

Where use of a species not native to a particular water body or region is deemed safe from the standpoint of the native biota, then it should be a species that is well adapted to the conditions of the water(s) and that will provide the highest quality fishery. Salmonids stocked to barren waters should come from nearby native stocks whenever possible.

G. MANAGEMENT TAILORED TO DIFFERENT SPECIES AND STRAINS

The unique requirements of individual species and strains of salmonids should be recognized in the design and implementation of fisheries management. Habitat improvement and fishing regulations must be suited to the characteristics of specific kinds of salmonids to be benefitted. Traits of salmonids to be stocked must be suited to the characteristics of the receiving waters and their biota.

H. USE OF HATCHERY PRODUCED SALMONIDS

Stocking of hatchery produced salmonids, whether "catchable size" or smaller, can be appropriate for enhancing fisheries where it will not harm native or wild salmonid populations. Due consideration must be given to agonistic behavior, disease and sanitation, and genetic mixing of wild and hatchery stocks. Stocking is recommended only as a measure of last resort. Use of hatchery fish should be guided by the following:

1. Stocking of hatchery fish should be avoided or minimized in waters with self sustaining populations of native or wild salmonids.
2. Stocking can be a valid management option for a. reestablishment of wild populations in habitats that have recovered from catastrophe or into waters reclaimed from infestation with undesirable fish; b. initial introduction of a species where it can be shown that it will fill a fisheries management need or a vacant niche in the ecosystem; and c. maintenance of a fishery where natural reproduction does not exist but where proper conditions exist for satisfactory survival and body growth.
3. Salmonids used for stocking, if not from native stocks, should be healthy, natural in appearance, and genetically adapted to the conditions of the receiving waters. For put-take catchables, the less spent per fish, the better.
4. Put-grow-and-use stocking is the preferred stocking method. This stocking requires fish to be planted at a small size and allowed to grow for several months or more before being enjoyed.

* As a last resort, in urban areas, where stream conditions prohibit year around survival, stocking of catchable salmonids is an acceptable method for introducing an appreciation for trout angling and salmonid ecosystems.

5. Anadromous populations of salmonids should be supplemented with hatchery-produced downstream migrants only after all other methods of enhancing the fishery are exhausted and only if damage to native populations is preventable. The presence of hatchery strains of anadromous salmonids threatens the integrity of wild anadromous salmonids in the same waters by stimulating intense fishing on the wild fish and by introducing unsuitable genetic traits through interbreeding.

[1989]

Ex. Henry's bk. - Economics
- spec. rego values
- Catchables $\frac{3-40\%}{\bar{x} 17\%}$

- yet
Legislation
ban -

- Critique previous -

How implement meaningful change - emphasis mgt. wild.

(Wild vs. hatch.) ^{fisher-} catch-pot-take - contrast - target - -

I - Reed - confused - specific domestic select. break? vs. No select
- mark diff drummer

- Go Gen. \rightarrow Specie, word \rightarrow deal, emotional appeal \rightarrow evidential basis

\rightarrow Admit. not dramatic - sensitive - eval. not revol. - slow, gradual - yet
15 yrs. 5 - -

- Ex. change way doing business - difficult

Mark Nelson Public Health ^{fight city} Establishment T.V. Mich - not evidence, need
Fundulus - Establishment - political &
wild vs. hatch

- Public attitudes for change

- life span - ^{public health} shorter - lung, hips, health

- mortality factor

- smoking - auto water
air pollution - ^{meta} city 10 mil.

over 10 yr. period 1% pop. ^{shorter life span} respir. dis. = 300,000;

mortality
risk

1/10yr. ^{shorter life} die stroke attack

what demands for law -

exciting-emotional

Cost per angler day

reservoir

- hatch. - put-grow-take
intrasp. - ⁱⁿ mid pack
5x1 man 2x2 angler cost

streams

Spec. Regs - acceptance
- Henry's bk.

