REPRESENTING ALL DISCIPLINES OF FISHERY SCIENCE

American Fisheries Society

COLORADO-WYOMING CHAPTER

Abstracts of the

14th Annual Meeting

March 7-8, 1979

Restrictive Angling Regulations in Yellowstone National Park, John D. Varley, U.S. Fish and Wildlife Service, Yellowstone National Park.

Yellowstone National Park, by its establishment act of March 1, 1872, was "dedicated and set apart as a public park or pleasuring-ground for the benefit and enjoyment of the people" for the preservation, from injury or spoliation of all timber, mineral deposits, natural curiosities or wonders...and their retention in their natural condition." Since 1872, additional legislation and policies have further defined the purpose of Yellowstone to prohibit hunting of all birds and mammals and to regulate fishing. The Park is managed as a natural area as to perpetuate as a composite whole the indigenous fauna and flora, geology, and scenic landscape. Because fishing is most often exploitive, its existence is an anomaly to the stated purpose and objective. Fishing has, nonetheless, a historical precedent and has been a major visitor activity for over 100 years. The objectives of fishery management have changed radically during this period. Following a very liberal and permissive initial 60 years, the present objectives have evolved since the late 1930's to more closely coincide with the Park's primary purpose. Specifically, the objectives of the fishery program are:

1. To manage the fishery program as an integral part of the park ecosystem.
2. To provide fishermen with a high quality angling experience with wild fish under natural settings.
3. To preserve and restore native species and aquatic habitats.

Regulations to restore or protect fishes and maintain high quality angling involve manipulating season dates, restricting baits, using creel and size limits, and designating certain species or waters for catch-and-release fishing only. Additionally, certain waters are closed to protect rare or endangered species, nesting birds, or to provide vistas for viewing scenic landscapes and undisturbed wildlife (including fishes).

Yellowstone now has one species of fish (the Montana grayling) and over a dozen waters classed as total catch-and-release. A number of others, including Yellowstone Lake, are partially catch-and-release

and have maximum or minimum length limits. These highly restrictive regulations have, by most measures of angling quality, improved populations and provided fishing superior to that found before the restrictions.

Despite improved sport fishing and fish populations, the question of achieving compatibility with natural area concepts remains unanswered.

Characterization of the Twin Lakes Sport Fishery for Pump-Back Storage Power Generation Impact Analyses, Tom P. Nesler, Colorado Division of Wildlife.

Installation of a pump-back storage type powerplant at Twin Lakes, Colorado, began in 1972. The tentative testing date of this unit is set for August 1979. The operation of the powerplant involves considerable potential for adverse impact upon the Twin Lakes sport fishery. Some proposed impacts include: increased mortality of trout and *Mysis* shrimp via entrainment and passage through the turbines, and adverse influences of turbidity and sedimentation upon lake trout reproduction and growth. Ultimately, these impacts would affect the quality and magnitude of the Twin Lakes fishery. Creel census studies initiated in 1972 have attempted to characterize the seasonal fisherman-use, harvest by species, catch rates, and return rates of stocked rainbow trout on Upper and Lower Twin Lakes. Further studies of the lake trout and *Mysis* shrimp have been conducted to determine the relative abundance and seasonal distribution of these respective populations.

A Report on the Establishment of a Coldwater Broodfish Program in Colorado, Larry E. Harris, Colorado Division of Wildlife.

Prior to 1973, the Colorado Division of Wildlife purchased all of its rainbow eggs for hatchery rearing. This amounted to a little more than 18 million eggs annually, the majority coming from private vendors throughout the United States. The Division found it increasingly difficult to obtain disease-free eggs. In 1972 the decision was made to establish and maintain a brood stock to produce all rainbow eggs needed by the Division. The first eggs were produced in 1973, amounting to less than two million. Since that time, however, six Division-owned hatcheries have been converted into broodfish units--either totally or in conjunction with their regular rearing activities--with very little additional expenses to the State. Included in these six units is a fish research unit at Bellvue. Today the Division of Wildlife has the capability of producing over 30 million eggs per year.

The Role and Problems of the Private Trout Industry, Kenneth E. Cline, Jr., Cline Trout Farm, Boulder, Colorado.

The role of the private trout hatcheries in the overall fish and public management problem will be discussed. Many problems of commercial hatcheries and the same as those of government hatcheries, and many problems are caused by government agencies. Often the problems are the result of lack of communication, so questions and discussion will be encouraged. If time permits some specific fish cultural techniques will be discussed.

Recent Advancements in Techniques of Salmonid Culture, William P. Dwyer, Fish Cultural Development Center, Bozeman, Montana.

There have been many advances in the field of fish culture in the last several years. Bozeman Fish Cultural Development Center personnel are working with a physical chemical water filtration system to remove ammonia from the water. This system may have advantages over the biological filter in climates where low water temperatures are encountered.

A very simple and efficient degasser has been developed by an engineer at Dworshak National Fish Hatchery. This system has been installed at Dworshak and Jackson National Fish Hatcheries with excellent results. Demand feeders are being studied for their use with rainbow trout by the College of Southern Idaho.

These and other advances will be discussed.

Ammonia Buildup in Fish Distribution Tanks, Allen Conder, Speas Rearing Station, Wyoming Game and Fish Department, Casper, Wyoming.

This experiment was conducted to determine if fish stress and mortality experienced during distribution and delayed mortality after stocking could be caused by un-ionized ammonia (NH_3^+) buildup in the tanks. Two distribution units, one with aerators and one with overhead spray, were used in order to compare the effectiveness of the two conditioning systems. The highest level of un-ionized ammonia was 0.027 ppm and 34 ppm was the highest carbon dioxide (CO_2) level reached. At these levels there were no delayed mortalities. The overhead spray proved to be the superior of the two systems.

Low Protein Diets for Rainbow Trout, Gary Reinitz, Spearfish Fisheries Center, Spearfish, South Dakota.

