

PROGRESS REPORT - November 1987

Fish Management Plan - Tenmile Lakes System

- Management plan adopted by the Commission 1981.
- A contract has been implemented for coho enhancement, hybrid bass evaluation, and habitat protection (objectives for salmon, warm water fish, and habitat). A combination of wild and hatchery steelhead are in the fishery but we don't have catch rate data.

## TROUT

### Background

Cutthroat trout are native to the Tenmile Lakes system and, apparently, during the 1920s fish in the 1-2 pound range were common. The fishery began to decline and the first hatchery supplementation was in 1939 and 1940.

By the late 1940s and through 1967, yearling rainbow and cutthroat were stocked annually. After chemical rehabilitation in 1968, yearling and fingerling trout were stocked in 1969 to provide a fishery. From 1970 through 1975, only fingerling trout were released. Results of the releases were not impressive. From 1976 to the present, yearling trout have been stocked. A 1982 statistical creel sampling program showed a 55 percent return to the angler.

### Policies

- Policy 1. Trout management will be for hatchery trout under Option C of the Wild Fish Management Policy.
- Policy 2. Trout management will be guided by the statewide Trout Plan under the Basic Yield Alternative.

### Objectives

- Objective 1. Objectives create an "instant" fishery early in the season, and prior to water warm up and activity among the warmwater fish species, by releasing yearling hatchery trout.
- Objective 2. Provide a relatively easy-to-catch fish for the "opportunist" angler.
- Objective 3. Provide the opportunity for anglers to catch some 16-20 inch trout in the fall.

### Assumptions and Rationale

1. Hatchery yearling trout stocked by mid-March will allow anglers (especially youngsters) to quench their early-season trout angling thirst.
2. A large number of yearling hatchery trout <sup>provide more catch opportunities</sup> ~~are easier to catch~~ (by the casual angler) than a few wild trout.
3. Trout that survive until fall will be 16-20 inches in length.

### Problems and Recommended Actions

Problem 1. More fish are needed in the fall fishery.

Action 1. Stock the yearling trout with a planting boat.

adopted 1981

DRAFT

FISH MANAGEMENT PLAN  
TENMILE LAKES SYSTEM 1/

INTRODUCTION

The Tenmile Lakes (Fig. 1) are large, shallow, highly productive freshwater lakes located in Coos County on Oregon's Pacific Coast. North and South Tenmile lakes have respective surface areas of 970 and 1,170 acres and are connected by a narrow, shallow canal. Several smaller lakes also drain into Tenmile Creek below the large lakes.

The lakes originally contained excellent populations of coho salmon and cutthroat trout. However, these species declined with the development of large populations of warm water fish including largemouth bass, bluegill, yellow perch, and brown bullhead.

Management problems in the lakes today concern continued reduction of salmonid populations and high abundance of bluegill. Largemouth bass appear incapable of fully utilizing bluegill as forage. As a result, the Department has considered introducing additional predator species to provide fishing diversity and to better utilize bluegill.

