



State of Alaska  
Department of Fish and Game  
Division of Sport Fish

Nomination Form  
Anadromous Waters Catalog

Region: SCN USGS Quad(s): Anchorage B-7  
 Anadromous Waters Catalog Number of Waterway: 247-50-10220  
 Name of Waterway: Matanuska River  USGS Name  Local Name  
 Addition  Deletion  Correction  Backup Information

For Office Use

Nomination #	<u>12-001</u>	_____	_____
Revision Year:	<u>2013</u>	Fisheries Scientist	Date
Revision to:	Atlas _____ Catalog _____	Habitat Operations Manager	Date
	Both _____	AWC Project Biologist	Date
Revision Code:	<u>F-1</u>	Cartographer	Date

OBSERVATION INFORMATION

Species	Date(s) Observed	Spawning	Rearing	Present	Anadromous
					<input type="checkbox"/>
					<input type="checkbox"/>
					<input type="checkbox"/>
					<input type="checkbox"/>
					<input type="checkbox"/>

**IMPORTANT:** Provide all supporting documentation that this water body is important for the spawning, rearing or migration of anadromous fish, including: number of fish and life stages observed; sampling methods, sampling duration and area sampled; copies of field notes; etc. Attach a copy of a map showing location of mouth and observed upper extent of each species, as well as other information such as: specific stream reaches observed as spawning or rearing habitat; locations, types, and heights of any barriers; etc.

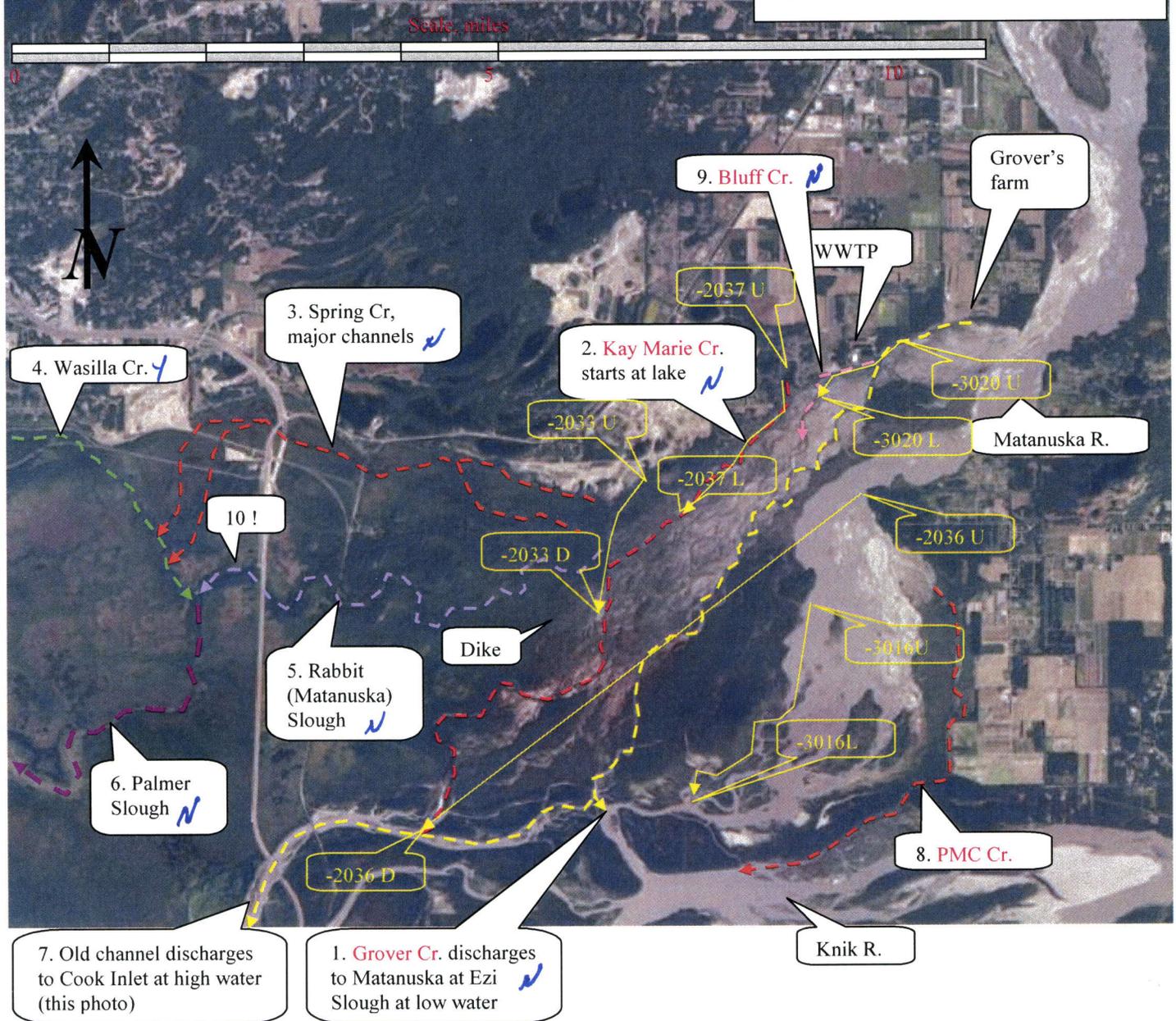
**Comments:** Information was submitted in 2012 for proposed changes to Matanuska River and tributaries hydrography w/in the watershed. Revisions may require repositioning of points w/in stream arcs. Upon review, decision was made to table revisions until 2014 update to include discussions w/local staff & site visits to determine best course of action.

