

LAKE STOCKING POLICY FOR SPORT FISH DIVISION

**Original Policy Established in February of 1998
Revised 04/07/2008**

Current Policy Revised and Approved 02/25/2013

INTRODUCTION

The stocking of Alaska's lakes with hatchery-reared fish was initiated in the 1950's and has remained an integral component of the Alaska Department of Fish and Game (ADF&G) Sport Fish Division's management program. Early fish stocking included the introduction of species and stocks from the Pacific Northwest, as well as transporting Alaska stocks into non-native areas with the intent to establish reproductive populations. These types of stockings were acceptable management practices at the time, but they are generally not allowed today. Over 300 lakes in Southeast, Southcentral and Interior Alaska have been stocked with hatchery-produced fish.

Fish stocking is stringently regulated in Alaska. Title 16 of the Alaska Statutes and Title 5 of the Alaska Administrative Code specifically address the transportation and possession of live fish. Although the statutes and administrative code provide overall directives, they do not provide specific recommendations on what physical and biological characteristics define acceptable stocking locations, appropriate measures to sterilize fish, or specific recommendations for the use of species, life stages or genetic type. Fishery managers need guidelines on these variables to consider when evaluating stocking projects. This policy is intended to guide the development of Sport Fish Division lake stocking projects that benefit recreational anglers. Regular review of this policy will be necessary to keep it germane to management philosophy and hatchery technology changes.

PLANNING

Sites for stocking fish are proposed, reviewed, and approved through a formal process. Sport Fish Division Area Management Biologists or regional stocking program personnel initiate all stocking requests for their area of responsibility. Public inquiries relative to lake stocking should be directed to these people. They will investigate the ability of the lake to sustain fish, public access opportunities, and lake characteristics. A recommendation to stock or not to stock a lake will be made based on the investigation results and appropriate lake stocking guidelines.

Sport Fish Division lake stocking is primarily funded with Federal Aid in Sport Fish Restoration funds and license sales revenues. Therefore, each lake stocking project must comply with rules outlined in the "Federal Aid Manual" and other criteria specified by the Division of Federal Aid, U.S. Fish and Wildlife Service (USFWS).

The primary planning document for lake stocking is the *Statewide Stocking Plan for Recreational Fisheries* (SSP). This document describes a five-year plan for stocking projects

for recreational anglers and is updated annually. The SSP receives state, federal, and public review. Any proposed lake stocking should appear in the SSP one year or more prior to the initial stocking.

PERMITTING

Once the planning phase of a stocking project is complete, a Fish Transport Permit (FTP) must be obtained. The FTP is required as part of authorization for possession, transport, and release of live fish within the state (5 AAC 41.005). An FTP can be obtained by filling out a detailed application that contains information pertinent to the project. Each application is reviewed by relevant ADF&G personnel and submitted to the Commissioner of ADF&G with a recommendation for approval or denial.

Numerous lakes stocked by Sport Fish Division may be grouped together on a single FTP. The primary groupings are organized by species and ploidy. Multiple life stages can be included on a single FTP. Secondary groupings can be organized by lake category and geographic area.

Lake stocking FTPs will be issued for a fixed period. Sport Fish Division has selected a maximum period of 10 years. FTPs for each species are scheduled to expire simultaneously. Expiration of an FTP for a species will trigger an internal review of the stocking program for that species. The expiration dates by species are as follows:

Species	Expiration Date
Rainbow trout – Fort Richardson Hatchery brood	12/31/15
Coho Salmon	12/31/17
Arctic char – Fort Richardson Hatchery brood	12/31/18
Chinook salmon	12/31/19
Lake trout	12/31/20
Arctic grayling	12/31/21
Rainbow trout – W. Hernandez Hatchery brood	12/31/23
Arctic char – W. Hernandez Hatchery brood	12/31/24

Following review, FTPs may be issued or amended to extend the effective date for another 10-year period.

