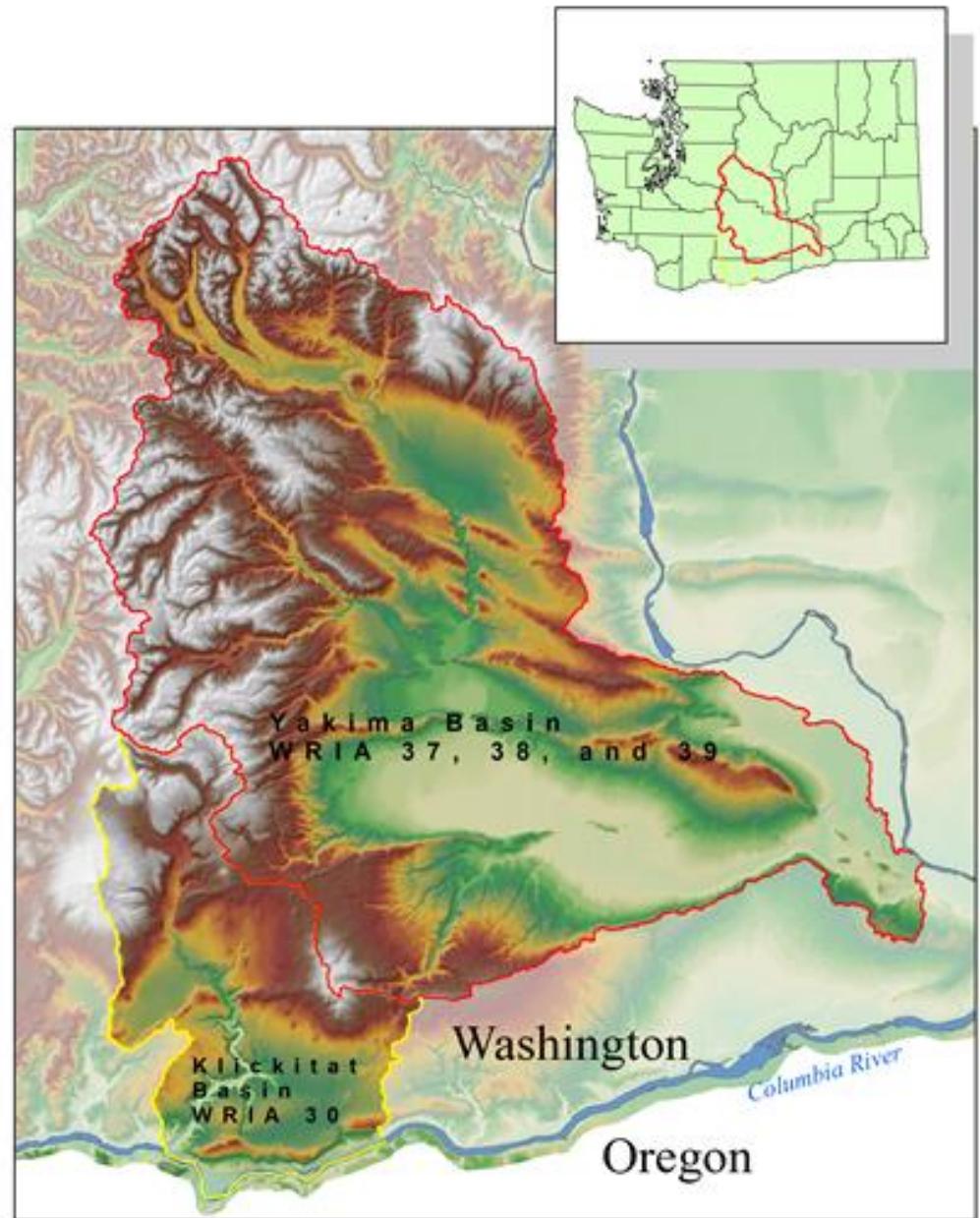


Yakima Klickitat Fisheries Project

Michael Porter
Fisheries Biologist

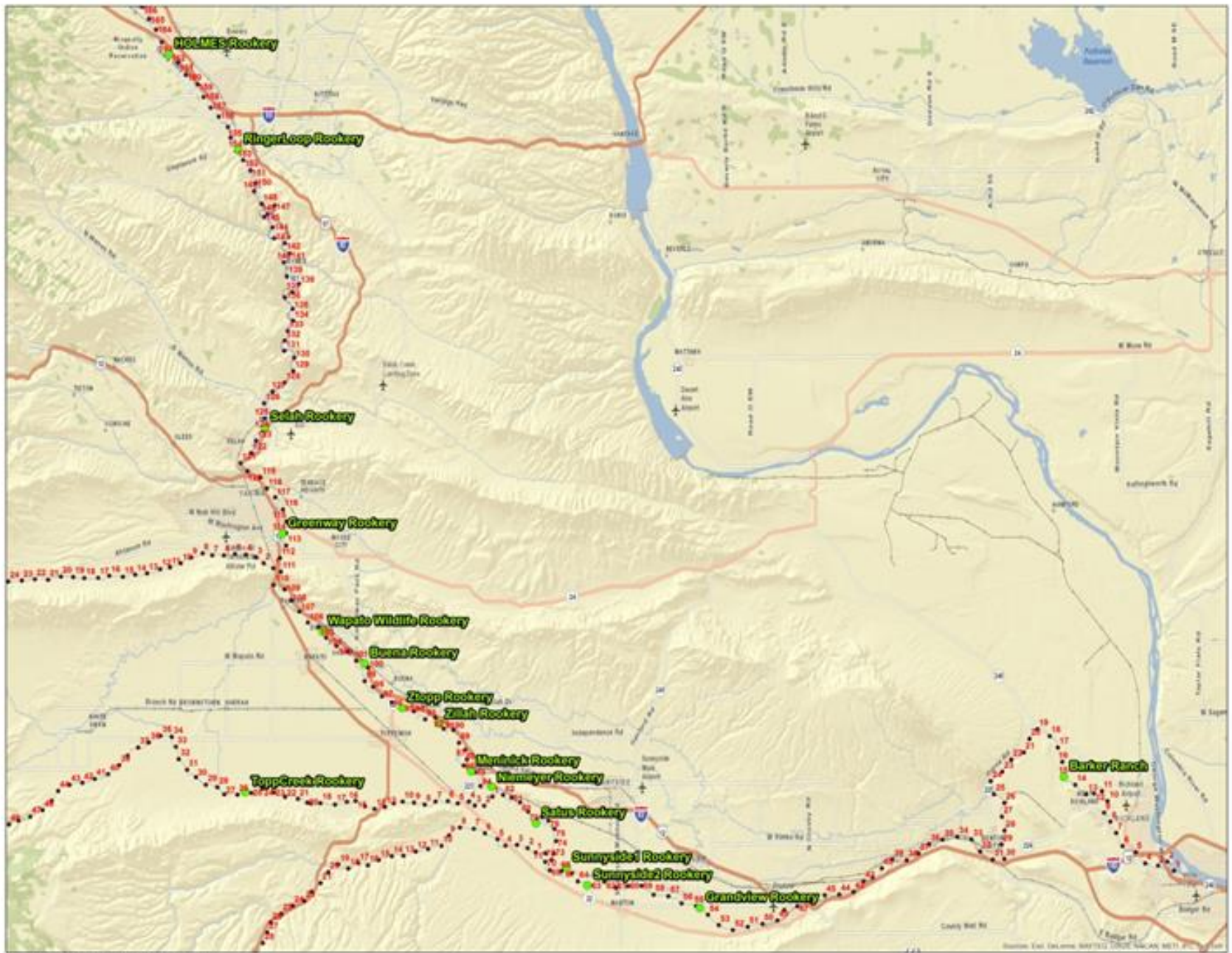
- Avian and Fish Predation Studies
- Yakima River Basin
- Great Blue Heron
