

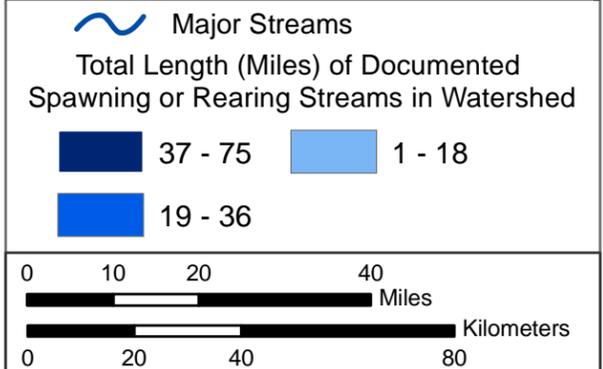
Alaska Department of Fish and Game maintains a Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes that documents spawning, rearing, and presence of anadromous fish. Inclusion in the catalog affords certain state protections under the Anadromous Fish Act (AS 16.05.871).

Documenting anadromous waters in Alaska is complicated by remoteness, short field seasons, and limited resources to conduct inventories. Surveys may not capture lifestage information due to varying timing of return of spawning adults of different species and seasonal movement of rearing juveniles. For spawning, the data may reflect Chinook and sockeye salmon better than the other species.

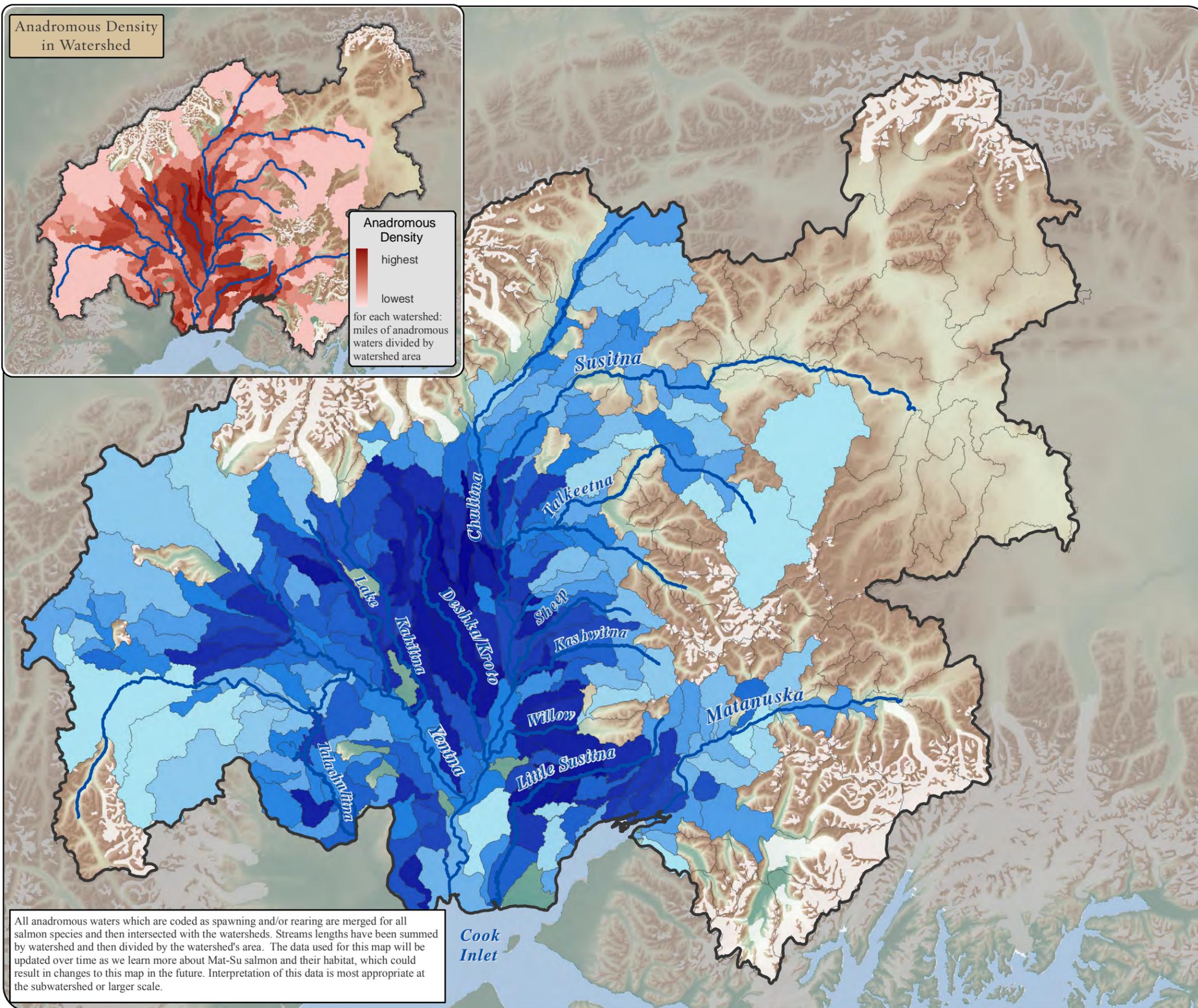
Currently the catalog contains less than 5000 miles of the more than 23,900 miles of mapped streams in the Mat-Su Basin. Despite providing an incomplete record of salmon habitat, the catalog can be used to identify patterns of spawning and rearing habitat across the Mat-Su Basin.

The National Hydrology Dataset aims to map all national waterbodies. Like the Anadromous Waters Catalog, however, it is not complete yet for the Mat-Su Basin. It does provide a way to assess the relative amount of salmon habitat for all the waterbodies in a watershed.