Priorities

- livestock
- stream degrades
- if surge

similar

vs. guzzling - poor way

vs. barrel-barrel
freedom

SFI Conserv. Highlights 1956

p. 119 - Virginia - cost catchable (2 yr. - old) -
received searching attention in 1956. - cost average
of \$40 each - ca. 300,000/yr. - ~~\$110,000~~ 11-14"
labor 40% food 38% of total cost - 9% to capital costs
and amortization and administration 7% to distribution
6% to hatchery repair and maintenance.

Hunting & Fishing - May 1956: 22
Arthur Conant "Goldplated trout"
re. question \$ for catchable vs. wild trout as sound investment

SFI Bull - Nov 56: 3

"Conn. - 1954 Conn. Long Range Program
balance re. sp. supporting use - 100,000 lb. ann. limit catchable
1957 Virginia - 40/trout 60% return - \$3.50/lb.
in cost

July 56: 6 Vir. trout costs - Mr. T.D.
West Kinis, progressive-minded Virginia Game & Inland Fish
Commissioner - writing thought provoking series
on Virginia trout program - in Virginia Wildlife.

30 yr. amortization

May 1957: 6 Trout production costs
- Prog. Fish Cult. Apr. : A.V. Tunison - 15 fed. hatch.
\$ 1.05 / lb. for trout - best was 76/lb. costs include
labor, food, distribution, + "miscellaneous" - but not
construction, administration (office overhead) - an interest on
investment. SFI think such costs are true costs
+ 0% return = probably > \$2,000 lb.

Anglers Choice, Howard Welden - Trout & water 1847 - women L. F. Trout

Land use
 Miller 61 - Man changes fish base
 Bohrer 75 - - -
 organism-substrate Pymatuning Lab exp.

Chapman
 (Down) Civil Engineering 3(2):74-78

ref. Feather Cak

Hastings, J.R. - Arid Lands Colligium, Univ. Ariz (1958-59)

Hastings, J.R. and R.M. Turner 1965. The changing mile. U. Ariz. Press

- Straud R.H. - Fish Mgt / Culture & Mgt. A.F.S.

Folio
 QK938
 D4 H37

SH
 3285
 593

BLM Gully book
 County Res.

Folio
 TAI
 C452

Fish Culture in Fisheries Management
 1986 AFS R.H. Straud (ed).

Coldwater salmonid - 85% lakes, reservoirs
 15% streams

policy, guidelines
 on angling pressure
 stocking catch

Stocking Criteria: Patten & Bontas
 MT one angler day per 6 catchable acres
 WY " " " " 10 "

MT - if catch rate < .5/hr. + 0.1% + stock -
 min. acceptable catch rate - CA - .5/hr. 2/day
 min. accept. return on catchables

- Calif. - 50%, MT 40%, N.Y. 75%, OR. 40%,
 S.D. 75%, OSDI 60%, WY 40%.

- Wydoski R. 341-57 - Information needs for cold-water stocking

* - F&W.S. data -

no. salmonid fishes stocked by fed. & st. agencies
 in U.S.
 1958 - 169.4 mil. 29.7% = 50.2 mil.

| | | | |
|------|----|-----|------|
| 17 | 9 | 53 | 256 |
| 26 | 27 | 190 | 30 |
| | 85 | | 256 |
| | 50 | 765 | |
| 1955 | | | 79.0 |

53% increase 1524.6
 3388
 50.211
 1983 256.5 mil. 30.4% 78 mil.

1980
 angling pressure
 increased
 148%

85% lentic (lakes res.) 15% streams -
 increasing decreasing

X. angling pressure all over water 1969 57 m (low) (MGT older)
 2000 120 "

1965 - 25% of st. fishery budgets spent on fish culture

- Weithman, A.S. Economic benefits and costs
 associated with stocking fish. 357-363

Agency cost - per angler day to provide variety of fish
 Trip 96-69 - Klein - west, Doudy. lake \$.35 - w/
 fryer/mr plants - - - but 3% aster.