- Yakima River Fish Assemblages





PIT Tags – Passive Integrated Transponder Tags

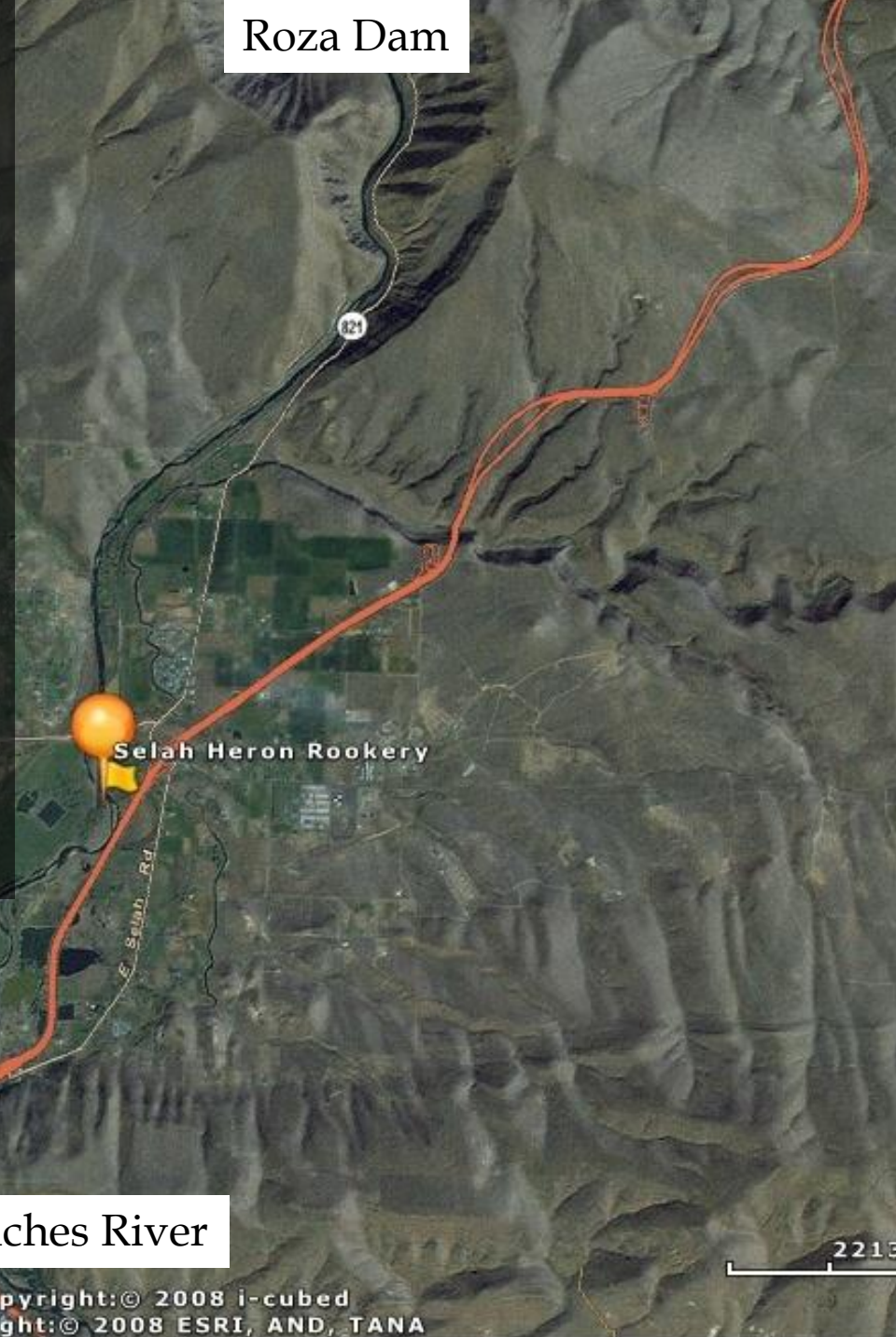
- Detailed info – Origin, Run, Rear....
- ESU specific species
- In river interrogation sites tracking tagged fish