Mat-Su Basin - Biological Value Salmon Spawning and Rearing Length



DATA SOURCES:
Alaska Dept. of Fish and Game - Anadromous Waters Catalog - 2008.
Alaska Geographic Data Committee (AGDC) Hydrography Subcommittee.
<http://agdc.usgs.gov/hydro/> - United States Geological Survey (USGS)



All anadromous waters which are coded as spawning and/or rearing are merged for all salmon species and then intersected with the watersheds. Streams lengths have been summed by watershed and then divided by the watershed's area. The data used for this map will be updated over time as we learn more about Mat-Su salmon and their habitat, which could result in changes to this map in the future. Interpretation of this data is most appropriate at the subwatershed or larger scale.

Alaska Department of Fish and Game maintains a Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes that documents spawning, rearing, and presence of anadromous fish and some resident fish. Inclusion in the catalog affords certain state protections under the Anadromous Fish Act (AS 16.05.871).

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The density of documented salmon use within a watershed may indicate a watershed's contribution to maintaining healthy salmon populations in the Mat-Su Basin. Due to the general lack of lifestage information in the catalog, this assessment mapped density of spawning and rearing and density of all lifestages for comparison.

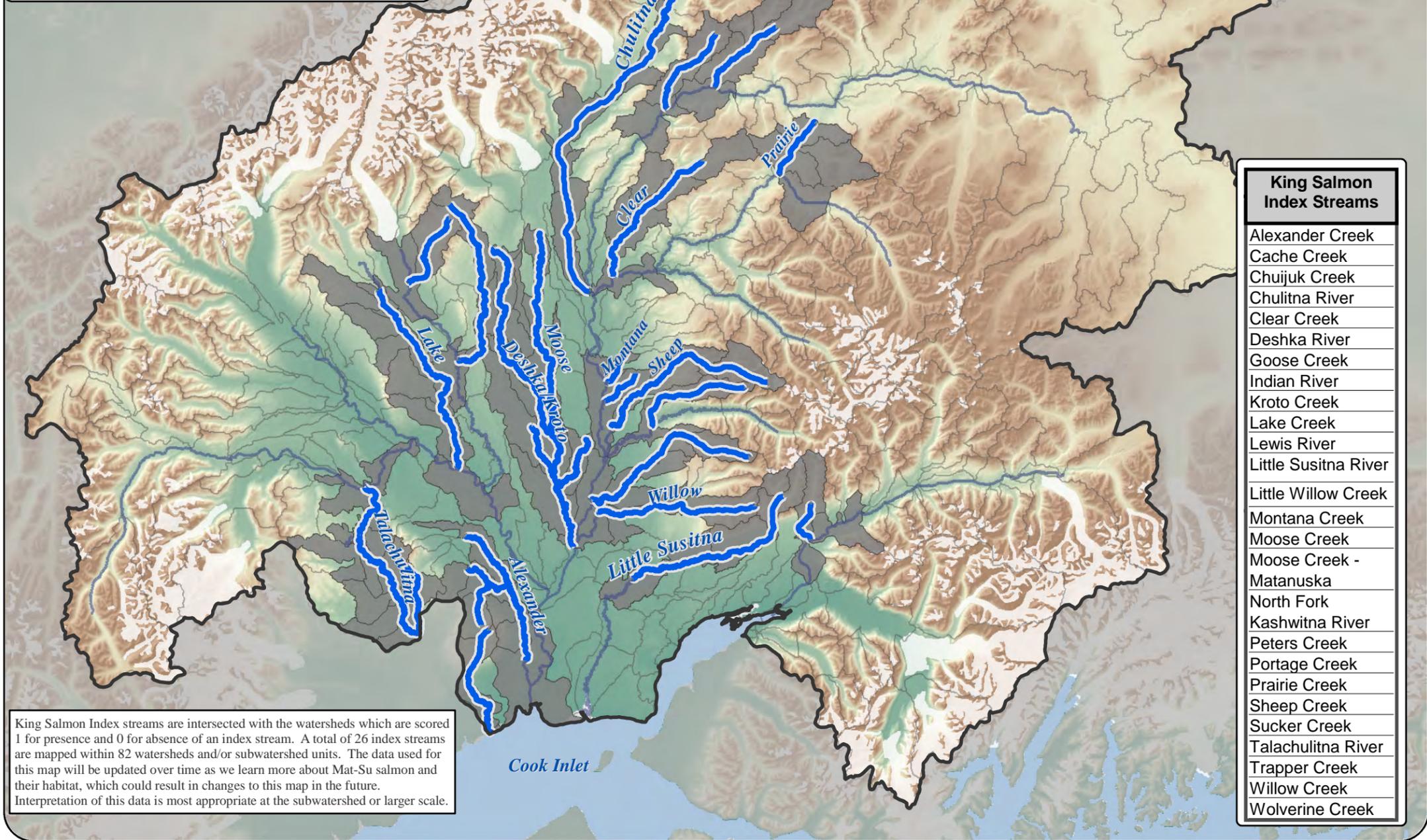
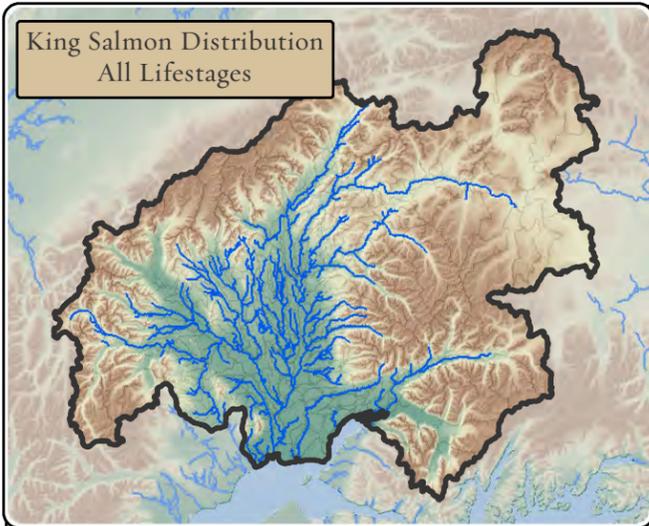
Mat-Su Basin - Biological Value
Salmon Spawning and Rearing Density

