has initiated securities rating coverage on Citizens by assigning a AA+ rating to the company's senior unsecured debt and industrial development revenue bonds and a D-1+ rating to its commercial paper. Duff & Phelps has also assigned a AA rating to Citizen's Equity Providing Preferred Income Convertible Securities. Citizens is one of 11 telecommunications companies and one of 16 utility companies to have been assigned a rating of AA+ or better by Duff & Phelps. "We are extremely pleased that Duff & Phelps has initiated ratings coverage on Citizens' long-term debt and commercial paper," DeSantis said.

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WESTERN Farm Credit Bank and its 27 affiliated associations in California, Hawaii, Arizona, Nevada, Utah and Idaho reported second-quarter 1996 combined earnings of $21.7 million, compared with $17.3 million in the same quarter a year ago. The stronger earnings were bolstered by an increase in loan volume of $381 million, or 9 percent, since the end of the same quarter last year, the news release states. "The significant increase in loan volume and continued strong earnings are indicative of a healthy Farm Credit System in the West," said James M. Cirona, president and chief executive officer of the Western Farm Credit Bank. Highlights of second quarter results include a report that total problem loans have decreased to $97 million, or 2 percent of loans, down from a high in the middle 1980s of $1.1 billion. The decrease is due primarily to improving borrower financial condition and continuing efforts by district institutions to work with financially stressed borrowers, Cirona said. He also reported that on June 30, the district's allowance for loan losses stood at $129 million, down from $153 million a year ago, and the district reported a strong capital position of $926 million (16.5 percent of total assets), compared with $870 million a year earlier (16.7 percent of total assets). The Western Farm Credit District is part of the Farm Credit System, a national network of borrower-owned agricultural lending institutions.

The Free Press *welcomes news about area businesses. Announcements about new businesses, business expansions or moves, new professional offices, new employees, retirements or employee promotions may be mailed to the* Free Press *3720 Idaho St., Elko 89801; the telephone number is 738-3118, and the fax number is 738-2215.*

ECVA may bring nearly $9 million to Elko area

Elko should see a nearly $9 million benefit from convention-related activities held at the Elko Convention Center this year, said the center's marketing director, Alyson Kazanis.

She estimates that $8,921,712 will be brought into Elko by the 425 events and meetings held or scheduled at the Elko Convention Center in 1996. Kazanis said she reached this estimate based on attendance at the events, average room prices and the average $125 expense per day.

June was the biggest month, with $2,623,375 brought in that month, which is the time of the Elko Mining Expo, her figures show.

"Few people realize the incredible impact that conventions and tourism have on our local economy," she said.

"Direct benefits go to owners and employees of tourism related businesses. Indirectly, each citizen benefits because every dollar tourists spend increases our tax base," Kazanis added.

For example, last week's convention of the Oregon-California Trails Association drew more than 600 people, of whom about 550 were from out of town, she said.

She told the Elko Convention and Visitors Authority earlier this week that these visitors stayed an average of five nights each, infusing about $130,000 into the Elko hotel/motel industry.

Figuring average expenses of $125 a day per person, Kazanis said the visiting convention participants had a $373,000 impact on the economy of Elko, not counting hotel rooms.

Usage of Elko's Convention Center has increased each year, with dramatic increases noted for the last several years, Kazanis said.

In addition to promoting and producing conventions, the ECVA also promotes tourism to travel agents, tour operators and family travel through advertising and trade shows, she said.

On the average, the ECVA sends out more than 100 tourists packets each month to individuals and travel agents interested in visiting this area, Kazanis reported.

"Results from these types of promotions are more difficult to track, however, we are experiencing a tremendous increase in interest for our area from all over the United States and internationally as well," she said.

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BLM says claim holders to file occupancy forms

U.S. Bureau of Land Management is requiring all individuals who occupy mining claims to file an occupancy form, according to a news release.

This form is part of a final rule that gives BLM managers the administrative tools they need to stop illegal occupancies on mining claims, the BLM explained.

Claimants may obtain and file the occupancy form at local BLM offices. The form consists of a few simple questions and requires a signature, the agency said. It must be filed by Oct. 15.

Claimants occupying a mine site may receive a one-year grace period to come into compliance with the new use-and-occupancy mining claim rule, the BLM also noted. The grace period is part of the final rule that the BLM published in the *Federal Register* on July 16.

Under the rule, an illegal occupant is defined as someone who resides on a mining claim on BLM-managed land while using that claim for nonmining purposes. The rule permits those persons who are engaged in legitimate mining operations to continue their residency on mining claims.

Under the new rule, mining claimants on BLM lands may continue their occupancies for one year after the date the final rule became effective, Aug. 15, providing that they meet certain requirements.

The BLM said any claimant whose activities are not reasonably related to mining and whose activities pose a threat to health, safety or the environment will not be allowed to remain on BLM-managed land during the one-year period.

The BLM is also reminding mining claimants that Aug. 31 is the deadline to pay the maintenance fee on each mining claim, mill site or tunnel site they wish to hold on public lands in the 1997 assessment year.

A miner with 10 or fewer claims, nationwide, may be qualified for an exemption. If so, that certificate of exemption is also due on Aug. 31.

The payment of maintenance fees or filing of certificates of exemption for claims in Nevada can be sent to the Bureau of Land Management, P.O. Box 12000, Reno 89520-0006. Cash, check or credit card (Visa, MasterCard) are acceptable, the agency said.

Each payment should be accompanied by a written list of claim and site names and BLM serial numbers for which the maintenance fee is being paid. The state BLM office numbers are 785-6400 or 785-6500.

Alaska's sad salmon gl...

Something clearly has gone terribly awry in Alaska. Millions of salmon are being thrown away while elsewhere in the nation and world charities are struggling to feed the hungry.

This massive waste of food is shameful. Surely there's a way to get Alaska's surplus salmon to those in need.

Alaska's embarrassment of riches is caused by a complex set of factors. Worried that wild salmon fish runs were declining, Alaska officials built numerous hatcheries – with below-market loans. It worked too well because the wild stocks also increased, and this year they all came home together. In addition, the increase in the number of fish farms in Norway, Chile and Japan has helped depress salmon prices year around.

The abundance lowered the price of salmon to the point that fishermen say they can't make any money selling it. Alaskan law says it's illegal to "wantonly waste" fish, but the hatcheries received permission to destroy returning salmon.

Michael O'Callaghan, whose charity Earth brought 40,000 pounds of salmon to feed the hungry in Washington state this year for 3 cents per pound, has offered to move the fish for that price. But he's had no takers yet.

Geron Bruce, special assistant to the Commissioner of Fish and Game, summed up the situation by saying: "It's not something we're proud of or something we want to repeat."

We certainly hope not.

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The New York Times

National Forests: Going, Going . . .

The forests are sanctuaries not only of human life but also of the human spirit. And every tree is a compact between generations.

So declared President Bush in 1989. Yet Mr. Bush has done little more than his indifferent predecessor to stop the devastation of these sanctuaries. Logging in the national forests continues at a furious pace. And neither the President nor Congress has tried to strike a fair compromise between the needs of nature and industry.

Last week, two senior Forest Service officials with responsibility for millions of public acres told Congress they had been kicked out of their jobs for resisting orders to increase the timber harvest that they felt were environmentally unsound. Their defiance, they said, provoked the wrath of the timber industry and the White House.

Such charges of industry favoritism are a further embarrassment to an Administration still smarting from the spanking it got in May from U.S. District Judge William L. Dwyer of Seattle. Accusing the Administration of a "deliberate and systematic refusal" to comply with laws protecting wildlife, he banned further logging in parts of the old-growth forests of the Pacific Northwest until Federal agencies produced an effective protection plan for the endangered spotted owl.

Congress is now seeking a compromise to the old-growth dispute. But it obviously has a much bigger task: the need to rethink the purpose of the national forests and the role of their designated stewards, mainly the Forest Service.

Historically, Federal policy has favored exploitation of the national forests, which provide roughly 15 percent of the nation's wood. The Forest Service has long been in the business of selling timber. In 1976 a worried Congress adopted the National Forest Management Act, which urged the service to treat the forests as valuable ecosystems by balancing wilderness and industry values.

Yet the trees kept falling. One reason was that a big chunk of the service's budget comes from selling timber. Perversely, some of its conservation programs — erosion control and plant and animal inventory — are funded by timber sales. As a result, the service assigns targets to each of its nine national forest regions, rewarding forest managers who meet their "cut."

It's a cozy deal for industry because the timber harvested from public land is cheap. The Forest Service picks up road construction and other costs. That, of course, creates artificially low prices, reduces incentives to harvest private land and further increases the pressure on public lands. But loggers love it.

The Government has been equally solicitous of industry in the Pacific Northwest, whose majestic old-growth forests are coveted by loggers. These forests are also home to the spotted owl, and for years, conservation groups — as anxious to save the forests as they were the owl — urged that the bird be listed as a threatened species.

The Reagan Administration dawdled, knowing full well that if it protected the owl it would also have to protect its habitat. And when Mr. Bush reluctantly agreed to list the owl in 1990, his aides torpedoed an interagency plan to set aside millions of acres to protect the habitat.

That's what set Judge Dwyer off. He acknowledged the complexity of the issue and the hardship his decision might cause for logging families, whose anxiety borders on desperation. Yet he found it inconceivable that "the mightiest economy on earth" could not find a way both to manage its irreplaceable old-growth forests and ease the pain for workers, families and communities.

Judge Dwyer is right. But the courts are not the place to set policy in the Northwest or anywhere else in the national forest system. That is a job for the "environment President" and the Congress. And so far, both have failed.

October 5, 1991

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"All the News That's Fit to Print"

The New York Times

National Edition

Florida: Some sunshine south, mostly cloudy central and north. Scattered strong thunderstorms all sections. Highs 70's central and north, lower 80's south. Weather map, page 24.

VOL. CXLVII . . . . No. 50,992 Copyright © 1997 The New York Times SUNDAY, NOVEMBER 30, 1997 Printed in Florida FOUR DOLLARS

Where Water Is Power, the Balance Shifts

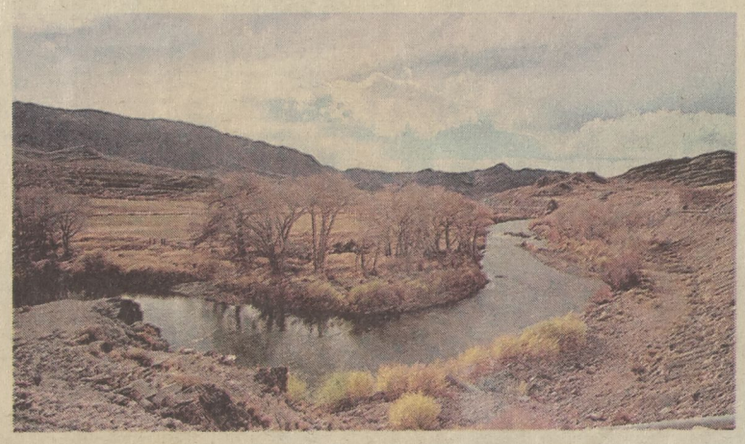
Photographs by Peter DaSilva for The New York Times

A fisherman on the Truckee River in Reno, above, which benefits from the new Government diversion of water to fish runs and new communities. The river winds north to empty into Pyramid Lake.

By TIMOTHY EGAN

PYRAMID LAKE, Nev., Nov. 26 — Over the last century, the American West was remade with exclamation points. Free Land! Unlimited Water! No Chance of Failure! So went the trumpeting in the dust as the Federal Government tried to build an oasis civilization in the driest part of the United States.

Now, a major corrective is under way as the Government tries to undo some of what billions of tax dollars have done. More than ever, water still shapes destiny, but it is changing hands now, without bands blaring, cameras rolling or [illegible]ers promising riches.



And the exchange in power is no less dramatic. From the Colorado River to California's Central Valley, water from the subsidized farms and playgrounds created by Government irrigation is being diverted to nearly extinct fish and wildlife, long-forgotten Indian tribes and cities that barely exist[illegible]hen the big dams and canals [illegible] built.

Perhaps the most significant of the efforts to alter the balance of power in the arid lands is taking place here on the Truckee River in northern Nevada, site of the nation's first major Federal irrigation project, and one of the most fought-over streams in the country.

Flowing out of Lake Tahoe on the California-Nevada border, the Truckee runs down the east slope of the mountains, trickles through fast-growing Reno, is diverted to farmers in the desert and ends its 105-mile ride at Pyramid Lake, where Paiute Indians have lived for at least a thousand years.

Until recently, most of the river's water was siphoned off to alfalfa and cattle ranches created by Government enticement 80 years ago in the middle of the high desert east of Reno. Now, the Government is buying back much of that water and giving it to the Pyramid Lake Paiute Indians, to projects to restore fish runs and once-bounteous wetlands, and to new communities in Nevada, the fastest-growing state in the nation.

The farmers feel betrayed, comparing the Government to the mob. Indians say they are getting some measure of repayment for lost wa-

Continued on Page 16

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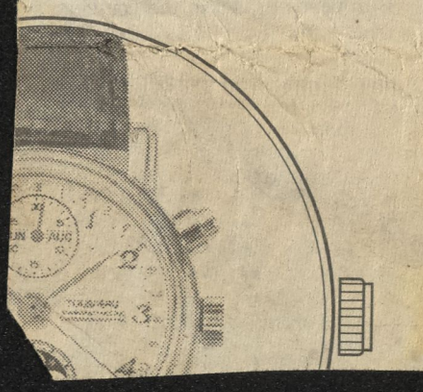


News Summary

INTERNATIONAL 3-8

Asian Economic Stresses May Ripple Into Politics
As its juggernaut stumbles, Asian frustrations could develop into upheavals in politics and social life. The threat is causing apprehension in many countries. 1

OPEC Plans More Output
OPEC raised its oil production ceiling by 10 percent, despite fears within the group that the increase might hurt prices. But the increase is not as big as it appears, because the previous ceiling was widely violated. 4

Turmoil in Prague
The Czech Government was on the verge of collapse after the Prime Minister was linked to a political slush fund. 4

Indians Parties Try to Regroup
India's main political parties maneuvered feverishly to cobble together a coalition to replace the 14-party Government that collapsed on Friday. 5

Political Surprise in Taiwan
Taiwan's governing Nationalist Party suffered surprising losses in local elections. 6

The Divide in Kyoto
A key issue at the talks on global warming beginning Monday will be burden-sharing between rich and poor. Yet there is hope that the divisive issue might be resolved. 6

Challenge to Congo's Leader
Six months in power, Laurent Kabila's Government faced its first direct challenge, in shootouts that killed as many as 20 people. 4

Germany's Melting Pot
Almost 9 percent of Germany's population are foreigners, the highest rate in Europe. But Germany is far from acknowledging the fact. 3

NATIONAL 10-24

Plans to Test Medicines In Children Draws Dissent
Opposition has erupted over a proposal by President Clinton that would require drug companies to test their products in children before putting new medicines on the market. Mr. Clinton says such studies will improve health care for children, but drug companies say the proposal would needlessly put thousands of children at risk. 1

Closing a Tap for the West
From the Colorado River to California's Central Valley, water from the subsidized farms and playgrounds created by Government irrigation is being diverted to nearly extinct wildlife, long-forgotten Indian tribes and cities that barely existed when the big dams and canals were built. 1

Trucks Favored by the Law
If most sport utility vehicles, pickup trucks and mini-vans were classified as cars, they would violate Federal standards for pollution and gasoline consumption aimed at protecting the environment and conserving energy. Instead, lawmakers have granted special favors to makers and buyers of light trucks. 1

A Cookie Jar on Wheels
There has never been a human fatality or serious mauling by a black bear in Yosemite National Park. There have been, however, 600 car break-ins this year, causing over $500,000 in damage, from bears drawn by careless campers who leave food on seats and in trunks. 10

Gay Foster Parent Debate
A Texas child welfare supervisor's decision to remove a baby boy from the care of a foster parent who is a lesbian has focused attention on a 118-year-old state statute that makes homosexual activity a crime. 1

NEW YORK 27

Investment Fraud Spreads
Investment fraud is spreading across the country, with New York at its center, according to law enforcement officials and securities regulators. The fraud involves the sale of marginal companies' low-priced stocks to amateur investors who are besieged by telephone sales calls While the victims are usually told that the company in question is the next Microsoft or McDonald's, the shares they buy often turn out to be worthless. 1

Brooklyn's Woodlands
Brooklyn's last forest, which is in Prospect Park, is being restored to the "rich, dark, cool" woodland envisioned by the park's designers, Frederick Law Olmsted and Calvert Vaux. The project, which has already cost New York City $6 million, and on which it may spent $2 million more, includes rustic bridges, three waterfalls and thousands of new plants, trees and shrubs. 27

QUOTATION OF THE DAY

"Bears are smart, and some are very smart. My problems start when the smarter bears and the dumber visitors intersect."

STEVE THOMPSON, wildlife biologist for Yosemite National Park. [10]

OBITUARIES

Richard R. Ruopp
A president emeritus of Bank Street College and a specialist in early childhood education and d... who adapted up-to-date tec...gies for the classroom, was 65. 2

Jack Berry
A Tennessee-born New York business... and the last of the Florid... citrus barons who transform... th... industry in the 1960's, was 81.