Rainbow trout with an initial average weight of 1.8g were fed experimental diets with 26 and 35% protein and varying amounts of lipid and the standard diet PR9 for 112 days. All experimental diets contained 10% fish meal with no other source of animal protein. The energy content of the diet was found to be the most important factor in determining growth rate. A diet with 26% protein and 11% fat produced a pound of rainbow trout for 20 cents while the least cost per pound of fish fed diets with 35% protein and 24 cents and 25 cents per pound for fish fed PR9. Feeding the lower protein diet could result in up to a 20% reduction in the cost of producing a pound of trout. Mortality rates did not differ significantly among all groups tested and the general health of all fish examined was good.

Establishment of Rainbow Trout Health through Hematological and Histological Assessment, William J. Logan, Department of Fishery and Wildlife Biology, Colorado State University.

Arlee (T.M.) rainbow trout (*Salmo gairdneri*) were cultured at two water temperatures and fed two nutritionally complete, balanced diets (Colorado Standard and Post Experimental diets) in order to establish

baseline data of hematological and histologicla health.

Hematological parameters measured were red blood count and morphology, packed cell volume, hemoglobin, plasma protein, albumin, glucose, cholesterol and urea nitrogen. Values for mean corpuscular volume, mean corpuscular hemoglobin and the ratio of albumin to globulin were calculated.

Histology included hemotoxylin/eosin stained cut sections of liver, kidney, spleen and gills.

Significant differences were found between culture temperatures but not between the diets in the hematological evaluation. No differences were observed in histology.

Quantitative and qualitative data will be compared at two Colorado Division of Wildlife trout production units during the second phase of the study.

Fishes and Macroinvertebrates of the White and Yampa Rivers in Colorado-An Overview, Clarence A. Carlson, Department of Fishery and Wildlife Biology, Colorado State University.

This paper summarizes a 1975-78 Bureau of Land Management-sponsored project to collect baseline data on selected reaches of the White and Yampa Rivers. A final report will be available from the author late in 1979. Previous work on the two streams was summarized. Eighteen fish species and four hybrids were collected from the Yampa River by electrofishing, seine and dipnet; flannelmouth, white and bluehead suckers, redside shiners, fathead minnows and speckled dace were most commonly collected. Sand shiners, plains killifish, and speckled dace x redside shiner hybrids which have not been reported before 1975 were collected from the Yampa River. Fourteen fish species and one hybrid were collected from the White River. Flannelmouth suckers, mountain whitefish; and speckled dace were most abundant in the White River collections. Distribution, spawning times, growth and food habits of selected fishes were determined. One hundred insect taxa were collected from the Yampa River and 77 from the White River. Mayflies were the predominant aquatic macroinvertebrates in both streams: caddisflies, and true flies were also abundant. Insect abundance by sampling station and date and Shannon-Weaver diversity were determined. Habitat of fish and macroinvertebrate communities was analyzed.

Distribution of Endangered Fishes in Western Colorado, Edmund Wick, Department of Fishery and Wildlife Biology, Colorado State University.

During 1978 and 1979 baseline and trend-zone studies conducted for the Bureau of Land Management and Colorado Division of Wildlife resulted in capture of seven humpback chubs (*Gila cypha*) and 19 Colorado squawfish (*Ptychocheilus lucius*). Selected areas on the Yampa, White, Gunnison, and Colorado Rivers were sampled by electro-fishing, seine and dipnet. Humpback chub were collected only in

the Ruby Canyon trend zone on the Colorado River: lengths of 131-335mm indicated recent reproductive success and presence of up to four year classes. Colorado squawfish were collected on all rivers sampled. Squawfish lengths varied from 462-820mm: the smallest and largest were collected from the upper Yampa River near Juniper Springs Canyon. Squawfish, aged by scales, were 6 to 11 years old. Most of the endangered fish collected had access to deep-water canyon habitat. During early spring runoff, squawfish were usually captured outside canyon areas at Maybell and Juniper Springs on the Yampa River. During late summer and fall, squawfish were most frequently found within canyons or near canyon mouths.

Evaluation of Variable Walleye Fry Stocking Rates in a Colorado Plains Reservoir, Steve J. Puttmann and Don T. Weber, Colorado Division of Wildlife.

The stocking of fry is an accepted management technique to create or augment existing populations of the walleye *(Stizostedion vitreum vitreum)* in Colorado. A research investigation was initiated in 1969 and continued through 1977 to ascertain the effect of various walleye fry stocking rates on the sportfish harvest in 688 ha (1,650 a) Boyd Lake, a typical Colorado Eastern Plains reservoir. Stocking rates of 3,000 and 2,000 fry/surface acre were evaluated in the years 1969-1972 and 1975-1977, respectively. Walleye fry were not stocked in 1973 or 1974 as an index on natural reproduction. Fish population sampling to determine the composition of the resident fish population, and random-stratified creel census to determine fisherman exploitation were conducted each year of the study.

Estimated walleye catch increased from a low of 861 in 1969 to a high of 9,913 in 1972, with a subsequent decline in the catch to an average of 4,320 walleye per year from 1973-1977. The estimated fisherman catch of crappie, the principle sportfish in Boyd Lake prior to the introduction of large numbers of walleye fry, declined from a high of 9,960 in 1969 to 213 in 1977. Estimated annual total numbers of fishermen, hours of fishing effort and total fish caught declined over the nine-year study period. Average weight of walleye creeled declined during years of heavy fog stocking and increased in years of no stocking. Walleye catch-per-man-hour (CPMH) for the period 1969-1977 averaged 0.084 and ranged from a low of 0.01 in 1969 to a high of 0.17 in 1972. The mean CPMH for walleye caught from a boat and from the bank during the study period was 0.12 and 0.02 respectively.