Density of Documented Spawning & Rearing in Watershed (Length per Watershed Area)

High (Dark Blue)
Low (Light Blue)



DATA SOURCES:
Alaska Dept. of Fish and Game - Anadromous Waters Catalog - 2008.
Alaska Geographic Data Committee (AGDC) Hydrography Subcommittee.
<http://agdc.usgs.gov/hydro/> - United States Geological Survey (USGS)



| King Salmon Index Streams |
|---------------------------|
| Alexander Creek |
| Cache Creek |
| Chuijuk Creek |
| Chulitna River |
| Clear Creek |
| Deshka River |
| Goose Creek |
| Indian River |
| Kroto Creek |
| Lake Creek |
| Lewis River |
| Little Susitna River |
| Little Willow Creek |
| Montana Creek |
| Moose Creek |
| Moose Creek - Matanuska |
| North Fork |
| Kashwitna River |
| Peters Creek |
| Portage Creek |
| Prairie Creek |
| Sheep Creek |
| Sucker Creek |
| Talachulitna River |
| Trapper Creek |
| Willow Creek |
| Wolverine Creek |

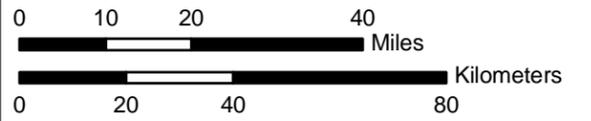
King Salmon Index streams are intersected with the watersheds which are scored 1 for presence and 0 for absence of an index stream. A total of 26 index streams are mapped within 82 watersheds and/or subwatershed units. The data used for this map will be updated over time as we learn more about Mat-Su salmon and their habitat, which could result in changes to this map in the future. Interpretation of this data is most appropriate at the subwatershed or larger scale.

The Susitna River supports the fourth largest Chinook (king) salmon (*Oncorhynchus tshawytscha*) run in Alaska. Between 100,000 to 200,000 king salmon return every year to the Susitna and its tributaries. These large returns support large and popular sport fisheries in the Mat-Su Basin. Alaska Department of Fish and Game count returning fish at the major spawning areas. These 26 index streams, mapped here, provide spawning habitat for most returning Chinook salmon.

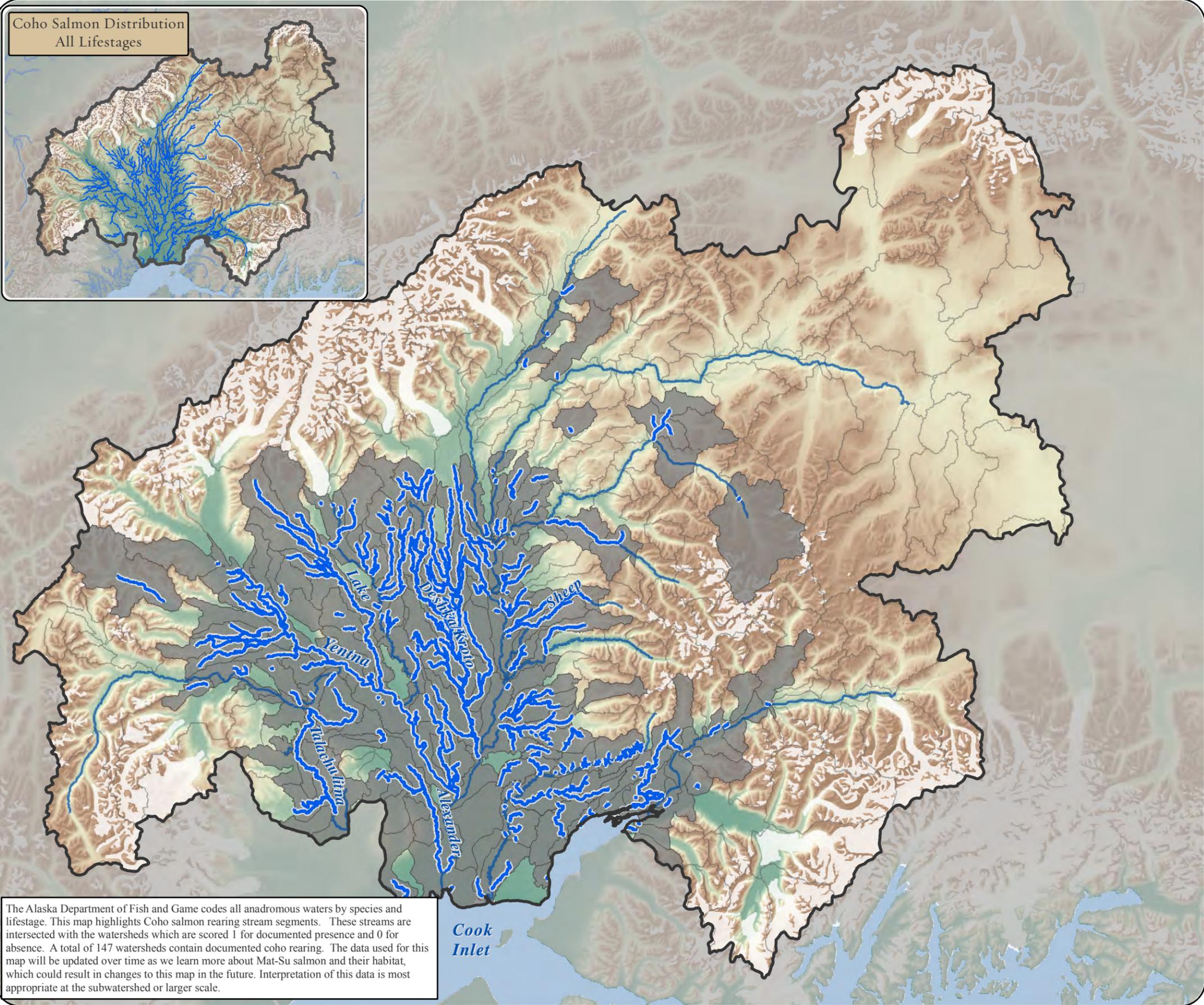
Chinook salmon generally spawn in deeper flowing waters during late summer. Juvenile Chinook salmon emerge from the gravel as fry in the spring and spend one year rearing in freshwater before migrating to the ocean the following year. Chinook salmon spend between one and five years in the ocean before returning to spawn as adults. Chinook salmon have been documented in 2,815 river miles in the Mat-Su Basin.