Roza Reach

- Reach - Roza Dam to confluence Naches River
- Reach Distance - 18.3 Km
- Dam pulls water for Irrigation & Power
- The Reach commonly experiences low water flow during smolt out-migration
- Provides predation opportunities for wading birds (Great Blue Heron)

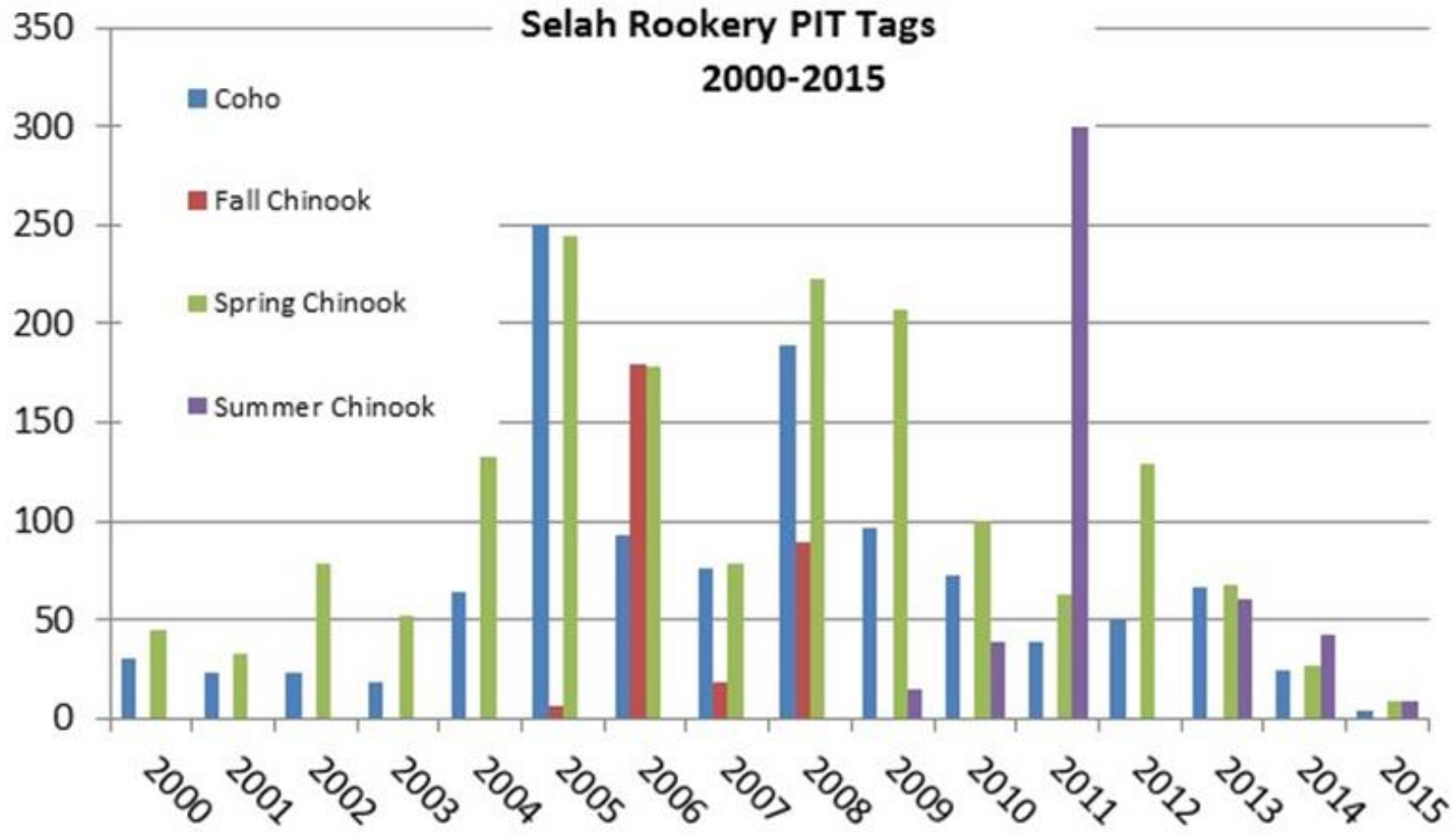
Roza Dam



Naches River



Selah Rookery PIT Tags 2000-2015



A photograph of two Great Egrets perched on a tree. One egret is standing on a branch above a large, cup-shaped nest made of dry sticks and twigs. The other egret is perched on a branch to the right. The background is a clear blue sky. The image is overlaid with text boxes.