Recommendations to fishery management biologists for the stocking of walleye fry in Colorado are as follows:

Year 1 - stock at 2,000 fry/surface acre
Year 2 - stock at 3,000 fry/surface acre
Year 3 - do not stock
Year 4 - do not stock
Repeat cycle

*Potential Environmental Effects of Underground Coal and Oil Shale Extraction Technologies**, G.M. DeGraeve and H.L. Bergman, Department of Zoology and Physiology, University of Wyoming.

Underground processing of coal and oil shale could affect surface topography, ground and surface water quality, water uses and aquatic biota. For underground coal gasification (UCG), ground subsidence could be important in commercial operations depending on depth and thickness of the coal seam and nature and thickness of overlying strata. Groundwater contamination could become a problem if aquifers become contaminated by gases during the gasification reaction or by ash, tar and char left in the gasification cavity. However, preliminary DOE studies suggest that contaminants may absorb to coal as groundwater migrates away from the cavity, thus restricting the lateral extent of groundwater contamination. Waters condensed from UCG product gas are high in phenolics and inorganics such as ammonia and cyanide. Toxicities to aquatic biota for DOE's Hanna 3 condenser water were 0.1 to 0.2% dilution for 96-hr TL_{50} with rainbow trout (*Salmo gairdneri*), fathead minnows (*Pimephales promelas*) and *Daphnia pulex* and 0.02 to 0.04% affecting fathead minnow egg hatchability and fry growth.

Underground oil shale retorting could produce similar environmental effects. Although subsidence is not a serious problem, groundwater contamination, if not avoided or mitigated, could produce long-lasting effects of competing uses of groundwater. Also the underground retorting process can co-produce at least one barrel of water, which is high in inorganics such as ammonia, bicarbonate and sulfur species, for each barrel of shale oil recovered. The 96-hr TL_{50} dilution for DOE's Omega-9 retort water from the Rock Springs experimental site was 0.43% for rainbow trout, 0.57% for fathead minnows and 0.55% for *D. pulex*. Toxicity tests on a synthetic mixture of the inorganic constituents at levels found in Omega-9 water suggest that inorganics, rather than organics, are responsible for most of the observed toxicity; the 96-hr TL_{50} concentration of this artificial inorganic mixture was 0.56% dilution for rainbow trout and 1.12% dilution for fathead minnows.

*This report is based on work funded pursuant to an Interagency Agreement between US DOE and US EPA.

Biochemical and Cytogenetic Analysis of Geographic Variation and Subspeciation in Cutthroat Trout, Salmo clarki, Eric J. Loudenslager, Fisheries Biology Research Facility, Department of Animal Science, University of California-Davis.

The cutthroat trout (*Salmo clarki*) is a widely distributed species in North America. Populations occur in a diverse array of habitats ranging from small alpine streams and lakes to coastal rivers and lagoons. Complex morphological diversity has caused considerable taxonomic confusion. Six of the forms of *Salmo clarki* which are currently recognized as subspecies were studied using biochemical and cytogenetic techniques. Evidence from chromosome polymorphisms suggest three well differentiated geographic regions: coastal waters

are inhabited by cutthroat trout with a karyotype of 2n=68-70 (FN-104, 106); the upper Columbia and upper Missouri drainages are inhabited by cutthroat trout with a karyotype of 2n=66 (104); and the upper Snake, Yellowstone and Colorado Rivers as well as the Bonneville and Lahontan basins are inhabited by cutthroat trout with a karyotype of 2n=64 (FN-104). Electrophoretic analysis of protein polymorphisms confirms that the three chromosomally differentiated regions are also genetically differentiated. In addition, the populations of cutthroat trout with a 2n=64 karyotype can be further subdivided using electrophoretic data. The Lahontan Basin cutthroats are quite distinct from other cutthroat trout populations with a 2n=64 karyotype, whereas the cutthroat trout from the Bonneville Basin, Snake River and Colorado River are quite closely related.

Significance and Preservation of Riparian Ecosystems, Robert J. Behnke, Department of Fishery and Wildlife Biology, Colorado State University.

In recent years an increasing awareness has developed concerning the values of riparian ecosystem. These values include water quality, fish habitat, wildlife diversity and abundance and recreation. On public lands, however, management and protection of riparian areas in regards to multiple use management conflicts has been characterized by inconsistencies and lack of a unified approach to the problem. Guidelines have been established for riparian areas in relation to logging and road building but there are no workable guidelines in range management on public lands to allow for riparian protection under domestic livestock grazing. In the 11 western states, 48% of the land mass is federal lands and 75% of this is grazed by domestic livestock. Negative impacts of livestock on riparian vegetation is particularly severe in arid and semiarid lands. In areas suffering degradation, it is crucial that the riparian zone be given special management consideration, be separated from normal grazing allotments, and managed with a different set of priorities.

Multiple Use Management and the Riparian Ecosystem, Neil Morck, District Manager, Bureau of Land Management, Rock Springs.

The Bureau of Land Management provides multiple use resource management through the following activities. They are:

Energy and Minerals
Lands and Realty
Forest Management
Range Management
Recreation Management
Soil, Water and Air Management
Wildlife Habitat Management

Within these activities action plans are developed that permit respective uses and at the same time maintain the natural ecosystems ability to meet all resource production and other human needs, now and in the future.

The melding of uses or activities is achieved through the Bureau planning system which employs an integration of basic data, public comment, and environmental analysis in decision making. These decisions become the basis for activity action plans which when offered through the federal government budget process may be approved or disapproved by the executive or legislative branches of government.

The wildlife habitat and management plan and its relation to riparian zones is the wildlife programs action unit. These plans are particularly complex in that not only are they often impacted by the many uses authorized in other Bureau activities, but the plan also requires intense coordination with several agencies. BLM's responsibilities relate principally to habitat, while State Game and Fish Commission and the U.S. Fish and Wildlife Service are charged with species and population management.