Mat-Su Basin - Biological Value Chinook Salmon Spawning

- Major Streams
- King Salmon Index Stream - ADF&G
- Watersheds with King Index Stream**
- Contains Index Stream



DATA SOURCES:
King Salmon Index Streams, Alaska Dept. of Fish and Game - Sport Fish Division - 2008. Anadromous Waters Catalog, ADF&G; 2008.



Coho Salmon Distribution
All Lifestages

The Alaska Department of Fish and Game codes all anadromous waters by species and lifestage. This map highlights Coho salmon rearing stream segments. These streams are intersected with the watersheds which are scored 1 for documented presence and 0 for absence. A total of 147 watersheds contain documented coho rearing. The data used for this map will be updated over time as we learn more about Mat-Su salmon and their habitat, which could result in changes to this map in the future. Interpretation of this data is most appropriate at the subwatershed or larger scale.

Coho salmon (*Oncorhynchus kisutch*) may be the most widely distributed Pacific salmon in the Mat-Su Basin. Coho salmon generally spawn throughout many headwaters during the fall.

Juveniles can spend from one to three years rearing in freshwater, the longest freshwater residence of the salmon species, making them possibly more vulnerable to changes in freshwater habitats. They prefer smaller tributary streams, backwater and off-channel habitats, and beaver ponds. Wetlands within a watershed also provide juvenile coho salmon rearing habitat. Few of those rearing wetlands are documented in the Anadromous Waters Catalog, which contains primarily lakes and streams.

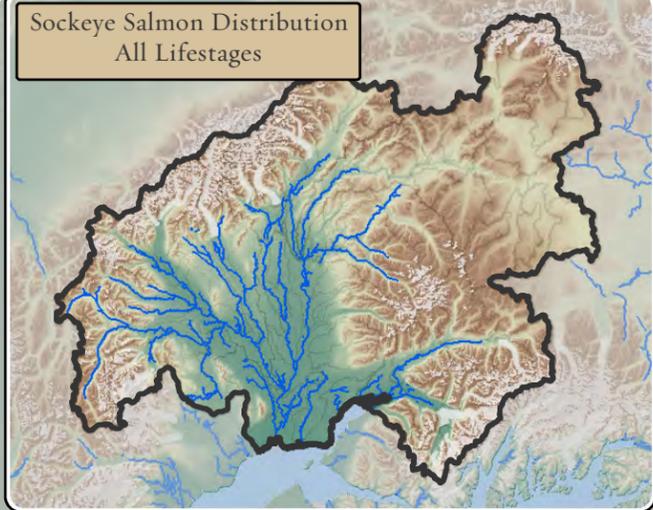
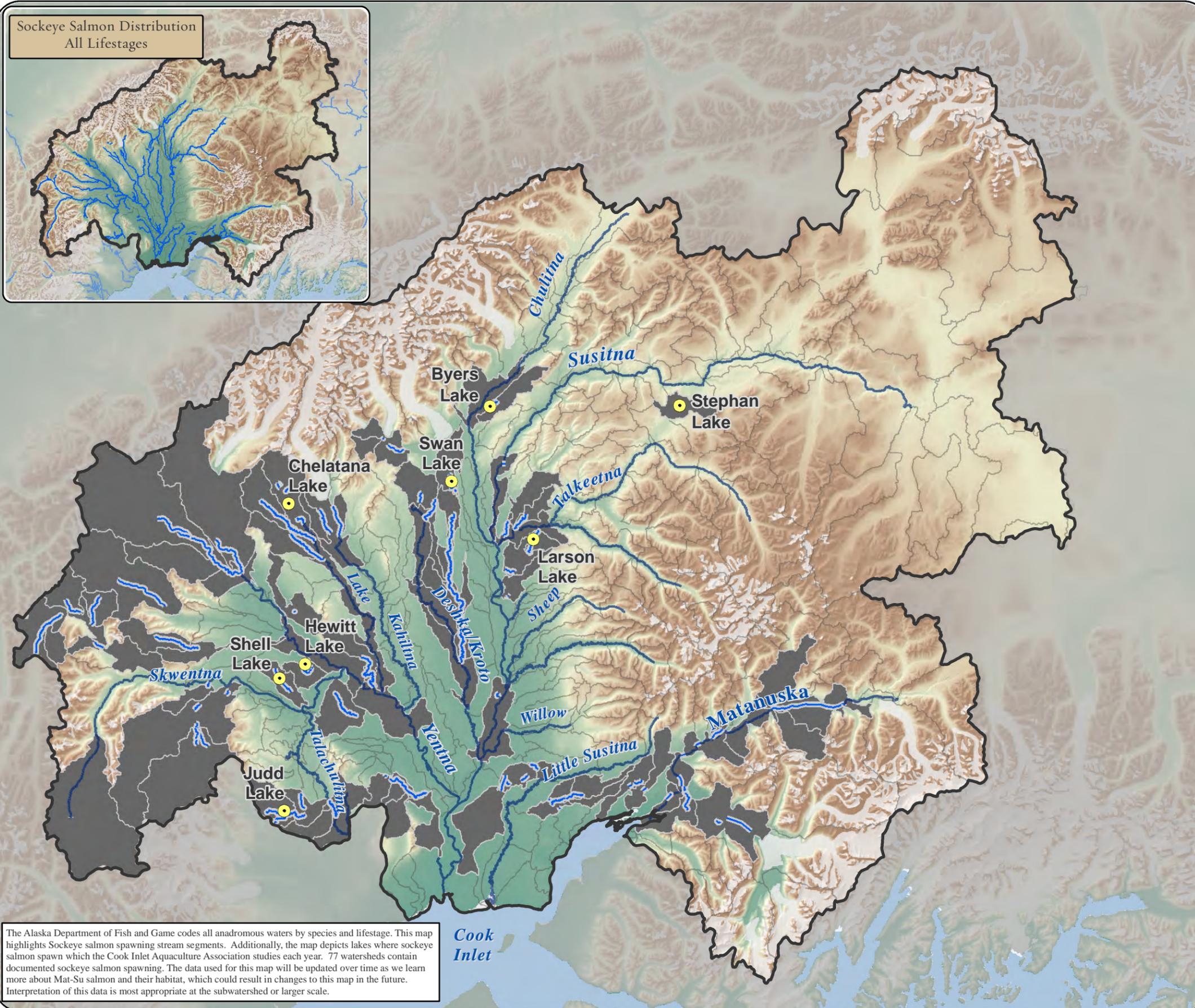
Coho salmon in the Mat-Su Basin support the area's largest recreational harvest. Commercial harvest of Mat-Su Basin coho salmon occurs in Upper Cook Inlet in mixed stock fisheries; it is unknown what portion of those harvested fish were bound for Mat-Su Basin streams.