HABITAT

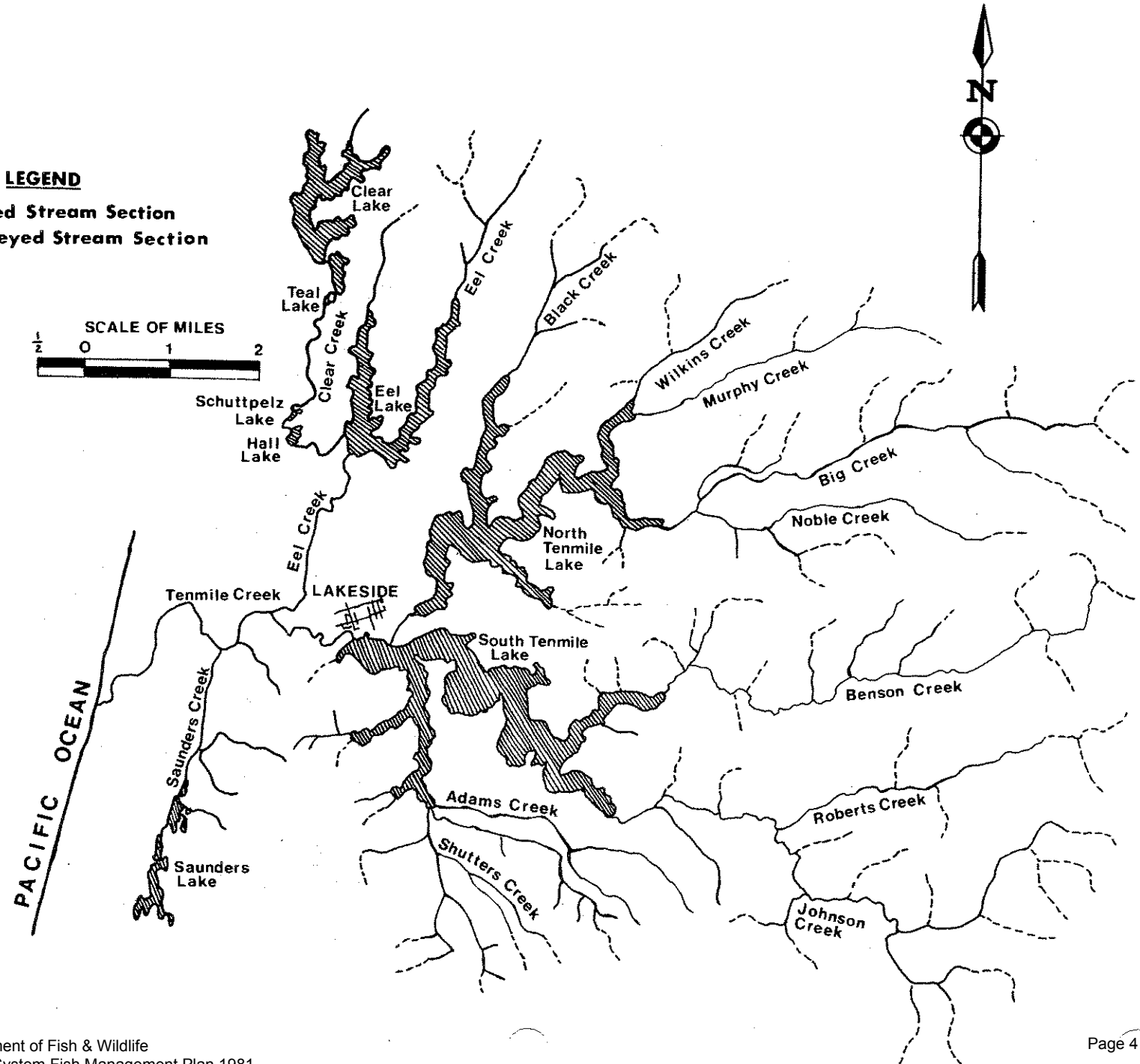
The lakes have a dense growth of aquatic vegetation (water weed, parrot feather, water lily, water shield, and bull rushes) especially near shore but also covering large portions of the lake basin. The dense vegetation is a nuisance to swimmers, waterskiiers, boaters, and anglers. Fallen logs and overhanging trees and brush provide excellent habitat for largemouth bass. Tributary streams contain spawning and/or rearing areas for salmonids.

Surface water temperatures reach into the 70's during the summer months. Dissolved oxygen levels, taken in South Tenmile on September 17, 1980, ranged between 8.4 and 10.5 mg/l on the surface to 2.5 and 4.5 mg/l at the bottom. The deepest point observed on this date was 19 feet.

Public access around the lake is somewhat limited by extensive development of summer homes and small farms. There are several main points of public access; the most important being the county ramp and parking development located at Lakeside on South Tenmile Lake.

