

**MATANUSKA-SUSITNA BOROUGH**

350 E Dahlia Ave., Palmer, Alaska 99645

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# FISH AND WILDLIFE COMMISSION

## MEETING Handout – TABLE OF CONTENTS

### Regular Meeting

### 01/19/2023

**Pg.---Item:**

- 2 = Presentation on Riparian Habitat, Michael Mazzacavallo, ADF&G
- 21 = 20230116 Comment on FWC 23-01/OR 23-002 from B. Long

**Physical Location of Meeting:** LLCR, DSJ Bldg, 350 E. Dahlia Ave., Palmer.**Remote Participation:** See attached agenda.

Planning and Land Use Department - Planning Division

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# Overview of Riparian Habitat and Its Relationship to Salmon

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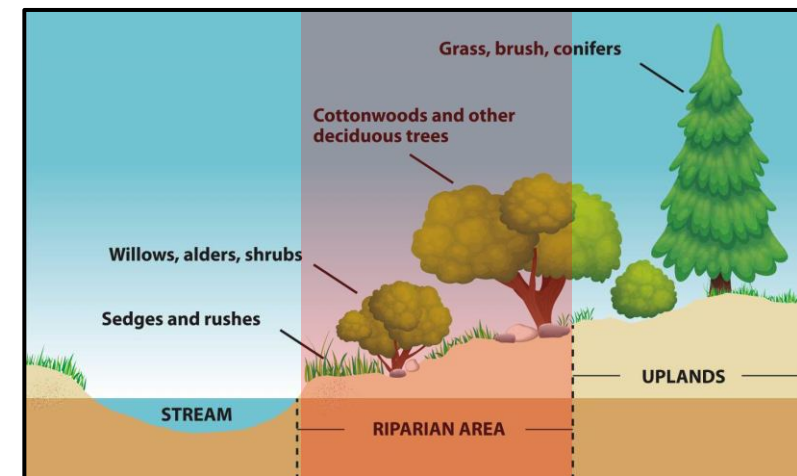
Michael Mazzacavallo  
Habitat Biologist III  
Alaska Department of Fish & Game  
Division of Sport Fish



# What is Riparian Habitat and why is it important ?

**Riparian (n):** relating to area adjacent to rivers and lakes.

A type of habitat occurring along the bank of, and is influenced by, a stream or lake, typically consisting of water tolerant trees and shrubs such as alder, cottonwood and willow.





# The Functions

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What are functions of riparian to streams.

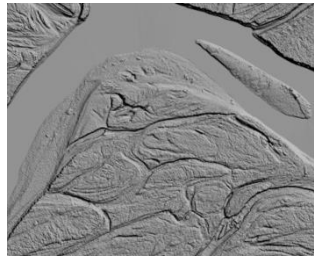
- Trapping /removing sediment from runoff
- Stabilizing streambanks and reducing channel erosion
- Trapping/removing phosphorus, nitrogen, and other nutrients that can lead to eutrophication of aquatic ecosystems
- Trapping/removing other contaminants, such as pesticides
- Storing flood waters, thereby decreasing damage to property
- Maintaining habitat for fish and other aquatic organisms by moderating water temperatures and providing woody debris
- Providing habitat for terrestrial organisms
- Improving the aesthetics of stream corridors (which can increase property values)
- Offering recreational and educational opportunities



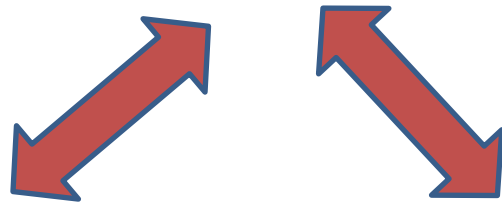
Koyukuk River, AK



# Erosion is not a Dirty Word



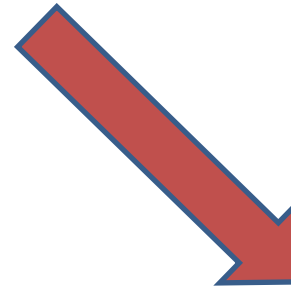
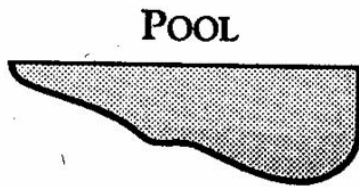
Channel Migration