Name of Observer (please print): see attached  
 Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
 Agency: \_\_\_\_\_  
 Address: \_\_\_\_\_

This certifies that in my best professional judgment and belief the above information is evidence that this waterbody should be included in or deleted from the Anadromous Waters Catalog.

Signature of Area Biologist: \_\_\_\_\_ Date: \_\_\_\_\_ Revision 05/08  
 Name of Area Biologist (please print): \_\_\_\_\_

Figure 1 Matanuska Delta Streams



**Larger Salmon Streams in Matanuska River Delta (2004 USDA satellite image)**

Several of these mostly clear streams have no formal name; **new names** are offered here only for clarification and need local vetting. Many smaller streams and side channels exist along the river.

1. **Grover Cr.** springs forth below Grover's farm and runs ~7 miles to Ezi Slough (Matanuska) at low water.
2. **Kay Marie Cr.** starts at small lake, merges with streams at dike and flood plain.
3. Spring Cr. has several channels, drains bluff, flows to Wasilla Cr.
4. Wasilla Cr. drains major upland areas and mountainside.
5. Rabbit Slough (officially Matanuska Slough) drains the flat south of Spring Cr. and west of the dike.
6. Palmer Slough (official name since 1911) combines Spring, Wasilla, and Rabbit, flowing to Cook Inlet.
7. The Matanuska north channel carries **Kay Marie Cr** when low and clear, but includes **Grover Cr.** when silty.
8. **PMC Cr.** runs along edges of fields to the Knik; it is silty much of the summer in recent years.
9. **Bluff Cr.** starts below WWTP, has good flow for a mile, then percolates into gravel; not anadromous
10. Pacific Ocean northernmost tidal limit.

April 17, 2008

Via email: scott.maclean@alaska.gov

Scott Maclean  
Alaska Department of Fish & Game

**Re: Palmer WWTP Discharge Creek; Need for Cataloging**

It was informative talking with you yesterday regarding the various streams in the Matanuska delta and difficulties in cataloging them. The small stream that the Palmer wastewater treatment plant discharges into is not cataloged by F&G, yet supports a strong salmon run. I have been asked to help the city come into compliance with their discharge permit and plan for upgrades.

Although the WWTP has discharging to the creek in the same spot for ~55 years, the lower reaches of the creek have evolved with the river. It has been in its present clear channel since 1985. Upon "discovery" of spawning salmon in the creek, regulators applied stringent ammonia limits in the 2007 permit which the WWTP can not readily meet. Before any serious study of whether the discharge harms or helps salmon in the creek, F&G needs to catalog it.

The attached Figure 1 is an annotated 2004 satellite image<sup>1</sup> showing the various creeks in the Matanuska delta. The wastewater treatment plant is shown near the upper left of the photo on the bluff above the river, accessed from Outer Springer Loop Rd.

The actual streams are delineated by colored dashed lines; those in the ~100 year flood plain have no formal names, but were named here (in red) only for purposes of discussion. I will not presume to name them for any other purpose, and defer to the F&G nomination process. I will suggest that the Palmer Historical Society be consulted for local names of the past ~70 years.

The yellow solid lines track the existing cataloged streams from their lower to upper coordinates, derived from F&G's stream catalog<sup>2</sup>; I followed existing channels if current, but most are no longer accurate. The interactive GIS coordinates on the image viewer have unknown precision.

The cataloged creeks are all tributaries to the Matanuska, prefix 247-50-1022, with suffixes:

-2033: This is a tiny stream springing from below the bluff and shown ending in the river plain southeast of the dike. Now, it merges with **Kay Marie Cr.** then flows ~2.5 miles to an older Matanuska overflow channel (tidal influenced), thence west a few more miles before joining the combined Knik-Matanuska.

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<sup>1</sup> USDA.ORTHO.MATSU; August 2004, <http://sv.gina.alaska.edu/>

<sup>2</sup> Catalog of Waters Important for Spawning, Rearing, or Migration of Anadromous Fishes – Southcentral Region, Effective June 1, 2007 ;Special Publication No. 07-05; p 251

-2036: These coordinates seem misplaced, at least for the discharge. It may have been intended to represent the creek system that previously extended from the toe of the Butte to Ezi Slough, which has become the main Matanuska channel for the past couple decades.

-2037: This creek starts in the lake by Kay Marie Dr., and is shown ending in the flood plain before merging with -2033. Since 1985, it has been merged with -2033 (as described above), and supports a regular salmon run into the lake. The combined creeks are labeled **Kay Marie Cr.**

-3016: This stream's upper reaches have more recently been consumed by the main channel.