1/ Exclusive of Eel and Saunders creeks.

Fig. 1 - Tenmile Lakes and Major Tributaries  
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## FISH POPULATIONS AND FISHERIES

### Warm Water Game Fish

Yellow perch and brown bullhead were reportedly introduced into Tenmile Lakes from Siltcoos Lake in the 1930's. Initial production and growth of these species was excellent and angling was good for several years. In 1948, anglers caught an estimated 54,000 bullheads and an equal number of perch. By this time, however, perch and bullheads evidenced stunted growth and they gradually became less attractive to anglers. In 1952, anglers caught 11,000 perch and 5,800 bullheads, while in 1955 only 600 perch were caught and bullhead were too small to be of interest to fishermen.

In 1952 and 1954-55, commercial fishing was allowed in Tenmile Lakes in an attempt to control perch and bullheads. The fishery removed 119 tons of brown bullhead and 34 tons of yellow perch from the lakes, but was terminated because of adverse public opinion and lack of improvement in the trout fishery. Commercial exploitation apparently improved the growth rates of all age groups of perch and bullheads, but this was not reflected in the population until 1957.

In 1968, the lakes were chemically treated in an attempt to eliminate warm-water fish. However, except for eliminating yellow perch, the treatment was not successful. After treatment, bluegill became established and today it is the most abundant species. Since 1974, bluegill has comprised over 90% of the fish in population samples (gill net catches) from both lakes except at South Tenmile Lake in 1980 when it was only 65% of the catch. While abundant, bluegill do not now appear to be stunted. From 1971 to 1980, their mean length was near 5.7 inches. About 40% of the catch in 1980 ranged from 6-10 inches long, a size range readily accepted by anglers. Growth rates of Tenmile bluegill rate well in comparison to those from other western Oregon waters. Dense aquatic vegetation in the lakes provides excellent escape cover for small bluegill and provides partial protection from predation by bass.

Brown bullhead are not as abundant as they were prior to chemical treatment although population samples indicate they are gradually increasing. Large-mouth bass feed on bullhead fry; and bullheads suffer some natural mortality during the summer. These factors may be limiting bullhead production.

Largemouth bass were introduced into Tenmile Lakes in October 1971 to utilize bluegill as forage and provide a more diversified sport fishery. They were not expected to control bluegill numbers or size, and apparently have not done so. Bass have become well established in the lakes and are now the most popular sport fish present.

From August 21 through September 20, 1979 the angler catch in South Tenmile Lake was composed of 53% bluegill, 18% largemouth bass, 18% brown bullhead, and 11% rainbow. The angler catch in North Tenmile Lake for the same time period consisted of 79% bluegill and 21% largemouth bass. In March to November 1980, estimated total effort and catch by boat fishermen was 26,500 angler days and 129,000 fish caught. Tenmile Lakes have developed into a popular site for bass angling tournaments, and most of the bass caught in tournament competition are released alive back into the lakes.

## Trout

Cutthroat trout are native to the Tenmile Lakes System and apparently during the 1930's fish of 1-2 pounds were common. The fishery began to decline, and the first trout were stocked in 1939 or 1940. By the late 1940's and through 1967, yearling rainbow and cutthroat were stocked annually. After chemical rehabilitation in 1968, yearling and fingerling trout were stocked in 1969 to provide a fishery. From 1970 through 1975, only fingerling trout were stocked. Results of these releases were not favorable. The catch of trout declined from 1.31/h in 1969 (with no competition from other species) to 0.02/h in 1975. It is likely that warm water fish competed with small trout for food or preyed on them. From 1976 to the present, yearling trout have been stocked. The catch rate averaged 0.1 fish/h from 1976-79.