Channel Form



Riparian Vegetation ,  
Large Wood, Sediment

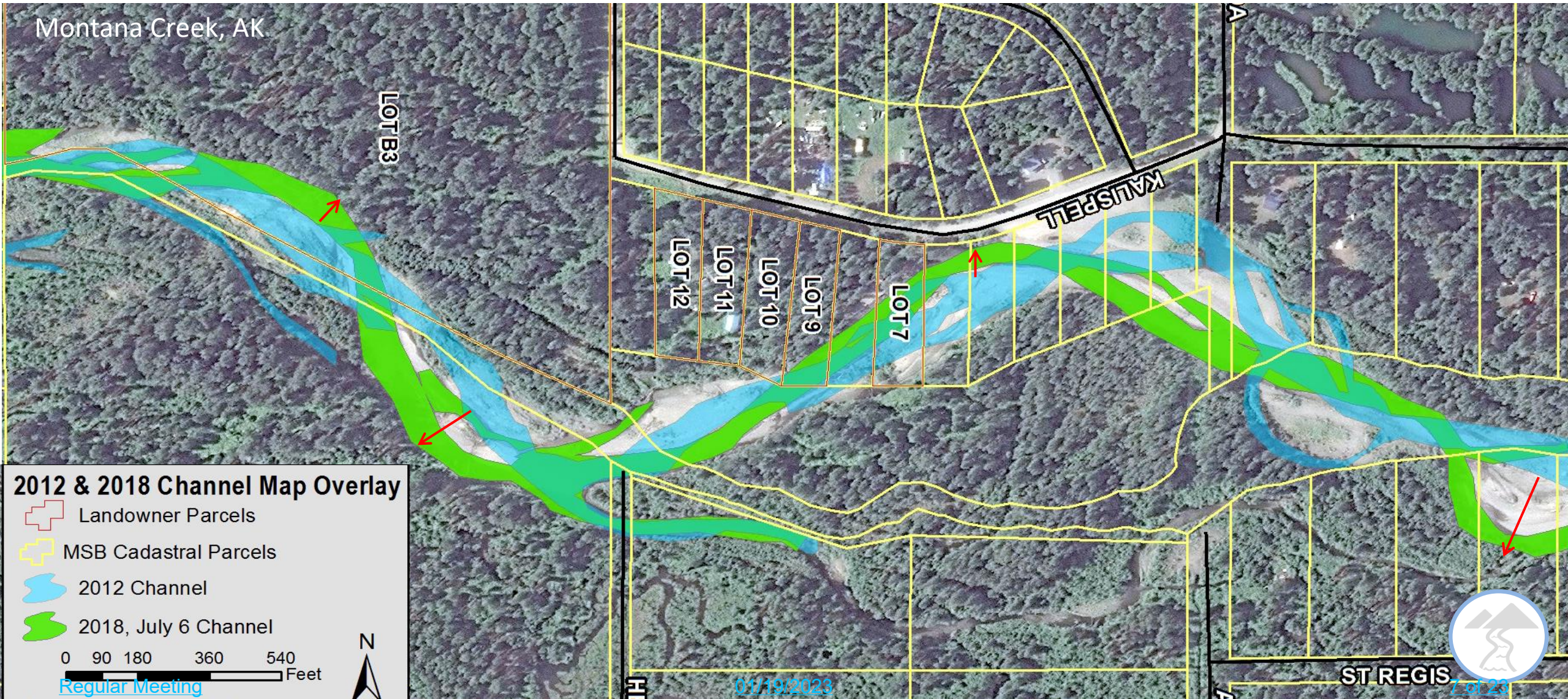


Aquatic and  
Floodplain  
Habitat





# RIVERS MOVE!

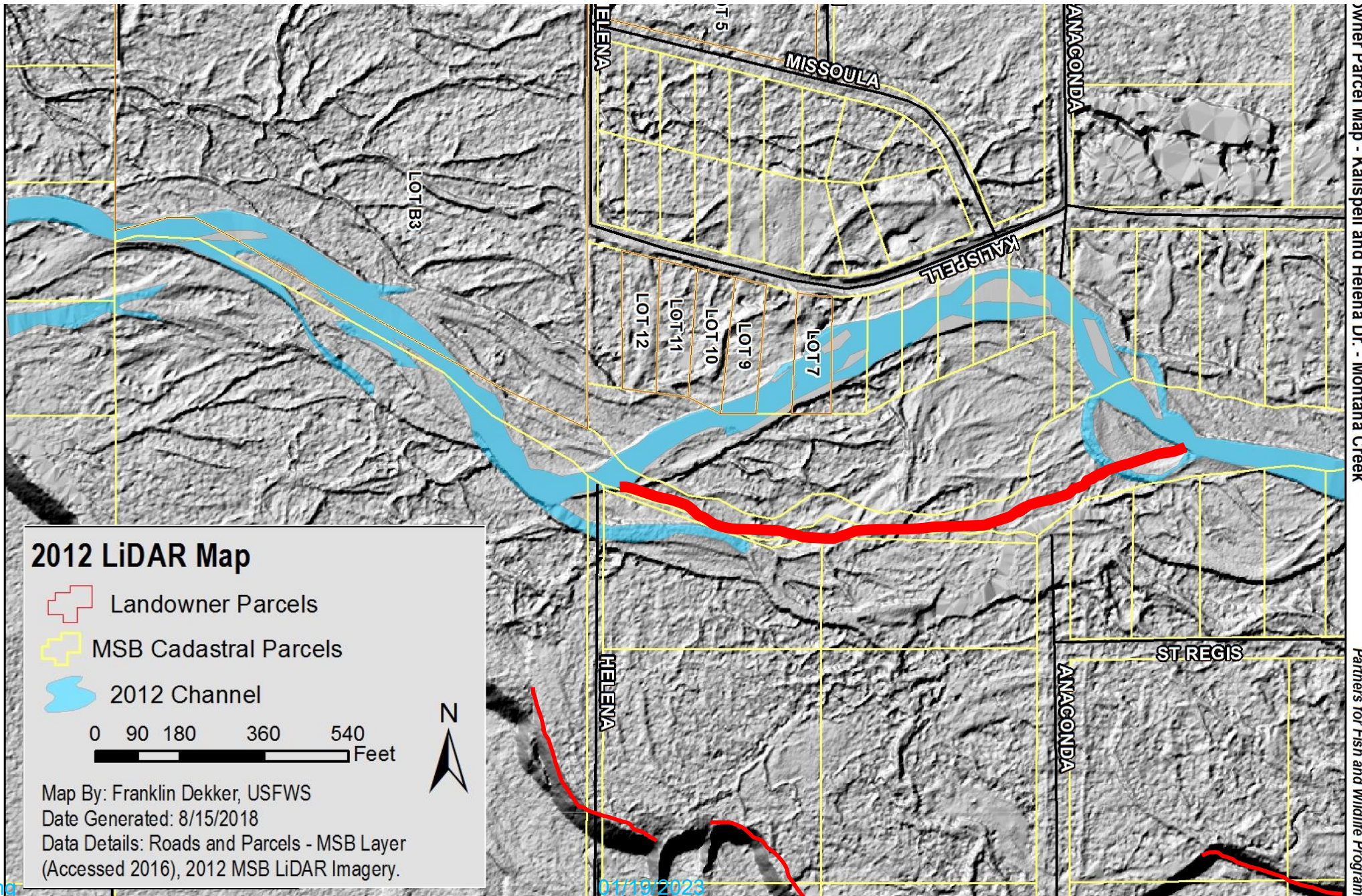


### 2012 & 2018 Channel Map Overlay




-  Landowner Parcels
-  MSB Cadastral Parcels
-  2012 Channel
-  2018, July 6 Channel







**2012 LiDAR Map**

-  Landowner Parcels
-  MSB Cadastral Parcels
-  2012 Channel

0 90 180 360 540 Feet

Map By: Franklin Dekker, USFWS  
 Date Generated: 8/15/2018  
 Data Details: Roads and Parcels - MSB Layer (Accessed 2016), 2012 MSB LiDAR Imagery.