Econ - Consumer surplus - Travel cost - further travel
 more willing to pay - estelvable - local - lowest value/angler day
 low, med. hi skill values - larger fish, wild f
 hatch 0.2 wild

← Check Klein - west / Doudy
 angler days - catch, v. fine.
 CPH/day -

↓ Danger - angler day
 "worth" \$50 - cost \$2.3 w/cap
 C.B. 20-1

- * AFS Memo - May 1 89 -

Socioeconomic Section - Econ. Strategy
 Development Conference - How to improve

"use the use of socioeconomic in fish. -
 - Market Clearing" value, ? = market equivalent.
 \$17.58 activity day ~ \$63.36 per 12 hr. day
 consumer surplus value, 86% higher

allocation = how much budget to what programs -

Cost/angler day (value/angler day) - hatch - net - present.

produce most days, least cost.
 for most people
 diverting
 program
 public

catch. v. fine sub 2.5 sterio.
 cold water

Colo. 1988 all hatch. production = 1.9 mil lb.

93% catch, 5.7% subcatch, 1.3% warmwater

catch. planted 1988 - 2,054,402 lbs.

\$ 3,850,104

4,853,658 fish

\$10.13/in, 2.36/lb.

size 1984-1988

9.03 - 9.55 - 9.81 - 9.97 - 10.15

lb 3.34 - 2.52 - 2.60 - 2.45 - 2.36

1988 direct costs to

catchables \$1.28/lb.

- labor - admin
- feed
- equipment
- disease
- delivery
- exp. other

depreciation

641,760

total 4.5 mil.

1987 2,126,545 lbs.

5,273,658

if direct costs = 3.9 mil \$ to produce 2 mil. lbs.

w/ indirect = 1.54/lb (1987 est)

w/ adm. overhead, support = 2.30 - 2.50/lb.

anyone read near historical record - to measure progress - to say could be better and some ideas on how to make it better

(I)

Reed's Concluding Statement.

I 1974. Telegram from Sec. Int. Rogers Morton read by Art. Sec. Nathaniel Reed ... "The future of wild trout, well balanced with selective use of hatchery-raised trout, is in your collective hands."
* well balanced * selective use - can we quantify?

457008
12 report hatchery system in wild

"The age old policy of dumping hatchery fish off bridges into all fishable waters will be all too expensive to consider in a very short space of time." - Translate as prediction of drastic reduction in catchable trout stocking a role of catchable trout in fish mgt. --- but - perhaps not --- "The quality of stocked trout, their genetics, their stamina, the waters where they will be stocked, their survivability, their ability to grow, their wildness, will be key factors in fish production in the future." - may have referred to selectively breed domestic strains but in practice

← *

← wild

- catchable - cheaper the better - let me reinterpret what really intended - Most salmonid fisheries in lakes, reservoirs - relieve pressure on wild trout in streams role of hatchery - 25% surplus can be used for restocking - not repeat, not sustain this.
"put-grow-take" - indeed the genetic quality determining survivability - wildness most important to increase growth - survival = fish caught / fish stocked = no. angler days supported
* Selective use of wild strains, raised in hatchery & stocked greatly increase returns to fishery.

your fingerling

A. - also I Paul Webster, Bill Zick's paper stocked wild & domestic strains brook trout N.Y. - re. lbs. stocked - lbs. surviving over 3 years 2 wild str 100% better than domestic

B. II (1979) I (based on Res. panel) - again stressed use of natural, wild diversity - (Use of genetic resources of wild trout) how to turn rough fish problem into forage fish asset

C. II (1979) Leopold - noted the recognition of genetic adaptations and use in fish mgt.

D. II (1979) Herbst (Art. Sec. Int. to F.W.P.) - talked about "new, exciting brand of management" - "we've had some heady results" - "Let me give you one example with rainbow trout"

"Rainbow trout study began 10 years ago,

457008
all hatch p's
1.9 - 2.0 mi - 12
93% catchable
5.7% about
1.3% response

1956 Conn.

- G. Griffith - Art Neuman - 1959 Mich. - by late 1950's much... overvaluing emphasis on stocking of catchable trout & detriment of wild trout - "A million or a half catches a year were being stocked - we have it as 2 great water" book Fish Culture - Fish Mgt 1986.