Closing Tap That Fed a Thirsty West

Continued From Page 1

ter that caused the biggest natural lake in Nevada to fall by 80 feet, killed off a species of cutthroat trout and drained one of the nation's first wildlife refuges. And the city of Reno, given a guarantee of future water as long as it learns to conserve and clean the water it uses, is no longer talking about withering up in the desert.

As contentious as this replumbing has been, many of the people who control water policy say the Truckee plan is a model for the reordering of river systems now taking place from the Florida Everglades to the Platte River in the Plains to the Olympic Peninsula in Washington State. The driving idea is that natural systems, whether they be wetlands or salmon-spawning channels, deserve as much water as agricultural plats.

"The Truckee River is the most litigated river in the history of the United States, and if we can pull off this huge change in who gets the water, it shows that any place can do it," said Steve Bradhurst, president of the Truckee River Partnership, a group made of business, environmental and government representatives that is helping to guide the new water allocation policy here.

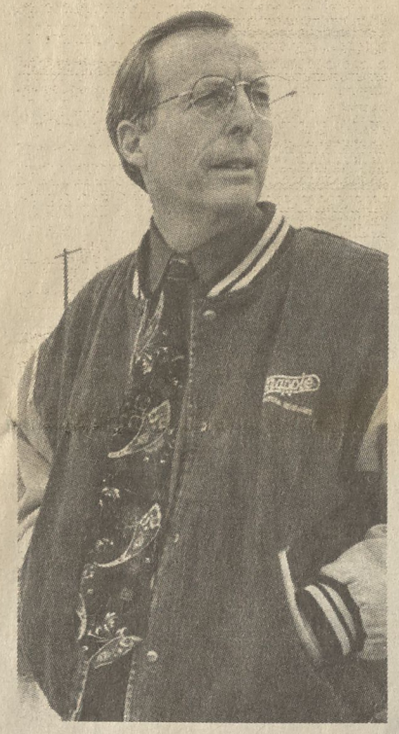
Many of the changes were started in the Bush Administration, but are being enacted, with buyouts, closing of dams and river restoration, during the Clinton Presidency. And just as it was when the Federal Government set out to dam, divert or straighten the major rivers of the West at the start of the century, there are clear winners and losers at the end of the century.

"I'm the first one to say that the Indians got the short end of the stick years ago," said Ted deBraga, a third-generation farmer near Fallon, about 50 miles east of Reno. "But now they're trying to do the same thing to us."

Mr. deBraga waved around a flier from 1914, when water was first being diverted from the Truckee to the flatland in the desert of northern Nevada. "The land is free," the flier from the United States Reclamation Service says. Water rights can be purchased through no-interest loans and are "permanent and assured."

Pyramid Lake and its cutthroat trout, the Indians and Reno, the little mining town that grew into a casino-cluttered city on the Truckee, were not even considered in the original diversion.

Pyramid Lake, though nearly as big as Tahoe, existed "only to satisfy the thirsting sun," said Senator Francis Newlands, the Nevada legislator who fashioned the 1902 law that transformed the arid West, beginning with the Truckee project.



Lyman McConnell heads an irrigation district fed by the Truckee.

In the desert, if a river runs through it, Government has trumped nature.

The project, named in honor of the Senator, diverted the Truckee from a dam through 32 miles of desert to a reservoir and then through 500 miles of canals to serve a small group of ranchers. It was the forerunner of the Hoover, Grand Coulee and Glen Canyon dams — some of the biggest public works projects ever built.

The Truckee diversion was an effort to create a garden West in places overrun by rattlesnakes and sage. It has never worked out as envisioned. The Newlands water was supposed to create 300,000 acres of farmland; today, there are barely 60,000. Similar predictions never panned out for the Columbia River or Colorado projects.

The cost to the environment was the loss of epic salmon runs on the Columbia, an altered shoreline through the Grand Canyon, the submerging of Glen Canyon and the extinction of the biggest of all American cutthroat trout — some weighed as much as 42 pounds — here in Nevada. The Truckee River essentially died, becoming an open sewer, and a bare trickle during drought years.

But recreational communities, ranchers, and subdivisions built around desert golf courses did follow the irrigated water here, as elsewhere in the West. And they are loath to give it up. "What did the taxpayers get for all this? They got economic development and growth," said Lyman McConnell, executive director of the irrigation district fed by water from the Newlands project.

The 4,000 farmers in the Newlands project used to get more than half of all the Truckee River water as it entered Nevada. Now, they are down to about a fifth of the allocation — still more than Reno-Sparks metro area, a community of more than 200,000 people, receives.

A similar reordering is under way in California. This year, about 800,000 acre-feet of water, well more than an entire year's runoff of the Truckee River near Reno, is being transferred from the big farms of California's Central Valley to help depleted fish runs in the San Joaquin and Sacramento Rivers. That amounts to 10 percent of the water in a system of 20 reservoirs and 500 miles that irrigates 3 million acres of farmland.

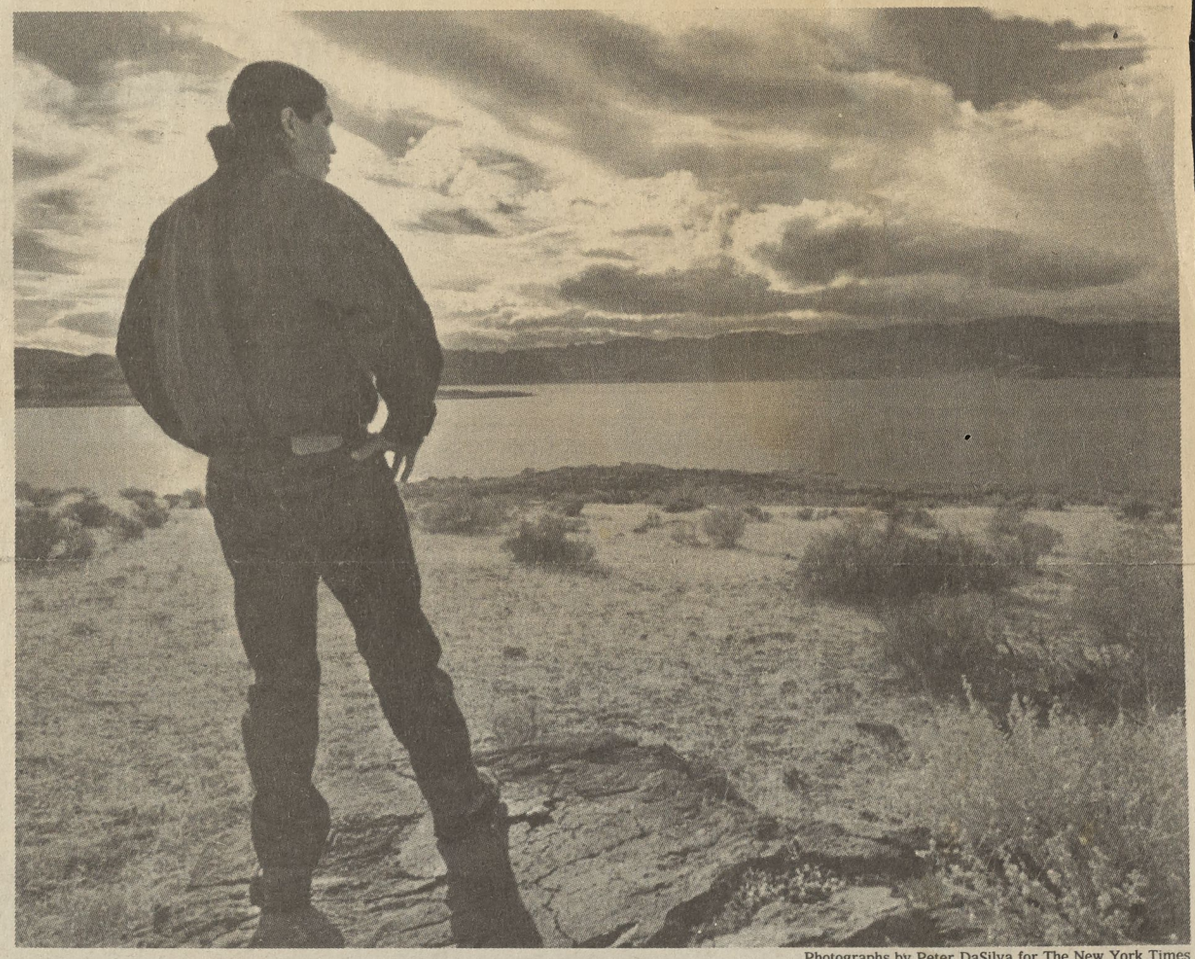
A plan started by Senator Harry Reid, Democrat of Nevada, and supported by all the big water users except the farmers, will likely further reshape water use well into the next century here in Nevada. It requires the Federal Government, the governments of California and Nevada, the Pyramid Lake Paiute Indian Tribe and the Sierra Pacific Power Company, which provides Reno's water, to sign on to a permanent design for Truckee River water allocation.

The biggest losers will be the biggest water users — the irrigated farms in the desert.

"Was it all a mistake? Is that what the Government is saying now?" Mr. deBraga said. "If it was, it's one the Federal Government made, not the farmers. This stuff is going on all over the West right now. And if we fall, everyone else will fall."

About 45 miles from the irrigated desert farmland, on the Paiute Indian Reservation, the tribe that was nearly wiped out by the diversions of the earlier part of the century has rebounded somewhat. There are new fish hatcheries for the cui-ui, a Pleistocene-era fish that was the foundation of the Paiute diet, and for a new strain of Lahontan cutthroat that has been reintroduced into the lake.

The lake level has come up, and recreation and fishing have brought jobs to the 2,000 or so members of the Pyramid Lake Paiute tribe. But a marsh that was full of birds and fish, called Winnemucca Lake, has disappeared because of the decades of lost water. It is a bare white alkaline flat, and dust swirls at its edges.



Photographs by Peter DaSilva for The New York Times

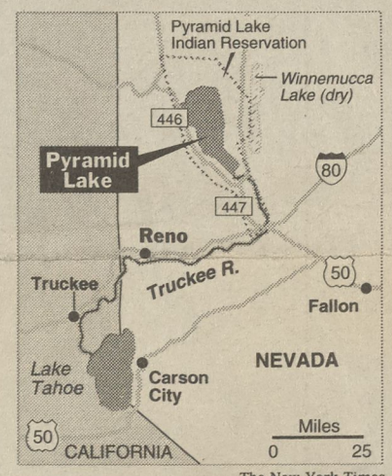
"We know that the white man is not going to go away and Winnemucca Lake is not going to come back," said Mervin Wright Jr., chairman of the Pyramid Lake Paiute tribe, which wants to reclaim Truckee River water.

Many Indians are still angry over the original diversions. They want all the Truckee River water that is being shipped to the ranchers put back in the river, as a clean source of water for the fish.

"We know that the white man is not going to go away and Winnemucca Lake is not going to come back," said Mervin Wright Jr., chairman of the tribe. "But we hope that once we sign on the dotted line sometime next year, there will be a permanent change for the better, and that all of our new friends will not then desert us."

The tribe, originally castigated by the city of Reno and the power company, has become an ally of those interests, and of environmentalists. All of them share the goal of trying to get back the Truckee's water from the irrigated farms. And the best legal leverage for that has been the long-ignored Indian water rights and stream requirements for bringing back endangered fish.

"For about 100 years it was everybody against the Indians," said Bob Pelcyger, the lawyer for Paiute water rights. "In a very short period of time, that's turned around. Now, it's everybody against the Newlands project."



The New York Times

Pyramid Lake, site of the nation's first major irrigation project.

On the land that turned green with diverted water, near the town of Fallon, the ranchers and new suburban home owners whose wells draw some of their water from Truckee River canal spills, many people still refuse to believe that they will no longer get the lion's share of the water.

Farmers say they feel betrayed by a shift in water policies.

"The Government is acting like the Mafia," said Mr. McConnell of the irrigation district. "A guy comes around and says 'Do you want to buy fire insurance?' You say no. Then they start a fire next door, and force you to buy fire insurance. That's how the Mafia works, but it might as well be the Government here in Nevada."

"This is all about power," said Mr. McConnell, who says the Newlands farmers are going to continue fighting to hold onto the water that was diverted to them more than 80 years ago. What the ranchers see as betrayal, however, the Indians see as justice and the city dwellers in Reno see as common sense. Asked about comments by the farmers that their interests were being sold out to satisfy a new water world, Mr. Wright, the Paiute tribal chairman, said, "What goes around, comes around."

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→ Fausch

Secrets of Siberia's White Lake

How we discovered a new species in a predator's stomach

by Mikhail Skopets

It was the last week in July; another fishery biologist and I were huddled in our little tent in the midst of thousands of miles of northeastern Siberian tundra. Heavy snows, driven by forty-mile-per-hour gusts, whipped our fragile shelter. We spoke little, listening to the whistling winds and the sounds of high waves crashing on the lakeshore twenty feet away. There were no trees or bushes we could burn to keep warm, but I was happy to be at this isolated spot I had long dreamed of exploring.

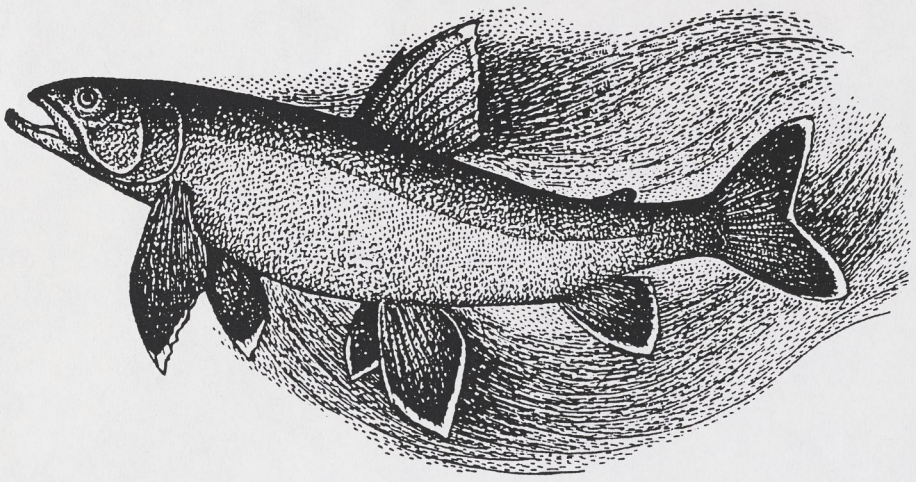
During my investigations into the distribution and ecology of salmonid fishes, which include salmon, chars, grayling, trout, and whitefishes, my home base had been the Institute of Biological Problems of the North, at Magadan, on the Sea of Okhotsk in eastern Siberia. A seaport built in the 1930s to supply the Kolyma gold mines, Magadan (population 150,000) is not reachable by any roads or trains from the rest of Russia, which we refer to as "the mainland." Unless you are willing to spend weeks on a slow, occasional freighter, the only way to reach it from Moscow is by an eight-hour airplane flight. During the summer of 1978, I was doing fieldwork in Chukotka, about 800 miles to the northeast of Magadan, when I heard from geologists and from the native Chukchi reindeer herders about an interesting site I should investigate. They told me of a remote lake that contained two species of char unlike any they had seen in other lakes.

The following year I persuaded our institute to fund a field helicopter for me to reach this lake, which is about an hour and a half by air from the nearest town. With two colleagues, I arrived on July 18, 1979, at Lake El'gygytgyn, which means "white lake" or "ice lake" in the local Chukchi language. For ten months out of the year, this lake is entirely covered by ice; in spring, it can be six feet thick. Only during July and August does the ice melt, although in colder years the lake is never entirely free of large chunks. It is among the coldest continental lakes in the world and can be compared only with Hazen Lake on Ellesmere Island in northernmost Canada. Near the lake's surface the temperature is always only about 34° F, and near the bottom it is no more than 36.5° F.

Fifteen hundred feet above sea level and surrounded by a ring of mountains, the circular lake is eight miles in diameter and 600 feet deep. Known to outsiders only since the 1930s, when it was first seen from the air, scientists at first thought it was a volcanic crater. In 1977, however, some geologists from Kiev demonstrated that the lake bed was actually an impact crater formed when a huge meteorite smashed into the mountains about 3.5 million years ago. Of the earth's meteor craters younger than 4 million years old, it is believed to be the largest.

Our little expedition lived in tents by the side of the lake for three weeks. That year in Chukotka the weather was very bad: two snowstorms in July and eight in August, sometimes with temperatures below zero. We found only one big predatory char, of a known species, and then my friends had to return to Magadan. I re-

"Boganid char" "S. boganidae" - same as L. labynkir (I believe) = alpinus



A male longfin char
Patricia J. Wynne

mained for another month, and by the first days of September, I had caught 200 specimens of a small char, which later turned out to be a previously undescribed species. During this period, the little char began to spawn and many ventured near the shore, where I easily caught them in my gill nets at a depth of only ten feet. In 1981 we published the description of these smallmouth char, *Salvelinus elgyticus,* which we named after the lake. This fish, we later found, lives on the sloping bottom, from the shoreline to a depth of about 300 feet, where it feeds only on zooplankton.