The Bureau faces many challenges in multiple use management of public lands not the least of which wildlife habitat.

Aquatic Experiences during Preparation of the Big Sandy, Livestock Grazing, Environmental Statement: or, A Fish Eye View of the Terrestrial World, Bruce Smith, Bureau of Land Management, Rock Springs.

The author presents a chronological review of the preparation for, and of, the first livestock grazing environmental statement on public lands in Wyoming. Initial stream habitat inventories, livestock grazing relationships, stream habitat conditions, statement preparation, impact assessment, mitigation and implementation of management decisions are discussed in relation to aquatic habitat management, within the precepts of multiple use.

The Biology of a Plains Stream, Salt Wells Creek, Southwestern Wyoming, Morris J. Engelke, Jr., U.S. Geological Survey, Cheyenne.

Salt Wells Creek typifies plains streams draining extensive oil-shale areas of southwestern Wyoming. The stream is intermittent but has several small tributaries in its headwaters that are perennial due to springs. Springs and perennial reaches support an abundant aquatic community, including several species of small fish. Aquatic organisms found in downstream intermittent reaches are generally washed in from upstream. Some invertebrates survive dry periods by burrowing into the streambed.

Each of the three stream environments--ponds, springs, and perennial reaches--contains distinct invertebrate communities. Green and blue-green algae are dominant during high streamflow. Diatoms are dominant during low streamflow. Seasonal succession of community development occurs in periphyton and benthic invertebrates. Amphipods and caddisflies are the principal benthic invertebrates. Aquatic organisms in plains streams survive through periods of relatively high temperature and high concentration of suspended sediment and dissolved solids.

The Biology and Ecology of Eleven Iranian Brown Trout Populations, Barry Nehring, Colorado Division of Wildlife.

The numerical density and biomass of eleven Iranian brown trout populations evaluated over a four year period were generally at the upper end of the range on a unit area basis when compared with brown trout populations referred to in the literature. In one population the density reached 19,000 trout/hectare and biomass exceeded 1000 kg/ha for two years prior to a massive die-off. Growth rates of brown trout in this study compared well with growth rates of European brown trout populations but were considerably below growth rates of most North American brown trout populations recorded in the literature.

Iranian brown trout were sexually mature at the end of the second summer in ten of the eleven populations studied. Annual mortality rates for age classes II through V ranged from 50% to 100% and exceeded 75% in most cases. Severe flooding in two instances resulted in heavy mortality and resulted in surviving catchable size trout suffering from severe head wounds. While predation was not considered limiting to recruitment in any of the populations studied, disease was a factor in reduction of one population that grossly exceeded the carrying capacity of the environment.

Poor instream cover and inadequate riparian vegetation were considered limiting to numbers of catchable and trophy size fish. The complete lack of riparian vegetation in some study areas was considered the primary factor limiting benthic and terrestrial invertebrate production which in turn limited the growth rate of the trout. Sport fishing was not limiting to the numbers of catchable size trout in the population in any instance evaluated. The most stable population densities were in those areas where the habitat was the best while several non-fished populations exhibited wild fluctuations in density and biomass on a yearly basis. Absence of adequate instream cover severely limited numbers of catchable size brown trout even in the absence of any sport fishing.

Fisheries Recolonization of a Channel of the Tongue River Reclaimed after Coal Strip Mining, James A. Gore, Water Resources Research Institute, University of Wyoming, Laramie.

The original channel of the Tongue River through the Big Horn Mine, Sheridan, Wyoming, was returned to its original configuration and the river flow returned to the channel. Before flow was returned, the channel was filled with layers of topsoil, small gravel, and medium cobble. Large boulders were placed at intervals as well as "snags" of pine trees to form backwater/slow water areas. Carp were spawning in the channel within a day of opening. Reclamation of game fish was followed by natural colonization and transplantation from the former diversion. Natural recolonization, for total species, followed power curves predicted for other types of animals. Of particular interest were the rapid (within 14 days) colonization of areas by presumably territorial fish (rock bass, white crappie)

which had been found by other investigators to take several years. The primary colonizers seem to be the early year classes of most species, possibly indicating classical dispersal patterns as adults outcompete offspring. Predictions of the power equations predict that equilibrium density should be reached in about 100 days from the time of the channel openings. Agreement of data to this prediction is discussed.

Biological Control of Aquatic Plants: Facts and Fantasies. Tom Jackson, Fish and Wildlife Service, Denver.

Biological controls for aquatic weeds include four general categories:

1. Insects and other invertebrates
2. Plant pathogens (fungi, bacteria, viruses)
3. Plant-plant competition
4. Fish and other vertebrates

Problem aquatic plants impacting fisheries in the western United States are primarily submersed forms for which neither insect predators nor plant pathogens have been found, although an intensive search is underway. Crayfish (*Orconectes* spp.) have successfully controlled submersed aquatic plants in several western lakes but are neither well studied nor widely distributed for this purpose. Plant-plant competition to control submersed weeds has promise but is still experimental. At present, fish provide the only widespread biological method for submersed aquatic weed control. However, the use of fish to control aquatic plants continues to be an area of much controversy and misunderstanding. Both the virtues and vices of some piscine controls have been overstated while the known biology of these control agents and the target plants have been overlooked. Fish used for aquatic plant control in the United States include members of the families Cichlidae, Ictaluridae, and Cyprinidae. Cichlids are generally unsuited for temperature weed control because of limited thermal tolerance and questionable efficacy. Bottom sediment disturbance by dense populations of some ictalurids (North American catfish) and cyprinids (common carp, goldfish) can produce turbid conditions which shade out aquatic plants but may be more objectionable than the plant problems. Direct feeding on plants by these fishes is considered a minor source of control. The herbivorous grass carp or white amur has potential for submersed weed control in western habitats but the effectiveness for weed control and environmental impact of this species are almost totally unknown for the 13 western states. The biology and distribution of grass carp in the United States are briefly reviewed in light of recent developments concerning aquatic plant problems. Biological control is not a panacea but can be an effective tool when integrated with other methods.