-3020: This stream includes the location of the WWTP discharge. Now, however, it is two separate streams. **Bluff Cr.** starts below the WWTP, runs along the bluff with a pretty robust year-round flow, then runs a mile south onto the gravel bar and dries up. It is not anadromous, but would have good spawning habitat if connected to one of the other streams; it would likely be a significant component of a constructed wetlands as part of the WWTP upgrades.

The WWTP discharges into **Grover Cr.** which runs ~1 mile along the bluff from Grover's farm to the WWTP, thence south ~6 miles to the Matanuska at Ezi Slough. The Matanuska overflows infrequently to this creek section since 1985. The outlet to Ezi Slough is 61.5107°N 149.1736°W and the upper spawning beds are 61.5642°N 149.0875°W according to the web GIS.

**Grover Cr.** has had strong salmon runs in the past 50 years. In the first week of October 2006, I estimated the spawners in a stretch of the creek a couple hundred yards from the upper springs. I paced off five 100 ft sections and counted carcasses and live spawners; the highest section had ~130, the lowest ~70, and I estimated the total was 500 fish for this 500 ft section. This is the best spawning habitat characterized by strong year-round upwelling. I've observed lower density spawning in many places downstream over the years, but have not counted them. Species observed in '06 included Coho ~75%, sockeye 20%, and chum 5%. It was a very strong silver run; other years seem to have a much larger proportion of chums.

I hope to encourage F&G to do habitat evaluation for these creeks starting this spring when the fry emerge. Please call me with any questions or comments.

Sincerely,



Ralph Hulbert, P.E.

Att: Figure 1 Matanuska Delta Streams

Cc: Mike Bethe, F&G

Bill Allen, City of Palmer



# Spawning Salmon Counts

in the

## Lower Matanuska River

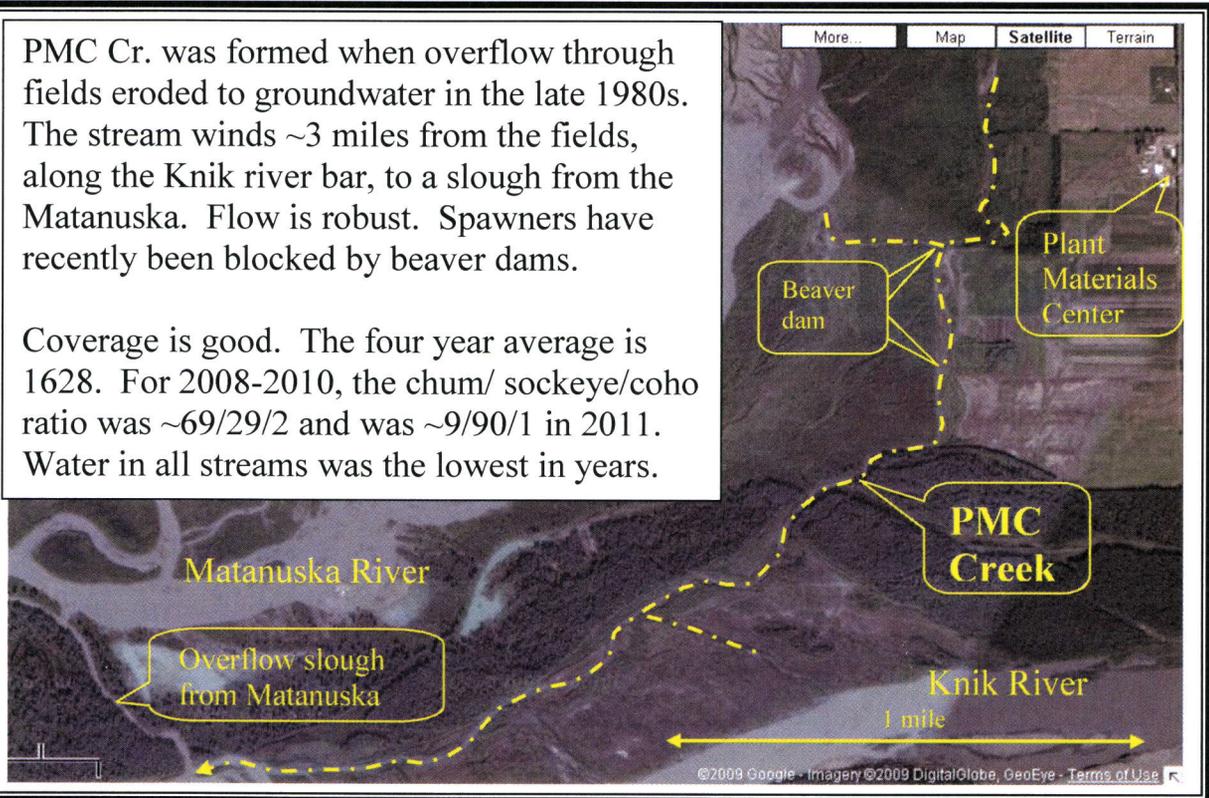
Volunteers have counted spawning salmon in four streams in the lower Matanuska River flood plain since 2008. These streams are 20-100+ yrs old, still evolving, and have no official names; we call them Dike Creek, Grover Creek, PMC Creek, and Bartko Creek. They had no previous counts and only parts of some of the creeks are included in the state Anadromas Waters Catalog.