Wildlife Service

Owner Parcel Map - Kalispell and Helena Dr. - Montana Creek

Partners for Fish and Wildlife Program







Uplands

Floodplain

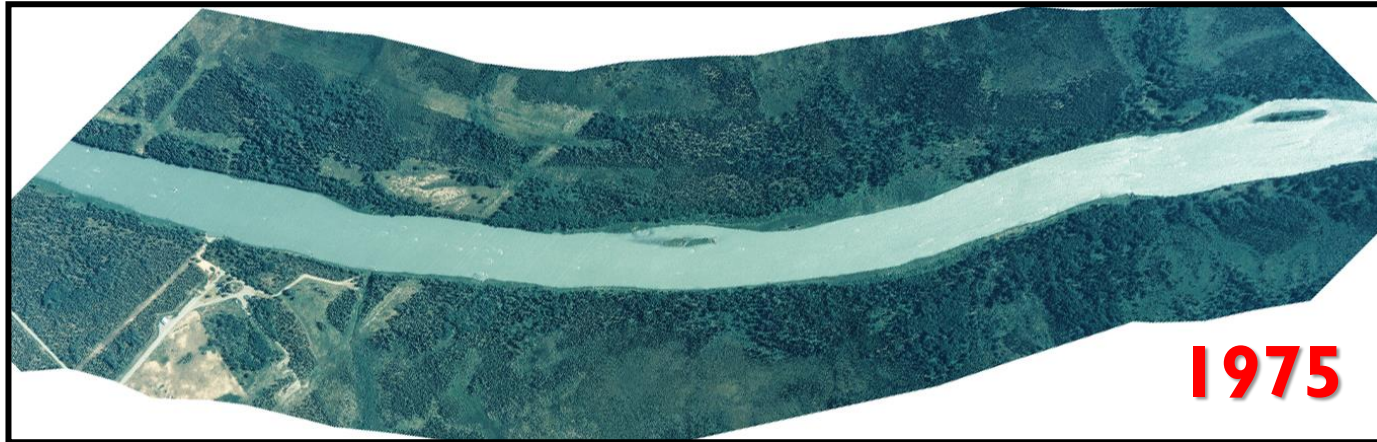
Uplands

Floodplain





# DEVELOPMENT IN RIPARIAN AREAS



**1975**

River Miles 24.5 – 26.5



**1998**

- ↑ Imperious surfaces
- ↓ Riparian buffers
- ↓ Floodplain Connectivity
- ↑ Stormwater inputs
- ↑ Peak discharge (flooding)
- ↑ Sediment Load
- ↑ Erosion







# WHAT CAUSES BANK INSTABILITY?

*Greater runoff and higher in-stream velocities contribute to stream bank erosion*

- Lack of riparian buffers
- Channelization
- Development
  - Recreation along streambanks
  - Impervious Surfaces

“Banks without riparian vegetation were found to be nearly five times as likely as vegetated banks to undergo detectable erosion during flood events.”

(Beeson and Doyle, Water Resources Bulletin, 1995)