REPRESENTING ALL DISCIPLINES OF FISHERY SCIENCE

American Fisheries Society

COLORADO-WYOMING CHAPTER

Minutes of the Thirteenth Annual
Business Meeting of the Colorado-Wyoming
Chapter of the American Fisheries Society

1 and 2 March 1978, Ramada Inn,
Fort Collins, Colorado

I. Call to Order. President Stephen Flickinger called the meeting to order at 3:15 PM on 1 March 1978. One hundred forty-four people had registered for the meeting by that time.

II. Minutes of 1977 Meeting. Minutes were made available prior to the business meeting. Secretary-Treasurer Carlson moved to change the Treasury total reported on page 4 of the 1977 minutes by current Vice President Wiley from $428.47 to $528.47 because the 1977 auditing committee had approved an erroneous figure. The motion was seconded and passed by voice vote. The 1977 minutes were then approved, as corrected, by the membership.

III. Treasurer's Report. Secretary-Treasurer Carlson reported that $184.35 were spent and $50.00 taken in prior to 1 March 1978 and that $1248.55 had been collected in payment of dues and banquet costs and $100.00 had been received from an anonymous donor for the 1979 Rollefson Award on 1 March 1978. The balance as of 3:15 PM on 1 March 1978 was, therefore, $1742.67.

IV. Old Business.

A. Thanks to Committees. President Flickinger formally appointed and thanked all those who served on 1977-78 committees. Committee membership was as follows.

1. Program Committee
   a. Roger Schoumacher, Chn. Colo.
   b. Jim Sinley Colo.
   c. John Baughman Wyo.

2. Resolutions Committee
   a. Bob Wiley, Chn. Wyo.
   b. Bill Wichers Wyo.
   c. Bob Pistono Wyo.
   d. Pat Davies Colo.

3. Nominating Committee
   a. Walt Burkhard, Chn. Colo.
   b. Ralph Huddleson Wyo.
   c. Kerry Connell Wyo.

4. Aquatic Issues Committee
   a. Mike Stone, Chn. Wyo.
   b. Fred Eiserman Wyo.
   c. Bruce Smith Wyo.
   d. Jim La Bounty Colo.
   e. Jay Windell Colo.
   f. Anonymous Colo.

5. Newsletter Committee
   a. Bob Wiley, Editor Wyo.
   b. Steve Facciani Wyo.
   c. Lou Pechacek Wyo.
   d. Mike Stone Wyo.
   e. Bob Jones Colo.
   f. Tom Nessler Colo.

6. Best Paper Committee
   a. Mary McAfee, Chn. Colo.
   b. Terry Sexon Colo.
   c. Chuck Viox Wyo.
   d. Jack McMillan Wyo.

7. Auditing Committee
   a. Dave Langlois, Chn. Colo.
   b. John Kiefling Wyo.

8. Fishery Worker of the Year Award
   a. Gerry Bennett, Chn. Colo.
   b. Willard Lewis Colo.
   c. Larry Harris Colo.
   d. Jon Erickson Wyo.
   e. Bob McDowell Wyo.
   f. Steve Facciani Wyo.

9. Max Rollefson Memorial Stream Habitat Award
   a. Rick Sherman, Chn. Colo.
   b. Bill Clark Colo.
   c. Bruce Smith Wyo.
   d. Allen Binns Wyo.

B. Report from Resolutions Committee. Chairman Wiley reported that the three resolutions considered at the 1977 Western Division meeting in Tucson were from the Colorado-Wyoming Chapter. The resolution on Affirmative Action programs was tabled after considerable discussion. The second resolution concerned habitat occupied by populations of the Colorado cutthroat (Salmo clarki pleuriticus). The resolution was passed as amended; the amendment deleted reference to Colorado-Wyoming Chapter and substituted Western Division AFS. The resolution was forwarded to the several organizations listed on the measure and feedback has indicated support for the consideration, including responses from state agencies as well as national agencies (Forest Service, Fish and Wildlife Service, senators). The third resolution dealt with concern for physical aspects of water quality and was also

passed as amended. The amendment included reference to the Western Division as a sponsoring organization. Copies of the resolution were forwarded to state fish and game agencies, senators and representatives from Colorado and Wyoming, the National Chapter of Trout Unlimited, Environmental Protection Agency, and Corps of Engineers. Response to this resolution was not as great as that to the preceding. A reply was received from Wyoming senator Wallop indicating support.

C. Report from Aquatic Issues Committee. Chairman Stone reported that the Committee considered four items during the year and developed detailed position statements on 1) the fishery resource and water development in Wyoming and 2) stream flows for Salmo clarki pleuriticus. These were considered in the New Business portion of the 1978 meeting. The Committee also drafted a response supporting recognition of water quantity related to maintenance of water quality and directed the information to appropriate agencies. President Flickinger directed the Committee to draft a letter supporting the American Fisheries Society Position on the Fish and Wildlife Coordination Act.

There are no existing guidelines for the Aquatic Issues Committee relative to consideration and development of position statements. However, it seems appropriate that the Committee address issues important to either or both states. Considerations may be state-specific or concern both states. The President of the Chapter has the prerogative of staffing the committee and appointing a chairman. During the past year the Committee has functioned anonymously in preparation of the two position statements. The statements, if approved, will be sent out over the signature of the Chapter President.

The Aquatic Issues Committee was established to address issues which may require attention at times other than the annual meeting. In such cases, the Executive Committee of the Chapter can act on the measures and distribute as required. The newsletter may serve as an excellent vehicle for publication of some of the issues. Chairman Stone urged the membership to actively support this committee.