Let's see trend - US FWS - 25 yr. period

| | | | |
|------|---|-----------------|---------------------|
| 1958 | 169.4 mil. ^{trout} / _{salmon} | stocked of this | 50.2 mil. catchable |
| 1983 | $\frac{29.7}{256.5}$ mil. | " | 78 mil. catchable |
| | (53% increase) | | (55% increase) |

Colo. - last 5 years - ^{Ashton} 93% of wt. stocked - 5 mil catch. / yr. - 2 mil lbs. - 38% license & catchable program 75-20% angler days

- Penn. next year 31%
- Calif. biggest program 12-14 mil. - 14%

Feed:

* Hatchery programs, and this includes the Fish & Wildlife Service hatcheries, have been preoccupied in raising rapidly growing, oddly shaped & genetically tame candidates, more suitable for cooking than for fishing. Anglers supposedly want fighting fish, yet we grow nice, safe, gentle idiots who have little chance for survival in the waters into which they are released. Furthermore, most hatchery fish, like too many American goods are programmed to self-destruct after two years. Pounds of fish per dollar expended has for too long been the Holy Grail, and I fear one day tired of the same old stuff. By hook or by crook I hope I will see the Fish and Wildlife Service take a leadership role in developing strains of fish which will survive, fight which may be difficult to raise, but which are strong and healthy, a sporting quarry in a real world of anglers."

webster

- Herbst (79) + Leopold - Blanke

how to activate - specifically - wild genomes -

misled selectively breed domestic trout - look into, first order

why not greater impact??

II

...selection of strains best suited for particular conditions - The fish genetics lab here in Wyoming, eventually wound up with 18 strains of rainbow trout - 12 hatchery, 6 wild strains - all were characterized for growth, survival, catchability and no. of other traits. -- lab tests, field tests document signif. differences. The experiment continues - with an eye to other traits that will spell out improvements in the species and improvements in the sport."

Pyramid 79
Horn 82
Alamy Guss - 10.
Thus, I & II 15 years, 10 years ago we have ^{evidence} statements regarding
- way of future - use of wild strains to vastly improve efficiency of hatchery, but 1 lb / stock / 1 lb no. / weight & more angler days for same per \$ - Reduce cost hatch trout / angler day
- How much progress? - F.W.S. Reed and "leadership role" - any leader? - Pyramid L. Cott - 1979 -
photo - use of Utah - Two years ago - Reed - Lindy
Bill Horn - still waiting: - Utah - brood pond
- photo - Utah - Wyo. - Engle G. - General Kanel, Eagle L.

Why not much progress? - meet 74-79 expectations??

- Hatchery's dept. budgets - too much catchable trout
- I - Dick Vincent - data Medium R. - "effects of stocking catchable trout on wild trout" - Mont. ceased stocking catchable in streams - Mont. reduced catch. prod.?? - past 15 years mont state increased, not decreased catchable prod. - in defiance of Reed's prediction

Quant. data for putting role of catch. in st. fish program

Am catch. benchmark for future comparison trends -

- * Wild Trout
- 1. Spec. Reg. Mt. streams
- 2. Use wild resources
- 3. Water shed - inst. - inst. - inst.

Alternatives to catch. - based on no. & cost / angler day of various mgt. strategies - Ex. Pure economics - no emotions, no special, no country, good, notables, - econ. pure & simple. (- coopting as balance use).

Ex. - Yellowstone R. - each coll in even lot size but in fish - 4-5-6-7 years to 20x - X size .16 in cost \$3 (best case scenario) - stock 30 to catch 20 (68%)
\$90 replacement cost!

