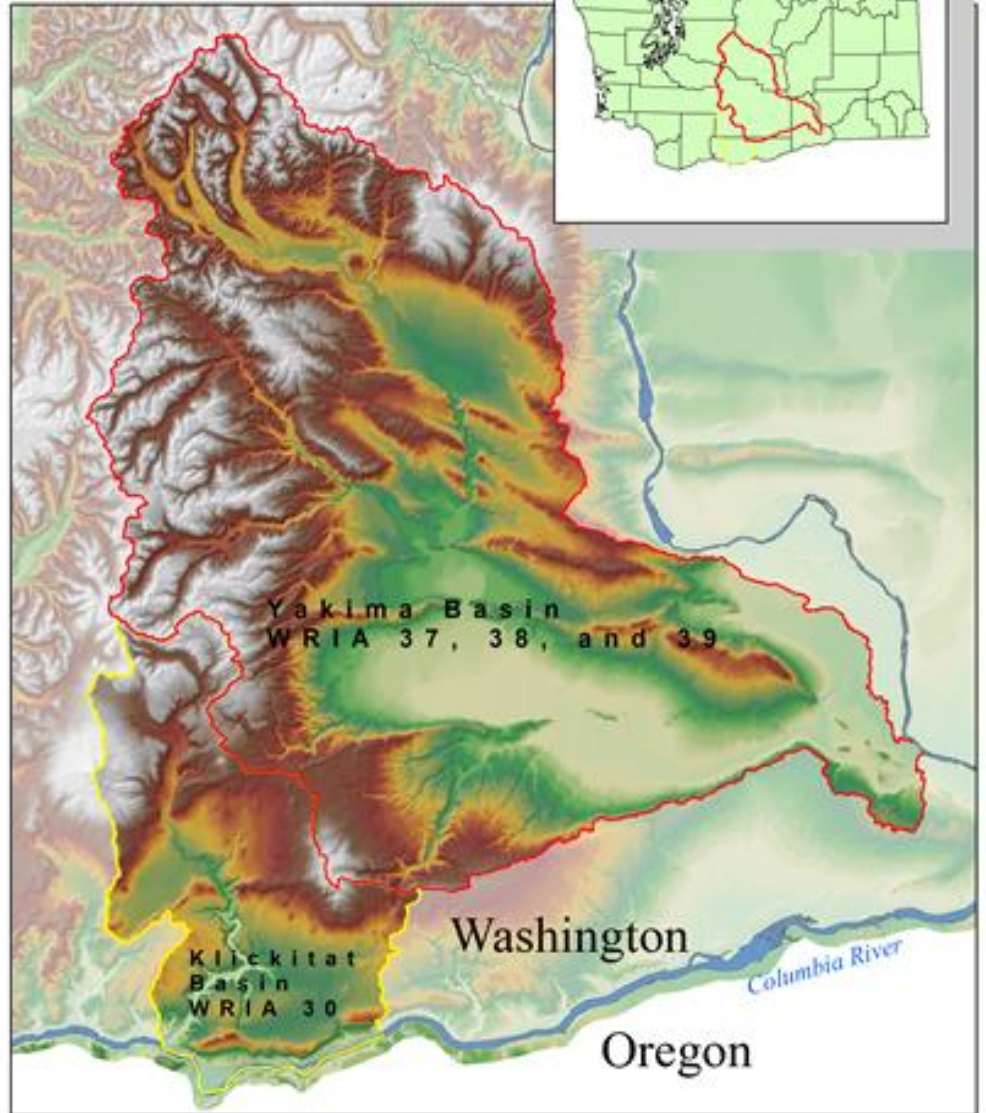




Yakima Klickitat Fisheries Project

Michael Porter
Fisheries Biologist

- Avian and Fish Predation Studies
- Yakima River Basin
- Great Blue Heron PIT Recoveries
- Chinook Survival in the Yakima River
- Yakima River Fish Predators