Yearling hatchery trout appear to be the best size to release for several reasons:

- (1) Fingerling trout cannot successfully compete with other fish species present.
- (2) Yearling trout can be stocked early in the season to create an "instant" fishery, prior to water warm up and activity among the warm water species.
- (3) They provide an easy target for the "opportunist" angler.
- (4) A few survive through the summer and may be caught at 16-20+ inches in the fall.

A statistical creel sampling program carried out in 1980 showed about 2,200 trout caught from a release of 8,000. The catch of 27.5% of the fish released was below the Fish Division's guideline for return on stocking of yearling trout. Additional catch data will be obtained in 1981.

Releases of yearlings initially included rainbow and cutthroat, but we mainly release rainbow into standing waters now since they contribute best to the fishery. However, the species stocking in Tenmile Lakes has depended on availability. Coastal cutthroat have the advantage of contributing as yearlings and again in the fall as returning sea-run trout. Based on sampling, few trout hold over in the lakes until fall.

## Steelhead

Steelhead were not stocked into the Tenmile Lakes system until 1977 when approximately 26,000 Alevin smolts were released into Tenmile Creek. This program was started to provide angling through most of the winter when larger streams are high and turbid.

The steelhead fishery peaked during 1970-72 when 1,000-1,200 fish were caught annually (punch card data) in the creek and lakes. It reached a low in 1976 when only 26 were taken. The catch rate in the creek during the 1978-79 season was fair with 10 h/steelhead, whereas in 1979-80 the rate was 22 h/fish. These figures were calculated from creel survey information but were not

expanded. Several experienced anglers have indicated that success during the 1979-80 season was excellent, so the creel data may not be representative. The fishery is concentrated in Tenmile Creek where boat and bank anglers have access on public lands.

### Coho Salmon

The salmon population of Tenmile Lakes is composed entirely of native coho. The lakes historically have been an excellent producer of coho, but runs have seriously declined in recent years. In the 1950's, adults supersaturated the tributaries with eggs; and excess fry were displaced to the lakes where they grew rapidly in the plankton-rich environment. The following spring, they entered the ocean as large smolts. Runs of mature coho have been calculated for many years based on numbers of jacks and adults observed on spawning tributaries (personal communication, McGie). These estimates ranged from 82,000 in 1956 to the current level of 4,500 in 1979. Trends in population estimates parallel counts of salmon on the spawning grounds which dropped from 526 coho/mi in 1955 to 13/mi in 1979. These data are not mutually exclusive, however, since counts of spawning fish were partly used to estimate total numbers. We believe the earlier decline in the coho run is related to the development of warm water fish in the lakes, and degradation of the spawning tributaries. Coho declined in numbers as the warm water fish populations increased during the 1960's. The coho runs briefly increased after the lakes were chemically treated in 1968, but numbers declined again as the bluegill population increased in the early 1970's.

The coho fishery occurs primarily in the ocean and is a combination of commercial troll and sport. McGie (1979) calculated that 1967 - brood coho from Tenmile Lakes contributed to the fisheries as follows: ocean troll - 18,402 (83%), ocean sport - 2,454 (11%), and river and lake sport - 1,231 (6%). The Tenmile Lake stock contributes well to Oregon (80%) whereas Washington recovered 7% and California 13% of the ocean catch (McGie, 1979). Survival rate of the 1967 brood coho smolts averaged 3.44% back to the spawning system. McGie calculated that the catch:escapement ratio for two groups of marked 1967 - brood coho averaged 1.4:1. This catch figure is relatively low compared to the 2.7 - 3.1:1 for coho produced in Columbia River tributaries; however, the higher catch rates can partly be attributed to terminal gill net fisheries in the Columbia River.

The adult coho catch in the creek and lake ranged from 379 to 1,156 and averaged 703/yr between 1960 and 1969 (salmon punchcard data, Koski, 1970). The adult coho catch between 1970 and 1974 ranged between 66 and 1,231 and averaged 556. The highest catches during this period resulted from releasing 930,000 hatchery smolts into the lake system from native stock. The coho catch in freshwater from 1975 to 1978 ranged from 19 to 163 and averaged 84/yr. These figures show a decline paralleling the decline of coho on the spawning grounds.