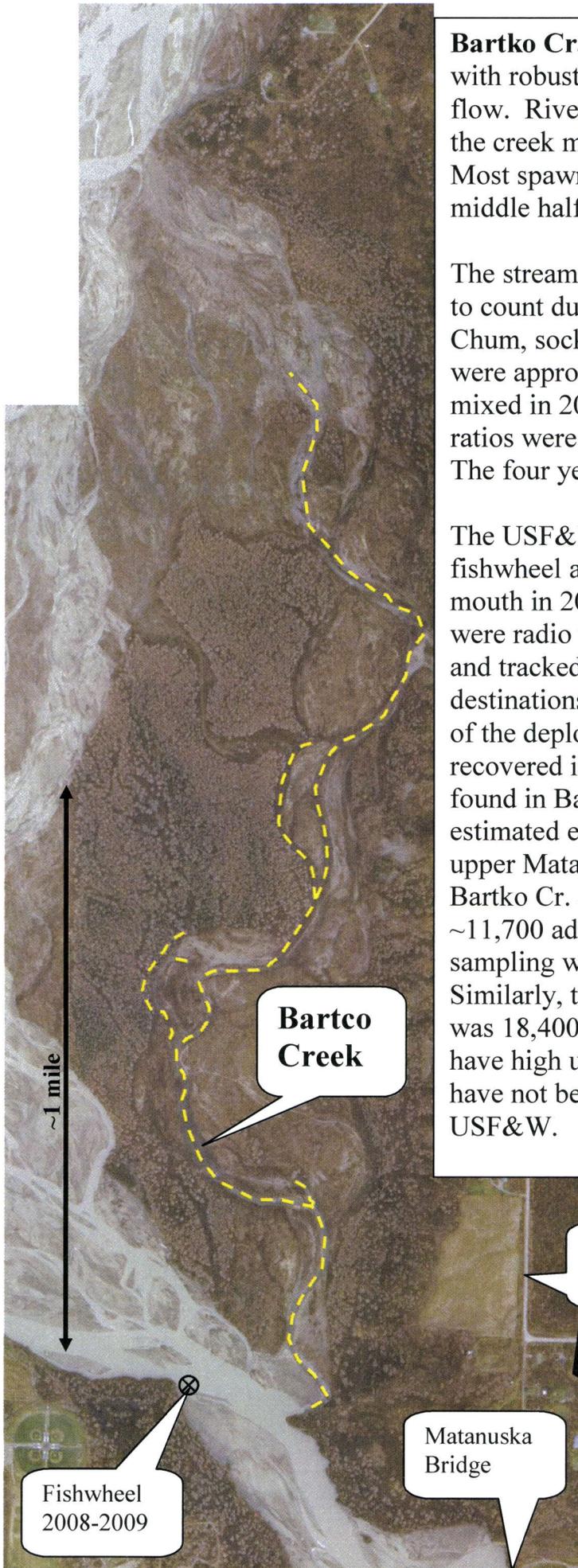
Foot surveys of the entire creeks were conducted in mid September after the peak run, counting all species live and dead and estimating species composition. We estimated accuracy of the counts due to predation losses and obscured viewing.

Fish & Game weir counted all species on Wasilla Creek 1998-2003 and index counts coho annually. F&G annually foot surveys all species on Bodenburg Creek. These two streams historically discharged into the Matanuska delta until dikes were built. USFWS operated a fishwheel at Bartko Cr. with radio tagging and tracking, allowing upper Matanuska R. estimates for 2008-2009.

PMC Cr. was formed when overflow through fields eroded to groundwater in the late 1980s. The stream winds ~3 miles from the fields, along the Knik river bar, to a slough from the Matanuska. Flow is robust. Spawners have recently been blocked by beaver dams.

Coverage is good. The four year average is 1628. For 2008-2010, the chum/ sockeye/coho ratio was ~69/29/2 and was ~9/90/1 in 2011. Water in all streams was the lowest in years.