Selah Rookery

- Produced over 3200 PIT tags to date

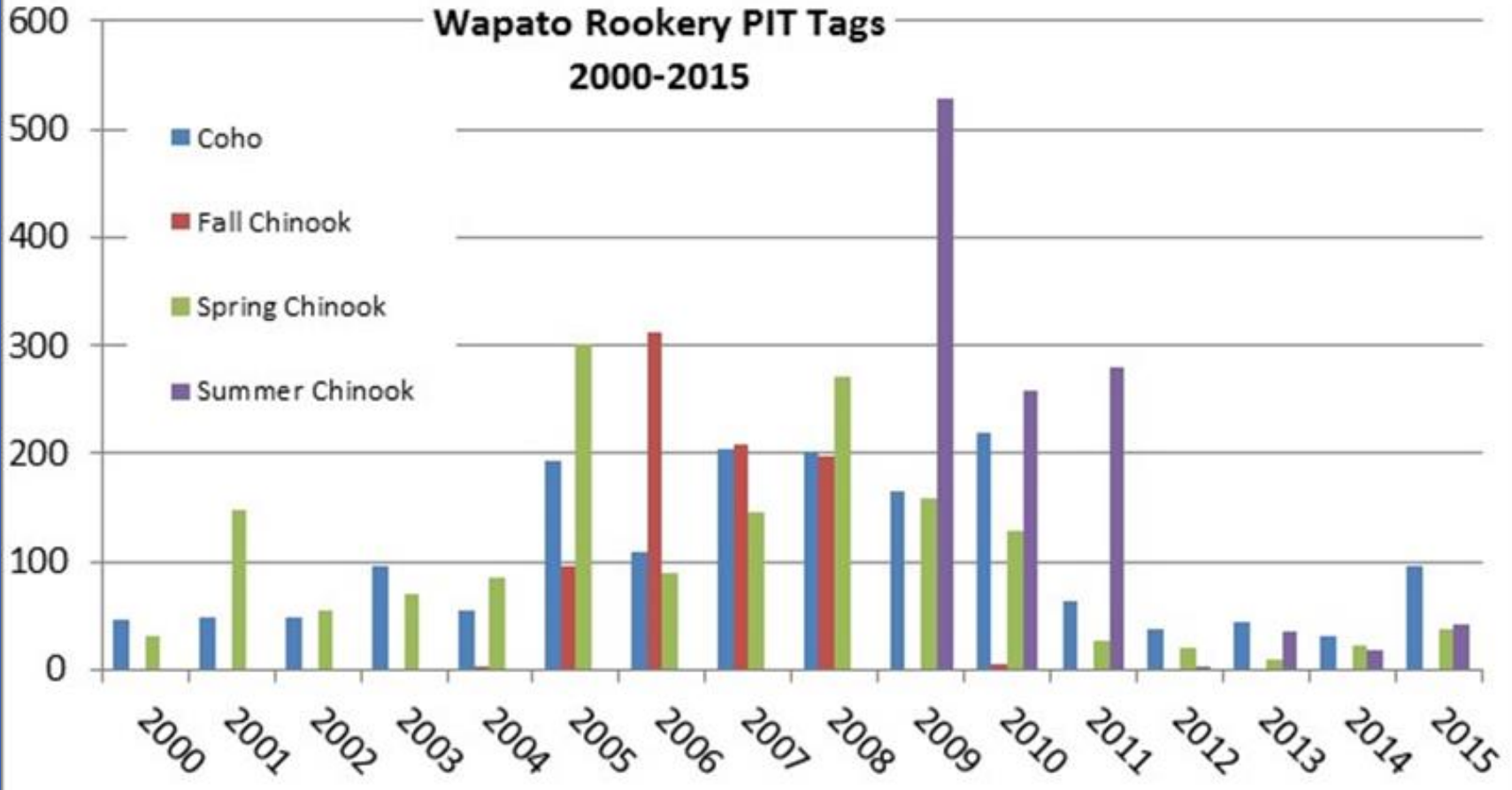
During drought years flows in the Roza Reach drop below ideal flow for smolt out-migration

The System Operation Advisory Commission (Basin Biologists) suggests that smolt migration flows should be at least 1000 CFS over a period of three days

