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Alberta's WALLEYE Management and Recovery Plan





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The following document describes the walleye management and recovery plan for walleye in Alberta and describes the walleye management and recovery plan for walleye in Alberta and describes the walleye management and recovery plan for walleye in Alberta.

This plan for the management and recovery of walleye in Alberta is based on an earlier version, Walleye Management Plan - An Overview published in 1985. That document was revised to include new information and to update the policy, principles and strategies. This plan is presented in a non-technical fashion to serve as public information. However, readers are referred to the scientific literature.

Walleye management and recovery plan was developed and coordinated by the Walleye Task Force and staff of the Alberta Fisheries Management Division. The task force was composed of representatives from the academic, commercial, recreational and regulatory sectors of the walleye industry with key stakeholders including the provincial government. The plan was developed with the assistance of the following individuals:

**ALBERTA'S WALLEYE MANAGEMENT
AND RECOVERY PLAN**

**David K. Berry
Recreational Fisheries Coordinator**

Appreciation is expressed to the more than 250 Albertans who participated in the workshops, and to the Walleye Task Force and staff of the Alberta Fisheries Management Division. Members of the task force, and their affiliation, are David Berry (Western Walleye Council); Wally Becker (Walleye Unlimited Foundation); Ivan Johnson (Alberta Fish and Game Association); Bill Mackay (University of Alberta); Andy Thompson (Commercial Fisheries); and Wally Barrett, Duane Redford, Ken Salt, Hugh Norris, George Stelling, Mike Sullivan, Dave Malty and Trevor Rhodes (Fisheries Management Division).

Mike Sullivan developed the model used for walleye management based on stock-recruitment characteristics. Mike also worked extensively with fishery managers throughout the province to classify walleye populations into management categories, and on presentations at public workshops for the review of management and the development of recovery strategies. Laverne McKay and Wally Cook provided input to the plan and developed public information material on walleye and walleye management to support the plan.

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PREFACE

The following document briefly summarizes the information on walleye in Alberta and outlines the management strategies that have been adopted. Companion documents will provide additional information on walleye in Alberta and describe operational plans for the management and recovery of specific populations.

This plan for the management and recovery of walleye in Alberta is based on an earlier version, *Walleye Management Plan--An Overview* published in 1985. That document was revised to include new information and greater detail on management policy, principles and strategies. This plan is presented in a nontechnical fashion to serve as public information; however, readers are encouraged to review scientific literature.

Walleye management strategies were reviewed and recommended by the Walleye Task Force--an advisory group consisting of representatives of sportfishing organizations, university academics, commercial fishermen and Fisheries Management Division. Public involvement in walleye management and regulation development was accomplished through 16 workshops with key stakeholders held by the Walleye Task Force throughout the province. Open house meetings at 23 locations were held in May to provide public information on the regulation proposals developed with the aid of the workshops.

Appreciation for their involvement is extended to the more than 250 Albertans who participated in the workshops, and to the Walleye Task Force and staff of the Alberta Fisheries Management Division. Members of the task force, and their affiliation, are David Gursky (Western Walleye Council); Wally Becker (Walleye Unlimited Foundation); Ivan Johnson (Alberta Fish and Game Association); Bill Mackay (University of Alberta); Andy Thompson (Commercial Fisherman); and Morley Barrett, Duane Radford, Ken Zelt, Hugh Norris, George Sterling, Mike Sullivan, Dave Walty and Trevor Rhodes (Fisheries Management Division).

Mike Sullivan developed the model used for walleye management based on stock-recruitment characteristics. Mike also worked extensively with fishery managers throughout the province to classify walleye populations into management categories; and on presentations at 16 public workshops for the review of management strategies and the development of regulation options. Laverne McAthey and Natlie Cook provided input to the plan and developed public information material on walleye and walleye management in support of the plan. The walleye management and recovery plan was reviewed by Editorial Services, Alberta Environmental Protection.

TABLE OF CONTENTS

1.0 SPECIES OVERVIEW.....	1
1.1 Description.....	1
1.2 Biology.....	1
1.3 Distribution.....	3
1.4 Status.....	3
1.4.1 Trophy Status.....	6
1.4.2 Stable Status.....	7
1.4.3 Vulnerable Status.....	7
1.4.4 Collapsed Status.....	8
1.5 Major Limitations to Production.....	9
2.0 MANAGEMENT PLAN.....	11
2.1 Present Management Policies.....	11
2.2 Management Policy Requirements.....	12
2.2.1 Conservation Policy.....	13
2.2.2 Fish-Use Policy.....	13
2.2.2.1 Domestic Use.....	13
2.2.2.2 Recreational Use.....	14
2.2.2.3 Commercial Use.....	14
2.2.2.4 Tournaments and Derbies.....	14
2.2.3 Habitat Maintenance Policy.....	15
2.3 Walleye Management Strategies.....	15
2.3.1 Allocation Strategy.....	15
2.3.1.1 Domestic Allocation.....	16
2.3.1.2 Recreational Allocation.....	16
2.3.1.3 Commercial Allocation.....	16
2.3.1.4 Tournaments and Derbies.....	16
2.3.2 Fish Production Strategy.....	16
2.3.3 Public Information and Education Strategy....	19
2.3.4 Habitat Maintenance Strategy.....	19
2.3.5 Enforcement Strategy.....	20
2.4 Management Actions.....	21
2.4.1 Management Action Requirements: Musts.....	21
2.4.2 Management Action Requirements: Wants.....	22
2.5 Sportfishing Regulation Amendments (1996).....	23
3.0 REFERENCES.....	25
Appendix 1. Alberta lakes and streams with walleye populations classified in stable status and managed for moderate harvest.....	27
Appendix 2. Alberta lakes with old-growth walleye populations classified in trophy status (better-than- average-size fish) and managed for minor harvest.....	28
Appendix 3. Alberta lakes and streams with walleye populations classified in vulnerable status and managed for minor harvest.....	29
Appendix 4. Alberta lakes and streams with walleye populations classified in collapsed status and managed for no harvest.....	31

LIST OF FIGURES

Figure	Page
1. General distribution for walleye in Alberta.....	4

LIST OF TABLES

Table	Page
1. Walleye population values for each of four management status categories, determined from field data for each characteristic examined.....	6

ABSTRACT

This document consists of a brief overview of the walleye in Alberta and a management plan detailing current practices and future requirements.

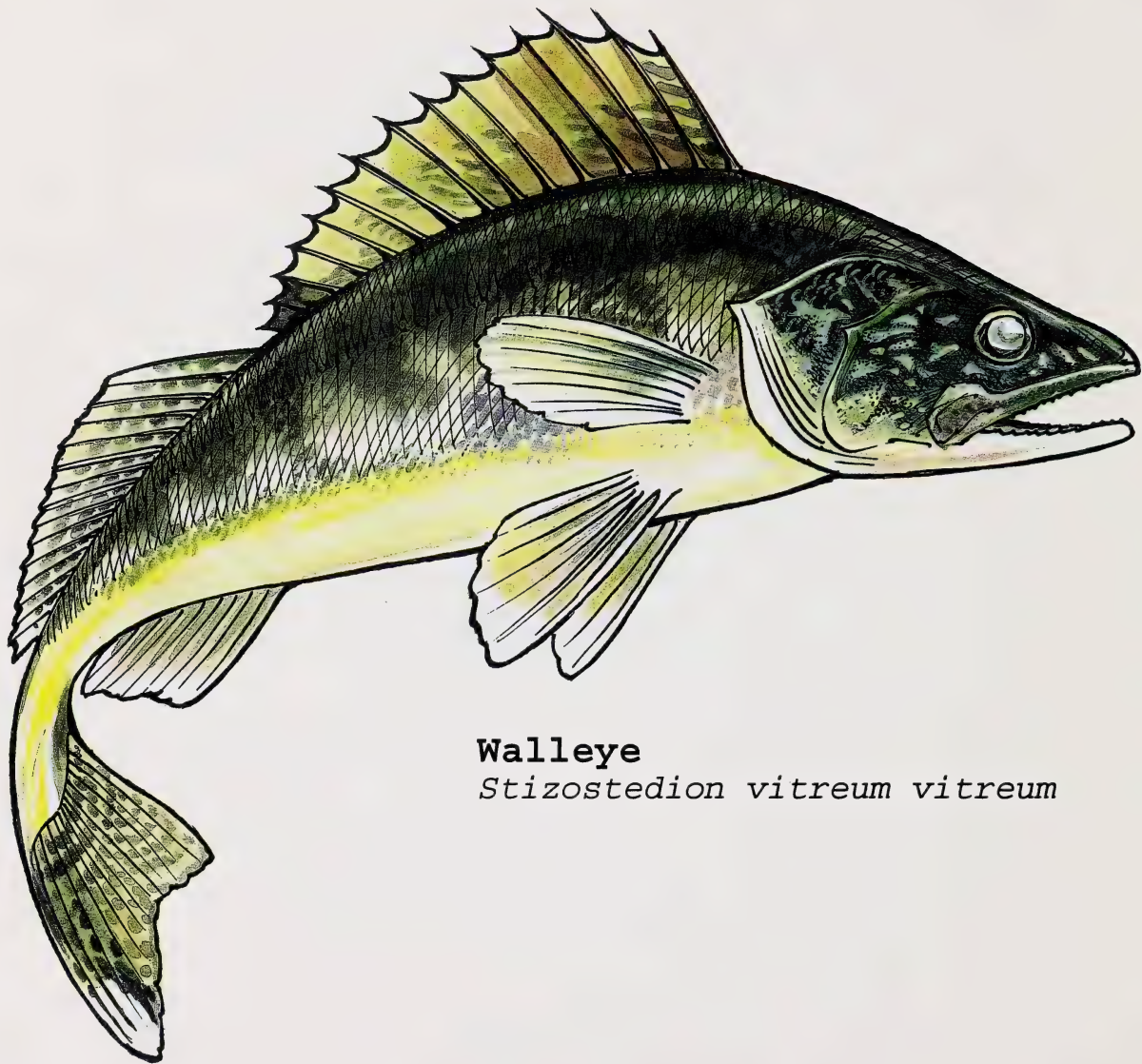
The walleye (*Stizostedion vitreum vitreum*) is native to Alberta. Walleye populations occur in 64 large river systems and an estimated 177 lakes throughout the province. Walleye distribution in Alberta has been extended into southern areas, particularly southern reservoirs; however, most of these populations have not become fully established.