### DISCUSSION

This section will summarize the Department's views of the fish populations and management problems of Tenmile Lakes. The warmwater species are again

dominant after the failure of chemical treatment in 1968 to control them. Bluegill is the most abundant species present in the lakes. Largemouth bass were introduced to use bluegill as forage and provide a sport fishery. Although bass have provided an excellent fishery, they have not, and were not expected to, control bluegill.

The introduction of a larger predator such as the striped bass/white bass hybrid, which is not known to reproduce naturally, could provide additional fishing and make further use of the abundant bluegill as forage. The bass hybrid can be released as fry or fingerlings; best survival would probably come from fingerlings if a rearing site can be located. The tiger muskellunge is a known sterile hybrid that could be released either separately or in conjunction with hybrid bass. A disease free source of the tiger musky may be difficult to obtain but due to its large size and fighting ability this fish would be attractive to anglers. Either of these fish might provide better fishing, use bluegill as forage, and possibly adversely affect other fish populations. Since neither are known to reproduce naturally, they should be easily controlled if their undesirable features outweighed their benefits.

The catchable trout program has one of the lowest priorities among fish populations and fisheries due to the relatively low returns to the angler. The primary benefit of this program is to start the fishery in the spring of the year. This fish does not contribute much to the fishery after early summer.

The steelhead population now consists of wild and hatchery fish. It contributes to the fishery at a reasonable rate in Tenmile Creek and is an important part of the overall fishery since anglers can fish this creek nearly any time due to the high water quality.

The coho salmon population has diminished since 1971, when the total return from the 1968-brood was 85,000 (includes jacks). The return was only 4,000 for the 1976-brood. We believe the rearing capacity of the lake for coho fry has essentially been lost to the increased numbers of warm water fish. Some options may be available to enhance the coho population in the tributaries and lake. The stream habitat could be enhanced to increase its carrying capacity. The survival of coho in the lake might be improved by reducing the biomass of bluegill or initiating a stocking program of fingerlings. If coho fingerlings successfully competed with bluegill and were not subjected to undue predation, they would provide benefits by utilizing the natural rearing capability of the lakes. A smolt release program would probably provide the highest return; but release of smolts into Tenmile Lakes would not utilize lake productivity. However, returns of adults from smolt releases would provide brood stock for the fingerling release program.

In summary, Tenmile Lakes has the potential for a diverse population of fish that will benefit sport and commercial users. Several species of warmwater fish now provide a fishery throughout most of the year. Angling for largemouth bass is especially popular; bluegills are caught in the largest numbers. Yearling trout stocked early in the season create an "instant" fishery prior to activity among the warm-water species. The steelhead fishery is important



to Tenmile Creek and depends to a large degree on release of hatchery smolts. Enhancement has been initiated by hatching surplus steelhead (Alsea stock) in streamside incubators as part of STEP. Coho salmon from Tenmile are taken in the ocean sport and commercial fisheries primarily off the Oregon coast. The freshwater sport fishery is concentrated in the creek and some in the lakes around the mouths of tributaries. The coho production and fisheries are at low levels now, but have been extremely important in the past and may produce again with proper management. Use of hybrid predators could provide better angling for large fish. We believe these fish could be tested in a way that would not preclude attempts to rehabilitate coho salmon.

We intend to address all viable options regarding management of North and South Tenmile Lakes and Tenmile Creek. The options should maintain fish populations that will optimize the highest sustained yield to the user. The options, recommendations, and selected course of management should be reviewed at least every 5 years to determine if the best approach is being taken.

### MANAGEMENT ALTERNATIVES

Two or more management alternatives are provided for each variety of fish (warm water, trout, steelhead, and salmon).