Frank Richardson
Jun 30
Apr ASP
After 5:00 P

Re. preparation

Summarizer: Until start symp yesterday. only seen titles
Prepare comment on - Mother's way, Riparian reciper, greenhouse fish,
Brown fixes, fires & droughts, looters & firebars, dollars & sense

- Note - Bill Horn -

Read papers & summaries, concl. remarks - de. I, II, III, 15 years - what

expected of summary conclusions re state of wild trout mgt. -
should reflect ^{goodwill} general optimism concordant w/ healthy fellowship and
happy precisism - ~~no~~ ^{willy networks} ~~no~~ ^{no profound}

Be. Style > substance - rather superficial - so Alex
- appropriate but not profound

Lincoln once said - the world will little note nor long
remember what we say here today - which wrote it -
published - thus mfr Proc. want to publish, summary
of substance that can be ~~used~~ ^{used} as a basis
for future symposia ~~planned~~ ^{planned} to quantitatively express the
state of wild trout mgt. and measure progress for this
time on. - based on 15 yr Summary + - -

Take care of 89

Emphasis = implement. Wild trout mgt. ~~not~~ progressing at optimum rate on
it - important if not, why not, what do to speed-up? To measure
progress future.

Concerns Wild Trout (Natural) vs. Hatch. not Artificial
Wild Trout Mgt. * specific catch trout (put-take) mgt.

not vs. hatch.

5x > ^{over} water ^{take, ven - it} stocked
but not dam /
good fishing in tent's
basic for better wild m
in stream

Wild Trout not progressing
so should because ^{easy} catch. -
^{easy} catch. still unbalanced, excess sw.?

- Am crying wolf - 1989 - 30 yrs after 15 yrs Wild T I + man etc. see -

draft 1989 - T.U. N. Am. salmonid policy: -

* As a last resort, in urban areas, where stream
conditions prohibit year around survival, stocking of
catchable salmonids is an acceptable method "for introduction
an appreciation for trout angling and salmonid ecosystem."

- Sounds extensible, very minimal program - very small part +
license \$ - a last resort, in urban areas, only where wild trout ~~are~~

Willy
Alla
- bench mark to
- enviro. mgt.
- 74 - Read 74 w/but
84 - 10-11-84
- do use here
- leadership role
- 1. en
- 2. use gen. div.
- ability not for
- why not
- back to Wilks 84
- meet. (10-11-84)
- 20th hatch.
- more hatch. work
- mich. fish - new for
- catchable but ^{easy} put-grow take it.
- 10-670
- Reed 74
- Vincent 74
- Madsen
- Luch - 89
- " Policy "
- look 2F figure

1959 - T.V. - G. Griffith, Art Newman - ^{Mitch catch 2 days} $1\frac{1}{2}$ mil. / yr ^{too much!} - Mitch - change catch $4\frac{1}{2}$ mil
put-grow-take 1:10

1974 - Reed ; telegram - well balanced - selective use - no translate

wild - hatch. ^{vet. cost/stock} ^{socioecon. day} of wild ~~man~~ - hatch
to resem - like other -

- Age-old policy - - - - -
balance ~~tr~~ -

- 1989 - last 5 year ^{cont. in} record levels ^{1 1/2 mil} ^{1/2 mil} ^{Mitch} ^{1/2 mil} ^{2 mil} ^{1 1/2 mil} ^{5 mil} ^{2 mil} ^{1 1/2 mil} ^{38%} ^{licens} [&] ^(undercost)
fede. est. agencies
- ~~U.S. Forest~~ - 1958 - 1983
^{no} ^{catch}
33% inc. 55% inc. ^{75% of anglers does} ^{low econ. value} ^{93%}

- Avoid emotional appeals; Quant. socioeconomic assessment
as Nat. Res. Mgt. or invest. \$ 80-190 - balance
simply cost per angler day w/ catch. vs.

45705
79 - Herbst.
- Horn

1. wild tent spec. req. ^{selective use} ^{increase price} ^{environmental} ^{no exhaust}
^{Grieb - west L} ^{1/2 mil} ^{2. wild tent - increase} ^{3. wild tent 1 yr} ^{better balance} ^{not exhaust} ^{gross} ^{1/2 mil} ^{etc.}

show ^{balance} ^{wild tent} - hotly ^{dollar} ^{make} reuse

- Spec. req. - wild w. catch. put-take
4-5-17
Yellowstone R. - cutts. 10x yr. 9 yr. - 20x -
 \bar{x} 16" = 3 (domestic RB) stock 30 - catch 20 (67%) = 90% replment of
- avoid area cost?