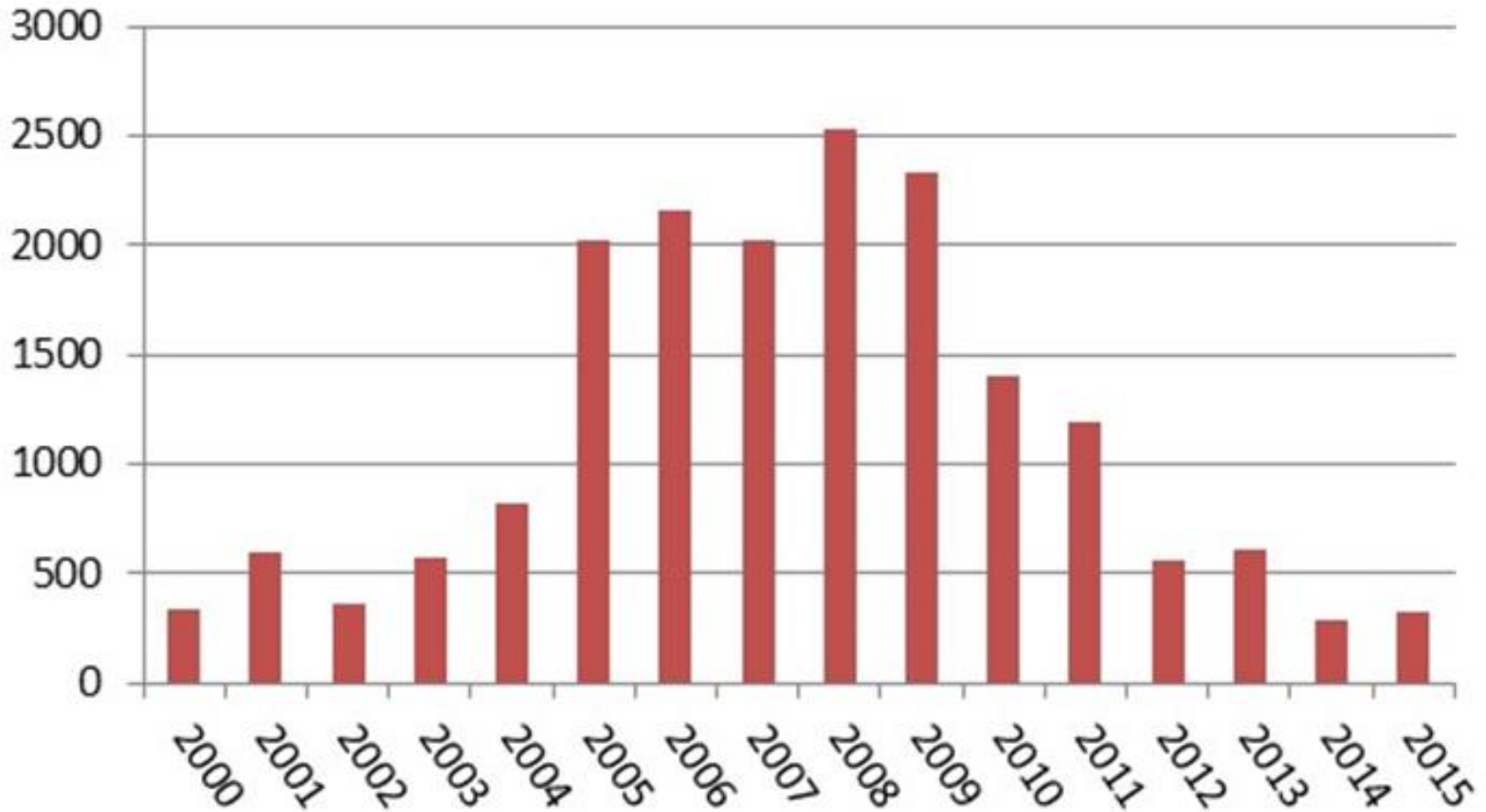
Great Blue Heron Predation & PIT Tags

- ▣ Useful in pointing out areas of smolt vulnerability to predation
- ▣ Wapato Wildlife Rookery
- ▣ Produced a high number of PIT tags ~ 4300
- ▣ Located below both Parker and Sunnyside Dams
- ▣ Investigation of close proximity Irrigation Diversion Canals and Fish Screening Facilities