#### Warm-Water Game Fish

1. Do nothing and let things develop as they will.

- Disadvantages
- a. Does not accomplish much for resource management in a water body which formerly produced a large number of coho, is now mainly populated by bluegills, and has a high potential for production of useful fish.
  - b. This approach generally is not consistent with policies of ODFW.

- Advantages
- a. No immediate direct expense to state.
  - b. Requires little effort.
  - c. May satisfy some users.

2. Complete chemical rehabilitation.

- Disadvantages
- a. Expensive with no assurance of being successful. Complete rehabilitation was undertaken in 1968 at a cost of \$161,800; benefits were short term.
  - b. Might eliminate an established bass fishery with a large following.
  - c. Destroys and wastes a good number of catchable size fish.

- Advantages
- a. Reduces total fish population for a time and initially produces good survival and growth for the newly established population. Initially, fishing is improved for salmonids (trout and coho).
  - b. Eliminates for a time over-abundance of certain species, i.e., bluegill.
3. Partially reduce bluegill numbers by spot treating shoreline with chemicals after fry have hatched.
- Disadvantages
- a. Tried unsuccessfully in 1970 and 1971, was time consuming with small kill for amount of effort expended.
  - b. May kill fry or bass and other warm water game fish as well as bluegill.
  - c. Expensive if much shoreline is covered. Must be carried out annually.
- Advantages
- a. While not highly successful, it is relatively easy to accomplish.
4. Destroy bluegill nests at spawning time.
- Disadvantages
- a. Difficult to locate nests in large weedy lakes.
  - b. Time consuming and difficult to do.
- Advantages
- a. Species specific.
5. Introduce hybrid predator species that cannot reproduce.
- Disadvantages
- a. Danger of introducing new diseases.
  - b. Difficulty in locating a dependable source of stock available over a period of years.
  - c. Must be stocked annually or periodically since they will not reproduce naturally.
  - d. Difficulty in rearing fry to stocking size.
  - e. Will take some time to build up a fishable population.
  - f. May adversely impact some existing species.
- Advantages
- a. Population size can be easily controlled or eliminated since hybrids have not spawned successfully in the wild and relatively low stocking rates would be used initially.

- b. Hybrids grow rapidly with the proper habitat conditions.
- c. Hybrids will provide an additional fishery. There is a potential for producing large fish for the creel.
- d. Bluegill are more numerous than needed to support largemouth bass and provide angling. They can be used to support this additional species. Striped bass/white bass hybrids and tiger muskellunge will feed on larger bluegills than the largemouth bass. Greater use of bluegill as forage could decrease their numbers and increase growth rates of the survivors.

### Trout

#### 1. Release yearling trout in the spring.

- Disadvantages
- a. Cost of rearing trout to yearlings is high.
  - b. Past contribution to the creel has been mediocre in Tenmile Lakes.

- Advantages
- a. Yearling trout provide an instant fishery.
  - b. The release of yearling trout stimulates a high amount of angler interest early in the season.

#### 2. Discontinue trout releases.

- Disadvantages
- a. There would not be a trout fishery in the spring.
  - b. Anglers and local businesses would be dissatisfied unless replaced by another fishery.

- Advantages
- a. There would be an economic saving from reduced rearing cost for yearling trout or we could use these fish elsewhere.

### Steelhead

#### 1. Release fingerling steelhead into Tenmile Creek, and tributaries.

- Disadvantages
- a. Additional competition with lake species if juveniles rear in the lake.
  - b. Predation on steelhead by lake and creek species.
  - c. Environment in lake may not be conducive for survival.
  - d. Steelhead would compete with coho for tributary habitat and food.

- Advantages
- a. Potential to enhance fishery in Tenmile Creek for adult steelhead through partial natural rearing.
  - b. Tributaries to the lakes may not be at capacity with fish at this time and could support additional steelhead.
  - c. Costs less to rear fingerlings than yearlings.
2. Release yearling steelhead into Tenmile Lakes and Creek.