**Mat-Su Basin - Biological Value
Coho Salmon Rearing**

-  Major Streams
-  Coho Salmon Rearing - ADF&G
- Watersheds with Coho Salmon Rearing
 -  documented rearing



DATA SOURCES:
Alaska Dept. of Fish and Game - Anadromous Waters Catalog - 2008.



The Alaska Department of Fish and Game codes all anadromous waters by species and lifestage. This map highlights Sockeye salmon spawning stream segments. Additionally, the map depicts lakes where sockeye salmon spawn which the Cook Inlet Aquaculture Association studies each year. 77 watersheds contain documented sockeye salmon spawning. The data used for this map will be updated over time as we learn more about Mat-Su salmon and their habitat, which could result in changes to this map in the future. Interpretation of this data is most appropriate at the subwatershed or larger scale.

Sockeye salmon (*Oncorhynchus nerka*) spawn and rear in numerous lake and river systems in the Mat-Su Basin. Most sockeye salmon spawning occurs in lakes and their associated tributary streams during late summer and fall. Sockeye salmon spawning has been identified in over 1845 river miles in the Mat-Su Basin. At least seven major lakes in the Susitna River drainage provide most of the known rearing and spawning habitat for sockeye salmon production.

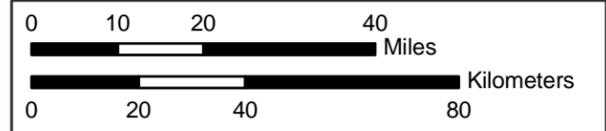
Although these lakes receive the majority of spawners, significant contributions toward overall productivity of Mat-Su sockeye salmon comes from minor systems, which include small lakes and streams as well as mainstem and side channel spawning and rearing areas in the Susitna River drainage, Knik Arm streams, and the Knik and Matanuska rivers.

Cook Inlet Aquaculture Association studies sockeye spawning lakes each year to improve knowledge about sockeye salmon spawning and habitat.