This species is not in danger of extinction in Alberta, yet, some populations are at a risk of loss, whereas others face continued decline. The numbers of walleye surviving to reach maturity and to spawn are too few to maintain self-sustaining populations. Many walleye populations are currently in a vulnerable or collapsed status.

Commercial fishing pressure during the first half of this century contributed to the decline and loss of some walleye populations. Strict conditions on season timing, lake zoning and tolerance limits have significantly reduced the effects of commercial fishing on walleye populations in the 1990s.

Increased sportfishing pressure, improved fishing techniques and more knowledgeable anglers have contributed substantially to recent reductions in walleye numbers. The growing popularity of walleye tournament fishing is increasing the pressure on some populations.

Walleye must be protected and managed to achieve population recovery. Recovery requires managing for conservation first. Conservation in the context of this plan is focused on the net gain in the production of walleye. The fulfilment of recreational benefits must emphasize catch-and-release-only fishing and limited, selective harvest until populations recover. Walleye harvest must also be minimized in domestic fisheries, commercial fisheries, and tournaments and derbies.



Walleye

Stizostedion vitreum vitreum

1.0 SPECIES OVERVIEW

1.1 Description

The walleye is a member of the perch family, which has five species in Alberta: walleye (*Stizostedion vitreum vitreum*), sauger (*S. canadense*), yellow perch (*Perca flavescens*), logperch (*Percina caprodes*) and Iowa darter (*Etheostoma exile*). The walleye is the largest member, and the logperch and Iowa darter are the smallest (minnow-sized).

Walleye are well known for their glassy eyes that allow them to see in low light conditions and for their sharp spines in the first dorsal fin, anal fin and on the gill covers. Walleye have well-developed teeth, distinctly suited for preying on smaller fish. Their body is torpedo-shaped, and their tail is broad and deeply forked.

Distinguishing colour features are a black blotch on the first dorsal fin and a distinctive white tip on the anal fin and lower lobe of the tail. Walleye have yellow-olive backs, yellowish sides and white bellies. However, colour can vary for walleye depending on where they occur. Most stream walleye are pale yellow, almost greyish, because of low light and silty water conditions. Clean water conditions tend to brighten and deepen the colours, which can reach golden tones in some cases.

Sauger, although smaller in size, closely resemble walleye. The main distinguishing differences are the sauger's lack of white fin tips, glassy eye and distinctive black blotch on the dorsal fin, all of which are features of walleye. Sauger occur only in the Milk, Red Deer, and South and North Saskatchewan rivers.

In Alberta, the common name pickerel is often used for walleye. Since pickerel is the accepted common name applied to some members of the pike family found in eastern Canada (e.g., chain pickerel), its usage for walleye is incorrect.

A taxonomic history of the walleye and a key to species of the perch family can be found in *The Fishes of Alberta* (Nelson and Paetz 1992).

1.2 Biology

The walleye is considered a cool-water species in contrast to trout, which are cold-water species. Walleye prefer large, moderately fertile lakes (termed mesotrophic). The most productive populations of walleye in Alberta occur in lakes over 400 ha (988 ac.). Such lakes provide optimum conditions

for walleye--maximum summer temperature around 20° to 23°C, low light penetration, abundant food sources and oxygen concentrations greater than 3 mg/L. Deep, cold, infertile lakes (oligotrophic) and shallow, warm, very fertile lakes (eutrophic) are less suitable.

In Alberta, walleye spawn in April or May, shortly after ice break-up. Walleye can use a variety of areas for spawning; however, spawning generally occurs in inlet streams or over shallow, rocky bars within lakes. Most lake populations migrate up inlet streams to suitable spawning sites. In some cases, walleye migrate long distances to spawn and can exhibit a high degree of homing, i.e., they will return to the same spawning areas they used before. After spawning, the adults actively feed as they move to summer areas. Since they are still congregated during their early spawning movement, they are extremely vulnerable to angling.

In most walleye populations in Alberta, male walleye do not reach maturity until after age seven, at about 43 cm (17 in.) in length and 700 g (1.5 lb.) in weight. Females do not generally reach maturity until after age nine, at about 50 cm (20 in.) in length and 1590 g (3.5 lb.) in weight. Egg production by the females varies with size, generally about 66 000 to 77 000 eggs per kilogram of fish weight.

As the water temperature reaches 6°-8°C, the females move on to their spawning beds, but do not select specific sites; nor do they build redds (egg nests). The eggs are released over the spawning area and fertilized by the male swimming close to the side of the female. The fertilized eggs settle to the bottom where they stay in the spaces between the rocks and pebbles or woody debris.

Optimal water temperatures for spawning lie between 6° and 12°C, and for egg incubation, between 9° and 15°C. The eggs hatch in 18 to 21 days. Climate has a great influence on spawning and hatching success, which ultimately affects year-class strengths. Cold weather occurring just before or during spawning can delay, interrupt or even prevent spawning. In Alberta, walleye populations frequently experience weak year-classes because of spawning failures.

Newly hatched fry are unable to swim freely because of their large yolk sacs. This feature causes them to drift passively downstream or in lake current. In four or five days the yolk reserve is completely exhausted and the fry must begin to feed on zooplankton (microscopic animals). It is critical that the fry population obtains abundant zooplankton of the right kind and size before large losses occur from starvation. Estimates

of mortality of walleye populations between spawning and the time of first feeding have been as high as 99 percent.

As fry grow, their diet changes from zooplankton to insect larvae and small fish. Walleye convert to a fish diet once they become fingerlings, but are still less than 50 mm (2 in.) in length. Walleye retain their fish diet as adults, thereby assuming the role of one of the top predators in the food chain. An abundant supply of food fish such as minnows, perch and whitefish is critical for walleye growth and survival.

Growth of individual walleye in Alberta is relatively slow compared to stocks in more eastern and southern locations in Canada and the United States. Alberta's shorter ice-free growing season is a major factor in this slow growth. Walleye in Alberta are capable of living to old ages, particularly in less exploited populations. This longevity can allow walleye to reach 30 years of age, and achieve sizes similar to or greater than southern populations, even though growing at slower rates.

1.3 Distribution

Walleye are distributed throughout Alberta's major drainages, occurring in an estimated 64 large river systems, their tributaries and about 177 lakes (Figure 1). Cold water temperatures, clear water and a low abundance of food fish are factors that discourage walleye from moving into the upper headwaters of rivers such as the Oldman, Bow, Red Deer, North Saskatchewan, Athabasca and Smoky.

Alberta is not endowed with an abundance of surface water, having only 2.5 percent (16 500 km²) of its area as fresh water. In comparison with other provinces and territories, Alberta ranks eighth in terms of the proportion of surface that is covered by water, and surpasses only Prince Edward Island, New Brunswick, the Yukon and British Columbia. Surveys indicate that only about 1030 of Alberta's lakes produce game fish.

The 177 lakes that contain walleye (813 106 ha) represent 17 percent by number and 73 percent by area of the total fish-bearing lakes in Alberta. Eight lakes make up about 65 percent of the total area of lakes containing walleye, with the Alberta portion of Lake Athabasca accounting for 29 percent of the total area. Approximately 75 percent of the lakes with walleye, 89 percent by area, are located north of Edmonton.