- Disadvantages
- a. Relatively high cost to rear smolts.
  - b. Steelhead released into the lakes would return to the lakes as adults and not be readily available to anglers.

- Advantages
- a. Survival rates would be best with smolt releases.
  - b. Smolts would not compete with other species since they would enter the ocean shortly after release.

### Salmon

1. Allow the coho population to manage itself.

- Disadvantages
- a. Continued negligible contribution to commercial and sport fisheries.
  - b. Long term loss of benefits.

- Advantages
- a. No direct or immediate cost to state for rehabilitation of coho runs.

2. Enhance coho population by releasing fry/fingerlings into tributaries and lake.

- Disadvantages
- a. Expense and manpower required to collect eggs, check for disease, hatch, rear, etc.
  - b. Predation would reduce survival in lake.

- Advantages
- a. Rearing costs would be reduced.
  - b. Could bring population level in streams up to saturation.
  - c. Release of fingerlings might increase lake production of coho despite presence of predators and competitors.

3. Stock lake with coho smolts.

- Disadvantages
- a. Highest expense to produce.

- b. No clear benefit to using lake productivity.
- Advantages
- a. Best possibility for survival in lake.
  - b. Best possibility for contribution as adults.
  - c. Positive impact on commercial and sport fisheries.
  - d. Could evaluate distribution, contribution, and survival of Tenmile Lakes coho by marking with CWT.

### RECOMMENDATIONS

The Fish Division of ODFW has developed recommended objectives for warm water fish, coho salmon, steelhead, and resident trout at Tenmile Lakes. However, it should be understood that the various fish species will interact with each other possibly to the detriment of one or more species. Also, existing habitat may favor some species over others. Because of these considerations, objectives may not be achieved for all species.

The staff believes it is important to determine if the large production of coho salmon formerly provided by rearing of juveniles in the lakes can be reclaimed. However, it is obvious from past work and existing runs that coho cannot compete with the warm water species present without some form of artificial aid. Large fingerlings stocked in the lakes might survive substantially better than naturally produced fry. Coho may not be able to compete even with supplementation, but their former production was so great that the attempt should be made.

While it is desirable to determine if the lakes can again be used to produce coho, the staff believes it is also important to investigate other potential uses of this highly productive water body. The lakes are presently mainly populated by bluegill and also provide good fishing for largemouth bass. However, there is a high potential for providing angling for predator fish that are larger than largemouth bass and may better use bluegill as forage. The striped bass x white bass hybrid appears to be a good first choice to investigate as a large predator that would utilize bluegill and provide good sport fishing. Attributes of the bass hybrid are: an apparent inability to reproduce naturally, relatively large size (commonly reach 5-10 lb), good availability, low incidence of disease, and very catchable. Unknowns include their adaptability to the shallow, weedy habitat at Tenmile since the bass hybrid more commonly frequents open water and their ability to utilize bluegill as forage.

A second choice for a large predator is the tiger muskellunge which has the following attributes: it is a proven sterile hybrid, has large size (commonly exceeds 20 lb, maximum up to 60 lb), it frequents shallow, weedy habitat of the type present at Tenmile Lakes, it commonly uses bluegill and other panfish as forage, and it is catchable for a large game fish. Unknowns or possible disadvantages for the tiger muskellunge include: they would mainly provide a trophy fishery since individuals require considerable space and their stocking

rate would have to be low, and a possible problem finding a disease free source. If it is decided the best use of Tenmile Lakes is to provide sport fishing for warm water species, the tiger muskellunge might complement fishing for the smaller but likely more abundant hybrid and largemouth bass.

The main thrust of our recommendations is to investigate the potentials for utilizing lake productivity to rear coho smolts and provide a fishery for large predators. While rearing of coho appears incompatible with production of large predators, the unique topography of Tenmile Lakes, which features two large lakes separated by a narrow, shallow canal, should allow us to study the two potentials independently. We must also realize, however, that either or both of these potentials may be inhibited by the environment and/or the presence of large populations of bluegill and largemouth bass.