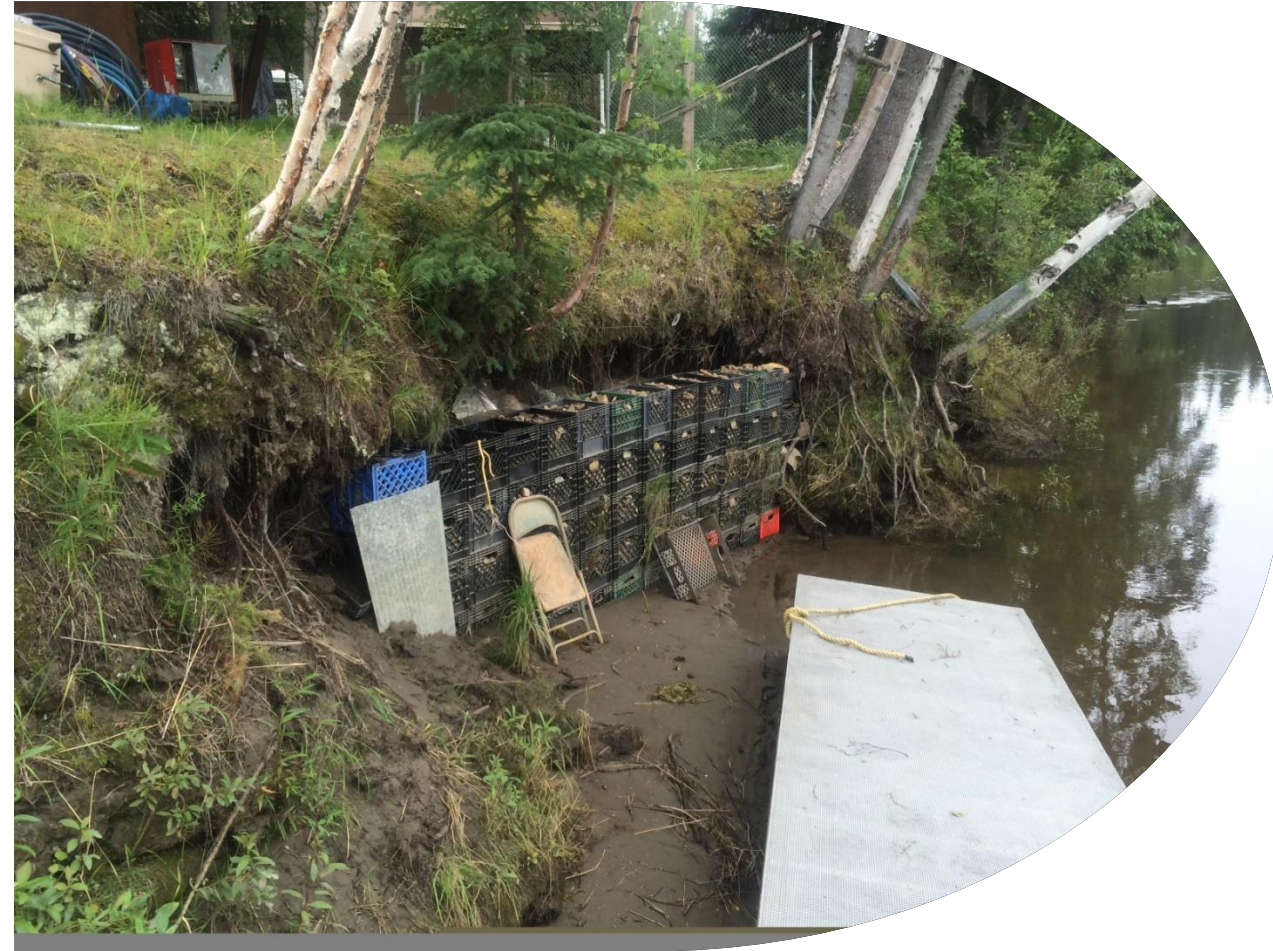
# TRADITIONAL APPROACHES TO STREAMBANK STABILITTY

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Goal – contain flow within channel

Streambanks were:

- Heightened
- Armored
- Removal of Vegetation







# FISH AND FISH HABITAT





# HABITAT Provides

Complex natural structures provide:

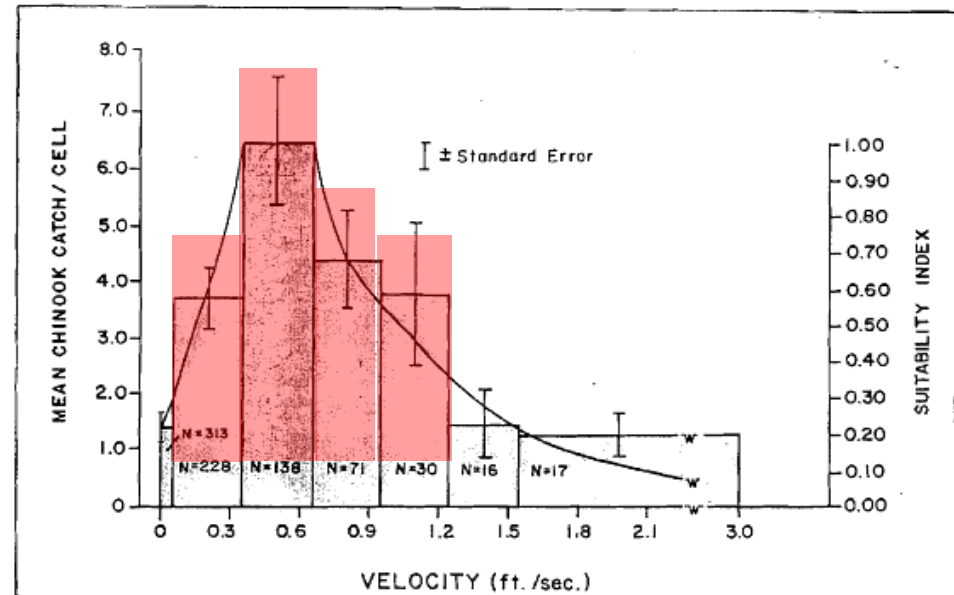
- Optimal juvenile salmon rearing habitat
- Shelter for juvenile salmon
  - High water velocity
  - Predation
- Substrate for macroinvertebrate food sources
- Optimal temperatures





# JUVENILE CHINOOK HABITAT PREFERENCES

Velocity



Depth

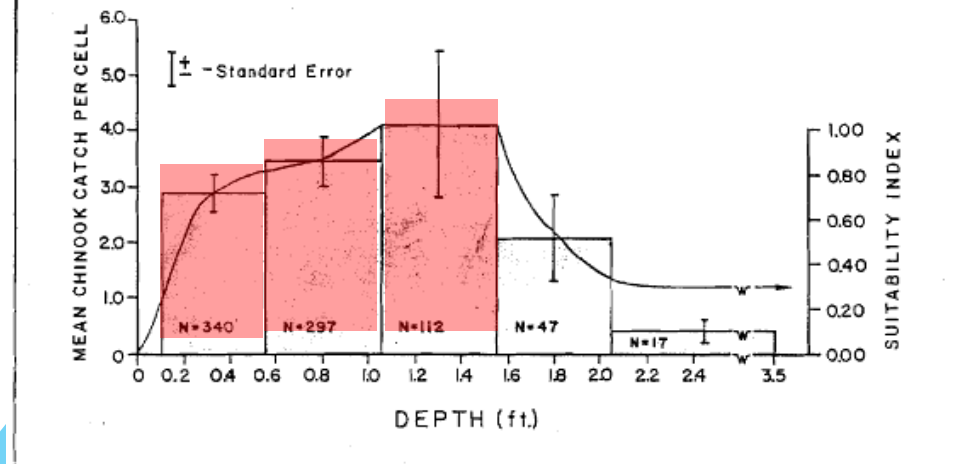


Figure 5. Mean catch of juvenile chinook salmon per cell by velocity and depth intervals (bars) in low turbidity waters, Chulitna River to Devil Canyon reach of the Susitna River. Suitability indices (lines) fitted by hand.