Wapato Rookery PIT Tags 2000-2015



PIT tags surveyed under Great Blue Heron Rookeries Yakima Basin 2000-2015



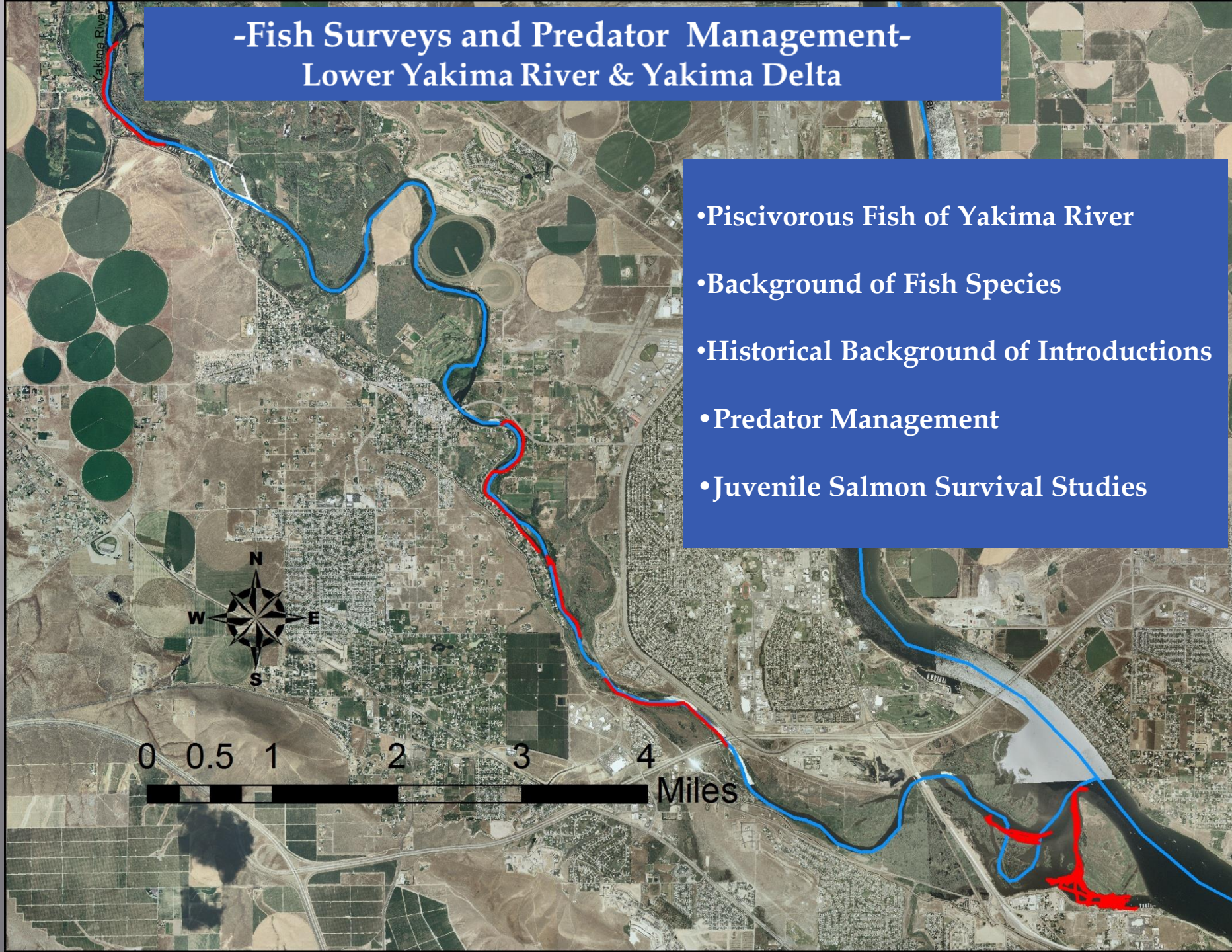
Total ~ 18,000 Salmon PIT tags

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

- Piscivorous Fish of Yakima River
- Background of Fish Species
- Historical Background of Introductions
- Predator Management
- Juvenile Salmon Survival Studies