LAKE CATEGORIES

Prior to stocking, a lake must be classified into one of five categories that rank lakes according to the likelihood that fish stocked in the lakes will escape into other water bodies within the drainage. **Category 1** lakes are single or multiple connected lakes that are landlocked from which fish cannot escape. These lakes have no outlet stream with direct or indirect access to an open system that eventually leads to saltwater. **Category 2** lakes have intermittent outlets. A small stream may flow out of the lake during high water periods. The incidence of high water periods

is usually less than 2 weeks per year. Fish may periodically escape and interact with wild fish populations. **Category 3** lakes have barriered or weired outlets. A barriered outlet has a natural structure that prevents fish passage into or out of the lake. A weired outlet has a man-made structure that prevents fish passage, has passed requirements for blockage to fish passage, and is annually inspected and certified for blockage. Birch Lake in interior Alaska and Cheney Lake in Southcentral Alaska are examples of weired Category 3 lakes that meet blockage requirements. Fish may periodically escape from barriered Category 3 lakes and impact wild fish populations. The incidence of fish escaping from weired Category 3 lakes is low, and these fish are not likely to impact wild fish populations. **Category 4** lakes are prone to flooding. These are lakes or ponds usually located in the floodplain of a stream and subject to flooding during high water flows. Fish can leave the system during flood events. Some lakes in this category may flood every year while others rarely flood. **Category 5** lakes have open outlets. Fish can pass freely in and out of the system. The potential impact to wild fish populations is high. The magnitude of impact depends on the species and life stage stocked and the wild stocks present.

STOCKING PRODUCTS

Five species are currently reared for stocking projects (Table 1). Hatcheries produce fish that are reproductively viable (diploid, mix-sex) or reproductively impaired. Triploidy and all-female induction produce fish that are unlikely to result in self-reproducing populations or hybridize with local stocks. Triploids have been produced for all species, except lake trout. Triploid induction success rate varies by species with high induction rates for Arctic grayling, landlocked salmon, and Arctic char, and lower rates for rainbow trout. To further insure the non-reproductive status of triploid rainbow trout, all-female lots are produced. Triploids are sterile, while all-females are incapable of establishing self-reproducing populations in the absence of wild fish.

The Department's threshold for mixed-sex triploids requires a 95% confidence level that the triploid rate is 99% or higher. The certification rate for all-female triploid rainbow trout requires a 95% confidence level that the triploid rate is 90% or higher. Fish certified at a lower rate can be stocked but only into lakes approved for stocking of diploid fish.

In order to reduce the potential for negative impacts on wild fish populations, Sport Fish Division endorses the use of sterile stocking products whenever practical.

Rainbow trout

Rainbow trout are the primary hatchery product used in lake stocking. All rainbow trout production comes from captive broodstock maintained at Fort Richardson Hatchery (through 2013) and William Jack Hernandez Sport Fish Hatchery (starting in 2014). The broodstock is descended from wild Swanson River rainbow trout collected in the 1980s.

Numerous sizes of rainbow trout are stocked. Excess broodstock are periodically used for stocking. Rainbow trout broodstock are 1 to 3 years old and usually weigh 0.2 to 2.0 kg (1/2 to 4.4 pounds). Catchable rainbow trout are 1 year old and weigh an average of 120 g (~1/4 pound). Sub-catchable rainbow trout are 6 months to 1 year old and weigh between 15 and 60 g.

Fingerling rainbow trout are usually 2 to 4 months old and weigh between 1 and 4 g. Rainbow trout fry are less than 2 months old and usually weigh less than 1 g.

Arctic Grayling

Arctic grayling are stocked in many Southcentral and Interior Alaska lakes. A few lakes in Southeast Alaska have been stocked intermittently. All hatchery-produced Arctic grayling are reared from eggs obtained from Chena River wild stock. No captive broodstock is maintained in the hatchery. Catchable Arctic grayling are 1 year old and weigh an average of 100 g. Fingerling Arctic grayling are usually 2 to 4 months old and weigh between 1 and 4 g.

Arctic Char

Arctic char are stocked in Interior and Southcentral Alaska lakes. Arctic char are produced from eggs taken from a captive broodstock maintained at Fort Richardson Hatchery (through 2014) and William Jack Hernandez Sport Fish Hatchery (starting in 2015) that descended from fish captured in Bristol Bay (Lake Aleknagik). Various sizes of Arctic char are stocked. Excess broodstock are periodically released into lakes. Broodstock Arctic char are 2 to 4 years old and weigh an average of 1,500 g (3.3 pounds). Catchable Arctic char are 1½ years old and weigh an average of 120 g. Sub-catchable Arctic char are 6 months old and weigh between 15 and 60 g. Fingerling Arctic char are usually 4 to 6 months old and weigh between 5 and 10 g.