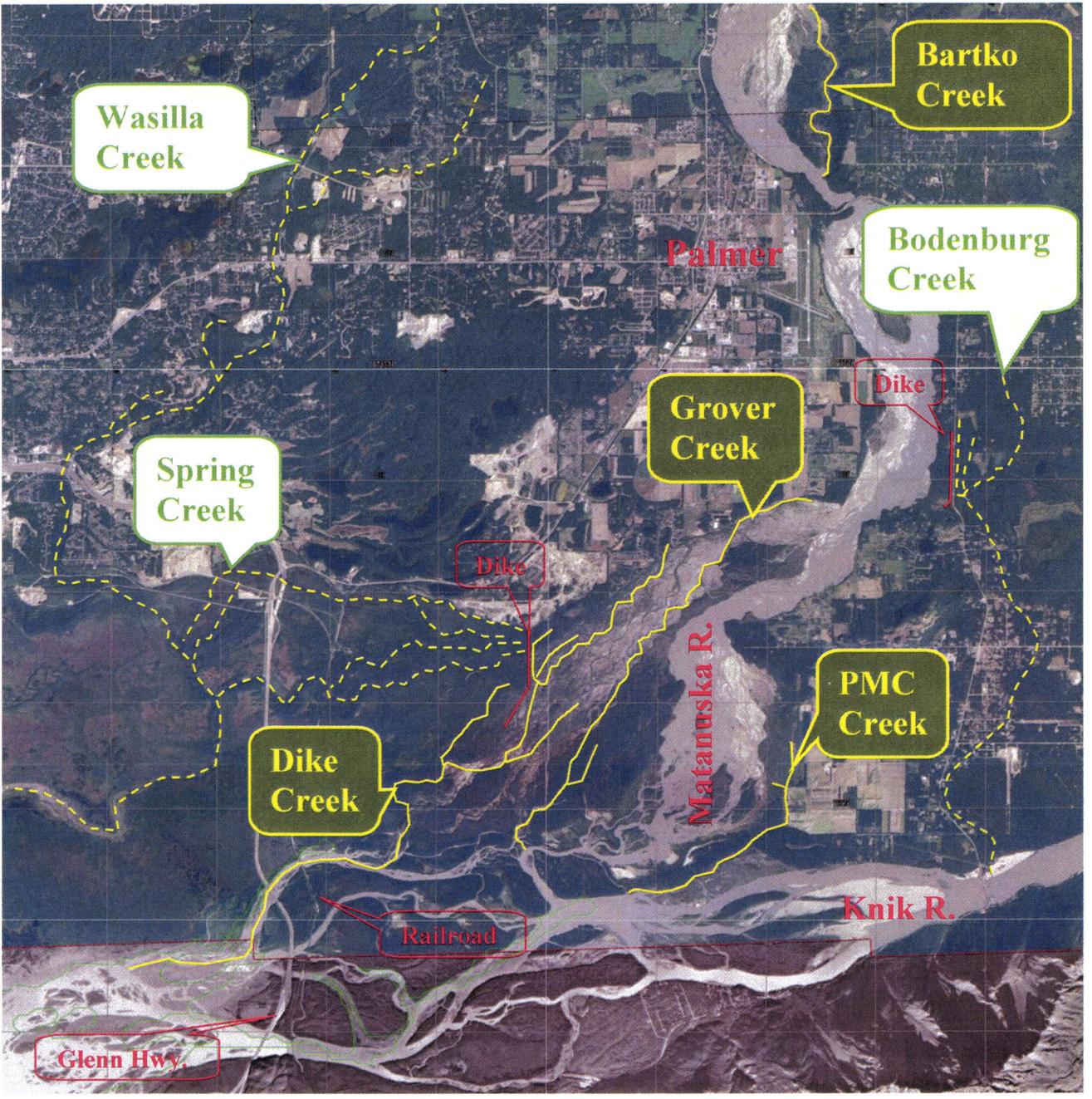




**Bartko Cr.** is ~2 miles long with robust springs and strong flow. River overflow floods the creek most summers. Most spawning occurs in the middle half of the stream.

The stream is relatively easy to count due to good visibility. Chum, sockeye, and coho were approximately evenly mixed in 2008-2010, but the ratios were 10/90/<1 in 2011. The four year average is 1721.

The USF&W operated a fishwheel across from the mouth in 2008-2009. Salmon were radio tagged, released, and tracked to their spawning destinations. In 2008, 13.3% of the deployed tags were recovered in the 1780 adults found in Bartko Cr. The estimated escapement to the upper Matanuska R. above Bartko Cr. appeared to be ~11,700 adults assuming the sampling was representative. Similarly, the 2009 estimate was 18,400. These estimates have high uncertainty and have not been verified by the USF&W.