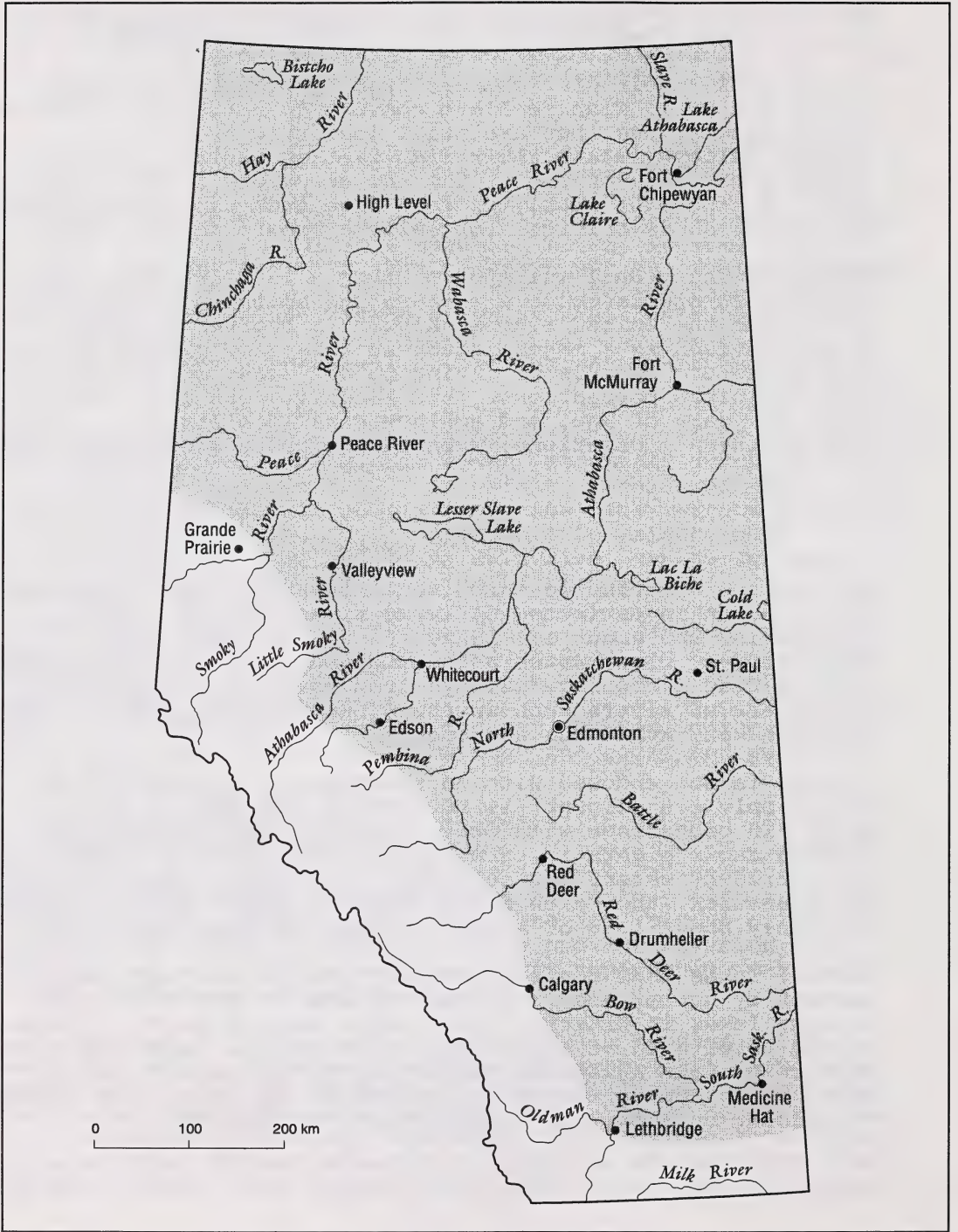


Figure 1: General Distribution for Walleye in Alberta (shaded area)

1.4 Status

The current and historical distributions of walleye in Alberta are similar; however, some populations have been lost. Walleye disappeared from Wabamun Lake in the 1920s; from Pigeon Lake in the 1960s; and were almost gone from North Buck Lake, Skeleton Lake, Lac La Biche and several other lakes by the 1970s.

Attempts to expand walleye distribution in Alberta have occurred through stocking programs since 1938, but most of this stocking was unsuccessful. Some success has been reported for Eagle Lake, Pine Lake, Sylvan Lake, Vincent Lake, Garner Lake, Sherburne Reservoir and Upper Chin Reservoir. Expansion of populations into some southern reservoirs has occurred through walleye movements within the irrigation systems. A few other lakes temporarily supported populations of stocked walleye, but these populations did not become self-sustaining. Walleye stocking efforts at about 45 lakes since 1980 will require several more years to pass before they can be evaluated.

Despite stocking programs that have introduced 79 million eggs, 182 million fry and 11 million fingerlings since 1938, walleye populations across Alberta have declined because the adult proportion has been reduced to critically low levels through fishing. The resulting loss of natural reproduction is the major factor in the decline of walleye stocks.

The walleye is a high-quality food fish that has been heavily harvested in commercial and recreational fisheries since before the turn of the century. In response to concerns over the decline of walleye stocks, a Walleye Enhancement Program operated between 1980 and 1989. This program resulted in the development of an ongoing walleye culture and stocking program, a number of spawning closures, a minimum-size limit and reduced catch limit for sportfishing, and low tolerance limits in commercial fisheries. However, populations have continued to decline primarily because of increased sportfishing pressure.

Fisheries managers with Fisheries Management Division have examined walleye populations in Alberta and identified four status categories: trophy (old growth), stable, vulnerable and collapsed (Table 1). This classification system was assisted by the use of a computer model (Sullivan 1994) to examine populations in terms of five biological characteristics: age-class distribution, age-class stability, growth (length-at-age), age-at-maturity, and catch rate (fish kept/h).

Walleye populations can change in status and shift from one category to another depending primarily on the harvest pressure exerted on the population. Increased harvest pressure results

in changes to the characteristics of a population which, under continuing pressure, will cause a decline in status. Population recovery requires a reduction in harvest to ensure that more walleye reach their mature size to increase the number of spawning fish and subsequently increase in the production of young fish. Based on the available habitat, the ability still exists for many water bodies to support more walleye.

Table 1. Walleye population values for each of four management status categories, determined from field data for each characteristic examined (modified from Sullivan 1994).

<u>Biological Characteristic</u>	<u>Management Status Category</u>			
	<u>Trophy*</u>	<u>Stable</u>	<u>Vulnerable</u>	<u>Collapsed</u>
Age-class Distribution	Wide, >8 yr. classes Mean age, >9 yrs.	Wide, >8 yr. classes Mean age, 6-9 yrs.	Narrow, 1-3 yr. classes Mean age, 4-6 yrs.	Wide or narrow Mean age, 6-10 yrs.
Age-class Stability	Very stable	Stable	Unstable	Stable or unstable
Growth (length-at-age)	Slow, 50 cm in 12-15 yrs.	Slow, 50 cm in 9-12 yrs.	Moderate, 50 cm in 7-9 yrs.	Fast, 50 cm in 4-7 yrs.
Age-at-maturity (mean age)	Females 10-20 yrs. Males 10-16 yrs.	Females 8-10 yrs. Males 7-9 yrs.	Females 7-8 yrs. Males 5-7 yrs.	Females 4-7 yrs. Males 3-6 yrs.
Catch Rate	>1-2 kept/hr.	0.5 kept/hr.	0.15 kept/hr.	0.05 kept/hr.
Population Decline $\Longrightarrow\Longrightarrow\Longrightarrow$ (caused by overharvest)				
Population Recovery $\ll\ll\ll$ (needs restricted harvest)				

* Trophy status (old growth) fisheries are sensitive populations that support low densities of better-than-average-size, old walleye.

1.4.1 Trophy Status

Walleye populations given a trophy status (old growth populations) are relatively unexploited and exhibit wide, stable age-class and size-class distributions. These fish grow very slowly and mature late. Generally, they take 12 to 15 years to reach 50 cm (20 in.) and 1200 g (2.6 lb.). The mean age of maturity for females ranges between 10 and 20 years (10-16 for males). Walleye in unexploited lakes can be long-lived, reaching 30 years of age. Catch rates are high (1-2 fish kept/h), consisting of large fish, but the productivity of these populations is low as indicated by the slow growth and limited number of small walleye produced. Because the harvest is generally low, few young walleye are required to sustain these populations.

At present, 19 lakes are considered as having old growth walleye populations and the ability to support trophy status. Although these lakes are in northern areas, some have been fished to the extent that the number of old walleye has declined and the trophy status is at risk. Populations in three rivers with trophy status potential have seriously declined. Healthy trophy populations resemble stable status populations; however, they are more susceptible to sharp decline due to high use and overharvest.