Near the end of summer, I used spin tackle and a lure (a perfectly respectable method of collecting scientific specimens) and caught a twelve-pound char. In its stomach I found some remains of small fishes and collected fragments of their skulls. Later, during the winter, I showed these bones to one of my colleagues, an expert in the morphology of salmonids. He told me some were from the smallmouth char, but that others were from a species he had never seen before. So now we knew that there was a third form of salmonid fish in this unusual lake—perhaps also unknown to science.

It took another six years before I was able to get the funds to return to Lake El'gygytgyn. On August 20, 1985, four scientists from our institute (with only one other ichthyologist, Igor Chereshnev) flew to the lake for a ten-day stay. Our only way of exit would be to float in an inflatable boat 250 miles down the single river outlet of the lake to the nearest village, racing to beat the onset of winter. I set my gill nets near the shore, but all I caught were the two species I had seen before: the large, predatory char and the smallmouth form we had discovered six years earlier. In the stomachs of the predators, I again found some partly digested bodies of the third, unknown species. We were really excited because we felt we were closing in on the creatures, but these decomposing corpses were not complete enough for a good scientific description.

It occurred to me that perhaps these elusive fish lived only at a great depth, where they were eaten by the big char, so I determined to set my gill nets more than 200 feet deep. In the morning, in the midst of a windstorm, I went out about half a mile in the inflatable boat to locate my buoy marker. I had some difficulty pulling the nets up but was overjoyed at what I found: about sixty individuals of the unknown species, a salmonid with very unusual body shape and colors.

Without the distinctive feeding habits of the large predatory char, we might never have known of the existence of the elusive, deep-dwelling species. The lake is so cold that this large char, which catches its prey mostly at great depths, has developed the habit of coming up and staying near the warmer (43° F to 46° F) mouths of small tributaries in order to digest its food.

The ecosystem of this lake appears to be very simple. The food chain goes from algae to zooplankton, then to small fishes, and finally to big predatory fishes—an ecosystem similar to that of the open ocean; most lakes have more complex systems, involving fishes that prey on bottom-dwelling invertebrates.

Later, we discovered that the predator's dinner, of which we now had scores of undamaged examples in our nets, belonged not only to a new species but to an entirely new genus. Most genera of salmonids had been described in the nineteenth century; only one more had been added during the 1930s. Our newly discovered species was noteworthy not only for its shape and its place in the ecosystem but also because it may be the most primitive representative of its group. In 1990, after a detailed study of its anatomy, specialists concluded that the species is closer to the ancestors of chars than any other living salmonid.

Because of its ample fins, we gave it the name *Salvethymus svetovidovi,* longfin char. Our genus name, *Salvethymus,* indicates that it looks like something between a char and a grayling, although it is not a hybrid. Our largest specimen was only thirteen inches long and weighed about a pound, yet it was thirty years old—determined by counting the annual rings on the small stones (otoliths) in the inner ear.

Longfins live mostly beneath 200 feet of water and inhabit the entire lake, including its deepest part. They are near-bottom feeders that eat mostly zooplankton and sometimes small amphipods. While short-finned, long-bodied trout make fast, straight runs when feeding, the shape of the longfin char allows precise movements when capturing very small prey without moving far. Although they can spawn all year round, most longfin char lay their eggs in May and June, about 300 feet under the ice.

All the species in Lake El'gygytgyn are well adapted to extreme cold. During the periods of Pleistocene glaciations, Chukotka was not covered by ice shields as was North America, but developed patchy glaciers in valleys, like those in the present Himalayas or Rocky Mountains. Many of the region's lakes were carved by these local glaciers, but Lake El'gygytgyn's meteor crater was an exception. Under thick ice, but not destroyed by glaciers, its ecosystem has persisted without interruption for more than 3 million years, making it a sort of "lost world" preserve. In comparison, most Canadian lakes have ecosystems that have been functioning continuously for only 10,000 years or so.

When I brought some small lake invertebrates back to the institute, some of them, too, turned out to be previously unknown in the scientific literature. I was not surprised. □

Adventure

The Denver Post / Bob Saile

Jim Walsh measures the water-flow velocity at Chief Ouray Ranch.

Stream Team

The Denver Post / Bob Saile

One part of the prescription for saving a stream is dipping nymphs and larvae off bottom of stream to study richness of insect life.

Curing Ailing Waters Is the Doctor's Order for Trout

By BOB SAILE
Denver Post Outdoor Editor

GRANBY — Jim Walsh was about to make another cast with his fly rod, but he stopped and turned to say something. He had to speak loudly to be heard over the tumble of water past a rock barrier in the stream.

"Hear that?" he said. "The sound of running water. Psychologists will tell you that this particular sound is one of the most soothing to the human psyche that they know of. It's like listening to classical music."

Walsh pointed out across the ranch meadow, in the direction of U.S. 34, where trucks and cars were zipping past. They were making sounds not particularly soothing to the psyche. Except that we couldn't hear them.

"Before we did the work on this section of river, that's all you would hear — the sound of highway traffic," said Walsh, sending out a cast. "The river was so spread out and slow-flowing that it didn't make any sound." Walsh's fly was accepted deep in the hole below the rock ledge, and a 14-inch rainbow went through an impressive variety of acrobatics before Walsh landed and released it.

"The trout population has just about doubled since we changed things here," said Walsh.

He smiled, watching the trout disappear into the shadowy hole on the Colorado River downstream from Granby Reservoir. His expression was that of an artist reflecting on a work that has given him great satisfaction.

James F. Walsh, 33, of Longmont, isn't an artist. Not exactly, anyway. It could be said he is a doctor. Of sorts, anyway. One could stretch an analogy and say that he goes beyond remedial medicine and gets into the area of miracles. He attempts to bring the terminally ill back to robust life.

Walsh is the sole proprietor of an unusual business dealing in a futuristic service: Rehabilitating — by means of various types of construction, earth moving, revegetation and other means — trout streams that have fallen on hard times.

He calls his service "Stream Team."

Calling upon machines, laborers and consulting biologists such as Dr. Jay Windell, a professor at the University of Colorado, Walsh hires out to ranchers, developers, clubs, agencies or whomever finds themselves sitting up days with a sick stream. A stream, that is, in which the trout are and have been declining, for reasons that are all too common in today's world.

The Denver Post / Bob Saile

The donkey isn't part of the team — only a curious bystander while Walsh does his work.

The stretch of the Colorado that Walsh rehabilitated with two weeks of intensive work back in the autumn of 1981 consists of 1.5 miles on the Chief Ouray Ranch, which lies between U.S. 34 and the dam at Granby Reservoir.

He hired out to partners in the ranch property, scooping out holes for trout resting and hiding places, constructing rock and earthen deflectors and ledges, uprooting willows and replanting them, and generally relocating or enhancing what he refers to as the "thalweg."

Translated, that means he improved the low-flow channel — that part of the stream bed in which most of the water flows when the river is at is lowest ebb.

"The trouble here has been that the dam keeps the river at such low and constant flows that what they were getting was a stream 50 feet wide and 9 inches deep, with not enough flushing action to get rid of the silt that had built up," explained Walsh. "Then they had livestock in here along the stream and they were wearing down the banks, causing erosion. What we did was essentially deepen the channel in places and bring the banks and vegetation in tighter, while creating some dams and deflectors to bring back a riffle-pool-riffle effect."

Walsh, a Colorado resident since 1975, has been a driving force in Colorado Trout Unlimited affairs. He put aside a contracting and real estate business to form "Stream Team" in 1980 after being project leader on the noted stream-improvement work the St. Vrain Anglers did on a section of the St. Vrain River.

That work was done on a section of the stream which had been designated catch-and-release in an attempt to bring back the trout population.

"We studied that water and we discovered a simple truth," Walsh recalled. "You can release all the trout in the world, but if they've got no protection, no cover, and no good feeding areas, it does no good in the long run."

Walsh realized that the potential existed to take stream rehabilitation work out into the private sector.

It is a costly service, at $6 a running foot of stream, or $30,000 a mile, but to the the sort of clients Walsh seeks, it's worth it. He has finished one other job on Cataract Creek near Green Mountain Reservoir, is in the midst of another on the North St. Vrain and has several others in the planning stage.

The ailments Walsh diagnoses in Colorado streams have to do with things like road construction beside or across stream banks, over-grazing of the fragile riparian environment, water diversion or "de-watering" of streams, and channelization of stream beds.

"Stream Team" is building business slowly, mostly by word of mouth, said Walsh. His efforts have not received the publicity given to another stream "doctor," Rich McIntyre of Bozeman, Mont., whose story was told in the May issue of the Smithsonian Magazine.

The magazine depicted McIntyre as running the only company of its kind in the United States, but Walsh notes that there are at least half a dozen individuals or companies doing private stream-improvement work.

Walsh has met with some skepticism on the part of professional fish biologists in government agencies, as has McIntyre. But Walsh sees his work "dove-tailing" in future years with those agencies. Already, he must cooperate with them to secure the incredible number of official sanctions and permits necessary to alter stream beds anywhere they exist.

Some observers view Walsh's relatively new service as the environmental-planning profession of the future, if trout streams are to be saved.

"It's funny," he said, "I had a dream not too long ago. I dreamed I was up on a huge space-station sphere somewhere in space and I had been appointed caretaker of a salmon river they had built around the entire girth of the sphere.

"A guy came up to me and asked how things were going with the salmon, and I said, 'Real well — they're on their spawning run and they've already made two loops.' "

The Denver Post / Bob Saile

The job is done. A stretch of the Colorado River at the Chief Ouray Ranch is healthy again.

SPORTS DIGEST

Marvis Frazier Signs For Shot at Holmes

Denver Post Wire Services

Marvis Frazier, son of former heavyweight champion **Joe Frazier**, has signed to fight **Larry Holmes** for reportedly close to $1 million, promoter **Murad Muhammad** said Wednesday.

Frazier is unbeaten in 10 pro fights. Holmes, the World Boxing Council heavyweight champion, is 43-0 and has made 15 defenses.

Holmes had said last week that he had signed for $3.1 million to defend against Frazier for Muhammad and **Robert Andreolli** of Providence, R.I.

The champion has been told by the WBC that he must sign before the end of July to make a mandatory defense against No. 1-ranked **Greg Page**. If he doesn't, he could have title recognition withdrawn.

Holmes has sent a telegram to the WBC for extension on the mandatory defense, Muhammad said. But both Holmes and Muhammad said the fight against Frazier will take place even if the WBC withdraws title recognition.

The fight will be scheduled for 15 rounds and be held in September or October, possibly in Atlantic City, Muhammad said.

Football

A Cincinnati plumber was convicted in U.S. District Court for distributing cocaine, including sales to Cincinnati Bengals football players **Pete Johnson** and **Ross Browner**. A 12-person jury found **John F. Schultz** guilty of 20 drug-related charges. Johnson, the Bengals' all-time leading rusher, and Browner, a defensive end, both testified that they had bought drugs from Schultz many times. Johnson and Browner were given informal immunity by the U.S. Attorney's office in exchange for their testimony . . . **Curt Warner**, the Penn State running back who was the Seattle Seahawks' first-round choice in the 1983 NFL draft, has signed a series of one-year contracts with the club . . . The Baltimore Colts may lose second-round draft choice **Vernon Maxwell**, a linebacker from Arizona State, but owner **Robert Irsay**, who has withdrawn his offer, said "we'll survive." Maxwell's agent, **Bob Cohen**, said he would continue talks with the Arizona Wranglers of the U.S. Football League . . . The International Football League, a second 12-team, spring-summer operation, will formally announce today plans to begin play in 1984 with a 16-game regular season.

Baseball

The Detroit Tigers' former American League rookie of the year, **Mark "The Bird" Fidrych**, announced his retirement, less than two years after attempting a comeback with the Boston Red Sox. He was 2-5 this season with a 9.68 ERA at the Red Sox's Triple-A team in Pawtucket, R.I. . . . **Steve Howe**, the Los Angeles Dodgers relief pitcher who has been treated twice because of an admitted drug problem, has been fined one month's pay, about $54,000, the team announced. The decision was reached "in coordination and consultation with the commissioner's office." The Dodgers also said that Howe had been placed on a three-year probation but that Howe was being activated immediately . . . Also coming back off the disabled list are Kansas City third baseman **George Brett**, activated Wednesday, and St. Louis Cardinals outfielder **Lonnie Smith**, who admitted to drug abuse on June 11 and is eligible to return to the club Saturday.

Quote

ABC baseball broadcaster **Al Michaels** on the $7,000 satellite dish he had installed at his home in Menlo Park, Calif.:

"I've got the Mercedes of systems. For a sports fan, it's the ultimate toy. It's the best of all possible worlds for me. If the house ever crumbles in an earthquake, the first thing we're going to rebuild is the dish."

Today's Calendar

BASEBALL — Omaha Royals vs. Denver Bears, Mile High Stadium, 7:35 p.m.
TENNIS — Denver City Open, Denver Tennis Club; Hilton Harvest House junior open, Boulder.
GOLF — PGA Adult Academy, Vail; PGA Junior Academy; Colorado Women's Stroke-Play Championships, Lakewood Country Club; Broadmoor Women's Invitational, Broadmoor, Colorado Springs.
HORSE RACING — Thoroughbreds, Centennial Race Track, Littleton, 2 p.m.
GREYHOUND RACING — Mile High Kennel Club, 8:15 p.m.; Pueblo Greyhound Park, Pueblo, 8:15 p.m.

WESTERN OUTDOORS

Operation Game Thief Gets Results

By BOB SAILE
Denver Post Outdoor Editor

Operation Game Thief, the tipster-reward program designed to come to grips with the steadily growing problem of big-game poaching in Colorado, will be 3 years old this September.

Since its September 1980 inception, the program has resulted in the successful investigation — and usually prosecution — of almost 200 poaching cases in which 261 violaters were involved. The conviction rate in these cases has been roughly 95 percent, according to Bob Leasure, who runs the program at the Colorado Division of Wildlife. Some $40,000 in reward money has been paid out to persons who telephone anonymous tips to the division's Denver office (295-0164 in Denver; 1-800-332-4155 in the rest of Colorado).

Operation Game Thief, as the result of opposition in the Colorado Legislature to state funding of a reward program, gets its reward money from private contributions. The program now has $7,000 in unobligated dollars for reward purposes, enough to carry it through the fall big-game seasons if nothing more came in.

Those who want to contribute to the program can do so by mail to Operation Game Thief, Colorado Division of Wildlife, 6060 Broadway, Denver, Colo., 80216. A bigger reward pot not only would insure the program of a long-term future, but also make it possible to increase the amounts of the rewards for various violations. Colorado now pays about half what New Mexico does — as an example, the reward is $250 here on an elk-poaching case; in New Mexico, it is $500.

Early Bird Dates

In the it's-later-than-you-think category, dates for the early bird-hunting seasons will be set by the Colorado Wildlife Commission at its meeting July 7-8 in Steamboat Springs. Seasons to be established include those for doves, snipe, band-tailed pigeons and teal ducks. The earliest of those seasons will be for doves. It will open Sept. 1, which is a Thursday.

Stream Panel

For those with a yen to become better acquainted with the trout streams here in their figurative backyards, a panel discussion set for the evening of July 6 is of more than passing interest.

The discussion will involve several expert fishermen in the West Denver Chapter of Trout Unlimited. It is set for 7:30 p.m. at 5725 Teller St. and is free to the public. Streams to be covered include Clear Creek, Bear Creek, the Cache la Poudre, the Frying Pan River, the Roaring Fork and the streams in the North Park area and the Estes Park area.

FISHING REPORT

NORTHEAST REGION
Lakes and Reservoirs

Big Creek Lake — Water high, clear. Fishing fair with bait.
Black Hollow Reservoir — High, muddy. Poor.
Boedecker Reservoir — High. Poor.
Boulder Reservoir — High. Poor.
Boyd Lake — Fair to good for walleye.
Brainard Lake — Inaccessible.
Carter Reservoir — High, clear. Fair.
Chambers Lake — High, roily. Fair.
Chatfield Reservoir — High, roily. Poor.
Clear Lake — High, roily. Poor.
Copeland Lake — High, clear. Good.
Delaney Butte Lakes (all three) — High, clear. Fair. East/North with flies, lures; South with bait.
Echo Lake — High, good.
Flatiron Lake — High, clear. Fair.
Hohnholz Lake 1 and 2 — High, roily, fair. Camping at Laramie River only.
Hohnholz Lake 3 — High, roily. Poor. Flies/lures only.
Horseshoe (Loveland) — Fair/good.
Jackson Reservoir — High, roily. Poor.
Jumbo Reservoir — High, roily. Poor.
Lake John — High, roily. Poor.
Lamamie Lake — High, clear. Poor. Road bad.
Lonetree Reservoir — Poor.
Lon Hagler Lake — Fair lake trout.
Lost Lake (Chambers) — High, clear. Fair.
Mary's Lake — Normal, clear. Fair.
McCall's Lake — Normal, clear. Fair.
North Michigan Lake — Poor/fair, with flies, lures.
North Sterling Reservoir — High, Fair. Lots of algae.
Peterson Lake — Road closed
Pinewood Reservoir — High, clear. Fair.
Prewitt Reservoir — High, roily. Poor.
Ranger Lakes — Good with bait.
Red Feather Lakes:
Belaire — High, roily.
Creedmore — High, clear.
Dowdy — High, roily.
Lost — High, clear. Fair/good.
Parvin — High, roily. Poor/fair.
West (Twin) — High, roily.
Seymour Lake — High, clear.
Smith Lake (Larimer County) — High, clear. Good with bait.
Wellington Reservoir 3 — High, clear, poor.
Wellington Reservoir 4 — Normal, clear, poor.
Zimmerman Lake — Frozen.
Long Draw — Frozen.
Barnes Meadow — Normal, clear. Fair with bait.
Slack Weiss — High, clear. Fair with bait.