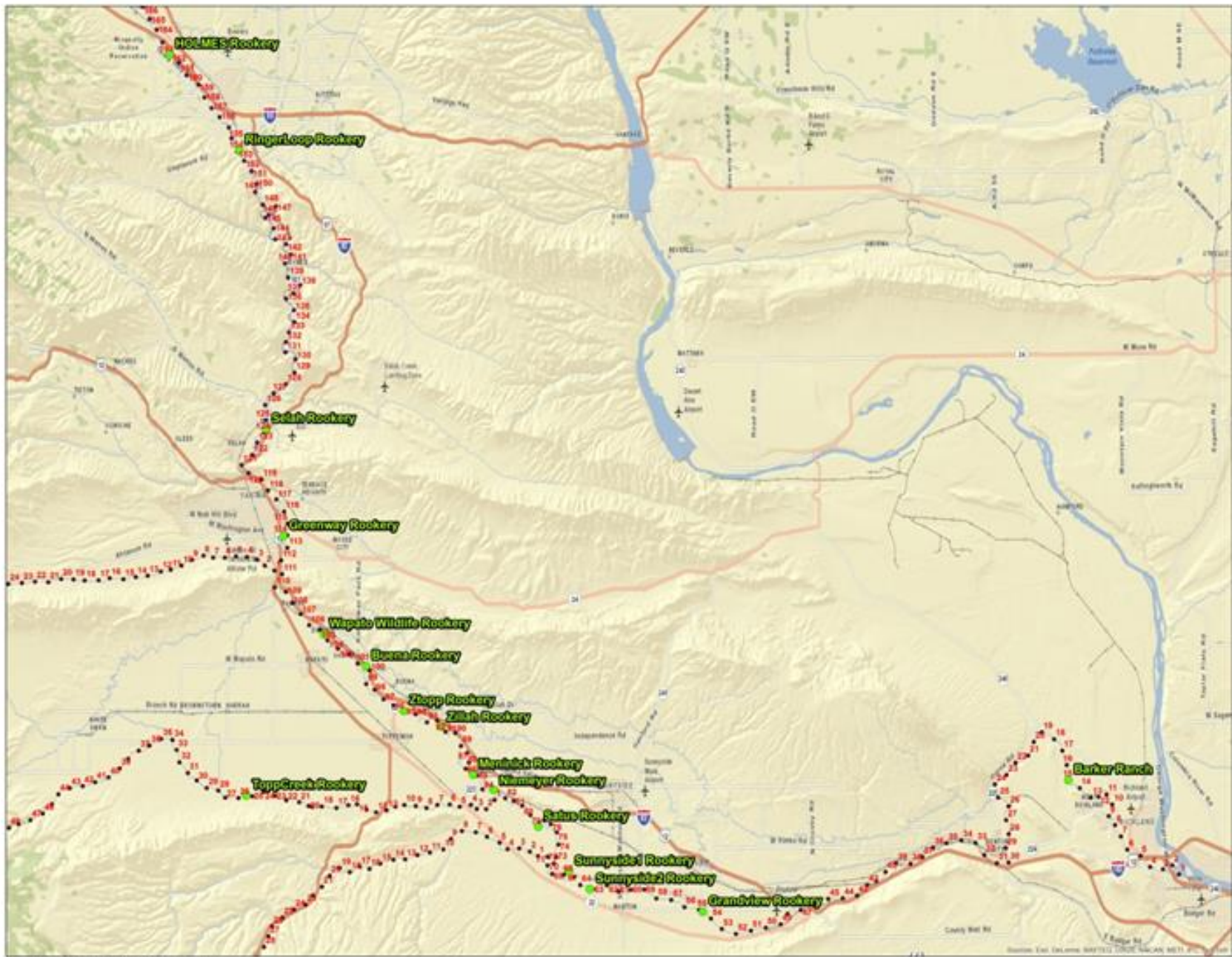


28 Great Blue Heron Rookeries Identified

- 8 New Rookeries in 2014 and 2015
- 2 Rookeries Contain Cormorants

PIT Tags – Passive Integrated Transponder Tags

- Detailed info – Origin, Run, Rear....
- In river interrogation sites tracking tagged fish
- Portable Antennas used for scanning



A photograph of two Great Egrets perched on nests made of sticks and twigs in a tree. The birds are dark with long necks and sharp beaks. The background is a clear blue sky. The tree branches are mostly bare, with some green leaves visible on the left side.

Selah Rookery

Surveys from 2008 to 2013
produced over 3100 PIT tags

Located along the Roza Reach of Yakima River

- Frequently drops below the ideal flow regime for smolt out-migration
- Creates predation opportunities for wading birds

Roza Dam

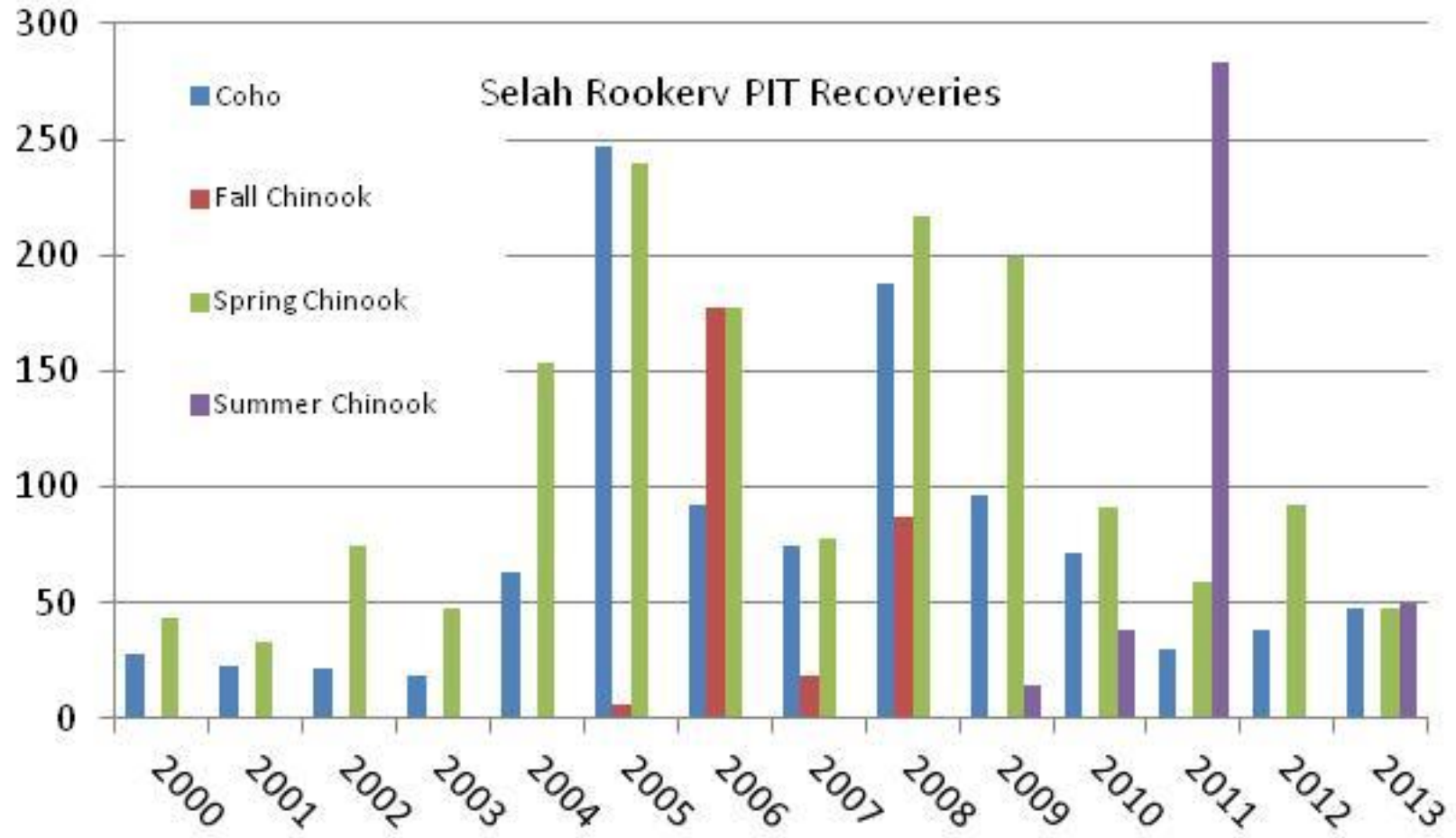
Roza Reach

- Roza Dam to confluence Naches River
- Reach Distance - 18.3 Km
- Roza Dam diverts water for Irrigation & Power