Lake Trout

The lake trout stocking program has been dormant since the 2001 stocking season but may be reinitiated in the future. Lake trout were stocked in a few Interior and Southcentral Alaska lakes. All hatchery lake trout were produced from eggs taken from wild fish stocks. The broodstock used was from Seven-mile Lake (Yukon River drainage) near Paxson. No captive broodstock was maintained in the hatchery. Due to the difficulty of conducting a wild egg take and the longevity of this species, eggs were only taken every other year. Two sizes of lake trout were stocked. Catchable lake trout were 1½ years old and weighed an average of 100 g. Fingerling lake trout were usually 4 to 6 months old and weighed between 5 and 10 g.

Coho Salmon

Coho salmon are stocked in many Interior and Southcentral Alaska lakes. Sport Fish Division use of coho salmon to stock lakes in Southeast Alaska has been limited. Currently most hatchery-produced coho salmon used for lake stocking in Southeast and Southcentral Alaska are progeny of hatchery-produced adults. Broodstock used may vary depending on availability. Hatchery produced coho salmon used for lake stocking in Interior Alaska are from eggs obtained from wild fish of the Delta Clearwater stock. Two sizes of coho salmon have been stocked. Fingerling coho salmon are 2 to 4 months old and weigh between 1 and 5 g. Sub-catchable coho salmon are 1 year old and weigh an average of 23 g.

Chinook Salmon

Chinook salmon are stocked in many Interior and Southcentral Alaska lakes and a few Southeast Alaska lakes. Currently, most hatchery-produced Chinook salmon used for lake stocking in Southeast and Southcentral Alaska are progeny of hatchery-produced adults. Broodstock used may vary depending on availability. Hatchery-produced Chinook salmon used for lake stocking in Interior Alaska are from eggs obtained from either Chena River or Salcha River wild stock.

Two sizes of Chinook salmon have been stocked. Catchable Chinook salmon are 1 year old and weigh an average of 100 g. Sub-catchable Chinook salmon are 6 to 8 months old and weigh an average of 20 g.

GENETIC AND DISEASE CONCERNS

The release of fish from hatcheries into lakes is guided by two additional policies. The genetic policy (Genetic Policy, Alaska Department of Fish and Game, 1985) was developed to protect the genetic integrities of wild and hatchery stocks. The disease policy (Regulation Changes, Policies and Guidelines for Alaska Fish and Shellfish Health and Disease Control, Alaska Department of Fish and Game, 2010) was developed to prevent the spread of fish diseases to wild and hatchery fish stocks. One area of concern for all lake categories is the illegal removal and transport of live fish from stocked lakes for release into other water bodies. To reduce the potential for spreading disease via stocking or illegal fish transfers, hatchery fish are evaluated and approved for release by the pathology section before stocking. The use of effective isolation and disease management protocols in hatchery facilities, pre-release disease evaluations of high risk production groups and certified triploids significantly reduces genetic and disease risks from illegal fish transfers.

The degree of genetic and pathology concern depends on the species and product (ploidy and sex) of fish stocked and the category of lake. There are minimal genetic and disease concerns with the stocking of any species of fish into a category 1 (landlocked) lake. The fish cannot escape from the lake and cause problems with wild fish populations. In addition, there is no outlet to transport water borne pathogens. The primary concern in category 1 lakes is the illegal transport and release by the public to nearby water bodies.

There are both genetic and disease concerns with stocking fish into category 2 (intermittent outlet), category 3 (certified weired or barriered outlet), and category 4 (flood prone) lakes. Whenever stocked fish escape from the lake of origin it is possible that genetic interaction, species range extension or the spread of pathogens will occur. Stockings should be considered for each instance based on episodic floods, certification of the weir structure, or barrier along with the species stocked, habitat suitability, and the wild species present, as all these factors influence the potential for negative impacts.