Rivers and Streams

Big Thompson River — High, roily. Poor.
Laramie River — High, roily. Poor.
North Park Streams — High, muddy. Poor.
South Platte River (Cheeseman to Waterton) — High, roily. Poor.
Poudre River — High, muddy. Poor.
St. Vrain River — High, roily. Poor.

NORTHWEST REGION
Lakes and Reservoirs

Avery Lake — High, muddy. Poor/fair.
Beaver Lake (Marble) — High. Fair for brookies.
Bonham Reservoir — Fair. Road is open from Collbran to Bonham.
Cottonwood Reservoir — No. 1 and No. 4 — Frozen.
Deep Lake — Frozen.
Dillon Reservoir — High. Fair/good.
Granby Reservoir — High. Fair.
Grand Lake — High. Fair.
Green Mountain Reservoir — Fair.
Hahn's Peak — Fair/good. Mainly open.
Harvey Gap Reservoir — Normal. Fair. Well stocked.
Lake Pearl — Fair/good.
Mack Mesa Lake — Fair.
Mesa Lakes — Most are now open. Highway 65 open. Check locally for changing conditions.
Rifle Gap Reservoir — High, spilling, clear. Fair for walleye, rainbows.
Ruedi Reservoir — High. Poor.
Shadow Mountain — High. Fair.
Steamboat Lake — Clear. Good. All campgrounds open.
Sweetwater Lake — Fair for rainbows, brookies.
Sylvan Lake — Fair.
Trappers Lake (Meeker) — Outlet open, fishing fair.
Vega Reservoir — Full and spilling. Fair. Road is open and okay.
Williams Fork Reservoir — Fair.
GENERAL STATEMENT: Wheeler Lake, Corn Lake, Island Acres and Walker Wildlife Area are now part of the Colorado River. Walker Wildlife Area is closed to boating.

Rivers and Streams

All are high, roily/muddy, fishing poor. Extreme caution is urged.

SOUTHEAST REGION
Lakes and Reservoirs

Most high lakes still frozen and inaccessible. Check locally
Antero Reservoir — Fair/good. Best from boats with assorted baits, hardware.
Bonny Reservoir — Fair for all species.
Clear Creek Reservoir — Fair.
Cottonwood Lake — Normal.
Jefferson Lake — Rising. Open. Check locally for road condition.
John Martin Reservoir — High. Fair for bass, channel cats.
Montgomery Reservoir — Full, open. Fair with salmon eggs.
Monument Lake (Trinadad) — Fair. Stocked.
Nee Noshe — Very high. Shore access limited due to high water.
No. Fork Reservoir (Ark.) — Frozen. Opening at inlet. Walk-in only.
North Lake — Fair. Stocked.
O'Haver Reservoir — Normal. Fair/good. Stocked.

SCATTERSHOTS

Camping Spots in Demand

For the upcoming July 4 weekend, camping spaces will be much in demand at state parks and recreation areas. The Colorado Division of Parks and Outdoor Recreation advises those who don't already have campsite reservations to arrive as early as possible to avoid getting shut out.

It's too late to make a July 4 campsite reservation; all reservations must be made at least 15 days in advance. But for future reference, a reservation can be made by calling the toll-free number 1-800-328-6338 and mailing $3 to the address which the caller will be given, or by paying the $3 in person at the Denver-area office of the reservation company, Tele Check, at 7510 W. Mississippi Ave., No. 100. The $3 is the reservation fee; it doesn't include the $4 or $5 that must be paid for the campsite itself.

Vinnola Pistol Winner

Robbin Vinnola of Arvada was the individual match winner at the recent Colorado State Outdoor Pistol Championships at the Arvada Rifle and Pistol Club range. The team match title went to the Cherry Creek Gun Club, with team members Robbin Vinnola, Joe Marosy, Jim Imes and Steve Tsutsumi.

Retriever Clinic

A training clinic for owners of hunting and field-trial retriever dogs has been set for July 9-10 at 1819 N. 119th St. in Lafayette. Instructors for the clinic, sponsored by the Rocky Mountain Retriever Field Trial Association, will be Jack and Cherylon Loveland. The basic fee will be $15 per person. Further details are available by calling 424-5929.

The Big Trout Contest
THE DENVER POST
DAVE COOK
Enter Today!
Enter Today!

HOOK BIG TROUT!
NET GREAT PRIZES!
*$20,000 in awards and fishing excursions
*14 Weekly contests to challenge your angling skills

GARY HILLSTEN
Holds Prize-Winning Trout

Gary Hillsten, 3120 W. Gill Place, netted a 7-lb, 2-oz. brown to win the sixth weekly Denver Big Post-Dave Cook Trout Contest. He used a nightcrawler to make the catch and wins a Campways 5-person boat, motor mount and Pflueger motor, plus a 3-day fishing expedition to Glenwood Springs in September.

Calvin Lepke, 14424 E. Colorado Drive, Aurora, finished in second place with a 6-lb., 8-oz. brown caught with nymphs at Secret Mountain Lake. He wins a Wright & McGill spin rod and reel, fly rod and reel, 100 yards of Stren line and a Floatmaster tapered fly line.

Third-place went to **Anthony Stand,** 6742 Estes St., Arvada, who hooked a 5-lb., 5-oz. rainbow at Lake John with flatfish to win a Fenwick Eagle graphite fly rod.

Nick Pinello, Colorado Springs, caught a 5-lb. rainbow with black daredevils in Eleven-Mile Reservoir. He wins a Daiwa mini-cast reel and 5-piece rod.

Bradley Hector, 3780 Garland St., Wheat Ridge, finished in fifth place with a 4-lb., 8-oz brown from Lake Dillon. The fish was caught with a Muddler Minnows. His prize is a Shimano 200 reel and Berkley spin rod.

Other winners, with size of catch, location, bait used and prizes won, were:

Charles Griffin, Parker—4-lb., 3 1/2-oz. brown from Pinery Lake with rapala: FIX Practical fly-tying kit.

Joe Valadez, 320 Cherokee St.—3-lb., 5-oz.brown from Delaney Buttes with wooly worms: Scientific Angler Ultra fly line.

Youth Prize—**Jim Beller,** Parker, with 4-lb., 14-oz. brown from Brigham Lake with minnows: He wins a Garcia spin reel and Berkley rod.

Weekly Drawing—**Mike Taylor,** Longmont: 3-day fishing trip to Glenwood Springs.

Consolation Prize: Rotary fly box with 12 flies for every entrant with fish weighing more than 2 pounds.

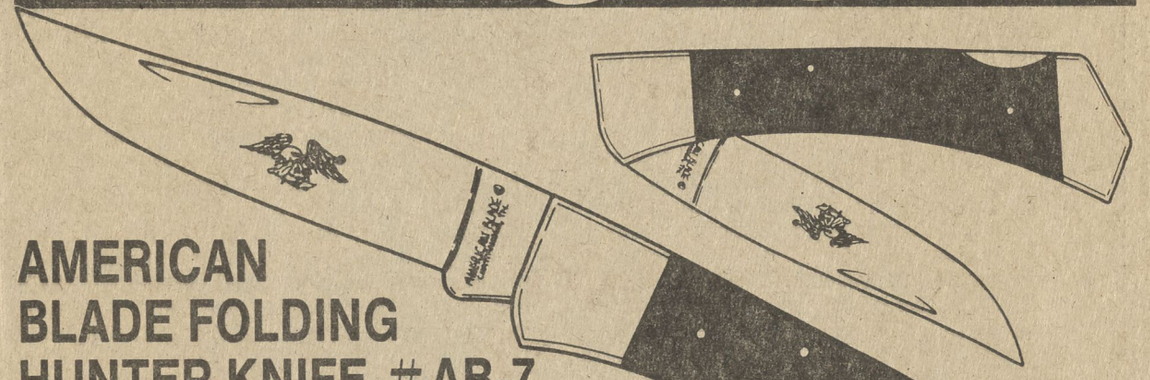
Deadline for this week's competition is 9 p.m. Saturday. Entries must be in accordance with rules listed on entry blanks.

The Big Trout Contest
THE DENVER POST
DAVE COOK

Please register me as a contestant
NAME _____
ADDRESS _____
CITY _____
STATE _____
ZIP _____
FISHING LICENSE NUMBER _____

RULES
1. Entrants who win a first prize or a weekly drawing prize (fishing trip) may not repeat in those categories for three years. They may, however, compete for all other prizes offered in the contest.
2.Conestants must register before fishing. One registration covers all Pot-Cook angling events in 1983. Registration must be received or postmarked 48 hours prior to the start of any contest week to be eligible for that and following weeks' prizes.
3.Contestants may register in person at any Dave Cook store or by mailing an entry coupon or facsimile to Dave Cook's, 16th and Market Street, Denver, Colorado 80201. Any Colorado fishing license holder and those under 15 who are not required to have a license are eligible to enter regardless of the location where license was purchased. Persons who buy their license at any Dave Cook store are automatically entered.
4. Employees of Dave Cook stores, The Denver Post, and members of their families, are not eligible.
5. Rainbow,Brook, Brown trout or cutthroat legally taken in Colorado waters are eligible to be entered.
6. Fish to be entered must be brought to the Dave Cook Sporting Goods store, 16th and Market Street, Denver, or to the firm's two Colorado Springs downtown stores, Ft. Collins, Boulder or Grand Junction outlets within three days after they are caught. Frozen trout will not be accepted. Contests end each week at 9 p.m. Saturdays.
7. Dave Cook's will have the prerogative to request that any large fish brought in remain on display at the Dave Cook store for two weeks.
8. Prizes will be awarded at the end of each comUetition based on weight of the fish. In case of a tie in weight, the first fish brought in will be declared the winner. Entries must be weighed on official scales by the official weigher of the Dave Cook store. Undressed weight will be standard.
9. Only one prize will be awarded to any contestant each week. Only one fish may be entered per week by any one family. A special prize will be given each week to a youth age 14 and under who catches the largest fish, provided the catch does not qualify for the regular weekly first or second prize. Weekly first-place winners receive a three-day fishing trip plus merchandise prizes. Weekly drawing winners receive a three-day fishing trip.
10. Any person convicted of violating Colorado State fishing regulations will be declared ineligible to compete in the contest.

DAVE COOK
FROM YOUR OUTDOORS STORE



AMERICAN BLADE FOLDING HUNTER KNIFE #AB-7
Blade has the famous positive-lock feature in the open position. The handle is made of golden-grain Macassar Ebony wood with solid brass bolsters and a liner forged in one piece. The length of the Hunter folded is 4⅛". The drop point blade is 3¼".
9.99
$1.50 Postage & Handling

STANSPORT MAP COMPASS #556-P
Every feature found in a top quality compass. Body plate with dial, magnifying lens, magnetic needle capsule, distance scales, bearing graduations, index line and holes for drawing orienteering symbols.
6.99
$1.50 Postage & Handling

EMERGENCY SIGNAL MINI-FLARE GUN KIT
A lifesaver for boaters, backpackers, hunters, pilots or off-road vehicles. Smaller than a pack of cigarettes, (5"x1½"x½"), and weighs only 3 oz. Kit contains 10 flares in assorted colors (red, yellow, green, white) in a crush proof case. DENVER STORES ONLY.
37.95
$1.50 Postage & Handling

EMERGENCY BLANKET #645
Reflects 90% of body heat back to you. Compact emergency protection in all weather. Waterproof, windproof, perfect for all outdoors. 84"x54".
3.99
$1.50 Postage & Handling

DAVE COOK
OPEN DAILY TILL 9:00, 16TH AND MARKET OPEN SATURDAY 9:00-8:30, 16TH AND MARKET AND SUBURB STORES OPEN SUNDAY 12:00-5:00PM.
16TH & MARKET • 16TH & WELTON • UNIVERSITY HILLS • WESTLAND • BUCKINGHAM • SOUTHWEST PL. • BEAR VALLEY • NORTH VALLEY • SOUTHGLENN • AURORA MALL • TIFFANY PLAZA • COLORADO SPRINGS 106 N. TEJON & RUSTIC HILLS • BOULDER • FORT COLLINS • GRAND JUNCTION

IDAHO AQUACULTURE NEWS

University of Idaho Aquaculture Research Institute Moscow, Idaho 83844 Phone: (208) 885-5830 / FAX: 885-5968

Second Quarter 1996

1995 Atl. volume
Europe 375 000 tonnes
270,000 Norway
750
825 mil lbs
Chile, Can.
Maine
ca. 1 bil. lbs

U.S. import Atl. salmon (fresh) -
197 mil. # 97%
from Chile + Canada
300 mil. lbs. ?!

Table of Contents

Aquaculture at the University of Idaho 1
IAA News & Notes 5
Statewide News 6
Across the Nation 7
Around the World 8
Aquaculture Outlook 8
Calendar of Events 9
Cook's Corner 10
Information Transfer 10
Bulletin Board 10

AQUACULTURE AT THE UNIVERSITY OF IDAHO

A Progress Report of the Aquaculture Research Institute

Research

New Contracts

Trout Marketing Survey. The Aquaculture Institute has been awarded a grant to determine consumer perceptions of trout as a food item. The grant is funded through the Idaho Department of Agriculture under the Federal-State Marketing Improvement Program. The project will provide the Idaho and U.S. trout industry with information useful in developing educational and marketing strategies to assist in strengthening the trout industry. Information will be gathered in various cities nationwide concerning preferences for product form, purchase and usage patterns, price sensitivity, and relevant products. John Foltz, Assistant Professor of Agricultural Economics, is principal investigator.

Trout Genetics Study. Dr. Madison (Matt) Powell, Research Scientist/Geneticist for the Aquaculture Research Institute, and Rick Williams, affiliate faculty member in the UI Department of Fish and

Wildlife Resources and owner of Clear Creek Genetics in Boise, Idaho, were awarded a 2-year contract with the Nevada Division of Wildlife for the genetic analysis of Nevada redband and Lahontan cutthroat trout.

Fish Nutrition Research. The Aquaculture Institute was awarded a subcontract with the University of Washington to conduct research on the evaluation of the nutritive potential of soybean protein concentrate as an alternative to fish meal protein in salmonid diets. This 6-month project is being conducted at the UI's Hagerman Fish Culture Experiment Station in Hagerman, Idaho, and is funded through the UW by North Dakota State University.

Ongoing Research

Fish Waste Management Project. Work at the UI Hagerman Fish Culture Experiment Station in southern Idaho is underway on a 3-year fish waste management research grant from Lockheed Corporation. The purpose of the project is to develop effective technology for the reduction of fish farm waste via decreased phosphorus in feed, increased feed efficiency, improved waste stability, and waste capture. See the Research Project Report (below) for more information about this project.

Current research in fish genetics includes the following projects:

- Examination of the genetic variation among populations of sockeye salmon throughout the Northwest using mitochondrial DNA. Our particular interest is in the federally-endangered Snake River sockeye salmon found in Redfish Lake, Idaho.
- Investigation of the use of randomly amplified polymorphic DNA (RAPDs) to describe genetic differences among northern squawfish, chiselmouth, and hybrids between these two fish.
- Investigation of the potential genetic differences between burbot populations found in the Kootenai River below Libby Dam in Idaho and burbot populations found above the dam in Montana.
- Examination of the use of several, various nuclear DNA sequences for use as potential genetic markers among sockeye salmon populations.
- Investigation of the genetic identity of adult sockeye salmon returning to Pelton Dam on the Deschutes River, Oregon. Our preliminary analysis indicates that the returning anadromous sockeye have similar mitochondrial haplotypes as the kokanee present in the Metolius River above the dam.

Completed Research

Completed research projects in fish genetics are:

- A collaborative study with the Washington Department of Fish and Wildlife to demonstrate that naturally occurring hybrids between northern squawfish and chiselmouth could contain maternally-derived mitochondrial DNA from either parent species, indicating hybridization is reciprocal among both males and females of each species.
- A collaborative project with Utah State University to demonstrate mitochondrial DNA differences between sympatric populations of kokanee in Flaming Gorge reservoir, supporting a hypothesis of spatial or temporal spawning isolation between these populations within the lake.

Research Project Report

Improving Fish Farm Wastewater Quality

by
Joel Green
Ph.D. Student Research Assistant
UI Aquaculture Research Institute

Research has now begun in earnest at the Hagerman Fish Culture Experiment Station on a topic important to all fish culturists: the improvement of aquaculture effluent water quality. In order to maintain clean rivers and streams, federal and state environmental agencies regulate the amount of nutrients and particulates in aquaculture effluent water. In particular, the amount of phosphorus in aquaculture effluent waters is strictly regulated. The reason for this is that too much phosphorus in rivers and lakes can cause excessive growth of algae, which can be unsightly and harmful to fish and other aquatic life. However, the regulation of phosphorus content in aquaculture effluent can be a real limitation to the amount of fish produced in aquaculture facilities. In

order for the aquaculture industry to grow, there must be improved methods of reducing the waste material in aquaculture effluent waters.