D. Report from Newsletter Committee. Chairman Wiley reported that two issues of the Angler were published in 1977 as per directions given at the 1977 meeting. Each mailing totalled 125 copies to Chapter members; issues were also sent to other Chapters in the Western Division, the Executive Director of AFS, the Western Division President, the Editor of the Western Division Newsletter, and several prospective members.

A summary of costs of newsletter preparation was also presented. Cost per issue is about $32.00, including postage. Duplicating costs are about 1 cent per page and, of course, first class postage is 13 cents per piece mailed. The newsletter has been printed and xeroxed through facilities at Colorado State University. President Flickinger and Secretary-Treasurer Carlson indicated that the Angler can continue to be published at CSU, and the Chapter can pay for duplication services through the University.

The newsletter has been received well within the Western Division and nationally judging from the feedback received. Contact with Chapter members indicates the newsletter has been well received. Response to requests for items for the newsletter was encouraging and will make future issues easier to prepare. Suggestions from Chapter members relative to what should be in the newsletter are encouraged and solicited.

Steve Puttmann moved that the newsletter be continued. The motion was seconded and passed by voice vote. The Executive Committee will appoint an editor and continue the newsletter.

E. Western Division Report. Steve Flickinger and Bob Wiley reported on the Western Division of AFS. Flickinger reported he represented the Chapter at the Division meeting in Tucson, that Wiley is now Secretary-Treasurer of the Division, and that the Western is the largest (membership-and area-wise) of the Divisions. Only about sixty people attended the meeting, and there was some discussion of July being a less-than-optimum meeting time. There was also discussion of splitting with the Western Association, whose 1979 meeting will be held in Alaska, which is likely to further curtail attendance. The Alaska people rarely can attend a meeting, so it was decided that the Western Division of AFS would continue to meet in conjunction with the Western Association of Game and Fish Commissioners at least through 1979. Wiley reported that Kirk Beiningen was invited to our meeting but was unable to attend. Wiley read excerpts from a letter from Beiningen in which he stated that he considers the Chapters to be one of the more important cogs in Society affairs. The chapters represent and are composed of fishery workers closely associated with management and research problems. The chapters are closer to the real world than any other part of the organization and are, therefore, very important to the Society as a whole.

Kirk advocates strong and active chapters as well as a strong and responsive Division. The combined efforts of divisions and chapters should serve to indicate to the Society the important role that each plays in the advancement of fishery science and the resource overall. The Colorado-Wyoming Chapter, through its recently-established Aquatic Issues Committee, is becoming more active in guiding the resource and bringing the efforts of collective talent together in responding to fishery-related aquatic and environmental issues.

Wiley's report went on to state that, during the recent meeting of AFS in Vancouver, British Columbia, there was much interest in the Aquatic Issues Committee of our chapter, and the Oregon Chapter, long recognized as one of the more active and involved chapters in the country, expressed much interest in the operation of the Committee. So, Wiley believes that our Chapter has made a lot of progress and is contributing greatly to the advancement of the Western Division and, in our own way, to the advancement of the Society as well. Wiley concluded that we must remember, and remind those who may forget, that the single way to solve issues and benefit the resource is to be involved in actions concerning the resource; involvement can lead to success or failure, but non-involvement can lead only to failure.

V. New Business

A. Election of Officers for 1978-79. Chairman Burkhard of the Nominating Committee nominated Bob Wiley of Wyoming for President and Clare Carlson of Colorado for Vice President. Burkhard moved to close nominations for President and Vice President and his motion was seconded and passed by voice vote. A show-of-hands election between Bob McDowell and Don Miller led to the selection of Don Miller of Wyoming as Secretary-Treasurer. Lou Pechacek moved that all officers be unanimously elected; the motion was seconded and passed by voice vote.

B. Presentation of the Fishery Worker of the Year Award. Chairman Bennett of the Award Committee summarized the accomplishments of this year's winner in fighting catchables, introducing kokanees and mysid shrimp to Colorado waters, and informing the public. He presented the award to Dick Klein of Colorado. Klein graciously and modestly accepted.

C. Presentation of the Max Rollefson Memorial Stream Habitat Award. President Flickinger announced that the Award would be presented at the resumption of the business meeting on 2 March to provide more time for the Committee to review the reports of candidates for the award.

D. Chapter Activism and Fund Raising Projects. President Flickinger called on Bruce Smith to discuss these subjects. Smith emphasized getting involved in various environmental issues, making chapter opinions known to decision makers, and exposing the existence and policies of AFS in our daily lives. He presented two ideas for raising our own esprit de corps, enhancing public awareness of AFS, and perhaps raising some money to provide for preparation of special reports on aquatic issues. One idea was production of an annual bumper sticker; sale of about 200 at a meeting (at costs of $65 for the first hundred, $70 for 200, and $75 for 250) could yield about $100 for supporting our activism program. His second idea was sale of a fisheries belt buckle (at roughly $5 each) for the same purpose. Preliminary discussion showed little interest in the belt buckle, considerable interest in producing a bumper sticker prior to our next meeting, and some discussion of thinking too small and requesting corporate donations. A motion was made and seconded to turn the bumper sticker idea over to the executive committee and to request possible slogans from the chapter membership on 2 March. A motion was then made to amend the original motion by stipulation that any profits be used for activities of the Aquatic Issues Committee. The motion as amended was seconded and passed by voice vote, and arrangements were made to collect slogans on 2 March.

E. Resolutions. Chairman Wiley of the Resolutions Committee presented synopses of the position statements which arose with the Aquatic Issues Committee. The position statements, which had been made available for consideration prior to the business meeting were

accepted (after appropriate motions and seconds) by voice vote. The two position statements as accepted are appended to these minutes.

F. Presentation of Past-President's Certificate. President-Elect Wiley presented the certificate to Steve Flickinger with thanks for a job well done.

