

LAKE CATEGORIES

Prior to stocking, a lake must be classified into one of five categories. These categories rank lakes according to the likelihood that stocked fish will escape into other waterbodies within the drainage. Categorizations for each lake are reviewed on a rotational basis (10-year preferred), whereby Division of Sport Fish staff visit the lake and document information necessary for accurate categorization. The process for gathering information for lake categorization should include observing lakes during episodic flooding and other high-water events.

- **Category 1: Landlocked.** Single or multiple connected lakes with no outlet stream to an open drainage (see definition of drainage; Table 2). *No possibility that fish can escape system and interact with wild fish populations. Few restrictions to fish stocking.*
- **Category 2: Intermittent outlet.** Lake is usually landlocked, but a small stream may connect a lake to a drainage during higher water. The incidence of high-water periods is usually less than two weeks per year. *Fish may periodically enter or escape through the outlet during high-water events and interact with wild fish populations. Moderate restrictions to fish stocking.*
- **Category 3: Barrired or weired outlet.** A barrired outlet has a natural structure that prevents live fish passage into or out of the lake. A weired outlet has a manufactured structure that prevents fish passage, has passed requirements for blockage to fish passage, and is annually inspected and documented for blockage to a drainage. Birch Lake in Interior Alaska and Cheney Lake in Southcentral Alaska are the most prominent examples of weired Category 3 lakes that meet blockage requirements. To meet requirements for blockage, the probability of fish escaping must be determined to be unlikely. *Fish may, but are not likely to, escape and genetically impact wild fish populations. Pathology remains a concern. Moderate restrictions on fish stocking.*
- **Category 4: Flood prone.** These are lakes that are usually landlocked but located in a floodplain subject to periodic high-water flows to and/or from a drainage. Lakes in this category may flood every year while others rarely flood. *Fish may leave the lake and interact with wild fish populations during and after high-water events. Moderate to severe restrictions on fish stocking.*
- **Category 5: Open outlet.** These are lakes with an outlet stream into a drainage. The magnitude of disease and genetic impacts depend on the species and life stage stocked and the wild stocks present. *Fish can pass freely in and out of the lake. The potential impact to wild fish populations is high. Severe restrictions on fish stocking.*

STOCKED PRODUCTS

To reduce the potential for negative genetic impacts on wild fish populations, the Division of Sport Fish prioritizes the use of sterile stocking products.

Six species are reared for stocking projects (Table 1). Hatcheries produce fish that are reproductively viable (diploid, mixed-sex) or reproductively impaired (triploid, sterile). Using the combined techniques of triploidization and all-female induction fish produced are unlikely to result in self-sustaining (reproductively viable) populations or hybridize with local stocks (see Table 2 for definitions of stocking products). Triploids have been produced for all stocked species. To further ensure the nonreproductive status of triploid rainbow trout, all-female cohorts are produced. All-female cohorts are incapable of reproducing and establishing viable populations in the absence of wild (male) fish.

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

Rainbow trout

Rainbow trout are the primary hatchery product used in lake stocking. All rainbow trout production comes from captive broodstock maintained at the William Jack Hernandez Sport Fish Hatchery (since 2014). The broodstock is descended from wild Swanson River rainbow trout collected in the 1980s and previously maintained at the Fort Richardson Hatchery. Numerous sizes of rainbow trout are stocked. Excess broodstock are periodically used for stocking.

Rainbow trout brood trout stock are 1 to 3 years old and usually weigh 0.2 to 2.0 kg (0.5 to 4.4 lb). Catchable rainbow trout are 1 year old and weigh an average of 150 g (0.33 lb). Subcatchable 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 2 and 4 g. Rainbow trout fry are less than 2 months old and usually weigh less than 1 g.

Arctic Grayling

Arctic grayling have been stocked in many Southcentral and Interior Alaska lakes; however, the program has been suspended since 2020. A few lakes in Southeast Alaska have been stocked intermittently. All hatchery-produced Arctic grayling are reared from eggs obtained from Chena River or Goodpaster River wild stock. No captive broodstock is maintained in the hatchery. Catchable Arctic grayling are 1 year old and weigh an average of 120 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 captive broodstock maintained at the William Jack Hernandez Sport Fish Hatchery (since 2015). The broodstock originally descended from fish captured in Bristol Bay (Lake Aleknagik) and previously maintained at Fort Richardson Hatchery until 2014. 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 1.5 kg (3.3 lb). Catchable Arctic char are 1.5 years old and weigh an average of 120 g. Subcatchable Arctic char are 6 months old and weigh between 15 and 60 g. Fingerling Arctic char are usually 7 months old and weigh 2 g.