Salmon counted by volunteers **PMC Creek**

Wasilla Creek Salmon counted by F&G

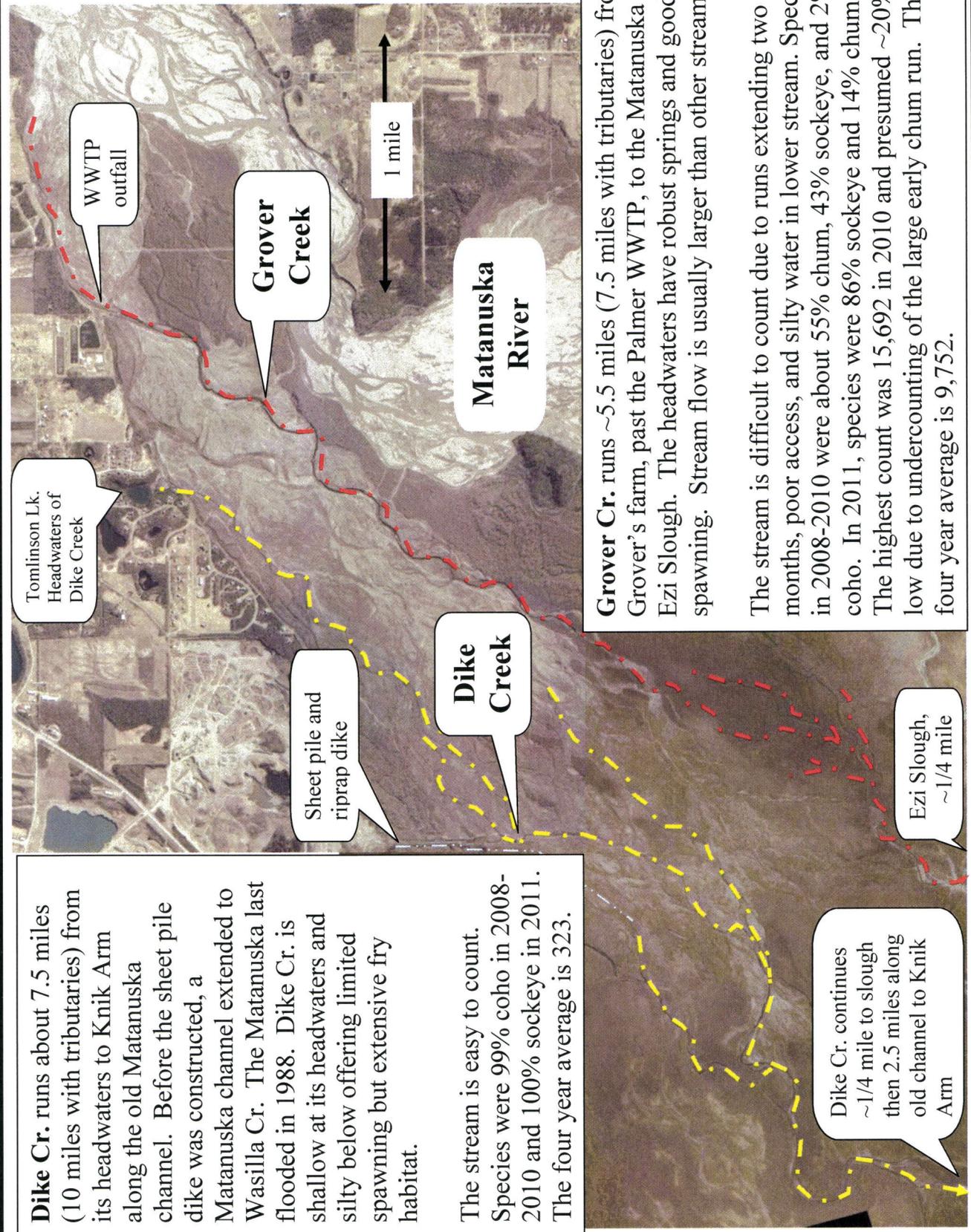
1 mile



**Lower Matanuska River  
2004 Summer Flooding**

**Dike Cr.** runs about 7.5 miles (10 miles with tributaries) from its headwaters to Knik Arm along the old Matanuska channel. Before the sheet pile dike was constructed, a Matanuska channel extended to Wasilla Cr. The Matanuska last flooded in 1988. Dike Cr. is shallow at its headwaters and silty below offering limited spawning but extensive fry habitat.

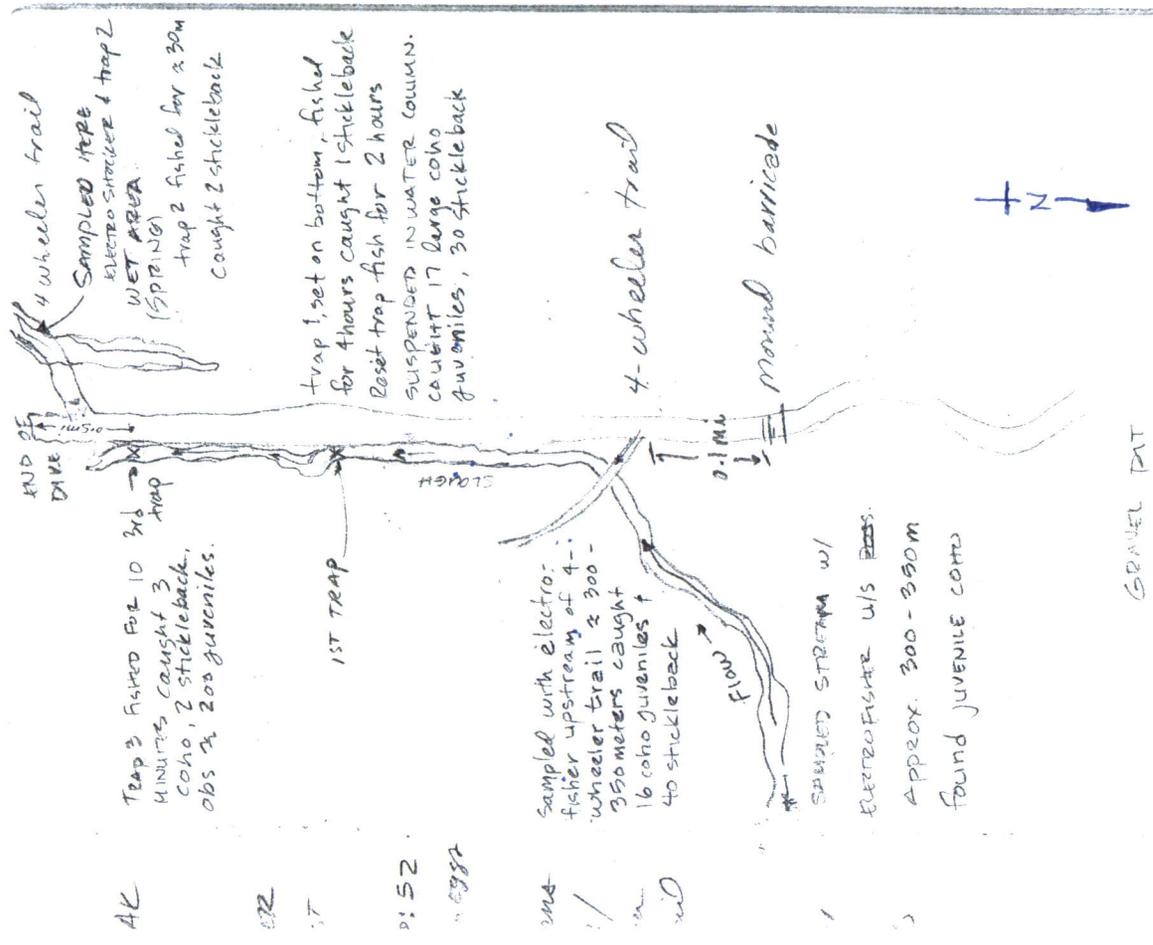
The stream is easy to count. Species were 99% coho in 2008-2010 and 100% sockeye in 2011. The four year average is 323.