1.4.2 Stable Status

Stable walleye populations support reasonable catch rates (0.5 fish kept/h). The range for age-class distribution, although still broad, is significantly narrower than in old growth populations and the strength of individual year-classes varies more. Fishing pressure lowers the number of adult walleye present in stable populations and few fish reach the age of 20. Much of the sportfishing catch consists of fish that are 3 to 5 years old because larger numbers of young fish are produced. Growth is somewhat faster, but adults still require 9 to 12 years to reach 50 cm in length. The mean age of maturity for females ranges between 8 and 12 years (7-9 for males).

Stable status populations still occur at about 26 lakes and in some northern streams. These fisheries attract considerable angler interest, but fishing pressure remains low to moderate because of poor access.

1.4.3 Vulnerable Status

Walleye populations in the vulnerable status have low numbers of fish and have narrow, unstable age-class distributions. The strength of individual year-classes commonly fluctuates because

of the occurrence of some years of successful spawning mingled among frequent years of poor and unsteady reproductive success. Vulnerable populations tend to fluctuate between a state of recovery (following periods of successful spawning) and a state of decline (from overharvest).

Compared to old growth and stable populations, the adult density in vulnerable populations is low and few fish over the age of 10 are present. These fish grow reasonably fast and mature at a relatively young age. A length of 50 cm is reached in 7 to 9 years and the mean age of maturity for females ranges between 7 and 8 years (5-7 for males). Sport fish catches are poor (0.15 fish kept/h), generally requiring 3 to 10 hours of fishing for each fish caught.

About 70 lakes, most located in settled areas, have walleye populations that are susceptible to overharvest and vulnerable to collapse. In addition, the accessible river systems and their tributaries are considered to have walleye populations in a vulnerable status. Most river populations of walleye are susceptible to overharvest because walleye in streams tend to be found in identifiable holes and the mouths of tributaries.

1.4.4 Collapsed Status

Collapsed walleye populations have very low densities of fish and support insignificant fisheries with catch rates below 0.05 fish/h (20 hours of fishing for each fish caught). Even under moderate fishing pressure, few fish reach maturity, most being caught when still immature. As a result, the spawning segment of these populations is very small, even though growth can be fast and maturity can occur at a young age. A length of 50 cm can be reached in 4 to 7 years and the mean age of maturity for females ranges between 4 and 7 years (3-6 for males).

Age-class distributions in collapsed populations are usually unstable and can vary from a narrow range to a broad range of year-classes. Many year-classes can be absent due to spawning failures. The occurrence of an occasional strong year-class can stimulate a good fishery; however, even moderate fishing pressure quickly depletes the stock and the population returns to its collapsed state without any long-term recovery.

Walleye populations in the collapsed status are divided into two sub-categories: native (natural) populations that have been severely overharvested; and introduced populations, from recent stocking, that have not become self-sustaining. Stocked populations have a low density of walleye and population characteristics similar to collapsed, native populations.

In total, 62 water bodies have been placed in the collapsed status for walleye populations; 19 containing native populations, and 43 that have been stocked. A portion of the Red Deer River has been classed as having a collapsed walleye population with a trophy status potential.

1.5 Major Limitations to Production

A number of factors limit the rate at which walleye can grow, both individually and as populations. Major limitations to walleye production in Alberta include the following:

1. Productive Capacity of the Habitat

Alberta is near the northwestern limit of the natural range for walleye in North America and, as such, contains habitat with greater limitations for the production of walleye in comparison with more southern and eastern regions. Alberta has a limited number of large lakes that are productive for walleye and the majority of the lakes that contain walleye can support only low rates of harvest.

2. Habitat Change

Habitat change, particularly the removal of shoreline weed beds, has contributed to the decline of walleye populations in many parts of North America. The loss of this important habitat alters the community of small fishes, which supports the walleye food chain, and reduces the areas of shelter for juveniles and adults. Land clearing along streams and in upland areas around lakes reduces water flows and lake levels, which in turn can result in the loss of available spawning and rearing areas. Sediments and nutrients entering water systems affect water quality and reduce the suitability of smaller lakes for walleye. In some cases, beaver activities and roadway culverts in streams have reduced walleye movements to spawning areas.

3. Biological Constraints

The climate for these northern populations of walleye has a significant effect on annual production and growth. Slow growth, late age at maturity, size and maturity differences between the sexes, and weak and variable year-classes make the species susceptible to population declines. Only small numbers of adults are found in vulnerable and collapsed populations, and consequently very few young are produced.

4. Overharvest

Most anglers wish to keep their catch because of the excellent eating qualities of walleye. Current levels of harvest in many populations exceed the levels of walleye that can be produced.

Because of their late age of maturity, most of the walleye caught by angling have not had a chance to spawn. Walleye can be very predictable in their habits. Using personal knowledge of where-when-and-how to fish, experienced anglers seldom find it a problem to catch walleye even at lakes with low population densities. Technology of modern gear and information materials are giving more anglers a similar change to catch walleye--on a more level playing field--which is resulting in greater harvest. Anglers are very mobile and frequently shift their fishing effort to water bodies supporting better catch rates, until catch rates decline. At present, the sport fishery takes more than 80% of the yearly walleye harvest in Alberta.

Poor compliance with sportfishing regulations represents an illegal harvest of walleye. Frequently, anglers fail to respect regulations, possibly believing that the keeping one fish over the limit, or the ignoring of a size limit, can cause little harm. However, the collective effect of anglers independently ignoring regulations results in the illegal harvest of many fish. Poor compliance is an important factor contributing to the failure of regulations to protect fish populations.

Gill netting in lakes can select for the mature, and mainly female, segment of the population. In the past, commercial harvest was excessive at some lakes. The current practice is to keep the walleye harvests at commercially fished lakes within low tolerance limits. The time of year that fishing is allowed and closed zones, where netting is not permitted, are established to minimize the harvest of walleye. The commercial fishery currently takes about 15% of the yearly walleye harvest.

The continued decline of walleye populations can not be attributed to commercial fishing--sportfishing has caused declines at lakes where commercial fishing has not occurred. Domestic fishing results in a relatively small harvest of walleye (less than 5%) because of the low numbers of individuals involved in this form of fishing.

Illegal netting of fish (poaching) can impact some walleye populations, which is why undercover enforcement operations are used to crack down on the illegal catching, selling and buying of walleye. Unfortunately, a large market place is available for the sale of illegal fish, which requires a continued effort to overcome.

2.0 MANAGEMENT PLAN

2.1 Present Management Policies

The *Fish and Wildlife Policy for Alberta* (Fish and Wildlife Division 1982) states: "It is incumbent upon the Government, as the resource steward, to ensure that appropriate use is made of the fisheries resource and that it is passed on to succeeding generations as it was received. The primary consideration of the Government is to ensure that fisheries populations are protected from severe decline and that viable populations are maintained." Inherent in the stewardship of the resource is the responsibility to conserve fish populations and maintain natural biodiversity in aquatic systems.

Fish are a public resource and must be managed to meet the requirements of present users without compromising the ability of future generations to meet their own needs. Wise use is an important component of fish conservation.

Sportfishing in Alberta operates under an open access policy and no limitation is placed on the number of licences issued. At present, youths under the age of 16 and Alberta residents aged 65 and older are not required to hold a licence.

The *Alberta Fishery Regulations* and the *Fisheries Act* of Canada operate as a set of rules restricting or prohibiting various fishing activities (restrictive code). Except as restricted by fishing regulations, fishermen may do the following: harvest any number of fish, and any species of fish; fish any waters; fish at all times of the year; and fish by any method. Under a restrictive code, everything is legal until restricted or prohibited by regulations.

Resource conservation under an open access policy and restrictive code is difficult and slow to be achieved. Resource overuse must be demonstrated before support and public acceptance are gained for the establishment of new regulations. The time required to demonstrate overuse, gain public support and implement new regulations can result in further damage to fish populations. It is now clear that many walleye populations throughout Alberta are at serious risk of being lost.

Future policies, strategies and actions for managing walleye in Alberta must follow the management principles outlined in *A Fish Conservation Strategy for Alberta* (Fish and Wildlife Division 1990) as follows:

1. The depletion or extirpation of self-sustaining walleye populations will not be permitted.

- controls to reduce walleye harvest and habitat losses must be implemented.
- 2. Walleye populations will be maintained by natural reproduction wherever possible.
 - sufficient mature fish and suitable spawning habitat must be maintained.
- 3. Walleye management will be based on fundamental ecological principles and factual information.
 - accurate and timely information on walleye populations must be gathered, using sampling techniques that result in the least damage possible to the fish being studied.
- 4. Public participation will be included in the management process.
 - public support must be maintained through review of management planning processes and volunteerism in project studies.
- 5. The "user pays" philosophy should be made applicable to the financing of the management and enhancement of resources.
 - A portion of the general *Sportfishing Licence* fee is directed into the *Fish and Wildlife Trust Fund, Buck for Wildlife Program*, and distributed equally to *Fisheries Habitat Development* and *Fisheries Management Enhancement*.