0 0.5 1 2 3 4 Miles



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*

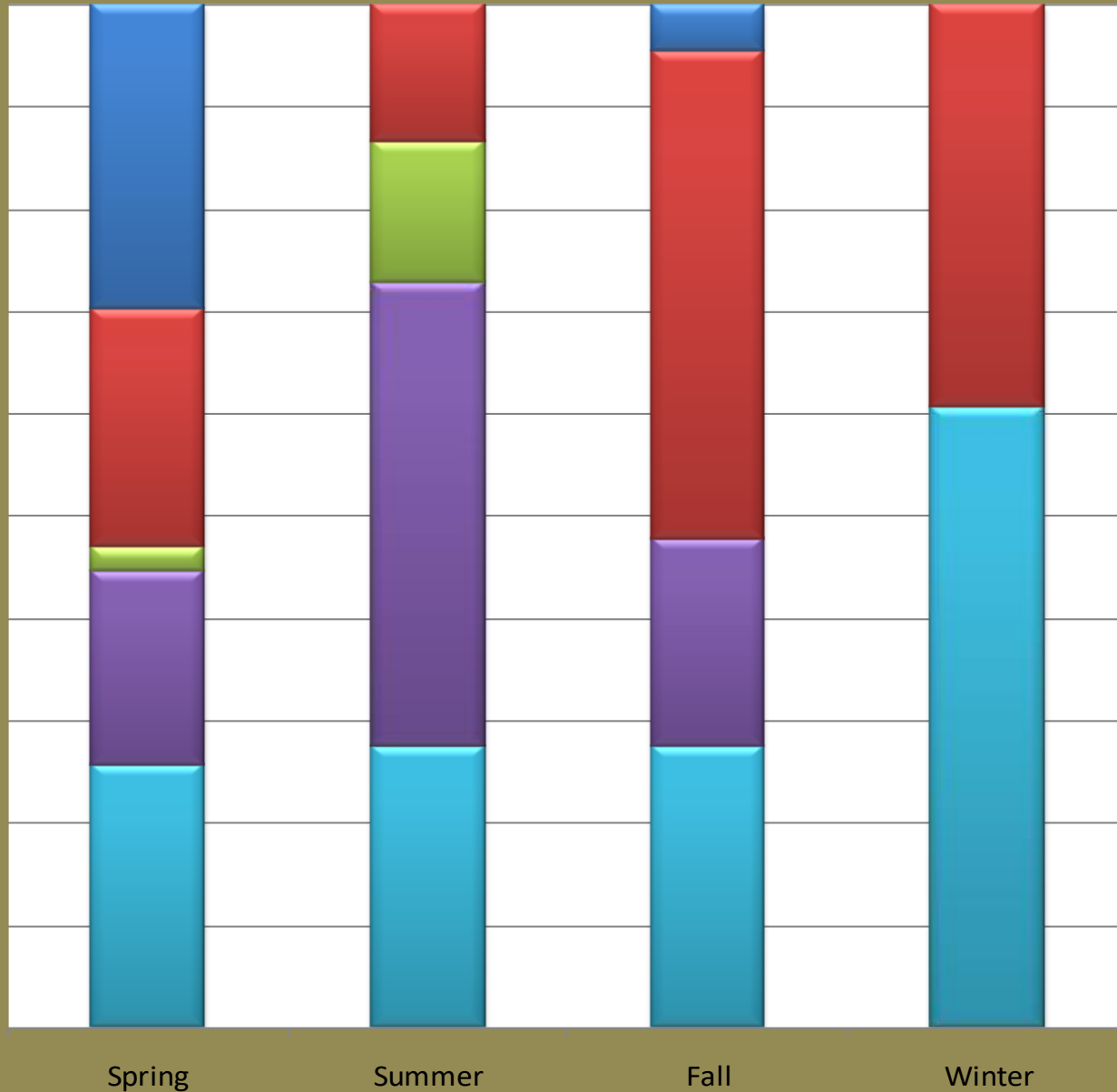


Widely introduced into Washington by 1895 the Largemouth Bass has established large populations in much of the Columbia River is frequently present in the Delta of the Yakima River

Lower Yakima River and Delta Fish 23 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

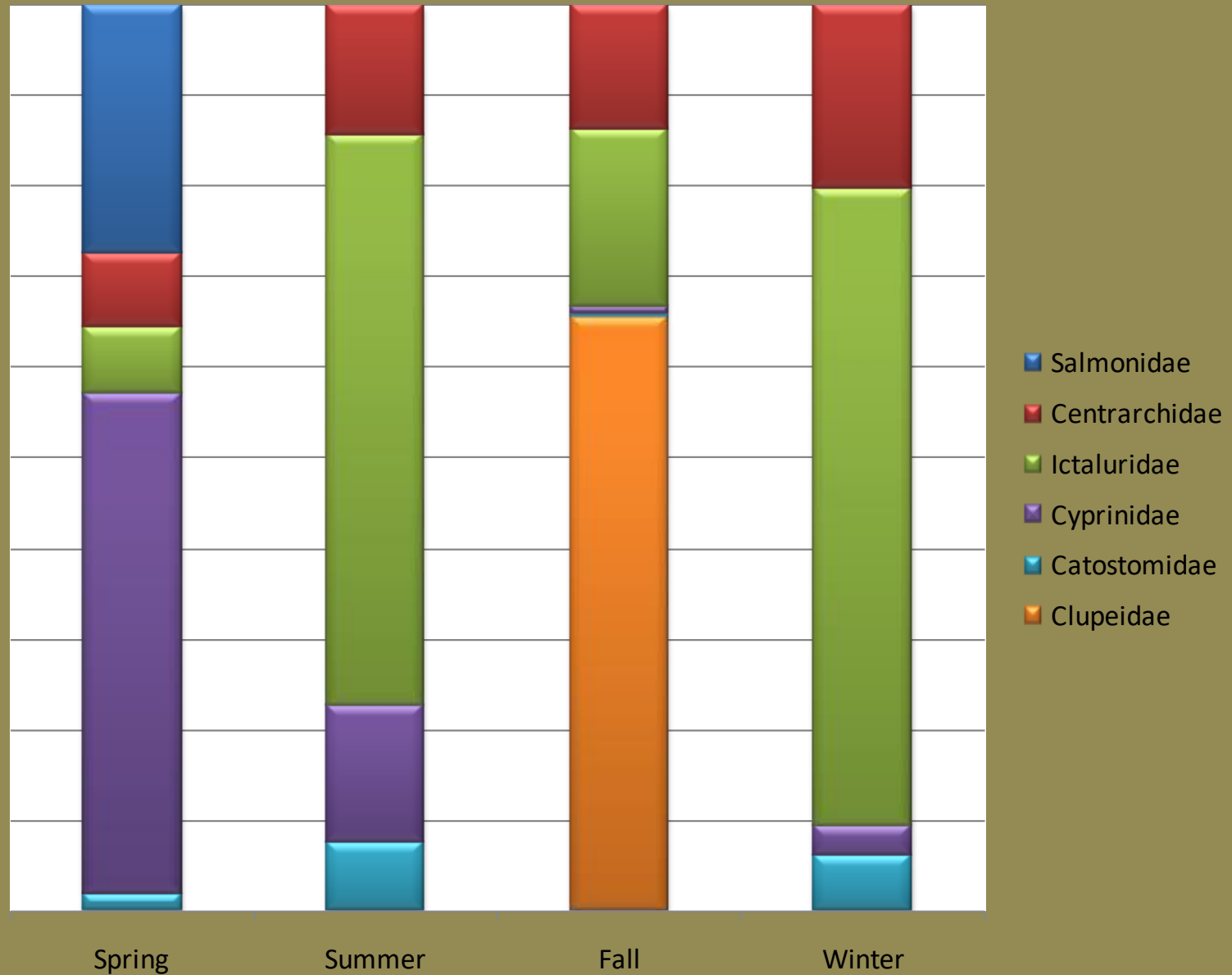


West of Causeway Below Bateman Island Displayed Greatest Utilization of Non-native Fish Species and Piscivorous Fish