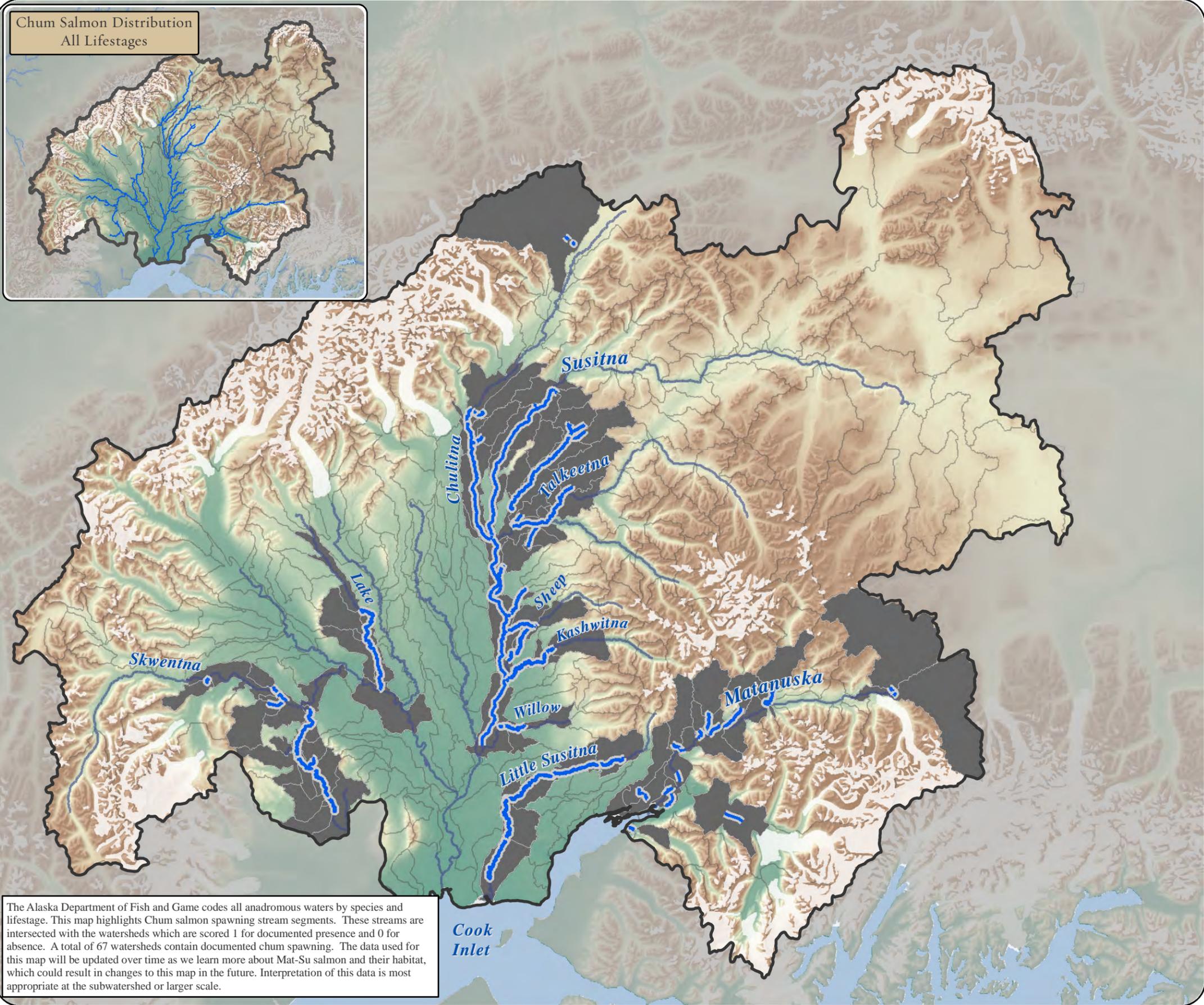
Residents of the Mat-Su have expressed concern about the health of sockeye salmon stocks in the Mat-Su Basin. Both the Yentna River and Fish Creek have not met escapement goals in some recent years, and the Alaska Board of Fisheries has identified the Susitna River sockeye salmon stock as a Stock of Yield Concern.

Mat-Su Basin - Biological Value Sockeye Salmon Spawning

-  Cook Inlet Aquaculture Association Sockeye Salmon Study Lakes
-  Major Streams
-  Sockeye Salmon Spawning - ADF&G
-  Watersheds with Sockeye Salmon Spawning documented spawning



DATA SOURCES:
 Alaska Dept. of Fish and Game - Anadromous Waters Catalog - 2008.
 Cook Inlet Aquaculture Association - CIAA - important sockeye lakes., 2008.



Chum Salmon Distribution
All Lifestages

The Alaska Department of Fish and Game codes all anadromous waters by species and lifestage. This map highlights Chum salmon spawning stream segments. These streams are intersected with the watersheds which are scored 1 for documented presence and 0 for absence. A total of 67 watersheds contain documented chum spawning. The data used for this map will be updated over time as we learn more about Mat-Su salmon and their habitat, which could result in changes to this map in the future. Interpretation of this data is most appropriate at the subwatershed or larger scale.

Chum salmon (*Oncorhynchus keta*) spawn on gravel bars and pool tail-outs in many rivers and streams during late summer and fall in the Mat-Su Basin. Juveniles spend little time in freshwater after emerging from the gravel in the spring before migrating to the ocean. Chum salmon can spend between one and five years maturing in the ocean before returning as adults to spawn. The Anadromous Waters Catalog, maintained by the Alaska Department of Fish and Game, documents chum salmon in over 1140 river miles in the Mat-Su Basin.