To address this problem, UI Aquaculture Research Institute Director Dr. Ernie Brannon; National Marine Fisheries Service Research Scientist Dr. Ron Hardy; Dr. Robert Cherry at the Idaho Nuclear Engineering Laboratory; UI graduate students Keya Collins, Joel Green, and Steve Todd; and UI Hagerman technicians Montie Peterson and Anila Allred have begun a series of experiments designed to identify ways of decreasing phosphorus and other nutrients and particulates in fish culture effluent water. The research, which is planned for the next three years, involves four aspects: feed formulation, feed efficiency, fecal stability and treatment technology.

Feed Formulation. In the first series of experiments, we are looking at ways of changing the composition of fish feed to decrease the amount of phosphorus in the feed, while providing essential nutrients for growth. By providing a diet high in digestible energy but low in phosphorus and poorly digested ingredients, it may be possible to decrease the amount of phosphorus and particulate matter in the fish waste.

Feed Efficiency. Feed efficiency (the efficiency of food utilization for growth) in fish is strongly influenced by their physical environment, including, in particular, the oxygen level in the water. We are planning to examine the influence of supplemental aeration of raceway water on feed efficiency of trout. Feed efficiency is important in reducing feed costs, and also in reducing the amount of waste nutrients which cause water quality problems in the effluent.

Fecal Stability. Fecal casts excreted by fish disintegrate in water at a rate which is influenced by characteristics of the fecal material and the level of turbulence in the surrounding water. As the fecal material disintegrates, nutrients such as phosphorus and nitrogen are leached into the water, and fine particulate matter becomes suspended in the water column. These nutrients and particulates often go out in the effluent water and contribute to poor effluent water quality. If the stability of the fecal casts could be increased, fecal material could be more efficiently collected before leaching of nutrients occurs. We are examining the effectiveness of various food additives (binders) which potentially could increase the stability of fecal casts.

Treatment Technology. The final component of this research project involves the development and testing of improved methods of wastewater treatment for aquaculture facilities. Treatments to capture waste material will include settling ponds, filtration of effluent water, and air sparging to facilitate surface collection of waste.

Education and Outreach

TOURS, TOURS, TOURS!

The more we provide guided tours of our facilities, the more popular we become! During the past few months, our sturgeon, trout, frogs and tropical fish have seen the Campfire Girls; University of Idaho Agricultural Education majors; a high school group from Troy, Idaho; high school ag education teachers from American Falls, Idaho, and Altaville, California; and a retired University of Idaho poultry science professor who lived in our building in the 1930s when he was a student majoring in animal sciences (the building used to house a rather large number of chickens and eggs, as well as a few students who lived there to care for the animals)!

Public School Outreach. The UI Aquaculture Institute has a strong commitment to promoting aquaculture education in Idaho's public schools. We are actively involved in fulfilling this commitment in the following ways:

- In March and April, the Institute staff conducted a 6-week, 15-hour aquaculture short course for 6 UI Agricultural Education majors in partial fulfillment of the requirements of their degree program. Many of these students will, upon graduation from the UI, seek teaching positions at the high school level. The short course was designed to provide them with sufficient understanding of, and introduce them to educational materials about, aquaculture as part of agriculture. In the future, a similar course will be offered on an annual basis as a 1-credit special topics course through the Department of Animal and Veterinary Sciences.
- The Institute's Hatchery Manager is currently assisting high school teachers in Deary, Idaho, and Cary, Idaho, with classroom fish culture projects.
- Our Outreach Program Coordinator annually informs Idaho's high schools about the latest aquaculture education materials, videos, and slide presentations, as well as provides

information about college-level aquaculture education opportunities in Idaho and aquaculture-related career options.

- The Institute staff will conduct a week-long (19-hour) aquaculture short course in July for each of two groups of 25 Upward Bound 11th-grade students from throughout the Pacific Northwest. The course will provide hands-on hatchery experience, as well as other information and skills which may stimulate an interest in pursuing aquaculture as a career.
- The Institute also plans to offer a half-day workshop to another group of Upward Bound Native American students sometime this summer.
- The Institute is in the preliminary design stages of a demonstration project involving aquarium fish culture for use in K-12 classrooms.
- Beginning in June, the Institute is hosting an Idaho Native American high school student who is participating in the summer HOIST (Helping Orient Indian Students and Teachers) program being conducted on the University of Idaho campus. The grant-funded program helps orient students toward math and science through formal classes as well as employment in a scientific field. The Institute's HOIST student has joined our aquaculture team to assist in isolating and processing kokanee and sockeye salmon DNA to determine the similarities and differences between the two species within and among populations. Other tasks involving hatchery fish will also be assigned.

Additional public school education delivery systems are in the planning stages. Once developed, funding will be sought to implement the programs.

The Aquaculture Information Service

Librarians vs Software: No Contest!!

by
Selma Carney
Information Officer
Aquaculture Information Service
Aquaculture Research Institute

[This article was inspired by "Put a good librarian, not software, in the driver's seat," by B.A. Nardi, V. O'Day, & E.J. Valauskas, in June 4, 1996 issue of the Christian Science Monitor.]

In these days of rapid and expensive computer technology changes, some budget-cutting and/or downsizing organizations have decided to replace librarians with computer hardware and software programs. But can an intelligent machine loaded with the latest software do what a librarian can do? The Aquaculture Information Service (AIS), part of the Aquaculture Research Institute at the University of Idaho, has shown that librarians are much more than the sum of the software parts they deal with on a daily basis. As the Aquaculture Information Officer for the AIS, I find that I am a people analyzer, language interpreter, and problem solver as well as someone who builds and loads databases.

Recently, an AIS client asked for all the information available on how to start a fish farm. During the reference interview with the client, I was able to determine what type of culture system he was thinking of using, the quality and flow of his water source, the species of fish he wanted to raise, the location of the fish farm-to-be, something about his financial situation, and the size and scope of his projected operation. Through a friendly conversation, I gleaned a great deal more information about what the client was actually looking for and located the right kind of reading material for his specific situation. By asking the right kinds of questions, a librarian can serve a client better than software alone.

Different types, levels and formats of information come into the Aquaculture Information Service on a daily basis -- from strictly factual, scientific journals to materials that espouse a particular political point of view. Since I see and/or process all of the materials that arrive, I become familiar with the content and quality of the various AIS holdings and can recommend publications to clients who express an interest in articles with a certain political slant, those which are written more for the lay person than for a scientist, etc.

Another benefit to a librarian's familiarity with the literature is the ability to locate publications with very little information. For instance, a client came to the Aquaculture Information Service with a numerical table with just an author's last name and a publication year. He needed information about what the figures in the table were referring to and where they came from. I recognized the author, walked to a shelf, picked up the appropriate book, and turned to the page on which the table was listed. The client was amazed and expressed his surprise at how quickly his seemingly impossible task was accomplished. I'm not suggesting that I can perform such feats on a regular basis, but no piece of

software, no matter how sophisticated, would have been able to provide that kind of service.

On another request, a client from a foreign country wanted an address for a particular aquaculture company that had patented a sea lice control device. He had searched the Internet and had not discovered anything except the names of the inventor and the company. Armed with the document numbers from the database, I looked in the hardcopy sources on the AIS shelves and EUREKA!, the company and its location appeared in one of the articles in a 1995 issue of the Water Farming Journal. Of course, the BRS SEARCH software helped me by providing document numbers to consult, but without the human element of physically walking over to the shelves and reading the sources on sea lice control, the answer to the question would never have been found.

There are many more real-life stories about what librarians can do that software cannot. What it really boils down to is the human touch. I, like many other information providers across the country, welcome any opportunity to assist clients with their information needs. If you have questions about our service, or would like assistance in locating and obtaining literature related to fisheries or aquaculture, please contact me at the UI Aquaculture Information Service, 208-885-5992.

Institute Administration

The Aquaculture Research Institute staff listed below can provide and/or arrange for various research and outreach services and may be contacted as shown:

Name/Title	Phone
Brannon, E.L. Director, Aquaculture Research Institute State Aquaculture Extension Specialist Professor, Fisheries and Animal Sciences	208-885-5830
Bryngelson, G. Secretary/Bookkeeper	208-885-5830
Carney, S. Aquaculture Information Officer	208-885-5992
Casten, M. Hatchery Manager	208-885-5706
Jacobsen, B.L. Administrative Assistant Outreach Program Coordinator Editor, Idaho Aquaculture News	208-885-5830
Powell, M.S. Research Scientist/Geneticist	208-885-7850

IAA News & Notes

from the desk of
Gary Fornshell
Aquaculture Extension Educator and
Editor, IAA Bulletin

The Idaho Aquaculture Association held its annual meeting on June 1 at the College of Southern Idaho in Twin Falls. Mr. Richard Bohn, the recently hired Executive Director of the National Aquaculture Association and the U.S. Trout Farmers Association, provided a "state of aquaculture" address. High priority issues included designating the USDA as the lead federal agency for aquaculture, new drug approvals, bird depredation, and fish health certification.

Mr. Charlie Smith of Rangen Inc. provided an update on whirling disease, following a national whirling disease workshop help in Denver last February which brought together a diverse group of participants whose opinions on the effects of whirling disease differed significantly.

The Western Regional Aquaculture Center's Pollution Reduction Workgroup presented four years of research in diet modification. The goals of the workgroup include development of low pollution diets which will assist the aquaculture industry in meeting regulatory requirements and which will produce a high-quality, cost-effective product. Members of the workgroup are Dr. Rick Barrows, Dr. Faye Dong, Mr. Gary Fornshell, Dr. Norm Haard, Dr. Ron Hardy, Dr. Bill Lellis, and Mr. Chris Nelson. A discussion of solid waste management was also included in the meeting.

Mr. Leo Ray, Fish Breeders of Idaho, Inc., presented information on raising alligators. This newest of Idaho's aquaculture species has generated a great deal of curiosity and public interest.

Mr. Jim Bowker, from the Fish Technology Center in Bozeman, Montana, provided information on the effectiveness of various therapeutants under U.S. Fish and Wildlife Service's investigational new animal drug approval process (a related article is included in this issue).

For additional information about the 1996 IAA Annual Meeting, contact Gary Fornshell, 246 3rd Ave. East, Twin Falls, ID 83301; (208) 734-9590.

Statewide News...

Idaho Aquaculture: Some Facts You Might Not Know

[The following is reprinted, in part, from a fact sheet prepared for Water Awareness Week by the Idaho Water Resource Research Institute.]

Commercial aquaculture in Idaho began in 1909 at Devils Coral near Shoshone Falls. Currently, Southern Idaho fish farmers raise about 77% of all the trout privately raised in the United States. That's more than 42 million pounds of trout a year!

Water, and lots of it, is the key to successful aquaculture. Every species has its own set of water quality requirements. Hundreds of springs along the Snake River in the Magic Valley provide an abundant supply of clean water with plenty of oxygen for aquaculture.

Not all fish are raised for food. State and federal agencies, such as the Idaho Department of Fish and Game, raise millions of trout and salmon to stock streams, lakes and reservoirs where wild fish populations have decreased because of habitat loss. These fish supplement existing populations and provide fishing opportunities for Idaho anglers.

The Idaho aquaculture industry is a "non-consumptive" user of water. That is, all the water that flows into the fish hatchery flows out again and is available for other uses. To help protect our environment, Idaho fish farmers work to ensure the water returned to rivers, streams and canals is of the same quality as the water that entered the hatchery. The chemicals in hatchery discharge water can reduce water clarity and lead to algae and weed growth downstream. Fish farmers must clean fish ponds frequently to prevent fish waste from entering our rivers and lakes.

Commercial aquaculture ranks third in value in animal agriculture in Idaho, after beef and dairy cattle. Following are some of the species cultured in Idaho for both commercial and conservation purposes:

Rainbow Trout can be identified by their evenly distributed spotting pattern and the red band that runs down their side. They prefer cool, clear water that is about 50-60°F. Rainbow trout are raised in Idaho for both food and sport fishing. Clear Springs Trout Company in Buhl, Idaho, is the largest producer of food trout in the world.

White Sturgeon are prehistoric-looking fish that have 5 rows of bony scutes down the length of their body giving them an armored appearance. Sturgeon have a specially designed mouth for "vacuuming" food off the bottom. They can live to be over 100 years old and grow to lengths in excess of 7 feet. About 450,000 pounds of sturgeon are currently being cultured commercially in Idaho, and around 2,000 pounds are processed for food each week. Sturgeon are also being cultured to ensure their preservation in the wild.

Alligators are reptiles that live in the southeastern part of the United States. They are raised for their hides and meat and are grown year-round on one warm-water farm in southeastern Idaho.

Catfish prefer water at 70-90°F. Idaho has an abundance of natural geothermal (hot) water. About 550,000 pounds of catfish are processed for food annually in Idaho.

Tilapia is another species raised in Idaho for food. They also like warmer water. Around 1 million pounds are processed each year.

Tropical Fish include many different warm water species from all over the world. Through years of careful breeding, fish culturists have developed fish with brilliant colors and fan-like fins. These fish make interesting pets for home aquariums. Tropical fish raised in Idaho include angel fish, mollies, platties, tilapia and many different types of cichlids. Most are raised in water that comes from geothermal springs.

Salmon are in the same family as trout and like cool, clean water with lots of oxygen. There are five species of Pacific salmon. Most salmon migrate to the Pacific Ocean and live in salt water for most of their lives before returning to spawn in the stream where they were born. Hatchery-bred salmon are raised to supplement wild stocks.

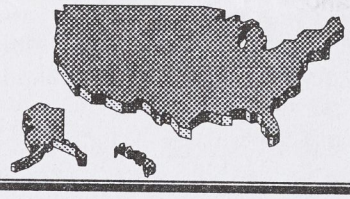
Idaho Policy to Aid Snake River Salmon. Governor Phil Batt, U.S. Senator Larry Craig, U.S. Representative Mike Crapo, and Attorney General Alan Lance endorsed a policy which calls for a

number of measures to help Snake River salmon migrate more successfully. Developed by Governor Batt in consultation with Idaho water users, environmentalists, community leaders from Orofino, power interests and state resource agencies, the policy calls for releasing 427,000 acre feet of Snake River water (in accordance with Idaho law) this spring and early summer to help juvenile fish migrate to the Pacific Ocean. The release of water includes Dworshak Reservoir near Orofino.

The policy also calls for a "spread-the-risk" approach to salmon migration, utilizing a mix of inriver migration (including controlled spilling of fish over the eight federal dams) and barge transportation. In 1995 operations, as many as 80% of the fish were barged. This year's plan calls for an equitable balance between the number of juvenile salmon and steelhead that migrate in the river and those transported downstream in barges.

The current policy also separates the technique of boosting flows from that of spilling water over dams so the two techniques can be independently evaluated. *[NPPC UPDATE, 13(3), March 25, 1996.]*

Across the Nation



National Aquaculture Association & USTFA. Richard E. Bohn is the new Executive Director of the NAA and U.S. Trout Farmers Association. He assumed his duties full time on March 1, 1996. Beginning April 1, their new address, along with the American Tilapia Association, will be 111 W. Washington Street, Suite 1, Charles Town, WV 25414. Phone numbers are: ATA 304-728-2175, NAA 304-728-2167, and USTFA 304-728-2189. The fax number for all three associations is 304-728-2196. *[Idaho Aquaculture Association News 4(2), May 1996).]*

Seafood Inspection, Standards and Grades. In response to the President's Regulatory Reform Initiative, the National Marine Fisheries Service (NMFS) amends the Code of Federal Regulations (CFR) by removing the product-specific voluntary Inspection Program (Program) standards for grades for fish and fishery products. These standards will be issued as Program policies and be contained in the NMFS Fishery Products Inspection Manual. The remaining regulations on these standards in the CFR are being revised to state the minimum requirements necessary for a grade standard to be issued as a Program policy. For further information contact: Richard Cano, Inspection Services Division, 301-713-2355. *[Idaho Aquaculture Association News 4(2), May 1996).]*

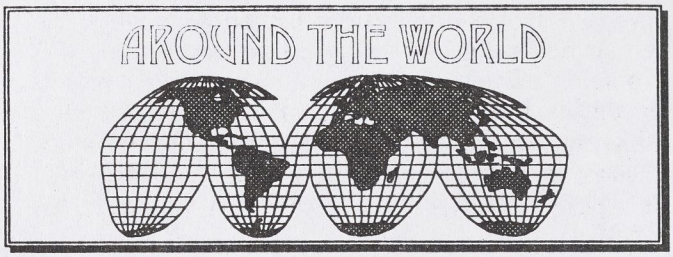
Congressional legislation (H164 & S185) was passed transferring the Stuttgart National Fish Farming Experimental Laboratory from the U.S. Fish & Wildlife Service (USFWS) to the U.S. Department of Agriculture where it will be known as the Stuttgart National Aquaculture Research Center. *[Idaho Aquaculture Association News 4(2), May 1996).]*

The USFWS plans to consolidate its Fish Health Center in Fort Morgan, Colorado, with its Fish Technology Center in Bozeman, Montana. *[Idaho Aquaculture Association News 4(2), May 1996).]*

USDA – Animal and Plant Health Inspection Service. APHIS has drafted legislation that would significantly expand its role in supporting commercial aquatic animal health, with services similar to those the agency now provides for the livestock and poultry industries. These services focus on the regulation of imports, certification of exports, and regulating interstate commerce. The draft proposal is currently under review. *[USDA Aquaculture Industry Report, March 1996.]*

Investigational New Animal Drug (INAD Update). The USFWS has established a National INAD Office at Bozeman, MT, with Dr. Dave Erdahl as project leader, to administer/coordinate the USFWS INAD program. A quarterly publication, ***The NAD Report***, has been implemented by the INAD office. The following is excerpted from this publication:

Chloramine-T, formalin as a parasiticide, formalin as a fungicide, copper sulfate, oxytetracycline as a feed additive, oxytetracycline as an injectable, oxytetracycline for immersion, and oxytetracycline for bath marking have all been rewritten, "standardized," submitted to FDA, and approved for use as INADs in 1996. Several IAA members are participating in the INAD process. *[Idaho Aquaculture Association News 4(2), May 1996).]*



European Aquaculture

[Condensed from an article by Baron Charles de Fierlant Dormer, President Federation of European Aquaculture Producers, in Trout News 21, December 1995.]