Fish stocked into Category 5 (open outlet) lake/stream systems can enter and leave most systems at will, which increases the possibility for genetic interaction, spreading disease, and expanding species range. Stocking fish in lakes with open outlets is generally unacceptable from either a genetics or disease perspective. However, particular circumstances exist at some lakes that may ameliorate genetic and disease concerns. This may include barren systems or open systems stocked with sterile fish not expected to significantly compete with or prey upon resident fish.

MANAGEMENT CONCERNS

Management concerns associated with stocked lakes are minimal. No commercial fisheries are involved and there are no conservation concerns with stocked fish. Sport anglers are likely the sole harvesters of fish from the Sport Fish Division lake stocking program, however, subsistence fisheries could develop at some lakes. If this occurs, stocking activity should be evaluated to assure adequate benefit is being derived by sport anglers to justify continued stocking. Some

lake stocking projects may require a change in area sport fishing regulations. Most area regulations are conservative to preserve wild stocks of resident fish. Regulations on stocked lakes are generally more liberal. Sport anglers are encouraged to harvest hatchery-produced fish and preserve wild stocks of fish. Sport Fish Division will attempt to maintain liberal harvest limits on all stocked lakes. Some stocked lakes now support fisheries where the objective is to provide the opportunity to catch several large fish. Public support for a wide range of “quality” fisheries is increasing and area management personnel are making adjustments to provide a balance among high harvest, mixed species, and trophy fishing opportunities.

Other management issues associated with lake stocking are public access and the sale of fish. Production of all hatchery fish is paid for with funds collected from sport anglers (through Federal Aid in Sport Fish Restoration and state license sales revenue). Consequently, no fish should be stocked unless the public has access to catch the fish. Sport Fish Division will not stock fish in a lake unless there is legally designated public access. In addition, fish produced by Sport Fish Division hatcheries will not be sold to private individuals or groups, since the fish were produced with public funds.

STOCKING GUIDELINES

In cases where triploids are required as a condition of permitted stocking activity, triploids must be certified before release. Fish not meeting certification criteria cannot be stocked into lakes approved for triploid stocking only. ***All hatchery fish must meet the established ADF&G Fish Health and Disease Control Regulations, Policies and Guidelines at the time of stocking.***

Category 1 lakes within the species range can be stocked with any hatchery product (Table 1). There are minimal genetic or disease concerns. The one concern for all lake categories is the illegal removal and transport of fish out of stocked lakes and into other water bodies. The use of certified triploids significantly reduces the genetic risk from this activity. Therefore, triploids (and for rainbow trout, all-female triploids) should be used whenever possible.

Category 1 lakes outside the species' range can be stocked with mixed-sex or all-female triploid rainbow trout, triploids of any other species, or diploid lake trout, in cases where there is no possibility of the stocked fish creating a natural population. Diploid mixed-sex rainbow trout can be used when there are no or insufficient triploid rainbow trout available.

Category 2 lakes can be stocked with all-female triploid rainbow trout and may be stocked with triploid fish of any other species and diploid lake trout as long as there is no possibility of the stocked fish interbreeding with native populations or establishing a new population. The life history of lake trout makes it highly unlikely that lake trout will escape the lake, establish a naturally reproducing population, and compete with native fish. Category 2 lakes in the Tanana River drainage may be stocked with diploid Chinook salmon, coho salmon, or Arctic grayling only if the hatchery-reared fish are F1 descendants of a local stock and are approved by Genetics staff under the FTP process.

Category 3 lakes can be stocked with all-female triploid rainbow trout and may be stocked with triploid fish of any other species and diploid lake trout as long as there is no possibility of the stocked fish interbreeding with native populations or establishing a new population. The life history of lake trout makes it highly unlikely that lake trout will escape from the lake, establish a

naturally reproducing population and compete with native fish. Weired category 3 lakes that have been annually certified as a blockage to fish passage can additionally be stocked with mixed-sex triploid rainbow trout. Mixed-sex diploid rainbow trout may be stocked when there are no or insufficient triploid rainbow trout available. Category 3 lakes in the Tanana River drainage may be stocked with diploid Chinook salmon, coho salmon, or Arctic grayling only if the hatchery-reared fish are F1 descendants of a local stock and are approved by Genetics staff under the FTP process.