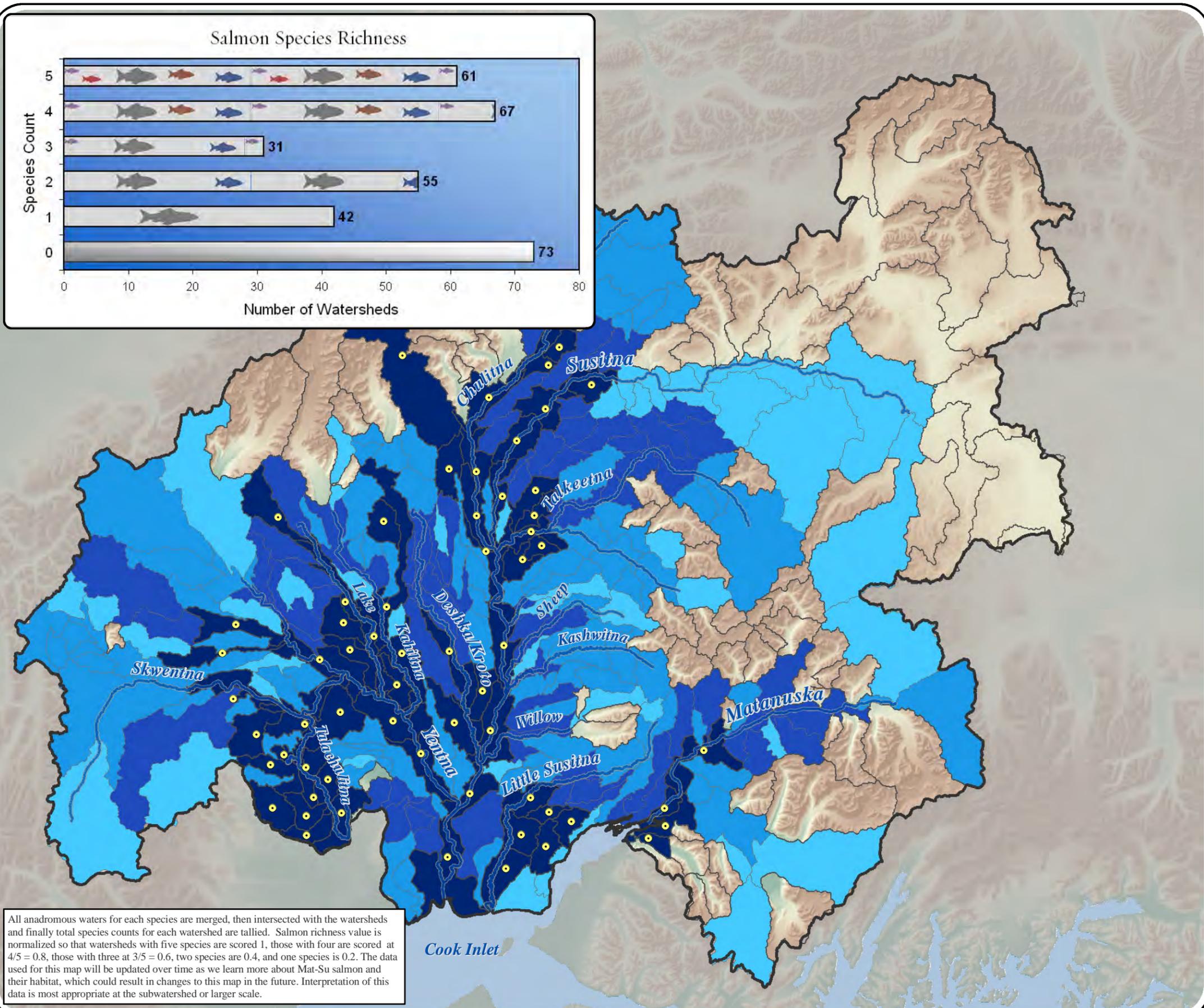
Little is known about the status of chum salmon populations in the Mat-Su Basin, although commercial harvests and incidental escapement counts in recent years seem to indicate that populations are recovering from record low returns attributable to severe fall flooding in 1986. Chum salmon commercial harvests have declined dramatically since 1986, and less than 200,000 fish have been harvested in most years from 1996 to 2004. Although harvest levels for chum salmon have been low in recent years, harvest in the commercial fishery is affected by closures and restrictions to protect sockeye salmon stocks. Low prices have also reduced fishing effort in recent years.

**Mat-Su Basin - Biological Value
Chum Salmon Spawning**

- Major Streams
- Chum Salmon Spawning - ADF&G
- Watersheds with Chum Salmon Spawning
 - documented spawning



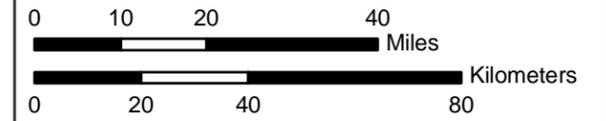
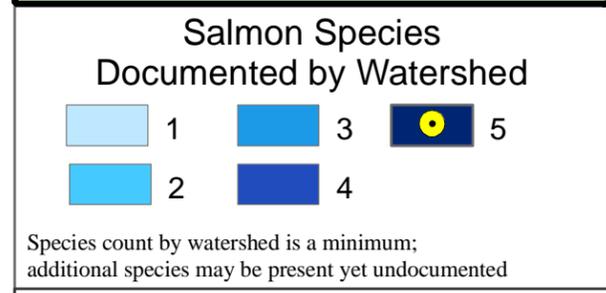
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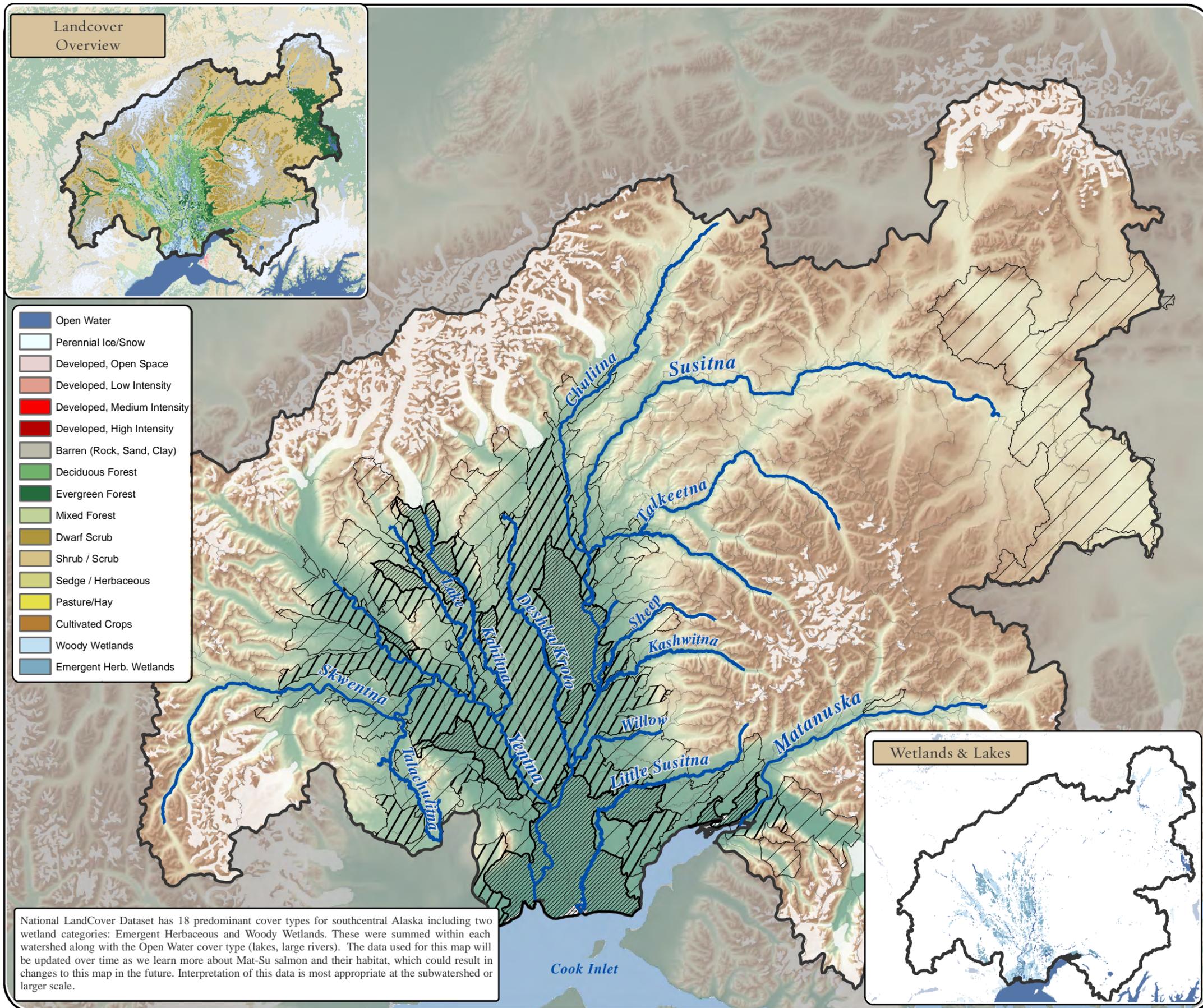
Using the catalog, this map counts how many of the five Pacific salmon species have been documented in each watershed. This count should be viewed as a minimum number of salmon species in each watershed. For those interested in restoration or protection activities that may have the most benefit for the greatest number of species, this map can provide guidance.