Dike Cr. continues ~1/4 mile to slough then 2.5 miles along old channel to Knik Arm

**Grover Cr.** runs ~5.5 miles (7.5 miles with tributaries) from Grover's farm, past the Palmer WWTTP, to the Matanuska at Ezi Slough. The headwaters have robust springs and good spawning. Stream flow is usually larger than other streams.

The stream is difficult to count due to runs extending two months, poor access, and silty water in lower stream. Species in 2008-2010 were about 55% chum, 43% sockeye, and 2% coho. In 2011, species were 86% sockeye and 14% chum. The highest count was 15,692 in 2010 and presumed ~20% low due to undercounting of the large early chum run. The four year average is 9,752.



AK

TRAP 2 FISHED FOR 10 3/4 HOURS CAUGHT 3 COHO, 2 STICKLEBACK, OBS 200 JUVENILES.

BR

BT

P: 52

1988

me

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me

id

SAMPLED WITH ELECTRO FISHIER UPSTREAM OF 4-WHEELER TRAIL 2300-350 METERS CAUGHT 16 COHO JUVENILES & 40 STICKLEBACK

Flow

SAMPLED STREAM W/ ELECTROFISHER W/ S PERS. APPROX. 300-350M FOUND JUVENILE COHO

GRAVEL PIT





State of Alaska  
Department of Fish and Game  
Habitat and Restoration Division

Nomination for Waters  
Important to Anadromous Fish

Region SOUTHCENTRAL

USGS Quad Anchorage C-6

Anadromous Water Catalog Number of Waterway 247-50-10220-2033

Name of Waterway Unnamed tributary to the Mat. River  USGS Name  Local Name

Addition  Deletion  Correction  Backup Information

For Office Use Arch# = 4483

Nomination #	<u>01 236</u>	Regional Supervisor	<u>[Signature]</u>	Date	<u>11/20/01</u>
Revision Year:	<u>2001</u>	AWC Project Biologist	<u>[Signature]</u>	Date	<u>11/2/01</u>
Revision to:	Atlas <u>    </u> Catalog <u>    </u>	Drafted	<u>[Signature]</u>	Date	<u>12/11/01</u>
	Both <u>X</u>				
Revision Code:	<u>A-Z</u>				

OBSERVATION INFORMATION

Species	Date(s) Observed	Spawning	Rearing	Present	Anadromous
O. kisutch (coho)	7/11/2001		36		<input checked="" type="checkbox"/>
					<input type="checkbox"/>
					<input type="checkbox"/>
					<input type="checkbox"/>
					<input type="checkbox"/>

**IMPORTANT:** Provide all supporting documentation that this water body is important for the spawning, rearing or migration of anadromous fish, including: number of fish and life stages observed; sampling methods, sampling duration and area sampled; copies of field notes; etc. Attach a copy of a map showing location of mouth and observed upper extent of each species, as well as other information such as: specific stream reaches observed as spawning or rearing habitat; locations, types, and heights of any barriers; etc.

**Comments:** Sampled unnamed tributary to the Matanuska River that runs along the east side of a large dike. Sampled with minnow traps baited with salmon eggs and Smith-Root model 12 Electrofisher. Caught 20 juvenile coho in the traps and 16 juveniles with the electrofisher.