* Time short - see what has in mind - ^{get ideas} in Pp.
CONY paper - in Proc. - challenge future T.V. / Col Treat.

- trend - - hotel, ec. - support, service, admin. ^{cap. constr. cost.}
- What % doubled catch. ^{40 total days support.} - what use of wild game dir. to increase effectiveness
- 3 wild tent - - - - - ^{hatchery industry - cost/benefit} ^{cost}

- FC Col Treat 777
Cony way to go - program 5 yr. ^{I'll look forward} ^{- report next group. ?}

- Behrke & Johnson paper -

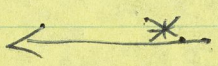
- Why must come from without - FWS - states - hatch - internal
dissension ^{-agony} (lib in forced out of agency) -
career ^{troubles} - Public perception of

I(94) Bill Luch, Pres. T.O. - Concl. Remarks.

re. wild trout ~~catchable~~ ngt. problem -

re. prof.
fish. biol.

"re deterioration of wild trout by stocking catchable.
- "if we allow to continue - we are committing a
crime not only against nature, but against
ourselves. It is a damn tough, hard question to
answer, but I am begging you, I am pleading
with you, go back and face the hatchery
bureaucracy that many of you grew up in and
tell them: this far and no further on these
streams. We'll be with you 100 percent."



- II(79) bk Jack Grieb - Colo. - Director's view -

- his responsibility to meet needs of all fishermen
coldwater, warmwater, bait, flies. w/ pop. increase - increasingly
difficult budget difficulties...

Colo. - has ^{put up} catchable, ^{subcatch}, ^{outgrowth}, and wild trout..

* "programs. to meet needs of all anglers
- There exists in many quarters criticism of hatcheries
and catchable trout programs. This is unfortunate
and I wonder if it is realized how important
our hatcheries are in maintaining fishing opportunities
in many waters incapable of supporting wild trout
populations. Ex. reservoirs - over 55,000 some reservoirs
stocked w/ catchable trout. Without this program there
would be strongly reduced fishing opportunity accompanied
by public outcry, political pressure & reduced license sales."

* Not argue - bad matter hatch. per se - only to put
catch. in persp. - - ltr 60s - early 70s Dick Klein

I - re. springling sub catch. trout in typical beats
fished - catchable ponds - West L. - >2000 hr/20/100.
RB fish 1 lb. 10-40 brown 1: 20-50 - S.R. with
1900 fish 2 lb. = 840 * a 400 a >2000:1 - low med.

investing \$
227,101.15 - 7
05.

Colo. - expanding spec. reg. wild trout waters stop stocker
catch - only tiny fraction of trout stock in state, but expanding -

Blue R. (trib. Colo. R.) - ^{catch} strictly 46" min size limit -
- 2nd wild fine. res. + Brown

Bill Logan, Jan. 29, 1983 - Since Blue R. became wild trout
fish. - fish. deteriorated. "It's only a shadow of what it
could be. It's fish pop. in no. & size has fallen off
drastically within past few years. Why is this? Common
sense would tell you the policy of trying to turn
the Blue R. into a wild trout ~~fishery~~ river without
any stockers is a faulty one. The failed attempts
to try to let wild trout grow to size in the river
and term the Blue a Gold Medal stream are an insult
to the angler's intelligence".

- Dotz - 2 sections 1983 - 1986 trout > 140
I biomass 77 kg/ha - 223 (3x) $\frac{3 \text{ fish}}{12} \rightarrow 94/ha$
II ... 5 - 135 (27x) 1 → 60/ha