2.2 Management Policy Requirements

Walleye populations must be protected from severe decline and managed to achieve population recovery, wherever possible. As a consequence, managing for conservation first is necessary. In this context, conservation focuses on the net gain in the production of walleye. Conservation also involves the wise use of the resource for the provision of benefits to Albertans.

Current management practices fall short of conservation needs by allowing sportfishing activities that overharvest walleye. Fisheries management must be adjusted to a policy that reduces the harvest of walleye to sustain populations and to recover populations. The burden of proof must be shifted to determine that a harvestable surplus exists beyond the number of fish needed to sustain a population before harvest is permitted.

Policies in the areas of conservation, fish use and habitat maintenance are required to support the following goal:

"To recover and sustain walleye populations and to provide domestic, recreational, commercial and economic benefits to Albertans."

Two important components of the above goal are as follows:

- Regulate walleye harvest in line with, and not exceeding,

- the production capability of walleye populations; and
- Recover walleye populations to their maximum production, within natural biological and habitat limitations.

2.2.1 Conservation Policy

The exact number of distinct walleye populations in Alberta is unknown; however, walleye occupying different watersheds represent different populations. In most cases, walleye occupying different lakes in the same watershed are isolated and constitute separate populations. Each population, within its natural production limitations, should be protected from further decline and managed for recovery.

The conservation policy will be to restore, expand and sustain walleye populations to achieve a net gain in production and to provide for domestic, recreational and commercial uses, by meeting the following objectives:

- a) Maintain a wide distribution of walleye populations;
- b) Increase the numbers of fish within populations through natural reproduction;
- c) Increase the size and age of fish in walleye populations through appropriate regulation of harvest;
- d) Re-establish populations in lakes that historically had walleye, provided these lakes have, or can be restored to have, suitable habitat; and
- e) Establish new populations in lakes and reservoirs that have, or can be enhanced to have, suitable habitat.

2.2.2 Fish-Use Policy

The overall fish-use policy is to recover collapsed and vulnerable walleye populations to stable status wherever possible, and sustain stable and trophy status populations. The fish-use policy emphasizes conservation, but provides for domestic, recreational and commercial benefits, now and in the future. Opportunities to harvest some walleye will be permitted so long as the primary emphasis upon conservation is not compromised. The importance of access to the use of other fish species occupying water bodies with walleye should not be overlooked and should be maintained as much as possible.

2.2.2.1 Domestic Use

Arrangements for subsistence fishing by Indian people were included in treaties and affirmed in the *Constitution Act* (1982). More recently, the *Sparrow Decision* (1990, Supreme Court of Canada), has affirmed the limits that can be applied to subsistence fishing rights. The *Fish and Wildlife Policy for Alberta* (Fish and Wildlife Division 1982) supports and endorses subsistence fishing by Alberta's aboriginal people.

Subsistence fishing will be managed in consultation with Native communities to promote the following objectives:

- a) Minimize the harvest of walleye, yet enable sufficient harvest levels of lake whitefish to fulfil traditional subsistence needs; and
- b) Minimize the use of lakes having significant walleye conservation concerns, whenever possible.

2.2.2.2 Recreational Use

Sportfishing in Alberta continues to increase as a significant form of outdoor recreation and the major use of the fish resources of the province. Sportfishing for walleye will be managed in consultation with sportfishing organizations and the general public to promote the following objectives:

- a) Establish a philosophy of nonconsumptive angling through catch-and-release regulations (zero limit), where necessary;
- b) Set strict catch limits and size limits where some harvest can be permitted to maintain traditional food-fish use or to provide trophy-class fisheries;
- c) Aim for low mortality on released walleye;
- d) Protect spawning fish; and
- e) Maintain fishing opportunities for other important fish species, wherever possible.

2.2.2.3 Commercial Use

In accordance with the *Fish and Wildlife Policy for Alberta*, a viable commercial fishing industry will be encouraged. Target species are generally lake whitefish and tullibee (cisco), and reasonable access to these species will be maintained.

Commercial use of the fish resources will be managed in consultation with commercial fishermen and recreational users to promote the following objectives:

- a) Recognize commercial fishing as a viable industry and a valid user of the fish resource to meet the food-fish needs of the public;
- b) Minimize the harvest of walleye, yet achieve allocated harvest levels for lake whitefish and tullibee; and
- c) Minimize the commercial use of lakes having significant walleye conservation concerns, high angling pressure, and low commercial catches of lake whitefish with marginal economic returns.

2.2.2.4 Tournaments and Derbies

Tournaments and derbies are activities that combine sportfishing with commercial ventures and use the fish resource for both recreation and economic gain--for the sponsors, promoters, local community and, in some form, for the participants. Walleye tournaments tend to attract more anglers, than might otherwise visit, to the water bodies where they are held. These anglers can take most of the annual production of

walleye in just a few days. High hooking mortalities can occur on released walleye as the result of stress and damage. Mortality increases when water temperatures are high, or lake surfaces are rough from windy conditions, or when walleye are caught from deep water (>8 m).

At present, no controls are in place to restrict tournaments any more than sportfishing regulations do. Some tournament organizers have developed self-regulation rules as registration requirements, and release all walleye after being weighed.

The management and recovery of walleye populations will require future policy to manage tournaments and promote the following:

- a) Minimize the effect of tournaments and derbies on traditional recreational use; and
- b) Minimize the effect of tournaments and derbies on fish conservation and the recovery of walleye populations.

2.2.3 Habitat Maintenance Policy

Fish production is a function of habitat and therefore dependent on the provision and maintenance of sufficient habitat. The habitat maintenance policy is essential to conserve fish and to provide recreational and economic benefits. This policy exists to maintain, improve and develop habitat necessary for all life stages to achieve a net gain in walleye production, through the following activities:

- a) Maintain and enhance the productive capacity of habitats;
- b) Restore the productive capacity of damaged habitats, wherever possible and appropriate; and
- c) Maintain unobstructed routes for migration between spawning, rearing and overwintering areas.

2.3 Walleye Management Strategies

Fisheries management strategies must achieve and maintain policies to reach the management goal for walleye recovery. Each strategy requires management actions to implement the strategy and achieve success.

2.3.1 Allocation Strategy

The *Fish and Wildlife Policy for Alberta* stipulates that allocation priorities will be in the following descending order:

- Conservation of fish stocks,
- Subsistence fishing for Indian people,
- Resident recreational use, and
- Commercial fishing and tourist angling.

Water body management plans, as outlined in the *Water Body Management Strategy System* (Berry 1994), must be developed for commercially fished lakes to address allocation issues. The allocation strategy involves water body management planning, through a process of consultation with user groups, to allocate the harvestable walleye production to various users according to policy priorities and the needs of user groups. The average estimated walleye production based on 0.86 kg/ha (0.75 lb./ac.) or the current five-year average production, whichever value is lower, should be used as the harvestable supply for each water body, until more accurate data are available.

2.3.1.1 Domestic Allocation

Beyond conservation needs, priority for use of the fish resource goes to subsistence fishing for Indian people. Management options concerning domestic fishing will be developed, with Native consultation, to conserve walleye populations and to sustain subsistence fishing (the use of lake whitefish will be encouraged).

2.3.1.2 Recreational Allocation

At present, the supply of harvestable walleye at most lakes and streams is limited. Recreational benefits at these lakes and streams must be based on selective harvest and the release of walleye to promote population recovery.

2.3.1.3 Commercial Allocation

At commercially fished lakes, a minimal tolerance limit for walleye in the commercial harvest will be the objective. Restrictions, such as timing of seasons and fishing zones, will be maintained to ensure that walleye harvests are within tolerance limits.

2.3.1.4 Tournaments and Derbies

The development of a regulatory system to govern tournaments and derbies may be required to reduce impacts to walleye populations and traditional recreational use. It may become necessary to restrict tournament activities at lakes where tournament loss of walleye is excessive.

2.3.2 Fish Production Strategy

The fish production strategy addresses the factors influencing the maintenance of a stable fish population. Fish production is primarily controlled by the productive capacity of the habitat and the productive capacity of the species. However, the level of fish harvest is a major factor that affects population stability. A high harvest level reduces population density,

particularly by removing the older walleye, which subsequently reduces a population's spawning capability.

Each water body has a limit to the biomass or total weight of fish that it can support (production capability). This biomass can consist of many small fish, a few large fish, or a mixture of fish sizes. A broad range of fish sizes, consisting of many year-classes, is best and there must be a sufficient number of mature fish to support spawning and subsequent recruitment.

Maintenance of a stable fish population involves the management of the factors described by the following simple model:

$$PM = (R + G) - (NM + FM)$$

where: PM is population maintenance,
R is recruitment,
G is growth,
NM is natural mortality, and
FM is fishing mortality.