Selah Heron Rookery

Naches River

Selah Rookery PIT Recoveries



Seeding PIT tags for Detection Efficiencies

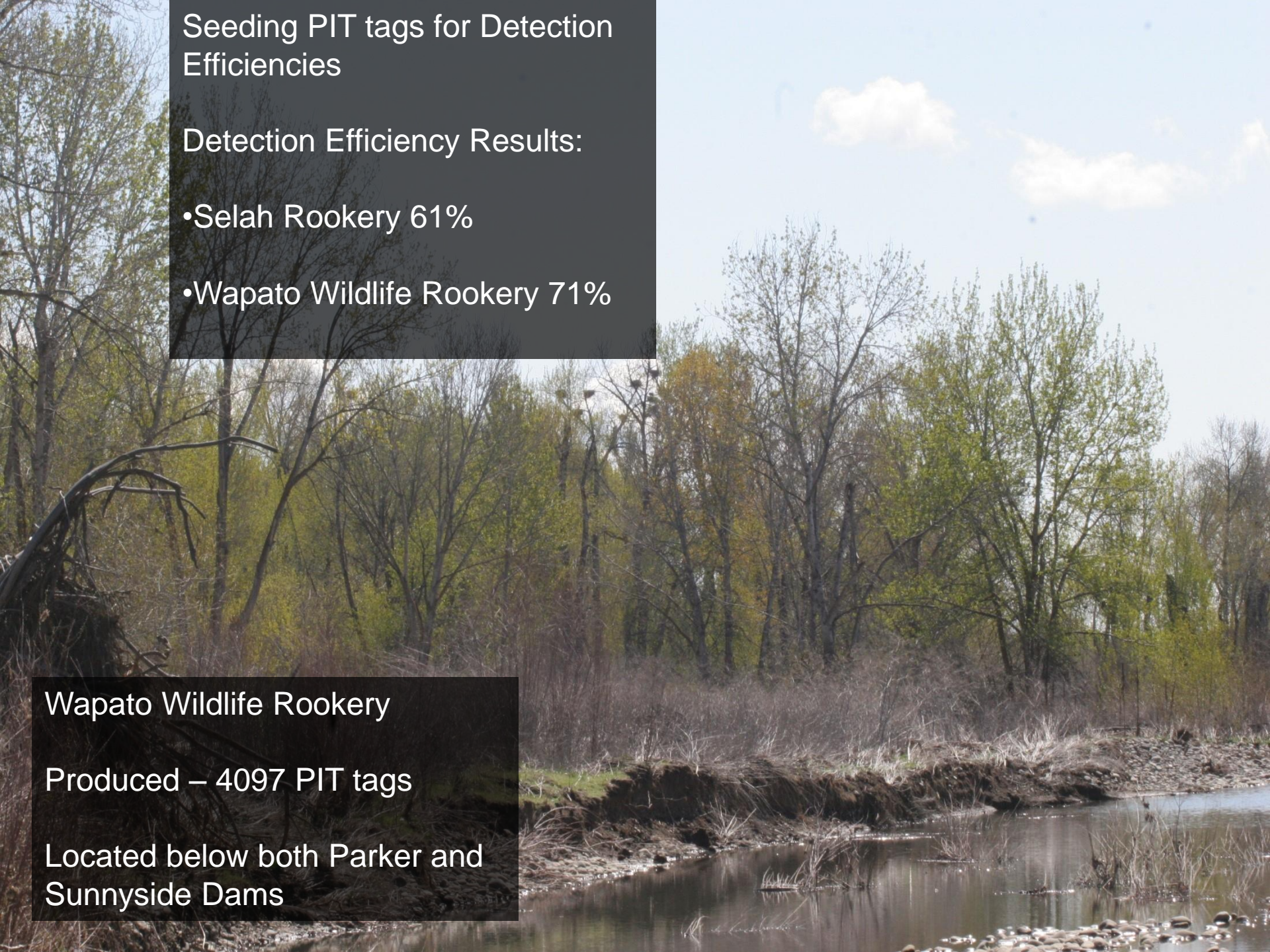
Detection Efficiency Results:

- Selah Rookery 61%
- Wapato Wildlife Rookery 71%

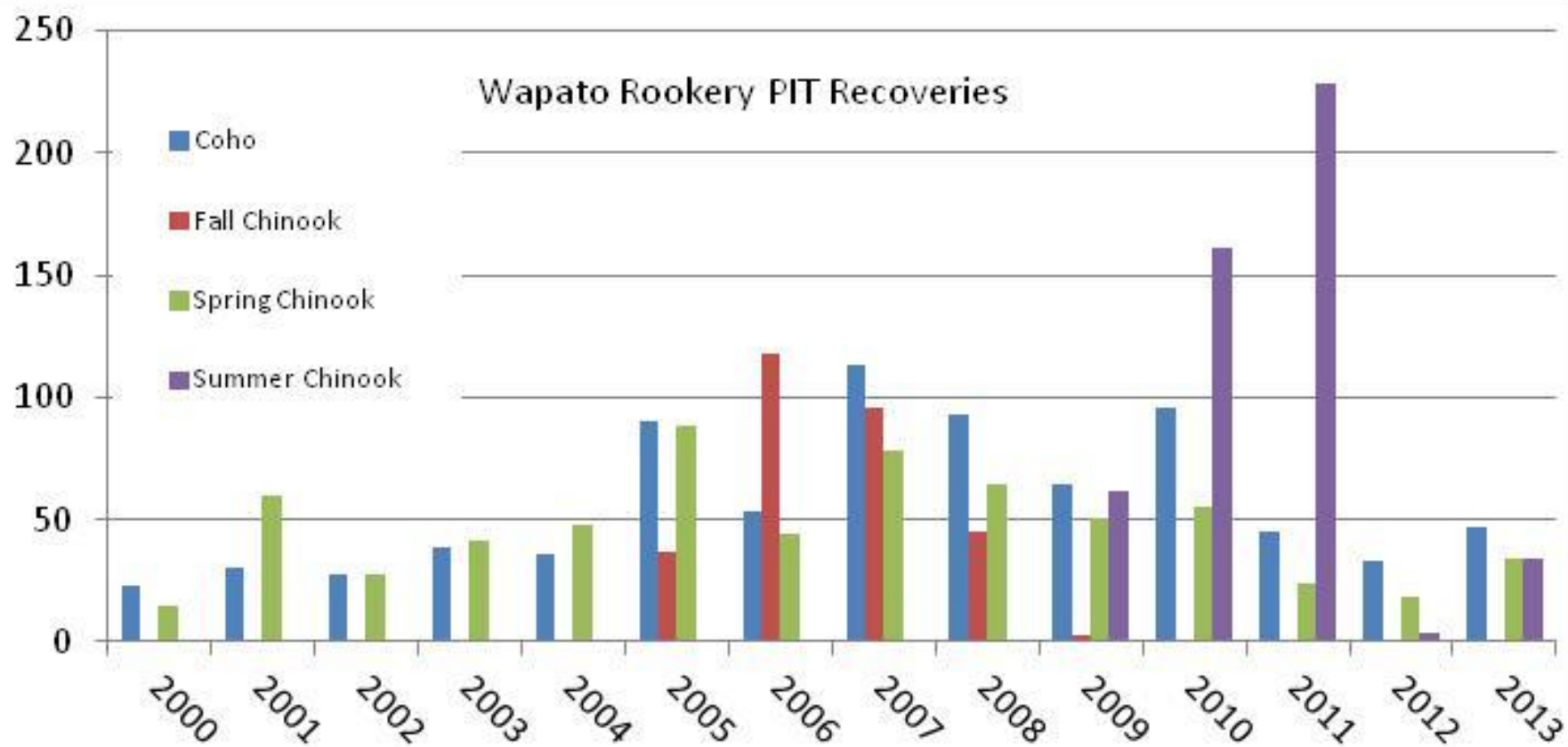
Wapato Wildlife Rookery

Produced – 4097 PIT tags

Located below both Parker and Sunnyside Dams



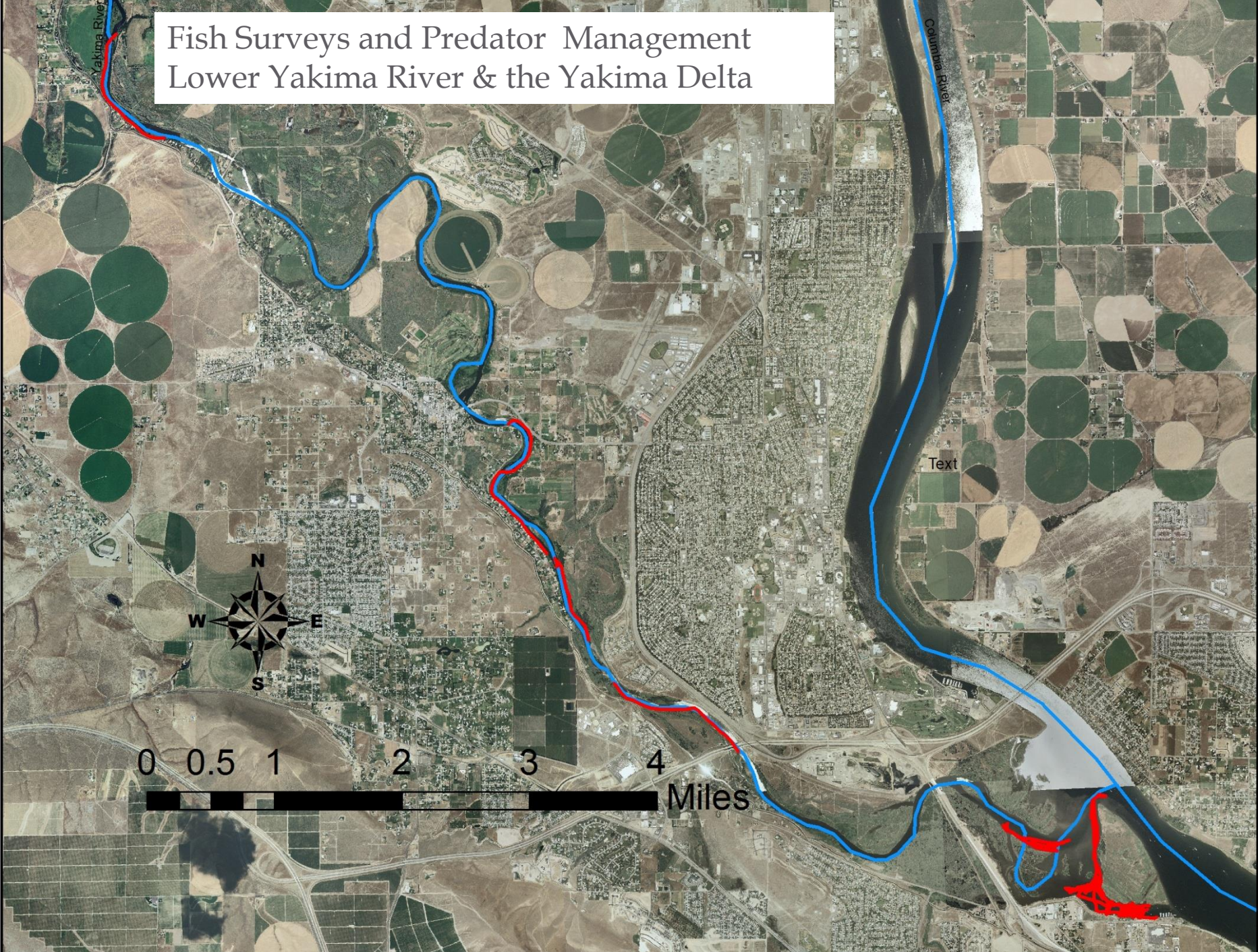
Wapato Rookery PIT Recoveries



Great Blue Heron PIT tag Surveys

- ▣ Useful in pointing out areas of smolt vulnerability to predation
- ▣ Investigation of close proximity Irrigation Diversion Canals and Fish Screening Facilities
- ▣ Gives a baseline Mortality

Fish Surveys and Predator Management Lower Yakima River & the Yakima Delta



SMALLMOUTH BASS – *Micropterus dolomieu*



By 1925, 5000, Smallmouth Bass had been introduced to the Yakima River and had established resident populations. The Yakima River serves as a spawning nursery for Smallmouth Bass coming from the Columbia River

CHANNEL CATFISH - *Ictalurus Punctatus*



Introduced into Washington State in 1892 (Lampman 1946)
Channel Catfish naturally produce in only the Columbia , Snake, Walla Walla, and
Yakima Rivers.