G. Other New Business.

1. Introduction of Don Duff, President-Elect of the Bonneville Chapter, was followed by discussion of our producing annual transactions such as those available for the 1978 Bonneville meeting (from Jim Young, % U.S. Fish & Wildlife Service, 125 So. State St., Federal Building, Salt Lake City, Utah 84111 at $2/copy). A motion to charge our Colorado-Wyoming Chapter executive committee with starting Transactions next year was seconded, discussed, and defeated by voice vote.

2. Invitation of AFS President Art Whitney to our meeting was mentioned by Steve Flickinger. Mr. Whitney is ill and could not attend but conveyed his good wishes. Next year's parent Society meeting will be held at the University of Rhode Island and will introduce a new inexpensive and informal format. The addition of a "President's Corner" to Fisheries was also noted in Whitney's correspondence.

3. The "Leaky Boot" Award was presented by John Goettl to Steve Puttmann for service above and beyond the call.

VI. A Motion to Recess until 2 March was made by Chuck Voix, seconded by Steve Facciani and passed by voice vote at 4:45 PM.

VII. Call to Order. President Flickinger called the 1978 business meeting back to order at 3:05 PM on 2 March 1978.

VIII. Final Treasurer's Report. Vice-President-Elect Carlson reported net collections of $38 since his 1 March report and expenditures of $1051.42 to Ramada Inn, $100 for the Rollefson Award, and $116.65 to CSU on the morning of 2 March. The balance in the Treasury as of 3 PM on 2 March was $532.60. Chairman Langlois of the Auditing Committee confirmed this amount.

IX. Presentation of the Max Rollefson Memorial Stream Habitat Award. Chairman Sherman presented background on this new annual $100 award for the best paper on stream habitat by an undergraduate student. Invitations were sent last fall to eleven colleges and universities in Colorado and Wyoming. Responses were somewhat limited. The 1978 Rollefson Award was presented to John Grubbs of the University of Wyoming and accepted in his absence by George Baxter and Hal Bergman. The membership was urged to support this award financially and in any other possible way.

X. Thanks to Program Chairman Roger Schoumacher were extended by President Flickinger.

XI. Presentation of Best-Paper Awards. Chairman McAfee presented the 1978 Best Paper Award to Tom Jackson for his paper on problem aquatic plants and the 1978 Best Poster Award to Larry Harris and Leroy Fyock for their joint effort on biological filtration systems for hatchery water reuse. A $25 check was presented for each of these awards, leaving a final treasury balance of $482.60.

XII. A Motion to Adjourn was made at 3:20 PM by Steve Puttmann, seconded by Rick Sherman, and passed by voice vote.

REPRESENTING ALL DISCIPLINES OF FISHERY SCIENCE

American Fisheries Society

COLORADO-WYOMING CHAPTER

FOURTEENTH ANNUAL MEETING COLORADO - WYOMING CHAPTER

AMERICAN FISHERIES SOCIETY

UNIVERSITY OF WYOMING

Laramie, Wyoming

March 7-8,1979

March 7, 1979

8:00 - 9:00	Registration
9:00 - 9:30	President's Welcome - Announcements
9:30 - 10:15	Robert Martin, Assistant Executive Vice President, Sport Fishing Institute. Keynote Address.
10:15 - 10:30	Break
10:30 - 11:15	John Varley, Fish and Wildlife Service, Yellowstone National Park. *Restrictive Angling Regulations in Yellowstone National Park.*
11:15 - 11:45	Tom Nesler, Colorado Division of Wildlife. *Characterization of the Twin Lakes Sport Fishery for Pump-Back Storage Power Generation Impact Analyses.*
11:45 - 1:00	Lunch

Afternoon - Split Sessions

Fish Culture Session

1:00 - 1:30	Larry Harris, Colorado Division of Wildlife. *A Report on the Establishment of a Coldwater Brood Fish Program in Colorado.*
1:30 - 1:50	Kenneth Cline, Jr., Cline Trout Farm, Boulder, Colorado. *The Role and Problems of the Private Trout Industry.*
1:50 - 2:20	William P. Dwyer, Fish Cultural Development Center, Bozeman, Montana. *Recent Advancements in Techniques of Salmonid Culture.*

more.....

2:20 - 2:40 Al Condor, Wyoming Game and Fish Department. *Ammonia Buildup in Fish Distribution Tanks.*

2:40 - 3:00 Gary Reinitz, Fish and Wildlife Service, Spearfish National Fish Hatchery. *Low Protein Diets of Rainbow Trout.*

3:00 - 3:30 William J. Logan, Department of Fishery and Wildlife Biology, Colorado State University. *Establishment of Rainbow Trout Health through Hematological and Histological Assessment.*

Management and Research Sessions

1:00 - 1:25 Clare Carlson, Department of Fishery and Wildlife Biology, Colorado State University. *Fishes and Macroinvertebrates of the White and Yampa Rivers in Colorado - An Overview.*

1:25 - 1:50 Edmund Wick, Department of Fishery and Wildlife Biology, Colorado State University. *Distribution of Endangered Fishes in Western Colorado.*

1:50 - 2:25 Steve Puttmann, Colorado Division of Wildlife. *Evaluation of Variable Walleye Fry Stocking Rates in a Colorado Reservoir.*

2:25 - 2:55 G.M. DeGraeve and H.L. Bergman. Department of Zoology and Physiology, University of Wyoming. *Potential Environmental Effects of Underground Coal and Oil Shale Extraction Technologies.*

2:55 - 3:30 Eric Loudenslager, University of California-Davis. *Biochemical and Cytogenetic Analysis of Geographic Variation and Subspeciation of Cutthroat Trout, Salmo clarki.*

3:30 - 3:45 Break

3:45 - 5:00 Business Meeting

6:00 Steak Fry and Social Hour

March 8, 1979

8:30 - 9:00 Robert H. Behnke, Department of Fishery and Wildlife Biology, Colorado State University. *Significance and Preservation of Riparian Ecosystems.*

9:00 - 9:30 Neil Morck, Bureau of Land Management, Rock Springs. *Multiple Use Management and the Riparian Ecosystem.*

more.....