# HABITAT SUITABILITY INDEX FOR CHINOOK SALMON

x Code	Cover type description	y SI
1	Debris	0.90
2	Undercut bank	1.00
3	Rubble/cobble/boulder	0.20
4	Aquatic vegetation	0.65
5	Large gravel	0.25
6	Overhanging vegetation	0.38
7	Emergent vegetation	0.30
8	No cover	0.01

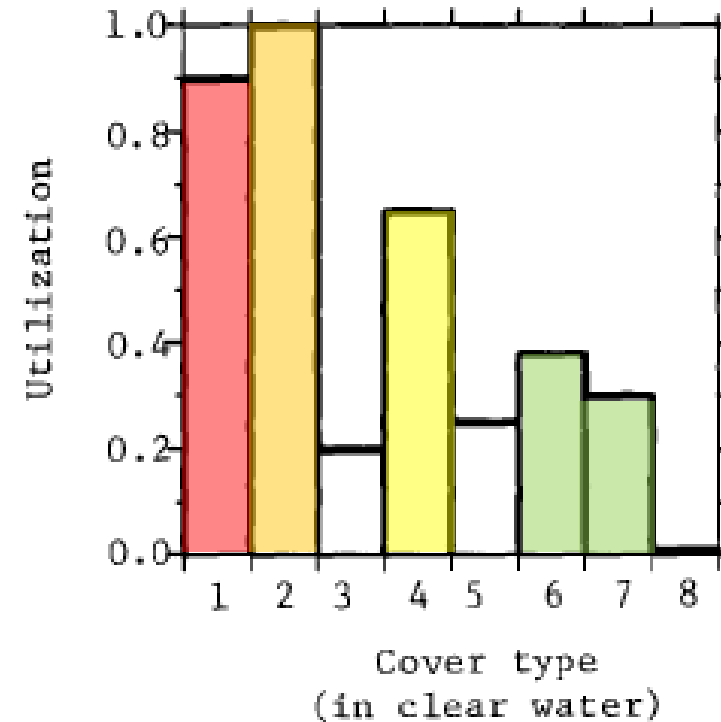


Figure 17. Category two SI curves for chinook salmon juvenile velocity, depth, percent cover, and cover type utilization (from Suchanek et al. 1984).