Category 4 lakes can be stocked with all-female triploid rainbow trout and, under special circumstances, with triploid fish of any other species as long as there is limited possibility of the stocked fish attempting to interbreed with native populations. Category 4 lakes in the Tanana River drainage may be stocked with diploid Chinook salmon, coho salmon, or Arctic grayling, only if the hatchery-reared fish are F1 descendants of a local stock and are approved by Genetics staff under the FTP process.

Category 5 lakes should not be stocked, except under special circumstances. Any stocking in a Category 5 system should be solely for creating a significant fishery for species not readily available in the area. If circumstances for stocking arise, all-female triploid rainbow trout and triploid fish of any other species may be stocked into systems that do not contain native fish of the species stocked. Reproduction will not occur.

Table 1: Classification of lakes and recommended stocking products for Sport Fish Division lake stocking projects.

		Rainbow Trout			Arctic Grayling		Landlocked Salmon		Arctic char		Lake Trout
		Mixed-Sex	All-Female		Mixed-Sex		Mixed-Sex		Mixed-Sex		Mixed-Sex
Lake Type ¹	Lake Category ¹	Diploid	Diploid	Triploid ² (90%)	Diploid	Triploid ² (99%)	Diploid	Triploid ² (99%)	Diploid	Triploid ² (99%)	Diploid
Landlocked/Connected	1	Maybe ³	Yes	Preferred	Yes ⁴	Preferred	Yes ⁴	Preferred	Yes ⁴	Preferred	Yes ⁵
Intermittent Outlet	2	No	No	Maybe ^{4,6}	Maybe ⁷	Maybe ^{4,6}	Maybe ⁷	Maybe ^{4,6}	No	Maybe ^{4,6}	Maybe ⁵
Weired⁸/Barriered Outlet	3	Maybe ³	Maybe ⁹	Yes ^{4,6}	Maybe ⁷	Yes ^{4,6}	Maybe ⁷	Yes ^{4,6}	No	Yes ^{4,6}	Maybe ⁵
Flood Prone	4	No	No	Maybe ^{4,6}	Maybe ⁷	Maybe ^{4,6}	Maybe ⁷	Maybe ^{4,6}	No	Maybe ^{4,6}	No
Open Outlet	5	No	No	No	No	No	No	No	No	No	No

¹ See Table 2 for definition of terms.

² Stocking of triploids in any particular category is based on the level of certification (See stocking guidelines).

³ Mixed-sex diploid rainbow trout may only be stocked into category 1 lakes, and weired and certified category 3 lakes in rare circumstances when no all-female diploid or mixed sex triploid rainbow trout products are available.

⁴ Outside the species range, it may be stocked only if there is no possibility of the stocked fish establishing a population.

⁵ The life history of this fish makes it highly unlikely that fish will escape the lake, establish a naturally reproducing population and/or interbreed with native fishes.

⁶ Within the species range, it may be stocked only if there is no possibility of the stocked fish interbreeding with native populations.

⁷ Mixed-sex diploid fish may be stocked into non-category 1 lakes in the Tanana River drainage if fish from the Tanana River drainage are used as broodstock.

⁸ Lakes with a man-made weir must be periodically certified (i.e., pass a test for fish blockage) to be considered category 3 lakes. The recommended period for certification is annually prior to stocking. Weired category 3 lakes that do not pass certification for fish blockage cannot be considered weired category 3 lakes.

⁹ Weired lakes that are certified for blockage may have all-female diploid rainbow trout stocked into them. Birch Lake in interior Alaska and Cheney Lake in Southcentral Alaska are examples of lakes that are certified for fish blockage.

Table 2. Definition of terms used for lake classification and stocking products.