Lake Trout

Lake trout have been produced intermittently since 1963 at various hatcheries. Since 2020, lake trout have been stocked in a few Interior and Southcentral Alaska lakes using eggs collected from Sevenmile Lake (Delta River within the Tanana River drainage near Paxon). To reduce potential negative impacts on wild fish and because the species is long lived, egg takes are conducted every other year. One size of lake trout is stocked. Subcatchable lake trout are 1 year old and weigh an average of 15 to 25 g.

Coho Salmon

Coho salmon are stocked in many Interior and Southcentral Alaska lakes. Releases in Southeast Alaska lakes have been limited. Broodstock varies depending on availability. Currently most hatchery-produced coho salmon used for lake stocking in Southcentral Alaska are progeny of anadromous adults from either Ship Creek in Anchorage or Bear Lake near Seward. Hatchery produced coho salmon used for lake stocking in Interior Alaska are from eggs obtained from the Delta Clearwater River stock (Tanana River within Yukon River drainage) but may be substituted with eggs from Southcentral broodstocks during times of low escapement. Two sizes of coho salmon have been stocked. Fingerling coho salmon are 2 to 4 months old and weigh between 1 and 5 grams. Subcatchable 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, hatchery-produced Chinook salmon used for lake stocking in Alaska are progeny of anadromous adults. Broodstock used may vary depending on availability. Ship Creek is the preferred broodstock; if insufficient broodstock are available from Ship Creek, Crooked Creek or Ninilchik River may be used. Hatchery produced Chinook salmon used for lake stocking in Interior Alaska are from eggs obtained from either Chena River or Salcha River (Tanana River within the Yukon River drainage) stocks, but eggs from Southcentral broodstocks may be utilized during seasons of inadequate escapement. Two sizes of Chinook salmon have been stocked. Catchable Chinook salmon are 1 year old and weigh an average of 120 g.

STOCKING GUIDELINES

All hatchery fish must meet the established ADF&G Fish Health and Disease Control Regulations, Policies and Guidelines at the time of stocking.

In cases where triploids are required as a genetic condition of the permitted stocking activity, they must be certified before release. Fish not meeting certification criteria cannot be stocked into lakes approved for triploid stocking only.

Due to the historical use of local stocks, Category 2, 3, and 4 lakes in the Tanana River drainage may be stocked with diploid Chinook salmon, coho salmon, lake trout, or Arctic grayling if the hatchery-reared fish are the first-generation offspring of a local stock and reviewed by Genetics staff under the FTP process.

Category 1, 2, 3, and 4 lakes outside the species range can be stocked with mixed-sex or all-female triploid rainbow trout, triploids of other species, or diploid lake trout where there is no possibility of the stocked fish establishing a new population (e.g., evidence of spawning). Mixed-sex or all-female diploid rainbow trout or other species may be used in Category 1 lakes when there are no or insufficient triploid fish available. Stocking outside a species range warrants a cautious approach to ensure ecosystems impacts are carefully considered.

Category 1 lakes within the species range can be stocked with any hatchery product (Table 1). There are minimal genetic or disease concerns. A primary concern for all lake categories is the illegal removal and transport of fish out of stocked lakes and into other waterbodies. Certified triploids (and for rainbow trout, all-female triploids) significantly reduce the genetic risk from this activity and should be used whenever possible. Mixed-sex or all-female diploid rainbow trout may be used when no or insufficient triploid rainbow trout are available.

Category 2 lakes can be stocked with all-female triploid rainbow trout, triploids of other species, and diploid lake trout where there is no possibility of the stocked fish interbreeding with wild fish or establishing a new population. The life history of lake trout makes it unlikely that lake trout will escape the lake, establish self-sustaining populations elsewhere, and compete with wild fish.

Category 3 lakes can be stocked with all-female triploid rainbow trout, triploid fish of other species, and diploid lake trout where there is no possibility of the stocked fish interbreeding with wild fish or establishing a new population. The life history of lake trout makes it highly unlikely that lake trout will escape from the lake, establish self-sustaining populations, and compete with wild fish. ***Weired Category 3 lakes*** that have been annually verified for blockage to fish passage can additionally be stocked with mixed-sex triploid rainbow trout or mixed-sex diploid rainbow trout when there are insufficient triploid rainbow trout available.

Category 4 lakes can be stocked, under special circumstances, with all-female triploid rainbow trout and triploid fish of other species where there is limited possibility of the stocked fish interbreeding with wild fish or establishing a new population.

Category 5 lakes should not be stocked, except under extraordinary circumstances. Stocking would be permitted solely for the purpose of creating a significant fishery for species not readily available in the area. If such circumstances supporting stocking arise, all-female triploid rainbow trout and triploid fish of other species may be stocked into systems that do not contain wild fish of the species stocked.

Table 1.—Classification of lakes and recommended stocking products¹ for Division of Sport Fish lake stocking projects.