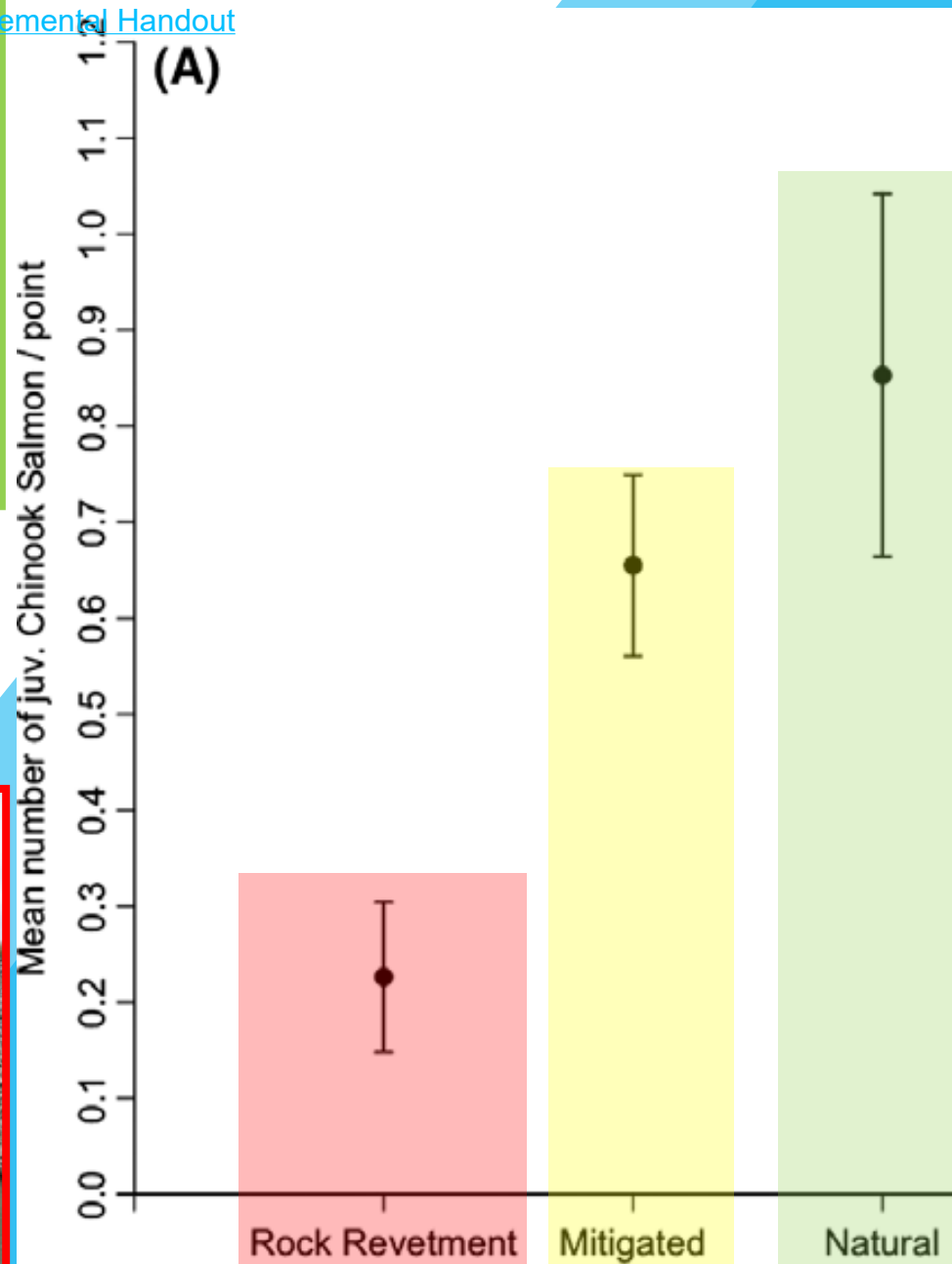
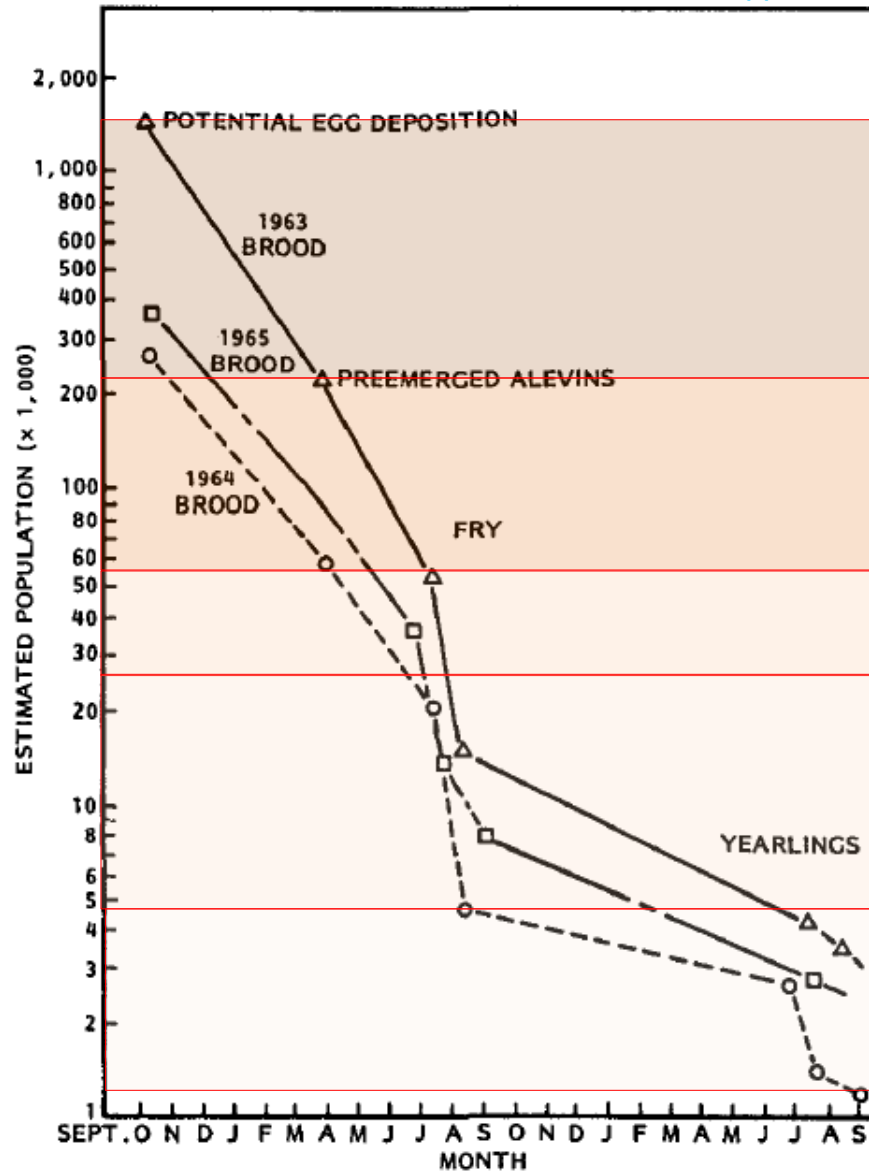