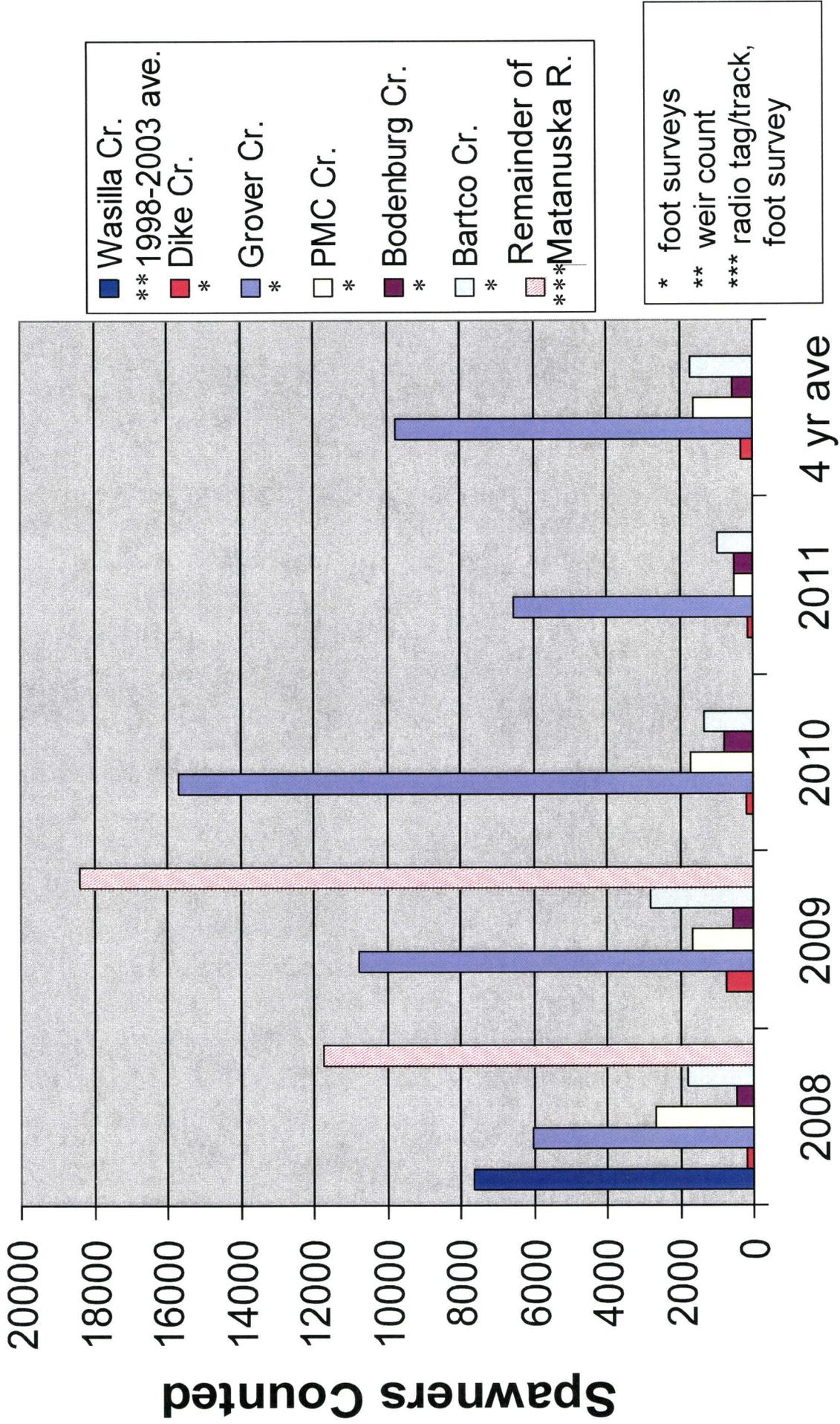
Name of Observer (please print): CEVIN GILLELAND, DAVID BYLAND  
 Signature: [Signature]  
 Address: 333 RASPBERRY ROAD  
ANCHORAGE, AK 99518

Date: 10/25/01

This certifies that in my best professional judgment and belief the above information is evidence that this waterbody should be included in or deleted from the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes per AS 16.05.870.

Signature of Area Biologist: \_\_\_\_\_

# Spawning Counts Summary



## **About the Counts**

Counting spawning salmon can be notoriously inaccurate. Weir counts are the most accurate for small streams - maybe videos will make them affordable for us. F&G counted Wasilla Cr. by weir until 2003, yielding daily counts by species.

Foot surveys may significantly undercount the escapement, depending on viewing conditions. A single survey for a single run on a small stream can be accurate,  $\pm 1-10\%$ , such as for Bodenburg and Dike Creeks. When major runs peak a month apart, such as Grover Cr., the first run is undercounted due to carcass loss. Index counts are annual foot surveys of small stream sections, useful for single species comparisons but less so for overall escapement. Comparisons of counts from different streams, years, or methods must recognize considerable uncertainty.

Large rivers require other methods. Whether sonar, tag/release, aerial surveys, etc., extensive calibration is needed before confidently estimating escapements. This has not yet happened for the entire Matanuska.

## **About the Volunteer Counters**

Ralph Hulbert has coordinated these counts with help from daughter Ruth and many friends. We thank F&G for technical advice. We think strolling for salmon is fun. Join us if you can.