Fish losses (natural mortality plus fishing mortality) cannot exceed fish gains (recruitment plus growth), if the fish population is to remain stable or grow. A value of zero for population maintenance represents a stable population. If the population maintenance value is greater than zero, the fish population increases. However, when this value is less than zero, the fish population declines.

Fish recruitment relies on the process of fish spawning and is represented by the annual addition of young fish to the population, but can also include fish migrating into a water body. Wherever possible, recruitment of fish to walleye populations will be accomplished through natural reproduction.

Successful recruitment to walleye populations requires strict protection of walleye to maximize, and increase, the available numbers of spawners. Closure of spawning areas is needed to protect spawners and to reduce disturbance of spawning fish.

Walleye stocking has been, and will continue to be, considered in plans to re-establish walleye where populations have collapsed and to establish new populations in suitable lakes. The primary intent of walleye stocking is to achieve self-sustaining populations, rather than maintenance of populations through continuous stocking. Walleye introductions are guided by the documents *A Decision-Making Process for the Evaluation of Fish Introductions in Alberta* (Berry and Stenton 1993) and *Alberta's Walleye Stocking Program, 1982-1991 and Program Strategy for the 1990s* (Berry 1992).

Fish growth is the increase in size of the fish, which reflects the productivity of the habitat and the density of the population. Maintaining the food base and regulating harvest is essentially all that can be done to improve growth.

Walleye growth slows down when a fish reaches maturity, which occurs a few years earlier in males than in females. On average, females over the age of four are larger at each age than males. Because of this biological factor, female walleye reach the size where they are vulnerable to commercial and sportfishing harvest at a younger age than males and generally experience higher harvest rates. It is important that walleye management emphasize the needs of the female segment of the population to ensure adequate egg production and subsequent recruitment.

Natural mortality refers to losses of fish as the result of natural causes such as diseases, predation or environmental conditions, but can also include fish migrating out of a water body. It can be difficult to reduce the influence of these factors beyond addressing habitat maintenance concerns.

Fishing mortality is represented by the fish that are removed from a population by fishing--harvest plus the death of released fish. Hooking mortality can be excessive, particularly when walleye are caught from waters deeper than 8 m (25 ft.). Improved access to remote walleye populations can also increase fishing harvest and result in population declines. Fishing mortality (harvest) must be regulated to match and not exceed the productive capacity of the habitat.

The fish production strategy involves designating each walleye water body as one of four management categories (trophy/old growth, stable, vulnerable, or collapsed status as described in Section 1.4), and taking action to recover and maintain these populations. In addition to habitat maintenance, the management and recovery of walleye populations requires appropriate objectives, where necessary, such as the following:

- Reduce the loss of immature walleye, permitting walleye to live longer and grow to a mature, spawning size;
- Reduce the loss of mature walleye to maximize, and increase, the available number of spawners and hence to ensure an increased production of young fish;
- Reduce disturbance and harvest of spawning walleye to ensure adequate recruitment;
- Maintain abundant numbers of prey species to ensure good walleye growth and survival;
- Allow the harvest of other species, whenever possible; and
- Establish or re-establish walleye populations where natural recruitment is not currently sustaining self-reproduction.

The following specific harvest strategies directed to the control of the sportfishery are required to address the significance of this fishery as the major resource user:

- Promote population recovery (or establishment) at water bodies containing a collapsed (or stocked) walleye population, using regulatory actions for "no harvest."
- Promote population recovery at water bodies containing a vulnerable walleye population, using regulatory actions for "minor harvest," provided the primary emphasis upon conservation is not compromised.
- Sustain healthy populations at water bodies with a stable population, using regulatory actions for "moderate harvest," provided the harvest does not push the population into a vulnerable status.
- Sustain a trophy status at water bodies with an old growth population, using regulatory actions for "minor harvest," in a manner that the harvest does not result in a collapse of the trophy status.
- Adjust harvest strategy and regulations at water bodies in response to a change in, or threat to walleye status (more restrictive if a population declines and less restrictive when a population shows sufficient recovery); and in response to significant increases in fishing pressure or decreases in compliance (more restrictive regulation).

2.3.3 Public Information and Education Strategy

Greater public awareness is essential to increase support for the management and recovery of walleye. Any attempt to regulate the harvest of walleye will be ineffective without the successful education of the public and the general acceptance, by resource users, of the regulation options. The primary objective is to achieve good compliance with regulations.

The public information and education strategy involves the use of a range of communications tools to convey information on walleye population status, walleye biology, and this management and recovery plan. Nongovernment organizations must also be included as participants in public information and education programs dealing with walleye management.

2.3.4 Habitat Maintenance Strategy

The habitat maintenance strategy emphasizes the need to minimize, to nearly zero, potential impacts on walleye populations, including undesirable public access to remote areas. Critical habitat for all life stages of walleye, but most particularly for spawning and rearing, must be identified and protected. Physical damage to spawning sites and shoreline vegetation must be minimized. Changes to watersheds that affect

lake levels, water flows, stream sedimentation, nutrient loading and contaminant levels in fish must be minimized. These disturbances can result from seismic activities, pipelines, road surfaces, ditches, side slopes, agricultural areas and industrial developments.

Habitat maintenance is essential for walleye conservation and the provision of recreational and economic benefits. The habitat maintenance strategy involves doing the following:

- Require the proponents of instream work and shoreline development to help determine the level and type of walleye use, and to assist in the planning of appropriate habitat protection measures, timing schedules and habitat mitigation requirements;
- Identify important migration routes and maintain these routes free of blockages to avoid population fragmentation that can lead to population extinction;
- Identify and maintain adequate habitat protection guidelines to minimize, to nearly zero, any impacts from physical disturbances of shoreline vegetation or within watersheds that may result in heavy sediment loading, flood events, increased water temperatures, reduced stream flows or reduced lake levels;
- Restrict or limit instream and lakeshore work in critical habitat areas to appropriate activities that can be fully mitigated;
- Implement habitat enhancement projects to improve spawning and rearing areas, to remove or reduce the impacts of stream blockages, to improve stream bank cover and stability of lake inlet streams, and to maintain adequate and stable lake levels; and
- Develop guidelines to control the construction or maintenance of undesirable public access to remote walleye populations.

2.3.5 Enforcement Strategy

It is difficult to achieve angler compliance with fishing regulations through enforcement, without first achieving public acceptance of the management plan through public education. A well-informed public will assist enforcement efforts. The enforcement strategy involves the following actions:

- Incorporate a public information and education program, emphasizing the management needs of walleye, into the annual workplan for enforcement priorities in each Fish and Wildlife District;
- Strictly enforce sportfishing regulations to protect walleye populations and encourage compliance;
- Strictly enforce regulations that protect critical habitat;
- Continue covert operations to discourage and apprehend individuals and businesses involved in the illegal catching,

- selling and buying of walleye; and
- Encourage the levying of higher fines for offenses.

2.4 Management Actions

Existing management actions, i.e., walleye stocking, catch limit of three, minimum-size limit of 38 cm total length, spring closure of some spawning locations, enforcement and public information programs; are no longer consistent with the strategies and goal of this management and recovery plan. Although some populations have shown improvement over the last five years, full recovery of collapsed and vulnerable populations is not possible without adjustments to the existing sportfishing regulations. Furthermore, stable and trophy populations are not being adequately maintained and are showing signs of decline.

2.4.1 Management Action Requirements: Musts

To carry out the management and recovery plan, the following management actions must be undertaken:

1. Develop simple and effective regulations for sportfishing (regulatory actions) that are biologically sound and socially acceptable to anglers. This action was completed by the Walleye Task Force, by holding interest group workshops throughout the province concurrent with the preparation of this walleye management and recovery plan (see regulation amendments in Section 2.5 below).
2. Implement changes to sportfishing regulations (Section 2.5) on April 1, 1996 by completing the following:
 - Communicate this management and recovery plan, and proposed regulation changes, to the public at open houses, through news releases and general public information;
 - Obtain provincial and federal approval for required regulation changes to the Alberta Fishery Regulations under the Fisheries Act of Canada; and
 - Publish regulation changes in the 1996 Alberta Guide to Sportfishing.
3. Communicate, to the public, the management and biological requirements for walleye conservation, and promote involvement in the management and recovery of walleye. This action is to be delivered on a continuing basis.
4. Hold a workshop on tournaments with representatives of sportfishing organizations, event organizers, sponsors, and tournament participants to review concerns regarding tournaments and derbies; and develop options to regulate these events. A workshop was held in September, 1995 and initial recommendations were established.