BROWN BULLHEAD - *Ameiurus Nebuloso*



Introduced into Washington State in 1882 - 1883(Lampman 1946)
Brown Bullheads inhabit warm-water ponds, lakes, sloughs, and
Sluggish areas in streams. (Yakima Delta)

LARGEMOUTH BASS - *Micropterus Salmoides*

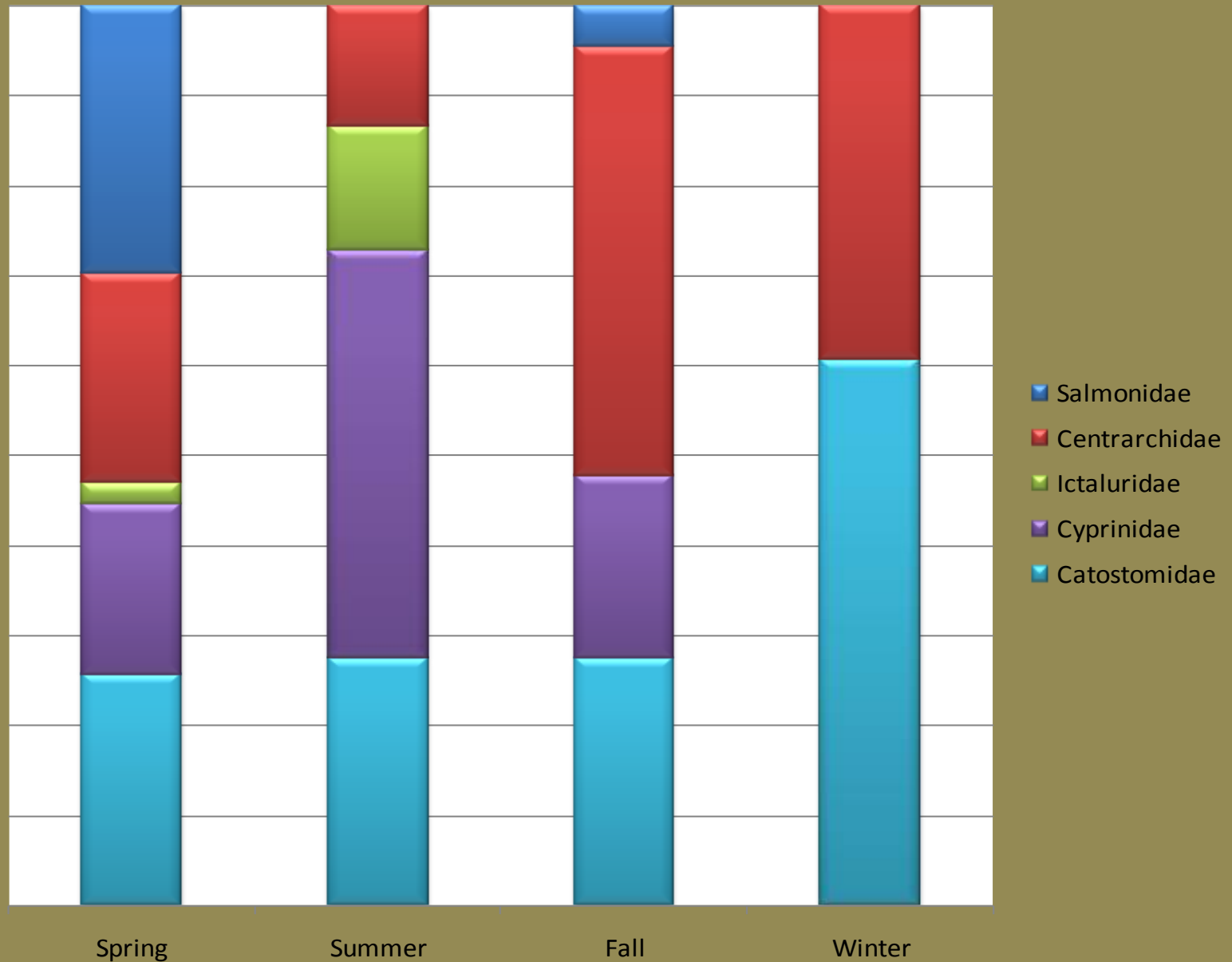


Widely introduced into Washington by 1895 the Largemouth Bass has established large populations in much of the Columbia River is frequently present in the Delta of the Yakima River

Lower Yakima River and Delta 23 Fish Species

Family	Common Name	Scientific Name
Salmonidae:		
	Steelhead/Rainbow trout	<i>Oncorhynchus mykiss</i>
	Coho Salmon	<i>Oncorhynchus kisutch</i>
	Chinook Salmon	<i>Oncorhynchus tshawytscha</i>
	Mountain Whitefish	<i>Prosopium williamsoni</i>
Cyprinidae:		
	Chiselmouth	<i>Acrocheilus alutaceus</i>
	Carp	<i>Cyprinus carpio</i>
	Peamouth	<i>Mylocheilus caurinus</i>
	Speckled Dace	<i>Rhinichthys osculus</i>
	Northern Pikeminnow	<i>Ptychocheilus oregonensis</i>
	Redside Shiner	<i>Richardsonius balteatus</i>
Catostomidae:		
	Sucker	<i>Catostomus columbianus</i> , <i>Catostomus catostomus</i>
Ictaluridae:		
	Brown Bullhead	<i>Ameiurus nebulosus</i>
	Channel Catfish	<i>Ictalurus punctatus</i>
Centrarchidae:		
	Pumpkin Seed	<i>Lepomis gibbosus</i>
	Blue Gill	<i>Lepomis macrochirus</i>
	Smallmouth Bass	<i>Micropterus dolomieu</i>
	Large Mouth Bass	<i>Micropterus salmoides</i>
	White Crappie	<i>Pomoxis annularis</i>
Percidae:		
	Walleye	<i>Stizostedion vitreum vitreum</i>
	Yellow Perch	<i>Perca flavescens</i>
Cottidae:		
	Sculpin	<i>Cottus bairdi</i>
Clupeidae:		
	Shad	<i>Alosa sapidissima</i>