- T.O. Deavers

style > substance - Proc. - substance

- Not seen abt. paper
 - Summarize + previous I, II, III, in platitude reflect hole & hearty fellowship and goodwill - but knowing that
 will play the golfy - but time to state some words overall summary
 or state of wild trout mgt. and provide a benchmark for
 pertinent W.P.V to make quantified extracts of progress.
 From past ~~there~~ were obvious indications that this symposium
 would attract mainly the zealots fly fishing purist who
 despises hatchery trout and anyone who would kill and eat a trout
 Dave, our former ex. ^{official} position of U.S.F.W.S. - 1st Symp. B.O. Reed -
 telegram - balanced - (key) - Reed went on to
 his ^{def.} ~~reputation~~ & "selective use" - (selective breeding of hatchery stream
 or trout to "survive" "fight" look "good" -

T.O. ^{Mr. Anselmi}
 Pol. of ^{care}

15th 74-79-84 -
 = hole, hearty, goodwill, optimism - ^{some with} ^{caution} ^{no one}
 = hole, hearty, goodwill, optimism - ^{some with} ^{caution} ^{no one}
 = hole, hearty, goodwill, optimism - ^{some with} ^{caution} ^{no one}
 To prepare for my summary - think brilliant, with, but not superficial.
 I don't want to be superficial: My summarizing statements to stand in
 Proc. - as a benchmark to gauge future success wild trout mgt. etc. feel one
 ... ~~Wild~~ Difficult to quantify the goalposts to ^{afford} director
 of how to reduce gap between the word & deed to direct talk into action
 - Do this by focus on ^{one} aspect theme -

of trout foregone

Wild trout = Natural - vs. - Hatchery trout - established - put-to-
 different, & put-grow tele
 Not bad as hatchery -
 - more expensive -
 where habitat of future - -
 5x > - - - great incm
 ... abt. hole - &
 - some as improving better
 wild trout -

Since 74 - 1989-70.
 Problem under control trend for ever increasing catch. - reversal
 upward trend → downward trend -

5 miles AM
 Spec. Reg.
 Wild Trout

1956 - Conn. - Uniff. N. Brown 1 1/2 mil. -
 1957 T.O. - Norton telegram
 1974 - Reed -
 Vincent. - - -

Records 05705 Luck.

O.K. - how B. & S. Conway - T.O. - C.A. trout Penn. econ. -

COST / angler day - catch. cost / catch \$1 3 / day \$3 (but Cap. Const. 1.000)
 - Yellowfin 90 end wild trout 4-5-6-7 12-15- cost 2 mt 4 days -
 16 in - cut 3 in. stock 3 catch 2 stock 30 = 20 90
 Options - foregone spec. - hand use - replacement cost
 - 3 frames - re - avoidance cost

Collip. bone in
 EXP. 12 mt
 - wild trout

74+77-87 cor 4m - ^{iron} ~~contaminated~~ steel - increase in spec. req. water wild trout

- Reed - Concluding Statement

I (1974) Webster Flick

increase yield hatch R by ^{selection} stocking selected wild race, - presented results Long Pond B.T.

- actually several yr det
- what does

| | | |
|-----------|------|--------|
| dom. | 1:7 | 10-12% |
| Long Pond | 1:80 | |
| Harmondy | 1:66 | |

"selective" - why? catchable dominance
J.G. Gerard, Eagle L.

Habitat - Environ. Prot: - why not more? -

- ex. BCM usgs - T.V. - livestock enhanc

1000 min - by 2500 sewer

100 days yr = 50,000 days

\$100,000 - 2 ds
catch - but invest 6
3 catch

Vincent - catchable impact

wild trout - Median R.

* landmark - trout today - catch prod. - lakes res.

balanced - hatch-wild

Spring chinook

Ore - coho reeding' Bill Luch concluding remarks

- wild hatch trout - pleased by stand up to hatch business

no more - well be with you 100% * Bill Logan - Jan 89

\$12/barrel oil

Reed - age old policy of dumping hatchery fish into all

fishable waters will be all too expensive to consider in very short time, ^{15 yr} hatchery stats decreased no. lbs. catch... - sadly disill.

II 1979 - Summary - Stonker Leopold:

- noted appropriate use of intra sp. genetic diversity - trout

why not more catchable diversity - emphasized environmental protectn, impu - waterheds, on multiple - or "grazing" - 1979 -

Belmonte - Requisition beeder & Res. Penn

increase, diversity, single sport 1. genetic resources

2. spec. regula. recycle 3 Environ. protectn - improved.