5. Set priorities for public education, protection of critical walleye habitat, and regulation enforcement as part of district enforcement work plans; these priorities are to be established at the outset of the plans and on a continuing basis.
6. Hold meaningful consultations with First Nation representatives for their involvement in the development and implementation of necessary actions to conserve walleye populations and sustain subsistence fishing.
7. Promote economic returns from commercial fishing as a recognized industry, by maintaining lake whitefish as the target species, and enforce strict tolerance limits for walleye in the commercial harvest (refine depth or area closures, timing of seasons, and restrictions on the number, kind and size of gear).
8. Develop operational plans from this provincial management and recovery plan for each Fish Management Area as well as lake-specific management plans to address allocation concerns and the status of walleye populations.
9. Maintain the productive capacity of walleye habitat through habitat protection, enhancement or both, including protection of spawning and rearing areas.
10. Identify and correct or mitigate stream blockages between walleye spawning, rearing and overwintering sites.
11. Monitor walleye populations and domestic, recreational and commercial fisheries to determine the effects of each fishery on the recovery and maintenance of walleye populations.
12. Monitor walleye populations to evaluate the effects of this walleye management and recovery plan; including such things as regulation strategies, stocking programs, and habitat protection/enhancement activities.
13. Adjust water bodies to a different category of sportfishing regulation in response to:
 - Changes in population status (more restrictive if a population declines, and less restrictive when a population shows sufficient recovery);
 - Significant increase in fishing pressure (more restrictive regulation); or
 - Significant decrease in compliance (more restrictive regulation).

2.4.2 Management Action Requirements: Wants

To maintain the walleye management and recovery plan, the following management requirements are desired:

1. Conduct inventories of walleye populations.
2. Conduct specific studies of life history, including movements and critical habitat requirements.

3. Determine the carrying capacity of various habitats for walleye, the conservation needs to perpetuate walleye populations and the numbers that constitute a potential harvestable surplus.
4. Develop standards to determine when stocked populations have become self-sustaining and capable of supporting some harvest; and to determine the need to terminate specific sites from future stocking and to remove protective regulation because of stocking failures at such sites.
5. Conduct specific studies to investigate alternative regulation options.
6. Maintain abundant numbers of prey species such as baitfish to ensure walleye growth and survival.
7. Evaluate and update this management and recovery plan as a working document to reflect new information as it becomes available.

2.5 Sportfishing Regulation Amendments

All workshop recommendations were reviewed by the Walleye Task Force and compiled into one set of simple and effective regulations. Fisheries managers finalized the assignment of each walleye population (lake or stream) to an appropriate management strategy and subsequent sportfishing regulation. The following recommendations for sportfishing regulations were endorsed by the task force:

1. Moderate Harvest Regulations

Healthy, stable populations will be sustained by implementing a daily catch limit of three (3) walleye and a minimum-size limit of 43 cm (17 in.) in total length at water bodies with a stable status population (see Appendix 1).

2. Minor Harvest Regulations

(a) Trophy Status with low fishing pressure

Trophy status fisheries with low levels of fishing pressure will be sustained at water bodies containing an old growth population by implementing a daily catch limit of three (3) walleye and a minimum-size limit of 43 cm (17 in.) in total length (see Appendix 2, Part A).

(b) Trophy Status with moderate or high fishing pressure

Trophy status fisheries with moderate or high levels of fishing pressure will be sustained at water bodies containing an old growth population by implementing a daily catch limit of three (3) walleye and a minimum-size limit of 50 cm (20 in.) in total length (see Appendix 2, Part B).

Note: Minor harvest is the intended objective at water bodies with old growth populations that produce better-

than-average-size fish (trophy status); however, most of these water bodies currently receive light fishing pressure, and for now, a moderate harvest regulation will produce minor harvest. The larger minimum-size limit of 50 cm will be implemented at trophy status water bodies if and when fishing pressure increases. A reduction in the daily catch limit or increase in the size limit may also be required in the future to sustain a high-use, trophy status fishery and to allocate harvest among anglers.

(c) Vulnerable Status

Walleye populations vulnerable to collapse (vulnerable status) will have a daily catch limit of three (3) walleye and a minimum-size limit of 50 cm (20 in.) in total length to promote population recovery (see Appendix 3).

Note: Walleye populations in accessible, heavily used rivers will be managed for minor harvest because the habitat for these fish is limited and dispersed, which makes these populations susceptible to overharvest.

3. No Harvest Regulations

(a) Natural (unstocked) populations

Water bodies with collapsed, natural walleye populations will have zero (0) catch limits (catch-and-release-only fisheries for walleye) to promote the recovery of these populations (see Appendix 4, Part A).

(b) Stocked populations

Water bodies with collapsed, stocked walleye populations will have zero (0) catch limits (catch-and-release-only fisheries for walleye) to promote the establishment of new self-sustaining populations (see Appendix 4, Part B).

4. Spawning Closure Regulations

Workshop participants preferred to continue the current practice of setting specific spawning closures, rather than establishing complete closures for an area or the whole province. There is a strong need to protect walleye spawners, and pre- and post-spawning aggregations of fish. Effective regulations must be maintained and implemented that will:

- Maintain existing (1995) closures until information is available that indicates alternate regulation is appropriate.
- Close known spawning areas to all fishing.
- Provide protection for migrating walleye.
- Accommodate spring fishing opportunities where possible; e.g., zero catch limit during the spawning season in specific cases where appropriate.
- Provide access to the harvest of other fish species where possible.

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Appendix 1. Alberta lakes and streams with walleye populations classified in stable status and managed for moderate harvest (catch limit is 3; minimum-size limit is 43 cm [17 in.] in total length).

<u>Name</u>	<u>FMA</u>	<u>Name</u>	<u>FMA</u>
<u>Lakes</u>			
Bistcho Lake (124-05-W6)	6	Smoke Lake (62-20-W5)	4
Burnt Lake (67-03-W4)	7	South Wabasca Lake (80-24-W4)	6
Fawcett Lake (73-26-W4)	6	Spencer Lake*** (67-09-W4)	7
Gift Lake (79-12-W5)	6	Sturgeon Lake (70-23-W5)	6
Graham Lake* (87-04-W5)	6	Utikuma Lake (79-10-W5)	6
Gregoire Lake (86-08-W4)	8	Utikumasis Lake (80-11-W5)	6
Heart Lake (70-10-W4)	7	Whitefish Lake (62-13-W4)	7
Iosegun Lake (63-19-W5)	4	Winefred Lake (75-04-W4)	7
Lake Athabasca (117-01-W4)	8		
Lesser Slave Lake (74-11-W5)	6	<u>Streams</u>	
Muskwa Lake (82-04-W5)	6	• FMA 6: All streams <u>excluding</u> the Lesser Slave River downstream of the mouth of the Driftwood River (21-72-02-W5), the Athabasca River, and the Little Smoky River (15-77-24-W5) and its tributaries	
North Wabasca Lake (81-24-W4)	6		
Pinehurst Lake (65-10-W4)	7		
Primrose Lake** (67-01-W4)	7	• FMA 8: All streams <u>excluding</u> the tributaries to Gardiner Lake, the Clearwater River upstream of the mouth of the Christina River (33- 88-07-W4) and tributaries, the Christina River and tributaries	
Rainbow Lake (107-08-W6)	6		
Richardson Lake (108-07-W4)	8		
Seibert Lake*** (66-09-W4)	7		
Shiningbank Lake (56-14-W5)	4		

FMA-Fish Management Area

- * Special regulation: 0 from Mar. 1 to May 31, and 3 larger than 43 cm in total length from June 1 to Feb. 28/29.
- ** Special regulation: Catch limit is two (2).
- *** Special regulation: Continuation of the existing experimental slot-size limit protecting walleye between 42 cm and 53 cm in total length.

Appendix 2. Alberta lakes and streams with old-growth walleye populations classified in trophy status (better-than-average-size fish) and managed for minor harvest.

PART A. Lakes and streams receiving light to moderate sportfishing pressure: catch limit is 3*; minimum-size limit is 43 cm (17 in.) in total length.

<u>Name</u>	<u>FMA</u>	<u>Name</u>	<u>FMA</u>
Barrow Lake (118-08-W4)	8	Pearson Lake (103-08-W4)	8
Bocquene Lake (121-07-W4)	8	Ryan Lake (117-07-W4)	8
Caribou Lake (116-13-W5)	6	Thurston Lake (126-01-W6)	6
Fletcher Lake (116-05-W4)	8	Unnamed (Island) Lake (99-16-W4)	8
Leland Lakes (126-06-W4)	8	Unnamed (Sand) Lake (100-15-W4)	8
Loutit Lake (115-06-W4)	8	Unnamed Lake (116-07-W4)	8
McLelland Lake (123-08-W4)	8	Unnamed Lake (118-04-W4)	8
Myers Lake (123-08-W4)	8	Wentzel Lake (115-03-W5)	6

FMA-Fish Management Area

* -a reduction in the daily catch limit or increase in the size limit may be required in the near future to sustain trophy status fisheries and provide an equitable harvest allocation.

PART B. Water bodies receiving heavy sportfishing pressure: catch limit is 3*; minimum-size limit is 50 cm (20 in.) in total length.