Lake Type	Definition
Landlocked	There is no outlet; fish cannot escape lake.
Connected Lakes	Two or more lakes connected by streams, but no outlet for lowest lake in the drainage. Fish cannot escape lowest lake.
Intermittent Outlet	Lake is usually landlocked, but fish can escape if high water flows occur.
Weired	Outlet stream is blocked by man-made structure. Fish cannot escape unless weir fails or is compromised. A lake is considered weired if it is periodically certified (i.e., passes a test of blockage). The recommended certification period is annually prior to stocking. Otherwise it is considered intermittent, flood prone, or open as per these definitions.
Barriered Outlet	Outlet stream is blocked by natural structure. Fish cannot usually pass through the barrier and survive.
Flood Prone	Lake is landlocked, but is subject to flooding during high water periods. Fish can escape during floods.
Open Outlet	Lake has outlet stream and fish can move into and out of lake.

Lake Category	Definition
Category 1	Lakes are truly landlocked and fish cannot exit the system. There is no interaction with any wild fish populations except those indigenous to the lake. Few restrictions on fish stocking.
Category 2	Lakes with an intermittent outlet. Snowmelt during heavy snow years may fill lake basin and create a small outlet stream. Fish may periodically escape from a Category 2 lake and compete with wild fish populations. However, the incidence of stocked fish escapement is low. The danger to wild fish populations is also low. Moderate restrictions on fish stocking.
Category 3	Includes weired lakes and lakes with barriered outlets. Fish may periodically escape from a category 3 lake and compete with wild fish populations. However, the incidence of stocked fish escapement is low. The danger to wild fish populations is also low. The primary concern with Category 3 systems is the passage of pathogens from stocked fish to wild fish. Moderate restrictions on fish stocking.
Category 4	Lakes are flood prone. These are small lakes or ponds usually located in the floodplain of a stream and subject to flooding during high stream water flows. Fish can leave the system during flood periods. Moderate to severe restrictions on fish stocking.
Category 5	Lakes with open outlets. Fish are free to pass in and out of the system at will. Stocking not recommended. Stocking may occur under severe restrictions.

Table 2. Continued

Stocking Products	Definition
Mixed-Sex	These are normal fish that are capable of reproduction.
Mixed-Sex Triploid	These fish have cells with three sets of chromosomes. Fertilized eggs are pressure shocked during early development to interrupt cell division, and this causes cells to retain a third set of chromosomes. Triploid fish are sterile and cannot reproduce. Populations with triploid rates <100% will contain some fish capable of reproduction. The certification rate for mixed-sex triploids is 95% confident that the triploid rate is 99% or higher.
All-Female Triploid	These fish have cells with three sets of chromosomes. Fertilized eggs are heat shocked during early development to interrupt cell division and cause cells to retain a third set of chromosomes. These fish are females, sterile, and cannot reproduce. The certification rate for all-female triploid rainbow trout is 95% confident that the triploid rate is 90% or higher.
All-Female Diploid	These fish are capable of reproduction, but a naturally producing population of fish cannot be established because all fish are female.
Drainage	All of the waters comprising a watershed, including tributary rivers, streams, sloughs, ponds and lakes which contribute to the supply of the watershed.

REFERENCES

Alaska Statutes Title 16 Chapter 5. Alaska Department of Law. Juneau, Alaska.

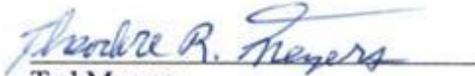
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Reviewed by:

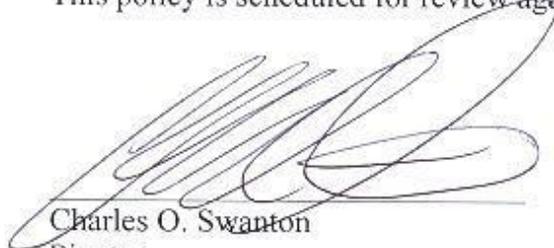

Ted Meyers
Chief Fish Pathologist

2/25/13
Date


William D. Templin
Principal Geneticist

2/25/13
Date

This policy has been thoroughly reviewed by Sport Fish Division staff in all regions of the State in addition to the state's Genetics and Pathology staff. This policy is approved as an official policy of the Alaska Department of Fish and Game, Sport Fish Division. This policy is scheduled for review again in 2018.


Charles O. Swanton
Director
Sport Fish Division

2/25/13
Date

DIVISION OF SPORT FISH

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