**Mat-Su Basin - Biological Value
Salmon Species Richness**



DATA SOURCES:
Anadromous Waters Catalog, Alaska Dept. of Fish and Game - Sport Fish Division - 2008.

All anadromous waters for each species are merged, then intersected with the watersheds and finally total species counts for each watershed are tallied. Salmon richness value is normalized so that watersheds with five species are scored at $4/5 = 0.8$, those with three at $3/5 = 0.6$, two species are 0.4, and one species is 0.2. The data used for this map will be updated over time as we learn more about Mat-Su salmon and their habitat, which could result in changes to this map in the future. Interpretation of this data is most appropriate at the subwatershed or larger scale.



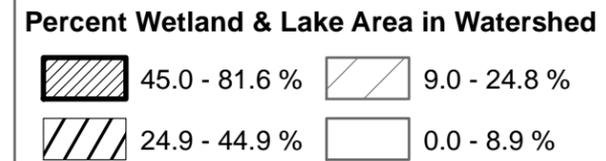
- Open Water
- Perennial Ice/Snow
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren (Rock, Sand, Clay)
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Dwarf Scrub
- Shrub / Scrub
- Sedge / Herbaceous
- Pasture/Hay
- Cultivated Crops
- Woody Wetlands
- Emergent Herb. Wetlands

National LandCover Dataset has 18 predominant cover types for southcentral Alaska including two wetland categories: Emergent Herbaceous and Woody Wetlands. These were summed within each watershed along with the Open Water cover type (lakes, large rivers). The data used for this map will be updated over time as we learn more about Mat-Su salmon and their habitat, which could result in changes to this map in the future. Interpretation of this data is most appropriate at the subwatershed or larger scale.

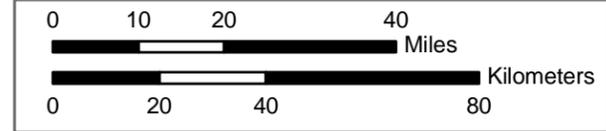
The presence of lakes and wetlands indicate amount of juvenile salmon rearing and sockeye salmon spawning habitat potentially available within a watershed. Wetlands are typically defined by one or more attributes: the substrate is periodically or permanently saturated with water; periodically the land supports water-loving plants such as cattails, rushes, or sedges; or the area contains undrained wet soil which lacks oxygen. Within the Mat-Su Basin, wetlands are associated with lakes, rivers, uplands, and the coast and may have emergent plants, shrubs, or forests.

Wetlands play multiple roles in providing healthy habitat for salmon. They store and release groundwater slowly, serving to moderate streamflows and lake levels. Wetlands are important for groundwater recharge and discharge, may act as filters to maintain water quality by removing pollutants and sediment, and are important for nutrient cycling. Wetlands provide primary productivity to drive the food chain. Many wetlands in the Mat-Su Basin are net receivers of groundwater, which moderates water temperatures, maintains dissolved oxygen levels, and prevents thorough freezing in the winter. If connected to anadromous waters, such wetlands provide productive rearing habitat for juvenile fish, and temperature-sensitive salmonids may seek them for refugia.

Mat-Su Basin - Biological Value Wetlands and Lakes



Note: on this map, adjacent watersheds with similar wetland percentages have been merged for visual clarity



Data Sources:
Wetlands: National LandCover Dataset (NLCD), USGS, 2008 - based upon 30 meter pixel LANDSAT imagery collected 1999-2001.
Lakes: National Hydrographic Dataset, USGS, 2006.