<u>Name</u>	<u>FMA</u>	<u>Name</u>	<u>FMA</u>
<u>Lakes</u>		<u>Streams</u>	
Bourque Lake (66-04-W4)	7	Little Smoky River and tributaries	6
Gardiner Lake (98-16-W4)	8	McLeod River and tributaries	4
Vandersteene Lake** (88-03-W5)	6		

FMA-Fish Management Area

* A reduction in the daily catch limit or increase in size limit may be required in the near future to sustain trophy status fisheries and provide an equitable harvest allocation.

** Special regulation: 0 limit from March 1 to May 31; and 1 larger than 50 cm from June 1 to Feb. 28/29.

Appendix 3. Alberta lakes and streams with walleye populations classified in vulnerable status and managed for minor harvest (catch limit is 3; minimum-size limit is 50 cm [20 in.] in total length).

<u>Name</u>	<u>FMA</u>	<u>Name</u>	<u>FMA</u>
<u>Lakes</u>			
Baptise Lake (66-24-W4)	7	Ironwood Lake (65-11-W4)	7
Beaver Lake (66-13-W4)	7	Jackfish Lake (90-02-W5)	6
Blackett Lake (66-11-W4)	7	Jackson Lake (67-11-W4)	7
Buck Lake (46-06-W5)	5	Kehiwin Lake (59-07-W4)	7
Calling Lake (72-22-W4)	7	Kinnaird Lake (67-10-W4)	7
Chip Lake (54-10-W5)	4	Lac La Nonne (57-02-W5)	7
Christina Lake (76-07-W4)	7	Lac Ste. Anne (54-03-W5)	7
Cold Lake (64-01-W4)	7	Little Sandy Lake (79-22-W4)	6
Eagle Lake (23-24-W4)	5	Long Lake (63-19-W4)	7
Elinor Lake (65-11-W4)	7	Long Lake (89-04-W5)	6
Equisetum Lake (89-05-W5)	6	Marie Lake (65-02-W4)	7
Frenchman Lake (64-10-W4)	7	Matchawan (Devil's) Lake (54-01-W5)	7
Frog Lake (57-03-W4)	7	May Lake (66-03-W4)	7
Gods Lake (90-02-W5)	6	McGuffin Lake (67-11-W4)	7
Goodfish Lake (61-13-W4)	7	Mildred Lake (93-10-W4)	8
Goodfish Lake (89-05-W5)	6	Moose Lake (61-07-W4)	7
Hebephrenic Lake (90-02-W5)	6	Murray Lake (10-07-W4)	1
Helena Lake (66-11-W4)	7	Orloff Lake (73-23-W4)	7
Hilda Lake (64-03-W4)	7	Piche Lake (70-11-W4)	7
Horsefly Lake Reservoir (09-16-W4)	1	Rock Island Lake (75-22-W4)	7
		Round Lake (89-04-W5)	6

Continued...

Appendix 3. Concluded:

<u>Name</u>	<u>FMA</u>	<u>Name</u>	<u>FMA</u>
Saddle Lake (58-11-W4)	7	Unnamed Lake (105-05-W4)	8
Sauder (Rattlesnake) Reservoir (11-08-W4)	1	Unnamed Lake (106-03-W4)	8
Sherburne Lake (09-14-W4)	1	Unnamed Lake (107-03-W4)	8
Stafford Reservoir (08-18-W4)	1	Unnamed Lake (107-03-W4)	8
St. Mary's Reservoir (04-24-W4)	1	Unnamed Lake (107-03-W4)	8
Taber Reservoir (10-16-W4)	1	Unnamed Lake (107-04-W4)	8
Touchwood Lake* (67-10-W4)	7	Unnamed Lake (107-04-W4)	8
Travers Reservoir (14-21-W4)	1	Upper Chin Reservoir (07-17-W4)	1
Twelve Mile Coulee Reservoir (14-12-W4)	1	<u>Streams</u>	
Unnamed Lake (10-12-W4)	1	• FMAs 1 to 5: All streams <u>excluding</u> the Red Deer River upstream of the Tolman Bridge; and the Raven, Little Red Deer, Medicine and Blindman rivers.	
Unnamed Lake (93-10-W4)	8	• FMA 6: Lesser Slave River downstream of the mouth of the Driftwood River (21-72- 02-W5), and the Athabasca River.	
Unnamed (Keith) Lake (103-06-W4)	8	• FMA 7: All streams <u>excluding</u> the Owl River downstream of the Peche River (36-69-13-W4) and La Biche River upstream of Road 858	
Unnamed Lake (103-07-W4)	8	• FMA 8: the tributaries to Gardiner Lake; the Clearwater River upstream of the Christina River (33-88-07- W4), and tributaries; and the Christina River, and tributaries.	
Unnamed Lake (105-05-W4)	8		
Unnamed Lake (105-05-W4)	8		
Unnamed Lake (105-05-W4)	8		
Unnamed Lake (105-05-W4)	8		
Unnamed Lake (105-05-W4)	8		
Unnamed Lake (105-05-W4)	8		

FMA-Fish Management Area

* Special regulation: Continuation of the existing experimental slot-size limit protecting walleye between 42 cm and 53 cm in total length.

Appendix 4. Alberta lakes and streams with walleye populations classified in collapsed status and managed for no harvest.

Part A. Natural (unstocked) walleye populations (catch limit is zero (0); catch-and-release-only fishing for walleye.

<u>Name</u>	<u>FMA</u>	<u>Name</u>	<u>FMA</u>
Lakes			
Amisk Lake (64-18-W4)	7	Jackfish Lake (52-02-W5)	7
Bangs Lake (59-07-W4)	7	Jenkins Lake (68-24-W4)	7
Barnes (Clear) Lake (44-05-W4)	7	Laurier Lake (56-04-W4)	7
Chickenhill Lake (59-08-W4)	7	Moore Lake (64-04-W4)	7
Chump Lake (65-18-W4)	7	Sandy Lake (79-22-W4)	6
Claude Lake (67-13-W4)	7	Wizard Lake (48-27-W4)	7
Ernestina Lake (61-03-W4)	7	Wolf Lake (66-07-W4)	7
Ethel Lake (64-03-W4)	7		
Floatingstone Lake (60-11-W4)	7	Streams	
Hope Lake (65-18-W4)	7	• Red Deer River* between Dickson Dam and Tolman Bridge (Secondary Road 585)	5
Island Lake (67-24-W4)	7	• Little Red Deer River	5
Isle Lake (54-05-W4)	7	• Medicine River	5
		• Blindman River	5

FMA-Fish Management Area

* This portion of the Red Deer River has the potential to support a trophy status population, as it did historically, when recovered from its current collapsed status.

Part B. Stocked walleye populations (catch limit is zero).

<u>Name</u>	<u>FMA</u>	<u>Name</u>	<u>FMA</u>
Battle Lake (46-02-W5)	5	Lac Sante (56-11-W4)	7
Bear Lake (55-15-W5)	4	Little Bow Reservoir (14-20-W4)	1
Burnstick Lake (35-07-W5)	3	McGregor Lake Reservoir (18-22-W4)	1
Crawling Valley Reservoir (22-17-W4)	1	Milk River Ridge Reservoir (05-20-W4)	1
Cutbank Lake (72-08-W6)	6	Minnow Lake (50-14-W5)	4
Fickle Lake (51-19-W5)	4	Muriel Lake (59-05-W4)	7
Fincastle Lake (10-15-W4)	1	Newell Lake (17-15-W4)	1
Forestburg Reservoir (40-15-W4)	5	North Buck Lake (65-18-W4)	7
Forty Mile Coulee Reservoir (08-11-W4)	1	Paddle River Reservoir (56-08-W5)	7
Garner Lake (60-12-W4)	7	Pigeon Lake (47-27-W4)	5
Gleniffer Reservoir (32-05-W5)	5	Pine Lake (36-25-W4)	5
Goose Lake (61-08-W5)	4	Rolling Hills Reservoir (16-14-W4)	1
Gregg Lake (52-26-W5)	4	Skeleton Lake (65-18-W4)	7
Gull Lake (41-28-W4)	5	Snipe Lake (71-19-W5)	6
Haig Lake (91-14-W5)	6	Sylvan Lake (38-01-W5)	5
Hutch Lake (112-20-W5)	6	Upper Mann Lake (59-11-W4)	7
Jackfish Lake (41-11-W5)	3	Vincent Lake (59-09-W5)	7
Jarvis Lake (52-26-W5)	4	Wabamun Lake (53-05-W5)	7
Jensen Reservoir (04-22-W4)	1	Wadlin Lake (101-10-W5)	6
Keho Lake (11-23-W4)	1	Winagami Lake (78-18-W5)	6
Lac Bellevue (56-09-W4)	7	Wolf Lake (49-15-W5)	4
Lac La Biche (68-15-W4)	7		

FMA-Fish Management Area

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