European aquaculture production for all cultured species continues to increase continuously in the different geographic regions of Europe. However; the salmonid sector is by far the largest producer.

Salmon. Farmed Atlantic salmon have increased most significantly in Norway, Scotland, and Ireland, the largest European producers. In 1995, about 99% of Atlantic salmon marketed was produced by fish farming. It was projected that European Union (EU)-farmed Atlantic salmon would reach 90,000 tonnes in 1995 within a European total of 375,000 tonnes, 270,000 tonnes of which come from Norway.

Trout. Large trout (1 kg individual weight) are produced mainly in Scandinavian countries and production has increased regularly to a current level of 67,000 tonnes, including 44,000 tonnes from EU countries. Annual increases of 10-15% have been achieved. Portion-sized trout production is estimated at 190,000 tonnes from the EU with average increases of 5% recorded.

The sensitivity of the salmonid sector, both trout and salmon, has been highlighted by a number of price crashes, attributed principally to increasing imports of salmon.

Fish farming in the European Union produces over 400,000 tonnes of fish at a value exceeding £1.4 billion. Aquaculture is an increasingly important contributor to the European economy.

Economically, many aquaculture products have evolved to where it is now cheaper to farm than to fish. Recent estimates indicate this to be true for prawns and some marine species such as seabass and seabream, and virtually all trout and salmon on the market is derived from farming.

From a marketing point of view, aquaculture continues to adapt and producers are increasingly aware of the need to provide products the consumer wishes to buy as opposed to the product the producer wishes to sell. In most of Europe, for example, fish products are moving away from fish sold in the round. New product forms include:

- With the use of bar codes, the fixed-weight pack is becoming more popular as opposed to the variable pack.
- Pan-ready boneless fillets, some herb-flavored or sold with a sauce, are increasingly popular with consumers who prefer products without bones.
- Product mixes, such as salmon with trout or where stuffings are used, provide variety as well as the ready-to-cook facility.

The European food market is dominated by quality and price. To be able to provide value for money as opposed to a luxury fish product is perhaps the real goal to be targeted for the future stability of aquaculture. This consideration is complemented by the growing markets for non-traditional fish species, usually presented as fillets.

The author is optimistic about the future of aquaculture in Europe if European fish farmers continue to be conscientious and imaginative. They must understand the problems associated with different competitive products in order to reinforce the strength of the profession which faces a daily battle, especially in the face of increasing regulatory and environmental factors, for the profitable sale of its products.

Aquaculture Outlook

USDA Outlook

Catfish production is expected to expand 5-7% in 1996, based on January 1 grower inventories. Live catfish deliveries to processing plants rose to 447 million pounds in 1995, up 2% from the previous year. Farm prices are averaging around 77 cents a pound; however, with higher feed prices, growers will be looking to maximize feed conversions by slightly reducing the stocking rates and feeding schedules.

Tilapia imports are forecast to further expand in 1996 as higher production of fillets allows tilapia to move into large food service markets. Domestic production is also forecast to grow. Domestic

producers will look to the live market first, but as output expands, larger producers will have to weigh the additional capital expenses and management needed to enter and compete in the processed fish market.

The value of tilapia imports in 1995 rose 33% to $34.1 million. The expansion in tilapia imports seen over the last three years continues. The increase in import value was chiefly the result of higher prices, as the quantity rose only 8%. On a liveweight basis, tilapia imports in 1995 totaled over 50 million pounds. The American Tilapia Association estimated that U.S. production expanded in 1995 and additional growth is forecast for 1996. Future growth in domestic production will depend on the ability of growers and processors to lower cost enough to compete with imports. If tilapia follows the same pattern as other finfish, larger production and declining grower prices will expand the market.

Salmon. U.S. pen-raised salmon production rose to 34 million pounds in 1995, about 36% higher than 1994. While output is expected to increase in 1996, domestic growers will continue to have their prices pressured by expanding supplies of imported farm-raised salmon and record harvests of wild salmon.

In 1995, U.S. imports of Atlantic salmon continued to grow. Imports were higher in all categories, but growth in fresh and frozen fillets was especially strong. Imports of fresh salmon (farmed and wild) reached $194 million in 1995, up 14%. Canada and Chile supply 97% of this category. In the frozen market, Norway supplied 63% of the imports. Total value of frozen salmon imports was $15 million.

The real growth in salmon imports was in fillets. Salmon fillet imports in 1995 were valued at $51 million, compared with less than $1 million in 1994. Chile is the chief supplier in the fresh fillet market, valued at $39 million and accounting for over 85% of the product.

In 1995, import prices for fresh salmon averaged only $2.43 a pound, frozen salmon averaged $2.46 a pound and fillets averaged $2.63 a pound. Farmed salmon prices are expected to be under continued downward pressure in 1996 as most growing areas are still looking to increase production. In both Norway and Chile efforts are underway to diversify production with halibut or steelhead. *[Aquaculture Outlook – Economic Research Service (USDA); Dave Harvey, principal contributor.]*

Trout Beware – Tilapia is taking off!

According to the American Tilapia Association (ATA), U.S. tilapia production is expected to reach 16 million pounds in 1995, three million more than in 1994, and more than triple what it was only four years ago.

In 1994, Americans consumed 48.8 million pounds of imported tilapia – quadruple the domestic production that year. Thirty-six million pounds of that came from Taiwan, the rest from Costa Rica, Indonesia, Columbia, Thailand and China. Imports of tilapia, combined with domestic production, surpassed domestic trout consumption (55 million pounds) for the first time. *[From the Seafood Leader 16(1), Jan/Feb 1996.]*

Calendar of Events

1996 Scheduled Short Courses, Charlottetown, Province of Prince Edward Island, Canada:

August 6-9: **Fish as Research Animals**.
August 10-12: **Basic Disease Diagnostics in Finfish Aquaculture**.
August 12-14: **Bacterial Diagnostic in Finfish and Shellfish Aquaculture**.
October 7-9: **Prescription of Aquaculture Therapeutants**.
October 10-12: **Applied Aquaculture Epidemiology**.

For more information, contact

R.P. (Bob) Johnston, Director
Canadian Aquaculture Institute
550 University Avenue
Charlottetown, Prince Edward Island
Canada C1A 4P3

October 13-15, 1996: **Marketing & Shipping Live Aquatic Products '96**, Seattle, Washington, USA. This industry conference and exhibition is in response to growing demand for information on transporting and marketing live seafood and aquarium stock. Sponsored by The University of Alaska Marine Advisory Program and Nor'Westerly Food Technology Services. For reservations or conference and exhibition information, contact Nor'Westerly Food Technology Services, 2743 56th Ave. SW, Seattle, WA, 98116. Fax: 206-933-7937. E-mail address: 103243.675@compuserve.com.

Cook's Corner

Poached Tilapia With Lemon and Basil

[Waterlines 5(1), Spring 1993, p 19]

6 tilapia fillets
¼ cup chicken broth
3 tbs. orange juice
2 tbs. lemon juice
½ tsp. nutmeg
2 tbs. olive oil
1 tbs. shredded lemon peel
6 whole basil leaves

⇒ In a large frying pan, combine chicken broth, orange juice, lemon juice, nutmeg, and oil over high heat. Cover and bring to boil.

⇒ Add fillets in single layer and gently simmer for 4 minutes.

⇒ Place a basil leaf on top of each fillet, cover pan and simmer until fish is opaque and moist looking in the thickest part (approx. 1 to 2 minutes).

⇒ Transfer fillets to plates with slotted spoon.

⇒ Boil the pan juices, uncovered, over high heat until reduced to about ¼ cup.

⇒ Spoon sauce over fillets, sprinkle with lemon peel and serve.

Information Transfer

Videos . . .

The Environmental Protection Agency (EPA) has developed a new video tape on the water quality standards program. The title is:

Developing Site-specific Criteria

The video discusses the development of site-specific numeric criteria for aquatic life and the role they play in the water quality standards and criteria process. This new video, along with videos previously released, are available on loan for use by various organizations in conferences, workshops, academic settings, and other forums. The video productions are part of the EPA's efforts to inform individuals about some of its important programs, their role in environmental clean-up and the role citizens may play.

Additional information about the water quality standards program can be obtained from the U.S. EPA, Office of Science and Technology, Standards and Applied Science Division (4305), 401 M Street SW, Washington, DC 20460 (phone 202-260-1315).

Bulletin Board

Opportunities for Aquaculture Sales. . . .

The Idaho Department of Fish and Game is seeking the following:

- Idaho aquaculturists interested in providing their names, etc., to IDFG to establish a referral list for individuals interested in purchasing fish for stocking in their privately-owned waters.
- Prospective contractors to provide 8- to 10-inch channel catfish (September delivery) for stocking in public waters.
- Prospective contractors to accept department-provided tiger-muskie eyed eggs for hatching and rearing for September delivery back to the Department as 8- to 10-inch fish.

Those interested should contact Steve Huffaker, Fisheries Bureau Chief, Idaho Department of Fish and Game, P.O. Box 25, Boise, ID 83707. Phone 208-334-3791. *[Idaho Aquaculture Association News 4(2), May 1996).]*

New Trophy Trout. Mt. Lassen Trout Farms, Red Bluff, California, recently announced production of a brand new trophy trout. It is a cross between the brown and the rainbow and has visual markings of both fish. This hybrid cannot occur on its own in the wild. It is currently being stocked in California lakes. *[Idaho Aquaculture Association News 4(2), May 1996).]*

For a free subscription to ***Idaho Aquaculture News***, or to request information, offer comments, or submit articles and letters to the editor, please contact:

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The University of Idaho (UI) Aquaculture Research Institute (ARI) occasionally receives requests from government agencies and other non-profit organizations for the names and addresses of Idaho fish farmers. These agencies are generally interested in (1) providing information about legislation and programs which affect the aquaculture industry, and (2) conducting surveys to compile information about the industry. The ARI will not provide your name and address without your written permission. Please indicate your preference:

The UI ARI has my permission to provide my name and mailing address to any non-profit agency or organization which requests it.

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es exist between kinds of trout, they
ccur among the various kinds of
professionals involved in stream
management. The potential for
benefit is great when biologists, engi-
neers, hydrologists and other comple-
mentary specialists cooperate. Such
cooperation is at the heart of much
recent upgrading of trout stream
habitat work.

Conversely, the tendency of each guild to go its own way is at the root of many trout habitat problems. Sometimes, a fishery biologist has designed habitat improvements with great understanding of the trout's needs but, when built, the work soon washed away because he did not seek help from an engineer or hydrologist – or the bushes he planted on the streambank died because he didn't consult a botanist.

Likewise, some engineers call their work "habitat" improvement but have little idea how it will affect trout or other aquatic life. Many aim for channel stabilization and structural durability to the exclusion of all else. For these folks, boulders, concrete, gabions and steel sheet-piling are the materials of choice. Logs and living vegetation are disdained as insubstantial. Straight-edged structures and uniform channels, trapezoidal in cross-section, are sought as the tidy ideal. It has been claimed that if a channel is stabilized, then habitat will "take care of itself." Habitat for what? Such glib assertions are made by those who don't understand what trout habitat is.

At a 1971 conference on stream ecology, a grizzled eminence in hydrology and channel engineering prefaced his presentation by vehemently declaring he had heard altogether too much from previous speakers about aquatic ecology and fish. A centuries-old traditon of arrogance and hostility toward nature rang forth.

"You people should oonterschtand," he ranted in the authoritarian tone that Middle European upbringing so often engenders, "ze *main* purpose of riffers is to conduct vauter!"

Because that recollection seemed almost too incredible to include in this article, I checked the printed conference proceedings for some confirming hint of the statement. Lo and behold, not only was the outburst intact as his conclusion, but it included embellishments that made it a classic:

> *...the various forms of life in a river are purely incidental, compared with the main task of the river, which is to conduct the water runoff from an area toward the oceans. Some people think the only purpose of the river is to provide them with fishing on Sunday; some people see it as a place to crank their boats up to full speed and beyond* [sic]*; some people look at the river only as a cheap way of disposing of their old tires; and some people think the only purpose of a river is to support life and its ecology. Even if the latter attitude is today fashionable, we must remember that the main purpose of the river is that of conducting water. All other activities are only permitted as long as they do not interfere with the main purpose.*

Incidentally, there's more than one reason to suspect this guy would have been happy in the plumbing business. His outlook was, of course, way behind that of many of his colleagues, and his words contrasted with those of other hydrologists and engineers at the same conference. Environmental attitudes in such fields have come a long way since the thinking represented above.

Perhaps it's no coincidence that the West Coast university at which the professor just quoted then taught still strives to keep the campus creek forced – with masonry in some places – into

Overstabilization of streams may be a particular stream engineering danger.

A county in Nevada assaults a river

■ **Elko County is still fighting the Sagebrush Rebellion**

County commissioners of Elko County, Nev., in the sparsely populated northeastern corner of the state, aren't known for their goodwill toward the federal government. So when they decided to do a little road repair on Forest Service land this summer, they didn't waste any time on paperwork.

They wanted to reopen the flood-damaged South Canyon Road, which skirts the west fork of the Jarbidge River and had been closed for two years. The Forest Service had decided to keep the road closed, but on July 15, three of the five commissioners signed a resolution supporting repair and reopening of the road, agreeing it was necessary for firefighting and for campground access. Six days later, a county road crew went to work, channelizing about 1,000 feet of the river and dumping sediment into the riverbed with a payloader.

They didn't bother with a federal permit, says county manager George Boucher, because the county believes South Canyon Road is a county right-of-way. "The road was there before the Forest Service was around," he says.

But in its rush to assert the county's rights, the commission overlooked a few details; as a result the road is still closed and the county is in a legal mess.

The Jarbidge River is the home of the Jarbidge bull trout population, which had been proposed for threatened status by the U.S. Fish and Wildlife Service. In fact, the county started its roadwork only hours before the agency held a public meeting in Jackpot, Nev., on the federal listing of the trout. Although the commission assured the press that residents of the nearby town of Jarbidge — which has a year-round population of seven — had rescued stranded trout in buckets and released them beneath the diversion, the roadwork had destroyed a long stretch of habitat.

And is the road county property? "Plainly not," says Humboldt-Toiyabe National Forest Supervisor Gloria Flora. The Forest Service had previously proposed reopening the road, but the nonprofit environmental group Trout Unlimited appealed the proposal. At the end of June, the Forest Service changed its position, saying it wanted the road replaced by a foot trail.

The commissioners' roadwork "denuded the whole damn place," says Matt Holford, an Elko resident and chairman of the 600-member Nevada Council of Trout Unlimited. "They were told (by the Fish and Wildlife Service) that if they tried a wacky action like this, they were going to get the trout listed."

And they did. The Nevada Division of Environmental Protection and the Army Corps of Engineers issued cease-and-desist orders to the commission. Then, the Nevada office of the Fish and Wildlife Service recommended an emergency endangered listing for the Jarbidge bull trout, which took effect on Aug. 11.

"Of all the populations of bull trout that we have listed or proposed for listing, this is the smallest one," says Bob Williams, field supervisor of the Fish and Wildlife Service's Nevada office.

"It's one of those things we use very seldom, but we're not afraid to use it," he says of the emergency listing. "It's a critical tool of the Endangered Species Act." The Jarbidge bull trout population is on the southern boundary of the species' range, and is isolated from other populations by a series of reservoirs.

The three commissioners were defiant. "They can list the moon as far as I'm concerned," Tony Lesperance told the Associated Press.

Elko County, the second largest county in the state, is dependent on the gold-mining industry for most of its paychecks, and more than 70 percent of the land is federally owned. As in many lightly populated Western places, hostility to the federal government is endemic.