Additional to objectives for the various important fish species, the staff has also developed recommended objectives for maintaining habitat. Maintenance of habitat is critical to production and utilization of the fish populations.

### Recommended Objectives

#### Salmon

1. Attempt to use the high productivity of Tenmile Lakes to produce large numbers of coho smolts. This is contingent on developing indigenous brood stock to supply eggs for fingerling release.
2. Maximize production of coho in the tributaries to Tenmile Lakes.
3. Determine the contribution of the Tenmile Lakes coho stock to Oregon fisheries.

#### Warm water fish

Develop diverse populations of predator fish to better use bluegill as forage and provide sizes and numbers of fish that will benefit anglers.

#### Trout

Maintain a spring trout fishery by releasing catchable size fish so anglers will have some fishing prior to activity among the warm water species.

#### Steelhead

Maintain a catch rate of 10 hours/steelhead with a combination of wild and hatchery fish.

#### Habitat

1. Reduce the dense beds of aquatic vegetation that obstruct use by fishermen and cause increased water temperatures.

2. Protect, enhance, and create spawning and rearing areas on the tributaries of Tenmile Lakes.
3. Increase public access to the lake.

#### Recommended Actions

1. Release large coho fingerlings (indigenous stock) into South Tenmile Lake and its tributaries, which we believe are understocked, to determine if we can utilize natural productivity to increase the run. The coho fingerlings are expected to compete with existing populations of bluegill and largemouth bass. We chose South Tenmile for the coho rehabilitation effort since it outlets directly to the ocean through Tenmile Creek. If this release is successful through several broods, release coho pre-smolts into North Tenmile Lake, which as stated in action 3 will be used to develop fishing on large predators, to determine if fingerlings can survive a mix of predator fish.
2. Rear native coho to smolt size for release into the system. Tag to determine the value of this stock to Oregon fisheries. If value is high and this stock adds to overall coastal coho production, propagate smolts on a continuing basis.
3. Test the use of the striped bass x white bass hybrid in North Tenmile Lake. This lake was chosen for release of the hybrid bass since it is separated by a canal from South Tenmile Lake and the coho released into the latter do not pass through North Tenmile on their ocean migration. Some hybrid bass could migrate through the canal to South Tenmile, but the number should not be great and they should not reproduce there. The hybrid bass are expected to compete directly with existing populations of bluegill and largemouth bass in North Tenmile Lake. We will study the fishery contribution of hybrid bass and attempt to assess the impact of the hybrid on the largemouth bass and bluegill fisheries.
4. Continue to release about 25,000 hatchery steelhead smolts annually. Evaluate the contribution to the fishery of the Alsea stock now in use. If their contribution is materially less than desired, develop a local stock for testing.
5. Continue releasing hatchery trout of legal size each spring to provide angling prior to warm water fish activity. While the catch of hatchery trout is less than desired (28% of the release in 1980), the release of legal size fish generates a large amount of angling effort early in the season.
6. Attempt to reduce vegetation in North Tenmile Lake by seeking funding and volunteers to treat with an approved chemical. North Tenmile was chosen for this purpose since reduction of weeds would make bluegill more vulnerable to predation by hybrid bass and would allow better access to fishermen. Continued weed growth in South Tenmile would protect pre-smolt coho released there.

7. Continue efforts to protect existing spawning and rearing areas in tributaries.
8. Work with landowners and managers to develop habitat improvement projects through STEP in tributaries. Possible activities include removing obstructions, planting shade trees, fencing streambanks, and installing devices to aid formation of spawning bars and rearing pools and protect and improve cut banks.
9. Encourage private enterprise to develop lake access and use by the public.

Oregon Department of Fish and Wildlife  
Fish Division  
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