FIGURE 3. Mean (A) number of juvenile Chinook Salmon per sampling point and (B) proportion of occupied points along different shoreline categories based on a cumulative 2,450 samples collected during 11 repeated visits to Sacramento River sites characterized by rock revetment ( $n = 3$ ), mitigated ( $n = 9$ ), and natural ( $n = 4$ ) shorelines in spring 2013 and 2014. Vertical bars indicate 95% confidence intervals.



# Freshwater Juvenile Salmon Survival



21% Survive Egg to Emergence

7.1% Survive to July

2% Survive to September

0.7% Survive to 2<sup>nd</sup> July

0.4% Survive to 2<sup>nd</sup> September

FIGURE 11.—Estimated populations of juvenile coho salmon of three brood years, Sashin Creek, from potential egg deposition to late summer of second year. (Semilogarithmic plot to indicate mortality rate.)

Crone and Bond 1976 LIFE HISTORY OF COHO SALMON, ONCORHYNCHUS KISUTCH, IN SASHIN CREEK, SOUTHEAST ALASKA







# ADF&G Habitat Section

## The Fishway Act, Alaska Statute 16.05.841

- Requires that any obstruction built across fish-bearing waters will provide for fish passage (i.e. dam, fish ladder, culverts...)

## Anadromous Fish Act, Alaska Statute 16.05.871

- (a) ADF&G must specify those waters that are important for the spawning, rearing, or migration of anadromous fish
- (b) anyone that wants to do anything in a specified water must notify ADF&G
- (c) must submit full plans for the proposed work
- (d) ADF&G will approve or deny the proposed work

Main Point: Permitting examples specific to construction in the riparian area include water withdrawals (both .841 and .871) as well as activities that will modify the bed and banks of catalogued anadromous water bodies

All permitting questions regarding fish habitat permits should be directed to the ADF&G Habitat Office in Palmer at (907)861-3200 or [dfg.hab.infopaq@alaska.gov](mailto:dfg.hab.infopaq@alaska.gov)



# QUESTIONS?







1/16/23

Dear Chair Mike Wood and Members of the MSB Fish and Wildlife Commission:

I support the draft FWC Resolution 23-01 on the importance of the protection of Riparian Buffers.

Extensive scientific research has been done with much documentation. Riparian buffers along waterways provide important physical, biological, and ecological functions along with positive economic benefits.

Mat Su lakes and salmon streams are a positive influence on real estate values. Mat Su lakes and streams are worth more than \$2.5 billion in commercial assets. This is 2011 data according to the Mat Su Borough's own Private Property Analyses-the Positive Influence of Lakes, Streams, and Open Spaces on Property Values. (See [Matsu2050.org](http://Matsu2050.org).)

The Assembly through passage of Resolutions 21-124 and 21-125 have made fisheries protection an important funding priority. Fisheries protection is 1 of 7 FY23 state funding priorities and 1 of 11 FY23 federal priorities. The combined FY 23 asks by the Assembly for fisheries protection is \$6.5 million. Restoration of fish habitat and passage are the goals in order to prevent the declining salmon populations. And your draft Resolution has stated that the borough has already spent \$20 million towards those goals.

So why jeopardize all this work and funding by eliminating riparian buffers? It is senseless and extreme.

We know from Assembly Resolution 21-125, that the borough has a huge problem now with residences being built too close to waterways. The estimate is of 100 homes worth \$20 million are in high hazard zones for flooding and erosion. Flood mitigation and acquisitions are going to have to be done. So why would we want to create more problems that will cost us money by allowing new buildings to be built right up to the shoreline with no setbacks or riparian buffers?

The current building setback in code is very weak. It is too minimal. An Assembly Ordinance to amend code should not eliminate the building setback. It should be to strengthen the code to include riparian buffers along with building setback. THIS IS WHY I SUPPORT THE FWC RESOLUTION.

Becky Long