- Herbst - Art - for - USFWS - 18 race other PN

6 wild - great potential - diff. - were future! - How much use? - Fleming Gray - Gerard, Eagle L, etc -

Pyramid coll. - 79 - Pilot Peak - S.E. - stock - photo!

SUMMARY STATEMENT

Robert J. Bohne

Summary

wild vs. hatchery - general euphoric
- win/win - wise use

Wild trout genetic conservation program - greater emphasis is
fishery mgmt in wild trout or protection regulations, permit hatchery
but: ~~the~~ ^{some} systems are not clearly delineated wild in opposite
to what is implied hatchery ~~is~~ ^{solved or treated} problem of general
specifics. What and how is "wild" and all consistent. contrasted and
compared with alternative mgmt. ^{low prices}

From 5 basic program methods, ~~to compare cost to that~~
^{so, emotional, figures side,} demonstrate the economic advantage
and ^{of} wild trout management compared to ^{extract that}
- cost per sugar day ^{by various mgmt. alternatives}
^{in three areas} In 1989 - ^{the} products, costs, present at fishery budget decision
catchable trout surprising.

Critique steel sugar day MT @ ^{was} 10

maintenance cost .5 x 2/day

stock 3 to 2

- Avoidance cost.

Yellowstone R. = 19" - 18" ?

83 for hatch day

3 x 2 = 6 (actually 5)

10 5-3-2

20 x =

each value

- What % total ^{is} ^{with} ^(Admin. support...)
- hatch costs ^{to} catchables

III 1984

The Role of Wild Trout in Fisheries Programs

Robert J. Behrke

With ^{is formal} the fourth wild trout symposium over 15 year period and ^{several} many other symposia devoted to aspects of wild trout, speed reg. etc. - the issue of wild vs. what? never confronted. If wild trout management proponents what opposition? - Catchable trout, if quietly expanded wild trout program to be implemented ^{role} critical examination of wild trout and role of ^{fishery} catchable - put-take fishery - - - . The emphasis of much is, ^{beliefs,} prejudices, emotion, and wild trout programs ^{will} clearly ^{emerge} from perspective of ^{quantitative} economics, ^{regional distribution of wealth,} and natural resources. ^{Presented} symposia have skirted the issue of ^{wild trout} hatchery trout mgt. or attempted ^{in most political programs} to place the conflict in win-win status - for ex.

- 1974 symposium introduction - telegram Sec. Norton - "The future of wild trout, well balanced with selective use of hatchery-reared trout, is in your collection hands" - - - the sound goal, to what balance is "well" - "selective use" - OSWS - 1982 hatchery symposium

- or - keynote address - selectively breed hatchery trout to emulate wild trout - fight, survive, look good - expensive -

No. selectively breed domestic crop - corn to compete, max - - - increase, ^{corn} herbicide, pests - cheaper the better

1989 - 1940s ^{size - survival} catchable, 1950s - not nat. rec. mgt. - backlash - T.O. 1959 - - - 1989 - 30 yrs later - - - those who believe both ways, ^{long-term} fish. mgt. by spot-take taking of post - sadly wrong - how ^{many} what % of total license rev. ^{deducted} to raising ^{spot} catch. trout - - - may be outstretched - esp. why sit ^{compare} how this ^{with} total angler days who'd by catch.

- Expanding role of wild trout mgt. (and increased effectiveness of salmon fishery takes - reason) ^{will} come at decreasing ^{with} role of catchable in program perspective.

- I attempt to address 1974 ^{postscript} balance and selective use - public perception - ^{what} what does it

- long overdue

value under day

rest - T.O. 1989 - public opinion - Mich. 64 -

- T.O. 59 - " " - Mi Anglos -

- Challenge T.O. Col Trout

- what foregoes

- C.R. yellowstone 890 trout replacement cost -

Hatch. Wild
- 1980 - Col. R.
dams & hatcheries
- Summit chairmans.