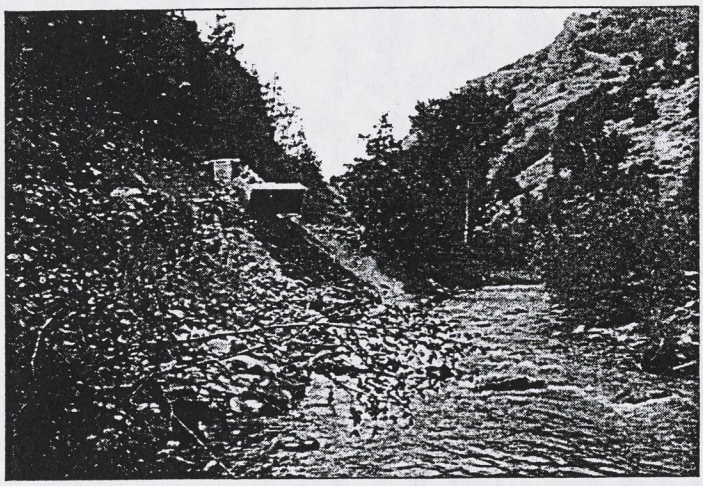
The county's major newspaper, the *Elko Daily Free Press*, continues to back the commissioners' action. "Without Trout Unlimited's interference, the Jarbidge road would have been reopened," said a recent editorial. "That fact alone makes Holford and his band responsible not only for the loss of access to the Jarbidge River, but also the emergency listing of the bull trout and all future economic loses (sic) to Elko County and the residents of Jarbidge." The three county commissioners who approved the reopening could not be reached for comment.

The county has asked the Nevada Division of Environmental Protection to lift the cease-and-desist order, and a hearing will be held by the state Environmental Commission in Jarbidge in mid-September, says agency spokesman Verne Rosse. Even if the order is reversed, says Rosse, the county would need approval from the Forest Service, the Army Corps of Engineers, and the Fish and Wildlife Service before continuing with the roadwork.

Approval doesn't seem likely: The federal agencies and Trout Unlimited are now considering lawsuits against Elko County, hoping to win enough money to restore the stream. "It would be an affront to have the American taxpayer pay to repair the damage," says Flora.

"To people who have devoted their lives to the preservation of natural resources, this is an abomination," she says. "It's bad enough when something like this happens accidentally. But this was no accident."

— Michelle Nijhuis, HCN reporter



TAKE THAT, FEDS: Elko County "repairs" a road (U.S. Fish and Wildlife Service photo)

YOU CAN CONTACT ...

- Matt Holford, Trout Unlimited, Nevada State Council, 702/753-4306;
- Fish and Wildlife Service Nevada Field Office (Reno), 702/861-6300;
- Humboldt-Toiyabe National Forest Headquarters (Sparks), 702/331-6444;
- Elko County Commission, 702/738-5398.

THE WAYWARD WEST

The fastest bird in the world could fly off the endangered species list in the next year, according to Interior Secretary Bruce Babbitt. The peregrine falcon nearly died out in the 1970s, after the pesticide DDT and other chemicals caused it to lay thin-shelled eggs. Today, there are 1,600 breeding pairs in the United States and Canada. "We have proved that a strong Endangered Species Act can make a difference," said Babbitt.

But the **Endangered Species Act** may not be as strong as Interior Secretary Babbitt once thought. In June, he announced that the law was working so well that 29 species were coming off the list. Now, the Interior Department acknowledges that some of those species were being dropped because they had gone extinct. U.S. Fish and Wildlife Service Director Jamie Rappaport Clark told members of Congress that Babbitt's original statement was due to a miscommunication, according to Greenwire.

The National Audubon Society recently flip-flopped on a lawsuit over restoring wolves in Idaho. The group was a plaintiff in the lawsuit claiming that the reintroduction was illegal because it endangered naturally occurring wolves. The goal of the lawsuit was tighter protection, but it backfired last December, when U.S. District Court Judge William Downes agreed that the program was illegal, and ordered the wolves removed (*HCN*, 4/13/98). Now, Audubon supports the reintroduction plan. It is appealing Judge Downes' removal order.

The state of California will pay dearly for poisoning **Lake Davis**, northwest of Reno, and wounding the local tourist trade. In August the state agreed to pay $9 million to Plumas County, the city of Portola and local businesses and property owners, according to the *Reno Gazette*. Two businesses closed and others reported 50 percent drops after the California Department of Fish and Game killed all aquatic life in the lake last October in order to eradicate the north-

Big Spring's beauty belies the fact that it often lacks sufficient oxygen to support fish and insects.

PENNSYLVANIA HATCHERY FALLOUT

After almost 25 years of denial, the Pennsylvania Fish Commission is finally 'fessing up to the fact that when it built a hatchery at the headwaters of Big Spring it destroyed one of the world's most productive brook trout fisheries.

Located in the Cumberland Valley just east of Newville, Big Spring is the largest spring creek in central Pennsylvania. The hatchery opened in 1971 over the objections of such well-known and knowledgeable anglers as Charlie Fox and Vince Marinaro—and within three years Big Spring's brook trout population crashed. The Fish Commission spent the next quarter-century blaming the disappearance of all wild, naturally reproducing trout on everything *except* the effluent from the 900,000 trout that inhabited its hatchery raceways. The usual suspects included housing development, agricultural runoff, a virus that killed aquatic vegetation, even siltation from natural clay deposits deep in the limestone springs themselves.

But last January, after completing studies on Big Spring, two scientists presented the Fish Commission with incontrovertible evidence that the hatchery is responsible for the suffocation of the stream. Dr. John Black found that nitrates and phosphates from manure produced by 300,000 pounds of hatchery fish—along with fish-manure solids themselves—were combining to drive dissolved oxygen from the stream. Black reported that oxygen frequently drops below the levels that fish need to survive.

The other scientist, Gene Macri, found that mayflies, stoneflies and caddisflies could not live in Big Spring because the stream lacked sufficient oxygen to support them as well.

After receiving the scientists' report, the Fish Commission admitted that the hatchery was a problem and immediately commissioned researchers to come up with a plan for cleaning up Big Spring.

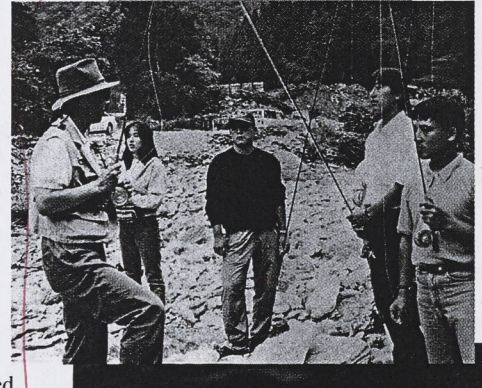
—Bill Ferris

JAPANESE SCHOLARSHIP FUND

Kazuhiro Ashizawa was the original Japanese fly-fishing bum, quitting his job in 1968 at the age of 30 to devote himself completely to the sport. He eventually founded Japan Fly Fishers, that country's largest fly-fishing organization, and before his death in 1996 his articles, books and television programs drew thousands of Japanese into fly-fishing and attracted many of them to American trout and salmon rivers.

Thanks in large part to Ashizawa, Japan now has plenty of angling enthusiasts. But the country still lacks trained ecologists and conservationists, and the newly formed Kazuhiro Ashizawa Memorial Scholarship Fund is trying to fix that problem by sponsoring two working land managers and two graduate students to study in Montana each year. The land managers will receive intensive practical training in conservation theory and methods while the students will work toward completing a degree in fish and wildlife or a related field.

Send donations c/o Yellowstone Glacier Adventures, PO Box 165, Bozeman, MT 59715, or for further information contact Steve or Noriko Braun at 406-585-9041.



Kazuhiro Ashizawa was a Japanese fly-fishing pioneer and popularizer.

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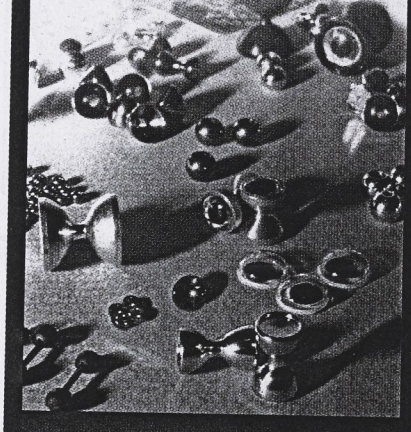
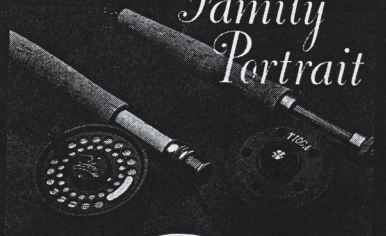


SPIRIT RIVER INC.

Family Portrait



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FISHING IN THE BRUSH . . .

Continued from page 55

tension of the water on the line and the weight of the line to load the rod tip for your forward cast.

Another way to get line out is to let the line drop from the rod tip and, as you start a backcast, hesitate and let the line collapse behind the rod, then drift the rod and line forward and make that short squeezing stroke.

The ***circle cast*** (discussed in my book, *Trout Tactics*, Stackpole Books, 1981) also works in tight places. Make the rod move in a circle by making a tiny circle motion with the wrist of your casting hand. With this motion, the line makes a circle in the space available. The movement of the line loads the rod for your cast.

Anytime you can get the line on the water either ahead of or behind the rod, you can make a cast. The tension of the water on the line and the movement of the line with that tension loads the rod enough to make a cast.

When you are very restricted in casting room, use a **flip cast** to get your fly on the water. Hold the leader just above the fly, and with your wrist, flip the rod and release the fly. You can also hold several loops of leader and line in your hand to attain greater distance. The flip of the rod hand is a short, quick, overhand motion—just a flip.

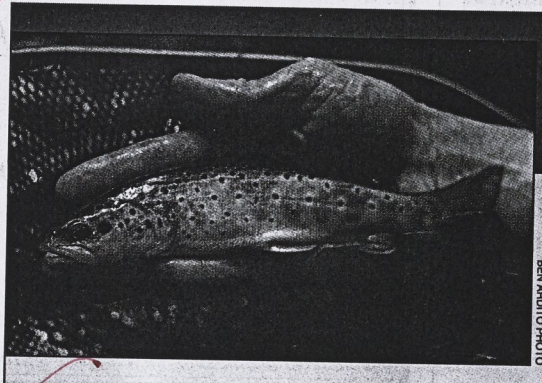
Once the line is on the water, the **circle roll cast** is an ideal technique for distance in a confined area. With a conventional roll cast, the line drops behind the rod and eventually stops and comes to rest behind the rod. The weight of the line dropping off the rod tip and the tension of the water on the line loads the rod; the rod drifts forward as you would drift a hammer to a nail; and then you make the short squeezing casting stroke.

The more line that drifts behind the rod tip, the greater distance the cast. With the circle roll cast, the motion never stops. The rod hand makes a circle, the line lifts from the water, drops briefly behind the rod tip, and you make the casting stroke as the rod circles forward. Remember, your rod hand makes a continuous circle; it never stops.

When I was a kid, fishing the mountain streams was always an adventure. There were several of them a short bicycle ride from my home in State College, Pennsylvania. Their trout were skittish, and all my attempts to get within casting range sent them scurrying. Crawling on my hands and knees to the water's edge didn't cut it, and I wasn't a good caster.

I found that if I could station myself far enough above the pool, get the fly on the water and release enough slack line into the currents feeding the pool, the fly would ride a good distance downstream to the fish. With the rod tip, I would give the line and fly direc-

PROTECTING THE WILD FISH



BEN ARDITO PHOTO

I CAUGHT MY FIRST TROUT, an 8-inch brown, as a lad of six on Spring Creek in central Pennsylvania. Brook trout from the mountain streams followed shortly after. That was more than 60 years ago, and of all the lessons I've learned, one remains paramount. If you want your children and grandchildren and future generations to have the same wonderful experiences you've had, then you must return the wild or native trout to its pool, so that it may continue to reproduce.

With today's increased number of anglers and volumes of information on "how to" and "where to go," these fragile streams and the wild and native trout in them can't take the pressure. Unrealistic limits, such as Pennsylvania's eight fish a day, depletes the wild-fish population. In addition, bait fishers often let trout swallow the bait, thereby gut-hooking the fish. Most gut-hooked small fish die after the hook is ripped out. Also, many anglers who use barbed hooks hold fish too tightly or for too long when they have difficulty removing a hook. Few of these fish ever survive.

The best way to assure the future of these streams and the trout in them is to limit your kill, or better yet, use barbless hooks and practice catch-and-release.

Continued from page 8

can keep only one trout or salmon per day of fishing.

Several studies have been carried out over the years by the Chilean Fisheries Department and some universities. The Nireguao is one more, and the above examples have been a model of management that will certainly help protect other unique pieces of water of this beautiful country.

ADRIAN DUFFLOCQ
Llifen, Chile

Catch-and-release Limits

Todd Tanner's Forum "License to Kill" (September 1998) was interesting, if a rather old idea. I feel, however, that he left out a lot of important information.

Catch-and-release fly fishing kills fish. Todd would like a special license to kill wild fish at a discount. He keeps mentioning "wild trout" as opposed to "native trout." Wild trout were at one time stocked or they wouldn't be in streams. Who paid for that? Since these are prime trout that Todd wants to catch, release, and sometimes kill, that special license should cost a premium. Certainly it might cost as much as a decent reel or fly rod.

Who would you rather have fishing in front of you? A fisherman that keeps his few fish and leaves, or one of our modern catch-and-release fisherman that you know won't leave until he has run up the score, as much as he is capable of, on a creature as dumb as a trout.

In other words, Todd, your idea doesn't really make a lot of sense. You and your clients are killing fish. I would be amazed if you ever suggest to your clients that they limit their kill by limiting their catch.

Anyone that does not have a self-imposed catch-and-release limit is a game hog and doesn't deserve to fish on our streams and lakes. When I hear someone claim he caught and released 40 trout, I don't think, "what a great fisherman." I think, "this guy needs a testosterone check."

The concept of "catch-and-release" is a travesty of sportsmanship until we not only limit our catch, but also have laws passed that specify what that limit is. After more than half a century of fly fishing, I obviously have a problem with what catch-and-release fishing has become. It's just another manifestation of "mine is bigger than yours." And yes, I do have a catch-and-release limit.

DR. ERIC PETTINE
Fort Collins, Colorado

Eric Strikes Again

Catch-and-release Fees

It's about time someone wrote about the way so many fly-fishing "catch-and-release" anglers feel ("License to Kill," September 1998). I believe Todd Tanner hit the nail, or the fish, on the head when he said it was not fair that "catch-and-release" anglers should have to pay the same license fee as "corndogger" or "catch-and-kill" anglers.

There is one important thought he has left out. Should a "catch-and-release" angler be able to fish stocked streams? What about streams that hold wild and stocked fish? I live in North Georgia and pay the $53 fee for a non-resident Tennessee license because there are times when it gets hot, or when I'm fishing with a beginner, and the wide-open tailwater streams, such as the Hiawassee, serve their purpose.

I also find it unlikely that the states would ever agree to "lowering" license fees. Therefore, I have a solution: Keep both license fees the same and let the angler decide the type of permit he buys and where the money will go.

I live in North Georgia and purchase Georgia, Tennessee, and North Carolina yearly licenses in addition to the daily and weekly fees I pay for fishing out West. I'm not bitter about forking over money, but as Mr. Tanner states, it would be nice to know where the money goes.

DOUG JONES
LaFayette, Georgia

Defending a Generation

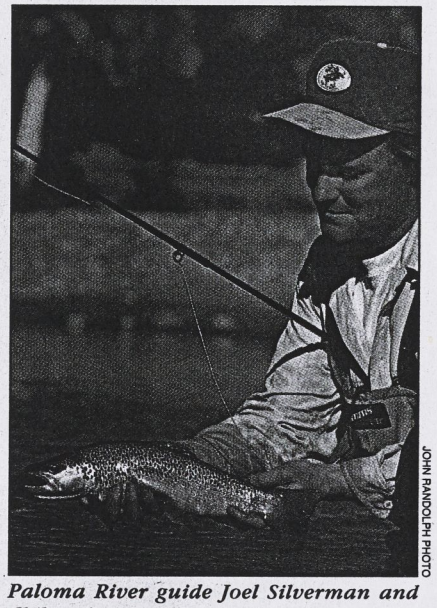
I am writing to defend a generation of fly fishers that is often maligned in letters and articles in many fishing magazines. This generation is usually referred to as the "A River Runs Through It" generation because we began to be seen on rivers and streams after the release of the movie based on MacLean's classic novel. We're young, numerous, and apparently uneducated in fishing etiquette. We're also women, ethnic minorities, and not far from any one class line. Most important, we came to fly fishing with a respect and awe for nature. We're eager to become part of a community of fly fishers, to learn the rules of the stream.

If the problem were purely one of numbers, the contempt shown my generation of fishers should be directed toward everyone on the stream. Unless the decline in American fishers began in the mid-1980s, I find it hard to understand why our fishing, and not our parents or grandparents fishing, is a problem.

Is our diversity a threat to those who object to our presence on the stream? I've read of the loss of "tradition" and "heritage" in fly fishing. "Just anyone" can pick up a rod. "Heritage" implies ownership, but I see no reason why men or whites should have special claim on what belongs to all Americans.

However we came to fly-fishing, by way of Hollywood or Hemingway, we're here because of passion, not pretense. We've sought to exclude no one, which is more than can be said of those who gripe that we're snobbish.

REBECCA COPENHAVER
Los Angeles, California



JOHN RANDOLPH PHOTO

Paloma River guide Joel Silverman and Chilean brown. (See cover.)