ASSUMES NO POSSIBILITY STOCKED FISH INTERBREED WITH WILD FISH OR ESTABLISH NEW POPULATIONS		Rainbow Trout				Arctic Grayling		Arctic char		Lake Trout		Salmon (Chinook/Coho)	
		Mixed-Sex		All-Female		Mixed-Sex		Mixed-Sex		Mixed-Sex		Mixed-Sex	
Lake Type ¹	Lake Category ¹	Diploid	Triploid ²	Diploid	Triploid ² (90%)	Diploid	Triploid ² (90%)	Diploid	Triploid ² (99%)	Diploid	Triploid ² (99%)	Diploid	Triploid ² (99%)
Landlocked /Connected	1	Maybe ₃	Yes	Yes	Preferred	Yes ⁵	Preferred	Yes ⁵	Preferred	Yes ⁶	Preferred	Yes ⁵	Preferred
Intermittent Outlet	2	No	No	No	Yes ⁵	Maybe ₇	Yes ⁵	No	Yes ⁵	Maybe ₇ ⁶	Yes ⁶	Maybe ⁷	Yes ⁵
Weired ⁸ / Barrired Outlet	3	Maybe ₃	Maybe ⁴	Maybe ₄	Yes ⁵	Maybe ₇	Yes ⁵	No	Yes ⁵	Maybe ₇ ⁶	Yes ⁶	Maybe ⁷	Yes ⁵
Flood Prone	4	No	No	No	Maybe ^{5,9}	Maybe ₇	Maybe ^{5,9}	No	Maybe ^{5,9}	No	Maybe ^{5,9}	Maybe ⁷	Maybe ^{5,9}
Open Outlet ¹⁰	5	No	No	No	No	No	No	No	No	No	No	No	No

¹ See Table 2 for definition of terms.

² Stocking of triploids in any category is based on the level of certification (see *Stocking Guidelines*). Fish not meeting triploid criteria are treated as diploid. An additional criterion of mixed-sex or all-female is applied to rainbow trout.

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 Weired lakes that are certified for blockage to fish passage may be stocked with mixed-sex triploid rainbow trout, or with all-female diploid rainbow trout. Birch Lake in interior Alaska and Cheney Lake in Southcentral Alaska are examples of lakes that are certified for fish blockage.

⁵ Outside the species range, stocking may occur only if there is no possibility of the stocked fish establishing a population. Within the species range, stocking may occur only if there is no possibility of interbreeding with native populations.

⁶ The life history of lake trout makes it unlikely that fish will leave the lake.

⁷ In the Tanana River drainage, mixed-sex diploid fish may be stocked into Category 2, 3, or 4 lakes if they are the first-generation offspring of broodstock collected from local stocks.

⁸ Lakes with a manufactured 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.

⁹ Stocking may occur for Category 4 lakes for triploid fish only under special circumstances (see *Stocking Guidelines* section for discussion).

¹⁰ No stocking in Category 5 lakes except under extraordinary circumstances (see *Stocking Guidelines* section for discussion).

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

Waterbody	Definition
Landlocked	There is no outlet; fish cannot escape lake.
Connected lakes	Two or more lakes connected by streams, but there is no outlet for the lowest lake in the drainage. Fish cannot escape the lowest lake.
Intermittent outlet	Lake is usually landlocked, but fish can escape via a small stream created if high water flows occur. Incidence of high-water periods is usually less than two weeks per year.
Weired	Outlet stream is blocked by manufactured structure. Fish cannot escape unless the 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 located in a flood plain. During high water periods, fish can escape. Flooding may occur annually or rarely.
Open outlet	Lake has an outlet stream and fish can move into or out of the lake.
Watershed	All the tributary rivers, streams, sloughs, ponds, and lakes which contribute to a body of water (lake, creek, or river). This is a subset of a drainage.
Drainage	All the waters comprising a watershed including tributary rivers, streams, sloughs, ponds, and lakes which contribute to the water supply of the watershed.

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. 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 escaping 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.

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Table 2.–Page 2 of 2.

Stocking products	Definition
Mixed-sex	These fish are normal male and females capable of reproducing.
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% confidence that the triploid rate is 99% or higher. Fish not passing certification can be stocked in places approved for Mixed-Sex diploids.
All-female triploid	These fish have cells with three sets of chromosomes. Fertilized eggs are pressure 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% confidence that the triploid rate is 90% or higher. Fish not passing certification can be stocked in places approved for All-Female diploids.
All-female diploid	These fish have cells with the normal two sets of chromosomes. These fish are capable of reproduction if there are wild fish (males) present. In barren systems, these fish cannot establish self-sustaining populations.

REFERENCES

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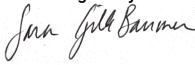
Reviewed by:

Ted Meyers

12/12/2023

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12/14/2023

Sara Gilk-Baumer
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Date

This policy has been thoroughly reviewed by Division of Sport Fish 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, Division of Sport Fish. This policy is scheduled for review in 2029.

DocuSigned by:
Israel Payton
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12/14/2023

Israel Payton
Director
Division of Sport Fish

Date