Relative Catch Per Unit Effort, Lower Yakima River



Yakima Delta Fish Survey Areas



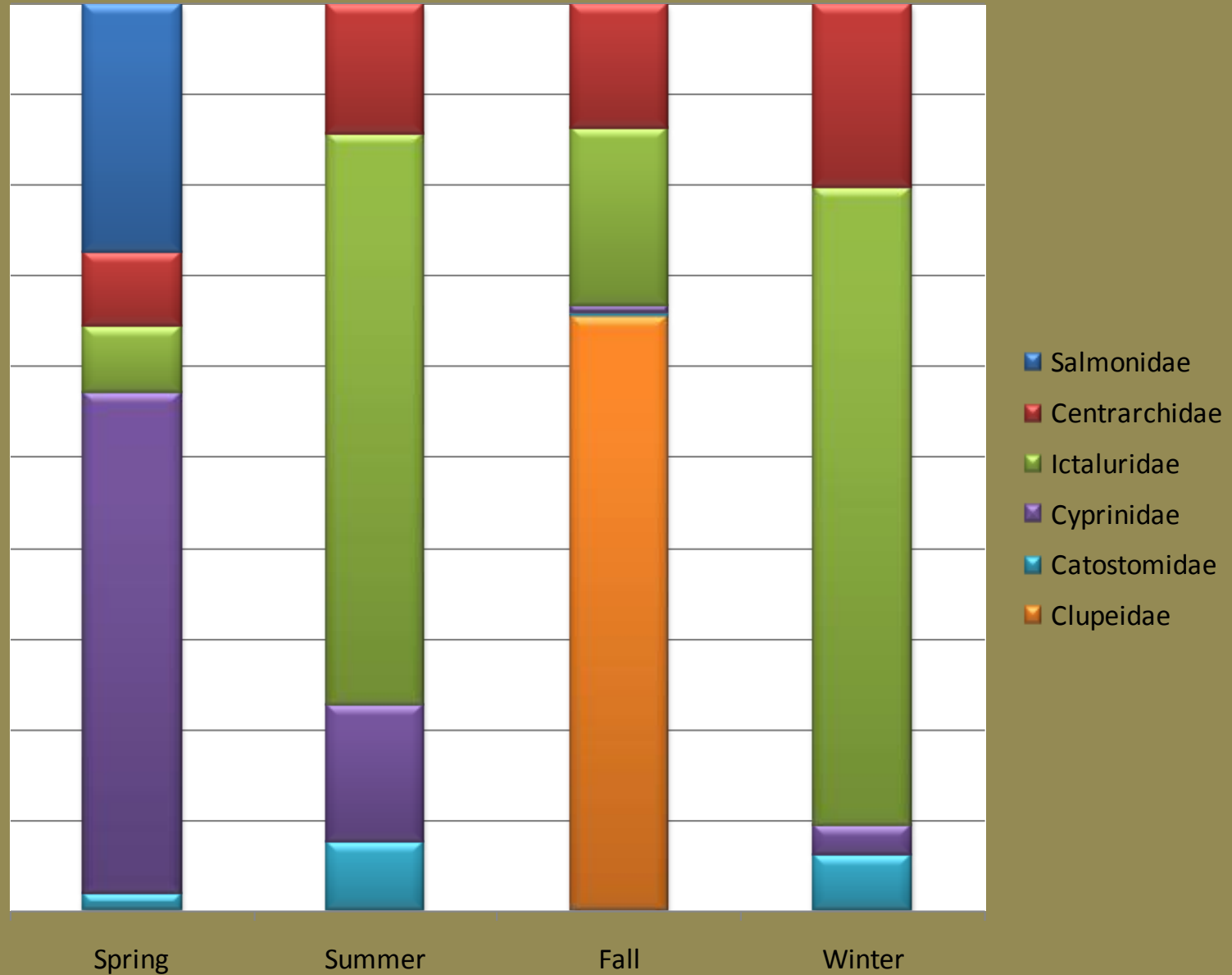
West of Causeway Below Bateman Island Displayed Greatest Utilization of Non-native fish species and piscivorous fish

Abundant Numbers of:

- Smallmouth Bass
- Largemouth Bass
- Brown Bullhead



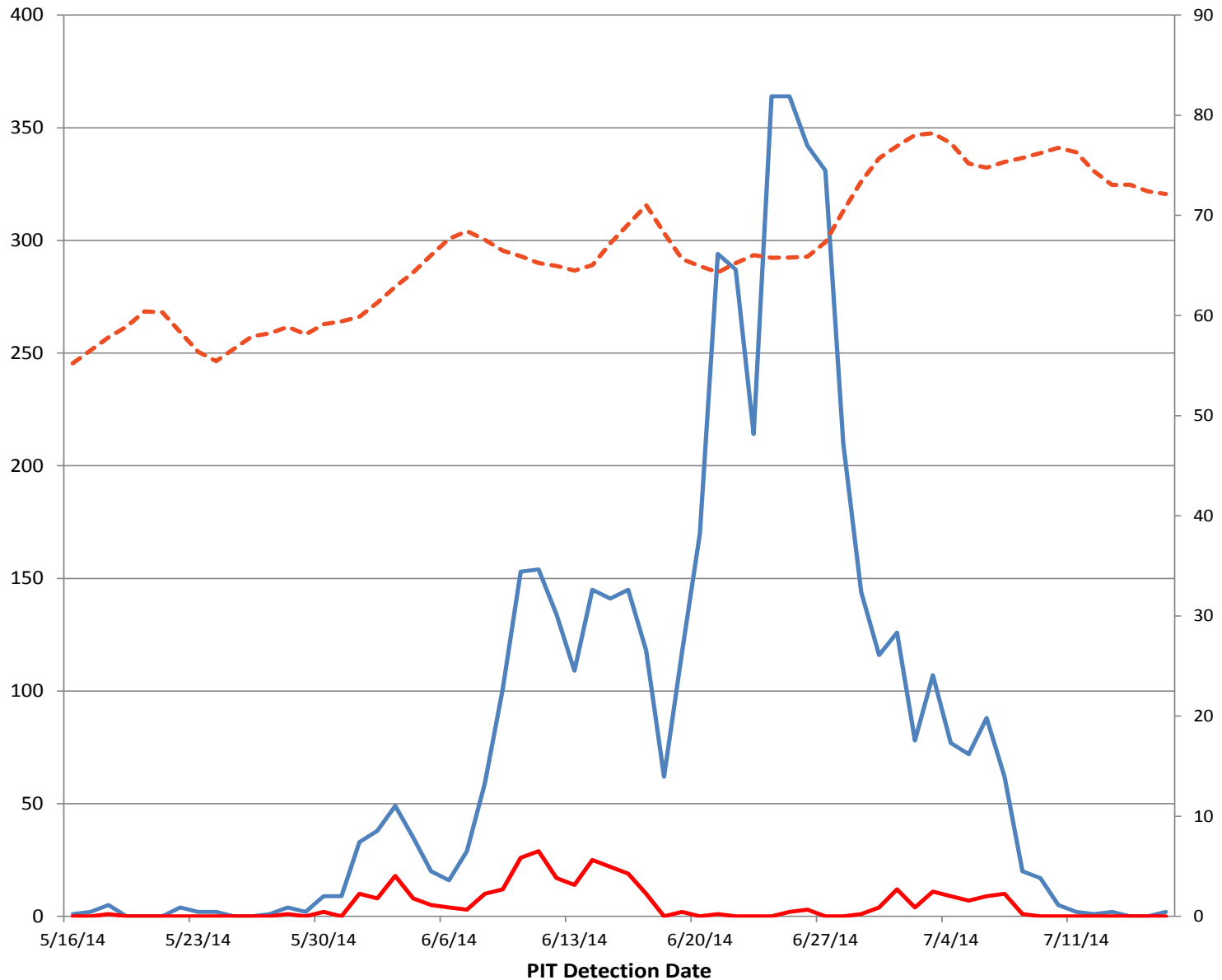
Relative Catch Per Unit Effort, West of Causeway



Sub yearling Chinook Survival

- ▣ Prosser to McNary
Dam survival
limitations
- ▣ Mortality in relation
to Temperature
- ▣ Parceling out areas of
Sub yearling Chinook
Losses
- ▣ Survival as a function
of Temperature
- ▣ Fish Predation
- ▣ Avian Predation
- ▣ Acoustic Tags

Summer Chinook PIT Detections 2014



— Detected Per Day at Prosser

— Also Detected Downstream (Any Site, Any Date)

- - - River Temp Kiona Farenheit

ATS Acoustic Tags

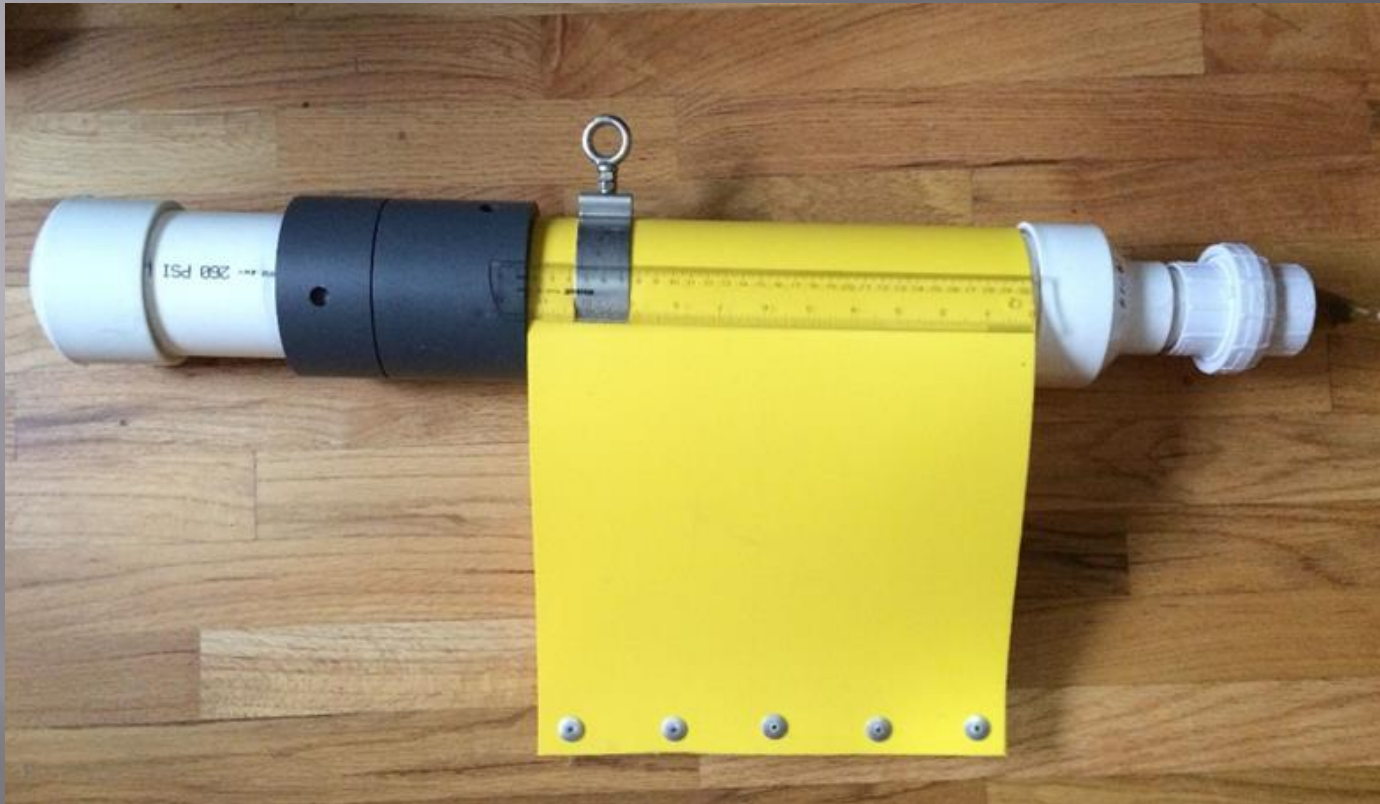
Used to investigate the location and level of sub yearling Chinook losses in the Lower Yakima River