9:30 - 10:00	Bruce Smith, Bureau of Land Management, Rock Springs. *Aquatic Experiences during Preparation of the Big Sandy Livestock Grazing E.I.S.: or a Fish Eye View of the Terrestrial World.*
10:00 - 10:30	Break
10:30 - 11:00	Morris J. Engelke, Jr., U.S. Geological Survey, Cheyenne. *The Biology of a Plains Stream, Salt Wells Creek, in Southwestern Wyoming.*
11:00 - 11:30	Barry Nehring, Colorado Division of Wildlife. *Biology and Ecology of Eleven Iranian Brown Trout Populations.*
11:30 - 12:00	Jim Gore, Wyoming Water Resources Research Institute, Laramie. *Fisheries Recolonization of a Channel of the Tongue River Reclaimed after Coal Strip Mining.*
12:00 - 12:30	Tom Jackson, Fish and Wildlife Service, Denver. *Biological Control of Aquatic Plants: Fact and Fantasy.*
12:30	Adjourn

WESTERN DIVISION AMERICAN FISHERIES SOCIETY
1985 ANNUAL MEETING
ASPEN, COLORADO

1. Call to Order by President.

2. Comments of President.

3. Determination of a Quorum.

4. Introduction of Guests.

5. Reports from Officers.

   - President-elect: Program, Budget Presentation - Tony Novotny.
   - First Vice President: Membership - Don Martin.
   - Secretary/Treasurer: Minutes of 1984, Treasurer's Report - Ellen Gleason.
   - Past-President: Nominations - Stan Moberly.

6. Reports from Chapters.

   - Alaska: Carl Burger
   - Arizona/New Mexico: Buddy Jensen
   - Bonneville: John Leppink
   - California/Nevada: Dennis Lee
   - Colorado State University: Timothy T. Baker
   - Colorado/Wyoming: John Baughman
   - Hawaii: Richard Brock
   - Humboldt: Michael Parton
   - Idaho: Ned Horner
   - Montana: Janet Decker-Hess
   - NPIC: Gerry Taylor
   - New Mexico State University:
   - Oregon: Don Ratliff
   - Portland: Mark Schneider
   - Sacramento: Larry Eng
   - University of Wyoming: Eric Featherstone

7. Reports from Committees.

   - Augdo-Visual: Daniel Crannell
   - Audit: Jim Fessler
   - Awards: Don Duff and Al Mills
   - By-Laws: Robert White
   - Endangered Species: Jack Williams
   - Habitat Inventory: William Helms
   - Marine Fisheries: Mike Laurs
   - Membership Concerns: Del Skeesick
   - Newsletters: Howard Raymond
   - Public Lands: David Cross
   - Resolutions: John Peters
   - Riparian: Gordon Haugen
   - Student Concerns: Debbie Konnoff

- Time and Place: Paul Cuplin - 1985
  Kirk Beiningen - 1986
  Don Duff - 1987
  Buddy Jensen - 1988
- Trade Show: Mit Parsons
- Water Development and Stream Flow: Dudley Reiser and Tom Wesche
- Small Hydro Symposium: Robert White

8. Other Old Business.

9. New Business.

- Project Wild
- Phone Tree
- Raffle
- National Meeting - Funding and Purpose.
- Water Quality Committee - EPA W.Q. Standard.
- Agency vs Consulting Biologists.
- Publications

10. Introduction of New Officers.

NEW BUSINESS TOPICS

1. Project WILD is a K-12 supplementary conservation and environmental education program emphasizing wildlife, jointly sponsored by the Western Association of Fish and Wildlife Agencies and the Western Regional Environmental Education Council. We have discussed with the Project WILD people the need for an aquatic section. We have been invited to participate in developing an aquatic section. Do you support this effort?

2. The AFS Excomm is considering the creation of a phone tree. The tree would begin in the Bethesda Office, connecting to the Division. Each Division and Chapter would develop a contact tree of members. The phone tree would be used for seeking support on Congressional or Administrative actions when support of members is needed. Do you support creating a phone tree?

3. We have been asked to contribute to the Sun Valley meeting raffle. Proceeds will go to the Skinner Memorial Fund. Last year we contributed $500 to purchase raffle prizes. In May, I sent a letter requesting comments, but received very few responses. Should we make a contribution?

4. Questions have been raised concerning the financing and purpose of the Society's Annual Meeting. At present, the Society's Annual Meeting registration fee is set to return money to the Society, Host and International (Note: The Western Division registration is set to recover part of meeting costs, and does provide money for other Division programs). Should the annual meeting be set to provide funds for Society operations or only to cover meeting costs? What should be the purposes of the Society's annual meeting?

5. On two occasions recently, the Division has been asked to comment on water quality issues. In addition there has been an ongoing concern over EPAs lack of effort in setting and enforcing water quality standards. As a result, we have been asked to consider a Water Quality Committee. Do we need a Water Quality Committee? If not, what is the best procedure to handle water quality issues?

6. AFS units often comment on projects, legislation, etc. In at least two instances recently, there has been differences among biologists over such comments on individual projects. Do we need guidelines on unit reviews of projects, etc.?

7. AFS units at various levels currently publish books and proceedings. Proceedings of special meetings and symposia have also been published in Transactions. Does AFS need a policy on publications? What kind of coordination is needed? Should AFS begin a series of proceedings issues? How should financing be handled?

American Fisheries Society

Student Chapter of the American Fisheries Society

presents

Dr. LeRoy Poff

Trout Unlimited: their mission, his role, and how they changed from pure angling to conservation

Wednesday, Mar. 17th
5:25 pm
132 Wagar

AFS

AFS