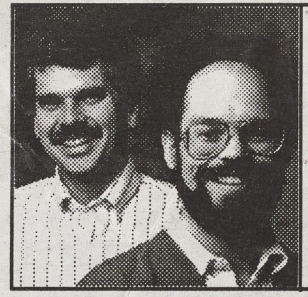
September Issue Corrections

In the "Trout Under the Condor" article we gave incorrect information regarding Angler Adventures. All of the lodges mentioned in the article can be booked through Angler Adventures, P.O. Box 872, Old Lyme, CT 06371, (800) 628-1447, (860) 434-9624; fax: (860) 434-8605; angler@snet.net, http://www.AnglerAdventures.com. Also, Spencer Moore's Rio Palena Lodge fishes 45 miles of the Rio Palena.

The caption for our September cover photo misidentified the fish. It was a 26-pound sea-run brown trout.

In the "Oregon's Trophy Trout" article we failed to give information on the Williamson River Club at Crystalwood Lodge, P.O. Box 469, Fort Klamath, OR 97626, fax: (541) 381-2328, SALM099@aol.com.

In the "Chesapeake Stripers" article we gave an incorrect phone number for Capt. Scott Russell. The correct phone number is (301) 737-0255.



SCIENTIFICALLY SPEAKING

by Dr. Bill Taylor
Michigan Council Scientific Adviser
and Dr. Dan Hayes

One of a faculty member's real pleasures is seeing students complete their research and hand in their thesis or dissertation.

It's been a particularly busy spring for Bill and me. We've had two master's students and one doctoral student finish their work during April and early May.

This research holds much material of interest to TU members, but in this column we'll focus on one element of Jessica Mistak's work on the Pine River in Manistee County.

Jessica has been evaluating the changes to the habitat and fish community in the Pine during the removal of Stronach Dam. As part of her study, she examined the diet of the river's trout, as well as the abundance of drifting insects.

We've talked quite a bit in past columns about trout diets and how various groups of insects (and other prey, like crayfish) contribute to trout feeding. Jessica's data on insect drift sparked a thought perhaps best viewed as a question: How many insects does a trout see drift by in the course of a day?

The answer depends on two elemental questions. First, How far can a trout see underwater? And second, How many insects exist in a given volume of water?

I searched the literature for an answer to the first question, expecting lots of research on what distance a trout can see various-sized organisms. But I came up with almost nothing.

This surprised me, given the interest in trout-feeding dynamics. But sometimes we find important research has never been done (or if done, never published).

So, without data, I had to make an assumption. I reasoned that fish can readily see and respond to insects in an area the size of the nets we use to collect drifting insects.

With this starting point, we can explore the range of conditions observed on the Pine.

At the range's low end, we collected about 40 insects in a two-hour period. But at the upper end, we captured over 3,000 insects in the same time. This means a range from 0.33 insects passing by each minute to more than 25 per minute.

The midrange of Jessica's observations revealed, however, that we typically caught 120 insects in a two-hour period. That's a drift rate of one per minute, and the rate we'll use.

Furthermore, over the summer, Jessica's sampling disclosed the average Pine River trout had about 50 insects in its stomach. If we assume trout digest food quickly enough to pass their stomach contents three times a day, then trout eat about 150 insects daily, or an average of about one insect every 10 minutes.

Making more assumptions (which is what scientists seem to do best), we create an imaginary, but statistically valid, typical trout on an average day looking at the usual number of insects. And we arrive at this conclusion: The insect drift rate is one per minute, and a trout eats only one of every 10 insects it sees.

With numbers like these, no wonder catching trout can be tough. If a trout ignores nine of every 10 real insects it sees, what chance does an artificial fly have?

This seems to us as good a reason as any to explain away those awkward, fishless days.

Stream Sweep on the move

by BILL WALKER

The Michigan Council of Trout Unlimited's Operation Stream Sweep is rolling into its second construction season.

Fueled by a busy work schedule, a substantially refurbished dredge and brisk donor participation, the council's amphibious dredge project to remove erosional sands from coldwater stream bottoms is anticipating increased success.

After a decade of preparation - raising funds, designing specs, consulting with manufacturers and fisheries experts, devising work plans, soliciting clients - TU's unique dredge began work last July.

By mid-November, when the Stream Sweeper drove out of a tributary of the Pere Marquette River, it had removed sediment from a variety of situations that revealed the machine's strengths and weaknesses.

Survey provides startling results

By Charlie Meyers
Denver Post Outdoor Writer

Snow soon will settle over the mountains, but here's a little thought to file away in your fishing memory bank for next year.

"If you're driving very far to fish high lakes, you're wasting time and missing a lot of opportunity," Greg Policky, said, poking a finger at a map of the Arapahoe National Forest close enough at hand to include the city of Boulder.

Policky should know. A fisheries biologist in the Colorado Division of Wildlife's Central Region, he recently completed this year's portion of an ongoing survey of timberline lakes north and west of the metro area. The trailheads for most of these are barely more than an hour from Denver, less from Boulder.

What Policky and his crew found will surprise most anglers who believe it's necessary to drive long distances to a Western Slope wilderness to find good fishing in high lakes. In fact, some of the findings were a considerable shock to Policky himself.

Chief among these was a 19-pound, 35-inch lake trout that turned up in a gill net at Diamond Lake, a 12-acre jewel at timberline in the Boulder Creek drainage.

"We didn't even find a record that lake trout had been put there," said Policky, who is having the fish mounted for display. "I'm assuming it was planted in the late 1960s, which would put it about 25 years old. Trout grow slowly at that elevation."

A short growing season in a hostile environment always has been the bane of timberline lakes, a handicap that, coupled with excess fishing pressure, puts them under a cloud of doubt. It generally has been suspected that high lakes adjacent to the heavily populated Front Range generally offered poor fishing; the trout were either sparse or small, perhaps both.

But this DOW survey of waters east of the Continental Divide, roughly from James Peak on the south to Arapaho Pass on the North, paints a completely different picture.

"They're better than I thought. A lot better," Policky said. "Most support at least an above average fish population and some are very good."

How good?

From Heart Lake, just beneath the divide in the upper reaches of South Boulder Creek, the crew nabbed a 4-pound cutthroat. A 6½-pounder was taken there a few years back.

"We got a half-dozen 20-inchers overnight," said Policky, who listed several other lakes with cutthroats nearly that big.

Most of the lakes are replenished with cutthroat from hatcheries on Pikes Peak, mostly Yellowstone strain with a mix of native greenbacks. More recently, DOW has introduced browns to Jasper and Middle North and Middle South Crater lakes to control a stunted overpopulation of brook trout. Other variations include placing golden trout in Big Arapahoe Lake and grayling in Woodland Lake. It will be a few years before these reach good size.

Meanwhile, larger cutthroats abound in other lakes such as Upper Crater, Upper Diamond and Murray lakes.

"Some fishermen might want a lot of fish and there are lakes with a really high catch rate for brookies and cutthroat 8 to 12 inches," Policky said.

He put Storm, Middle South Crater, Lower Crater, Bannana and the Forest lakes in that category.

"Most require a 3- to 4-mile hike which generally isn't too demanding," he added. "They're generally easier to reach than many lakes on the Western Slope."

The other big surprise here is that fishing pressure is less than you'd ever dream.

"I've been to really productive lakes where I'd see only one other fisherman all weekend," Policky said. "If you don't try these, you're missing a real bet."

Special to The Denver Post

MAC ATTACK: Biologist Greg Policky shows off the 19-pound lake trout he netted unexpectedly from Diamond Lake.

It's time for DOW to bite the bullet

BOB SAILE OUTDOORS

The most important color for Colorado big game hunters isn't orange. It's green.

Some 330,000 regular-season deer and elk hunters will wear blaze orange this fall, but they will spend long green. And the latter is both a blessing and a curse.

The blessing of [illegible] tober with visions of elk or deer [illegible] their heads are the [illegible]

mends cutting all deer hunters back to a maximum of five days of hunting no matter which of the three season options they choose.

The idea is to equitably spread hunting pressure while taking some heavy hunting pressure off Colorado's less-than-prime buck deer populations.

In my opinion, the proposed five-day limitation is ludicrous. We're going to limit 200,000 rifle [illegible] hunters a five days while we

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NATIONAL LEAGUE STATISTICS

TEAM BATTING
Through Friday

	AB	R	H	HR	RBI	Pct
....4973	702	1307	119	661	.262	
...4975	692	1296	131	649	.260	
...5024	633	1301	153	599	.258	
..4889	588	1253	60	543	.256	
.5061	635	1291	145	597	.255	
4982	626	1263	99	572	.253	
5005	606	1247	132	567	.249	
863	583	1182	106	550	.243	
892	522	1189	87	481	.243	
013	548	1222	73	513	.243	
976	576	1209	112	534	.242	
042	585	1222	104	550	.242	

IVIDUAL BATTING
n 360 plate appearances

	AB	R	H	HR	RBI	Pct
.....439	69	141	14	56	.321	
.....530	69	168	4	62	.317	
.....532	87	166	20	78	.312	
.....520	62	160	6	67	.308	
.....445	60	137	4	39	.308	
.....538	95	165	17	92	.307	
.....512	75	154	26	105	.301	
.....467	69	140	19	74	.300	
.....569	105	170	2	37	.299	
.....409	77	122	19	64	.298	
.....401	81	119	0	26	.297	
.....510	71	151	15	79	.296	
.....494	73	146	4	39	.296	
.....532	84	157	24	76	.295	
.....492	77	144	17	81	.293	
.....540	95	158	24	88	.293	
.....399	57	116	3	36	.291	
.....357	61	103	19	81	.289	
.....540	76	156	8	52	.289	
n 377	41	109	5	38	.289	
.....542	62	156	25	84	.288	
.....505	86	145	2	44	.287	
.....434	53	124	16	58	.286	
.....474	86	134	23	104	.283	
....394	59	111	3	30	.282	
....500	80	140	29	100	.280	
....527	69	147	11	76	.279	
....566	78	157	6	51	.277	
....333	46	92	5	31	.276	
.....517	63	142	28	99	.275	
.....460	72	126	19	46	.274	
.....440	55	120	9	58	.273	
.....394	79	107	10	50	.272	
.....539	79	145	4	33	.269	
.....463	48	124	3	46	.268	
.....571	88	153	15	59	.268	
.....553	67	148	11	56	.268	
.....347	49	93	6	33	.268	
.....454	81	121	25	92	.267	

Santiago SD	538	56	142	15	78	.264	
Van Slyke Pit	454	84	120	17	80	.264	
Grissom Mon	516	69	135	6	38	.262	
Scioscia LA	317	36	83	6	34	.262	
Blauser Atl	330	45	86	10	52	.261	
Dunston Chi	463	57	121	12	47	.261	
Candaele Hou	430	42	112	4	43	.260	
Hatcher Cin	407	42	106	4	37	.260	
Johnson NY	507	101	132	35	106	.260	
Guerrero StL	381	39	99	7	60	.260	
Pagnozzi StL	436	35	113	2	52	.259	
O'Neill Cin	487	67	126	27	87	.259	
KvMitchell SF	363	52	94	27	69	.259	
Murray LA	529	66	137	19	92	.259	
Magadan NY	418	58	108	4	51	.258	
McReynolds NY	493	59	127	14	67	.258	
MaWilliams SF	545	66	140	30	87	.257	
Caminiti Hou	540	59	138	12	76	.256	
Daniels LA	426	51	109	16	70	.256	
Murphy Phi	500	63	126	17	71	.252	
Thon Phi	490	42	123	9	43	.251	
DeShields Mon	530	79	132	9	48	.249	
Lankford StL	513	72	127	7	60	.248	
Gant Atl	511	91	125	30	97	.245	
Elster NY	319	30	78	6	34	.245	
Olson Atl	360	44	88	6	37	.244	
Griffin LA	344	27	84	0	27	.244	
LGonzalez Hou	426	47	103	13	60	.242	
Oquendo StL	355	34	86	1	26	.242	
Bass SF	327	42	79	9	37	.242	
Owen Mon	373	31	90	2	23	.241	
Brooks NY	357	48	85	16	50	.238	
CHayes Phi	443	34	104	12	52	.235	
JClark SD	341	26	79	10	46	.232	
Wallach Mon	530	56	116	12	63	.219	

TEAM PITCHING

	ERA	H	ER	BB	SO	ShO	SA
Los Angeles	3.12	1223	467	466	925	12	36
Pittsburgh	3.44	1275	507	369	831	9	46
Atlanta	3.51	1194	516	438	872	6	43
Montreal	3.58	1187	523	523	820	14	36
New York	3.58	1281	520	368	937	10	35
San Diego	3.59	1267	535	425	834	11	40
St. Louis	3.68	1255	534	408	735	5	44
Cincinnati	3.80	1245	557	509	883	10	41
Philadelphia	3.85	1235	572	608	900	10	33
Houston	4.03	1244	595	588	935	11	32
Chicago	4.07	1297	602	486	842	3	38
San Francisco	4.12	1279	605	502	807	9	41

INDIVIDUAL PITCHING
Based on nine decisions

	IP	H	BB	SO	W	L	ERA
GHarris SD	113	97	24	79	6	5	2.06
MiWilliams Phi	79	49	54	77	11	5	2.16
DeMartinez Mon	218	184	57	122	14	10	2.35
Rijo Cin	183	144	46	149	14	5	2.41
Glavine Atl	228	184	59	175	19	10	2.52
LeSmith StL	66	63	12	57	6	3	2.58
Harnisch Hou	199	155	80	158	10	9	2.61
Belcher LA	194	174	73	142	9	9	2.64
Franco NY	49	53	15	41	4	8	2.76
Morgan LA	214	179	55	118	13	9	2.81
DeLeon StL	157	141	59	114	5	9	2.81
McDowell LA	95	93	47	47	8	9	3.02
Tomlin Pit	159	153	50	96	8	7	3.05
Tewksbury StL	177	192	34	70	10	11	3.09
Benes SD	203	171	55	151	13	10	3.10
Greene Phi	201	167	63	149	12	7	3.17
ZSmith Pit	204	208	26	107	15	10	3.18
Assenmacher Chi	93	75	29	107	7	6	3.18
Drabek Pit	212	225	61	124	14	13	3.22
JHowell LA	50	38	10	39	6	5	3.24
Melendez SD	77	63	21	51	6	5	3.26
RMartinez LA	201	175	58	135	16	11	3.27
Hurst SD	221	201	59	141	15	8	3.29
Ojeda LA	177	171	68	110	11	8	3.29
Smiley Pit	191	183	39	122	18	8	3.29
Osuña Hou	76	57	41	62	7	6	3.30
Leibrandt Atl	209	195	46	118	15	11	3.31
Avery Atl	190	172	61	125	17	8	3.32
Walk Pit	100	87	32	60	7	2	3.33
Oliveras SF	74	64	19	45	6	5	3.41
Myers Cin	126	109	76	101	6	13	3.42
DeJesus Phi	163	136	116	108	10	6	3.42
BJones Mon	83	71	31	44	3	9	3.47
Cone NY	209	191	66	209	13	13	3.48
Boyd Mon	120	115	40	82	6	8	3.52
KeGross LA	112	116	49	90	10	10	3.54
Mulholland Phi	213	209	46	133	15	11	3.55
TWilson SF	184	160	70	124	11	10	3.56
MGardner Mon	149	128	63	93	8	10	3.56
Kile Hou	141	134	76	91	7	9	3.56
GMaddux Chi	231	211	62	177	12	10	3.58
Gooden NY	190	185	56	150	13	7	3.60
Ruffin Phi	109	116	33	76	3	7	3.62
Burke NY	89	86	21	50	5	7	3.63
Rasmussen SD	139	147	47	72	6	12	3.67
Belinda Pit	73	47	33	68	7	5	3.68
Lancaster Chi	143	139	43	93	9	7	3.71
Olivares StL	145	127	55	73	9	6	3.72
KiGross Cin	77	84	38	32	6	4	3.74
KHill StL	159	133	61	107	9	10	3.78
Scudder Cin	89	79	47	41	5	7	3.84
Viola NY	215	235	51	127	12	15	3.85
FCastillo Chi	95	90	24	62	6	5	3.88
Sampen Mon	76	80	39	46	8	4	3.89
BSmith StL	185	181	40	86	11	8	3.97
Palacios Pit	77	66	37	61	6	3	3.97
Nabholz Mon	133	121	51	85	6	7	4.05
Hammond Cin	99	92	48	50	7	7	4.06

Rockies to hire Twins' Gebhard

ROCKIES from Page 1B

president Steve Ehrhart.

"I used to come in to Denver on a regular basis when the old Bears were affiliated with Montreal," Gebhard said. "I've known John McHale for 20 years."

Denver was Montreal's Triple-A affiliate in the late 1970s and early '80s. At the time, McHale's father, John McHale, was an executive with the Expos and Gebhard was a special instructor.

Gebhard's addition to the Rockies' organization could be a key to the franchise's dealings in next fall's expansion draft.

Having worked for the Twins, Gebhard now has recent experience in both the A.L. and N.L.

"I would think having experience in both leagues would be an important factor for anyone who is drafting players," Gebhard said.

Rockies officials were unavailable yesterday to confirm either McHale's or Gebhard's appointment.

The Rockies are also expected to announce that Randy Smith, director of scouting for the San Diego Padres, will be joining the Rockies. Smith presumably would be a member of the team's scouting and player development department.

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