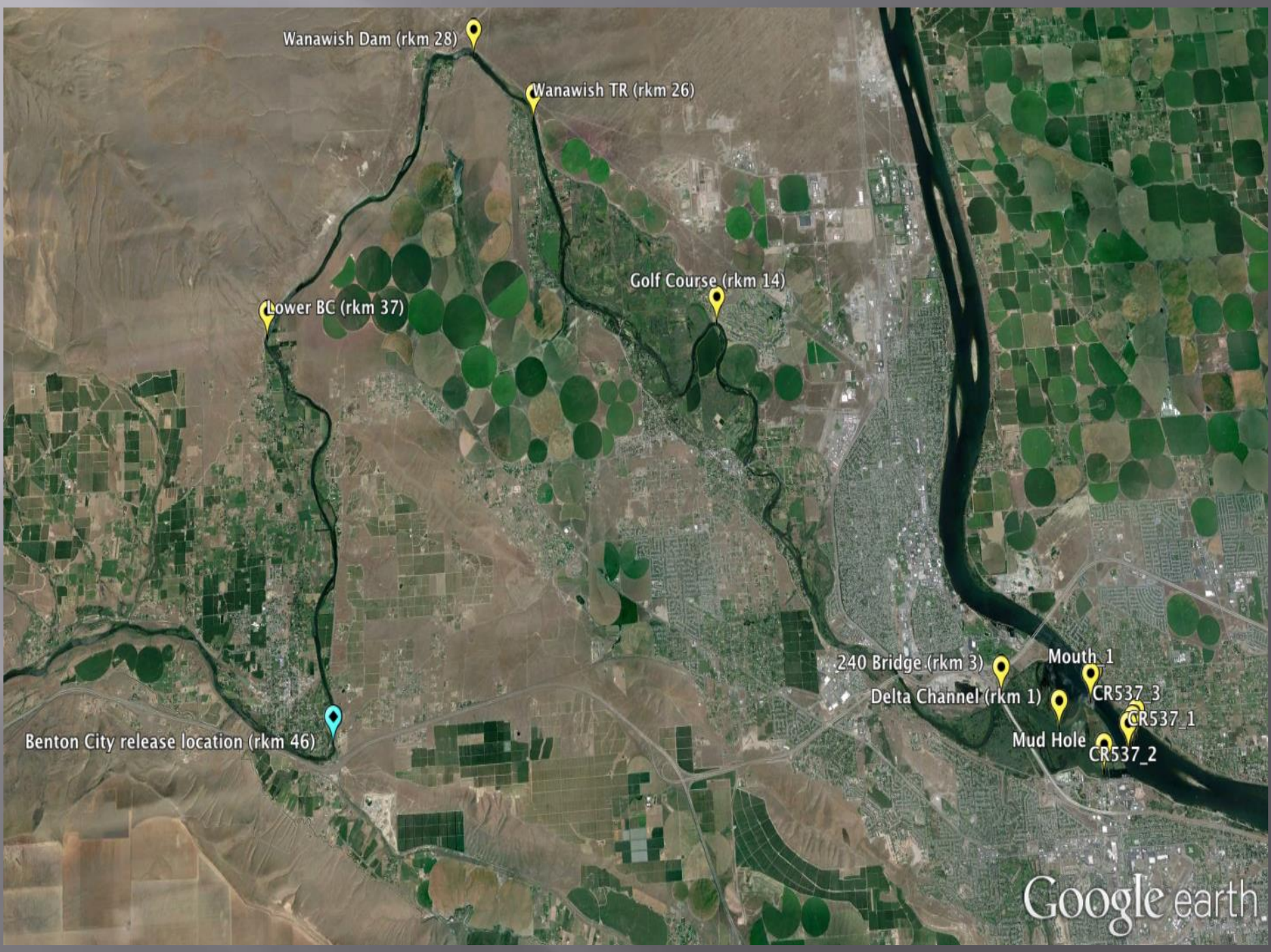




Acoustic Tag Receiver

12 ATS, Trident SR3000 Receivers will be strategically located in the Lower Yakima River and the Columbia River these will be paired with temperature gages





Wanawish Dam (rkm 28)

Wanawish TR (rkm 26)

Golf Course (rkm 14)

Lower BC (rkm 37)

Benton City release location (rkm 46)

240 Bridge (rkm 3)

Delta Channel (rkm 1)

Mouth 1

Mud Hole

CR537_3

CR537_1

CR537_2

Google earth

Acoustic Tag Pilot Study

- ▣ Determine Location and Magnitude of Sub yearling Chinook Losses
- ▣ Attempt to Identify Mortality Causes
 - Fish Predation
 - Avian Predation
 - Temperature
 - Structure
 - Water Flow

Yakima Delta as a non-native fish predator rearing area

Use Towed Bongo Nets to collect Larval Fish for identification







Implications of non-native fish predators rearing in Yakima River Delta

- ▣ Larval Walleye in lacustrine Yakima
- ▣ Adult piscivores actively spawning in Yakima River
- ▣ Various non-native piscivores rearing in delta
- ▣ Unknown component of Walleye predation



Yakima Delta – Bateman Island Causeway

- ❑ Blocks Yakima River Flow
- ❑ Creates an unnatural River Delta with stagnant water
- ❑ Stagnant pool raises water temperatures and creates recruitment habitat for exotic predator fish species
- ❑ Creates a thermal barrier for adult salmon migrating to the Yakima Basin by mixing with flowing river water
- ❑ Changes to the Delta structurally
- ❑ Water management may cause failure in year classes of exotic predators

Acknowledgments

MAINSTEM FISH
RESEARCH

PACIFIC NORTHWEST
NATIONAL LABORATORIES

Questions?