- Smallmouth Bass
- Largemouth Bass
- Brown Bullhead

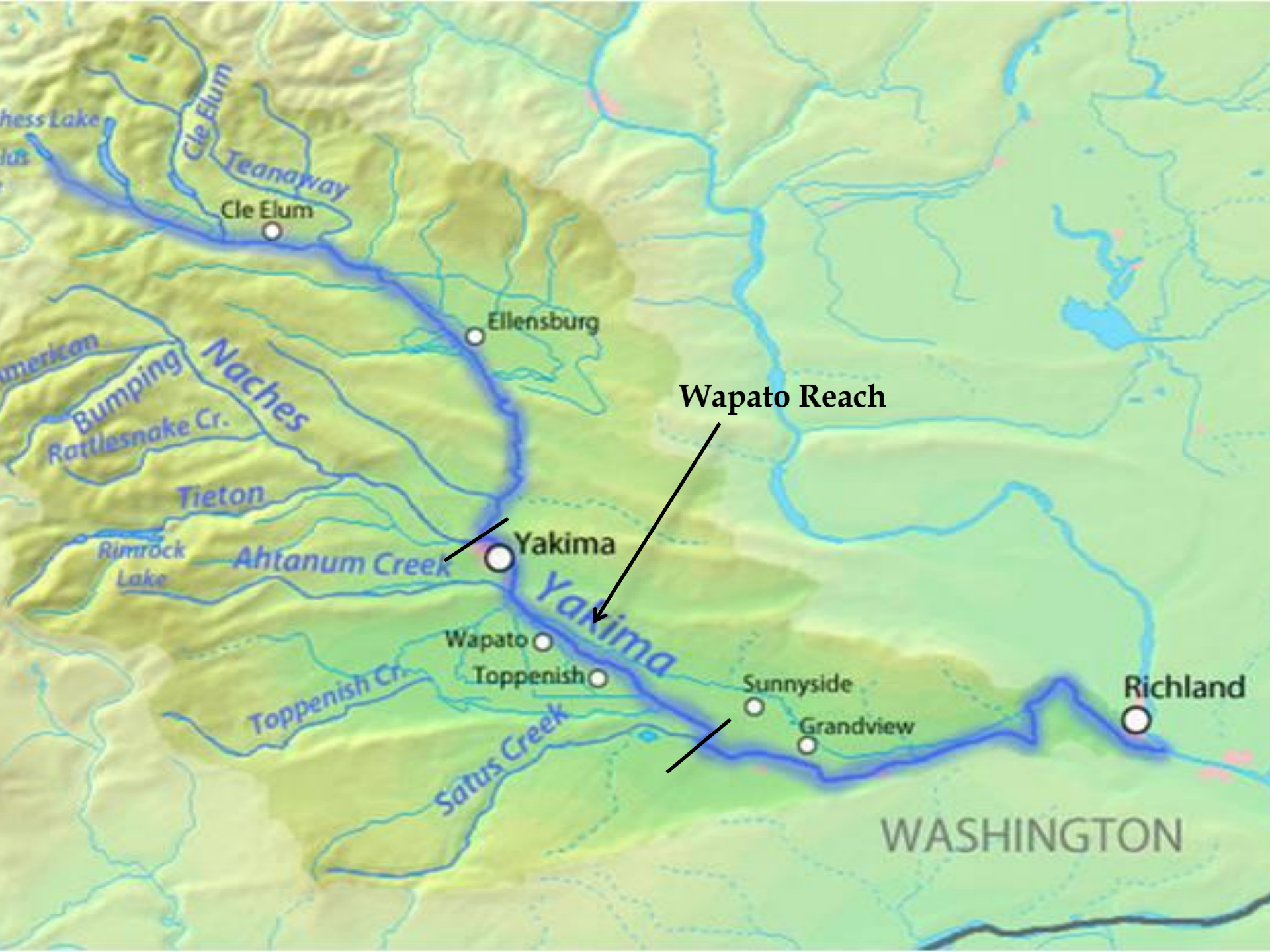


Relative Catch Per Unit Effort, West of Causeway



Yakima Delta – Bateman Island Causeway

- ❑ Blocks Yakima River Flow on south side of Island
- ❑ Creates an unnatural River Delta which limits flow and creates stagnant water
- ❑ Stagnant pool of water west of causeway raises water temperatures creating habitat for non-native warm water fish species (piscivores)
- ❑ Creates a thermal barrier for adult salmon migrating to the Yakima Basin by mixing with flowing river water
- ❑ Disrupts spawning timing for adult summer migrants and causes salmon to hold at the mouth of the Yakima River until temperature drops (Sockeye and Summer Chinook)



Wapato Reach

WASHINGTON

Yakima River – Wapato Reach – 10 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>
	Northern Pikeminnow	<i>Ptychocheilus oregonensis</i>
	Redside Shiner	<i>Richardsonius balteatus</i>
Catostomidae:		
	Sucker	<i>Catostomus columbianus</i> , <i>Catostomus catostomus</i>
Centrarchidae:		
	Smallmouth Bass	<i>Micropterus dolomieu</i>

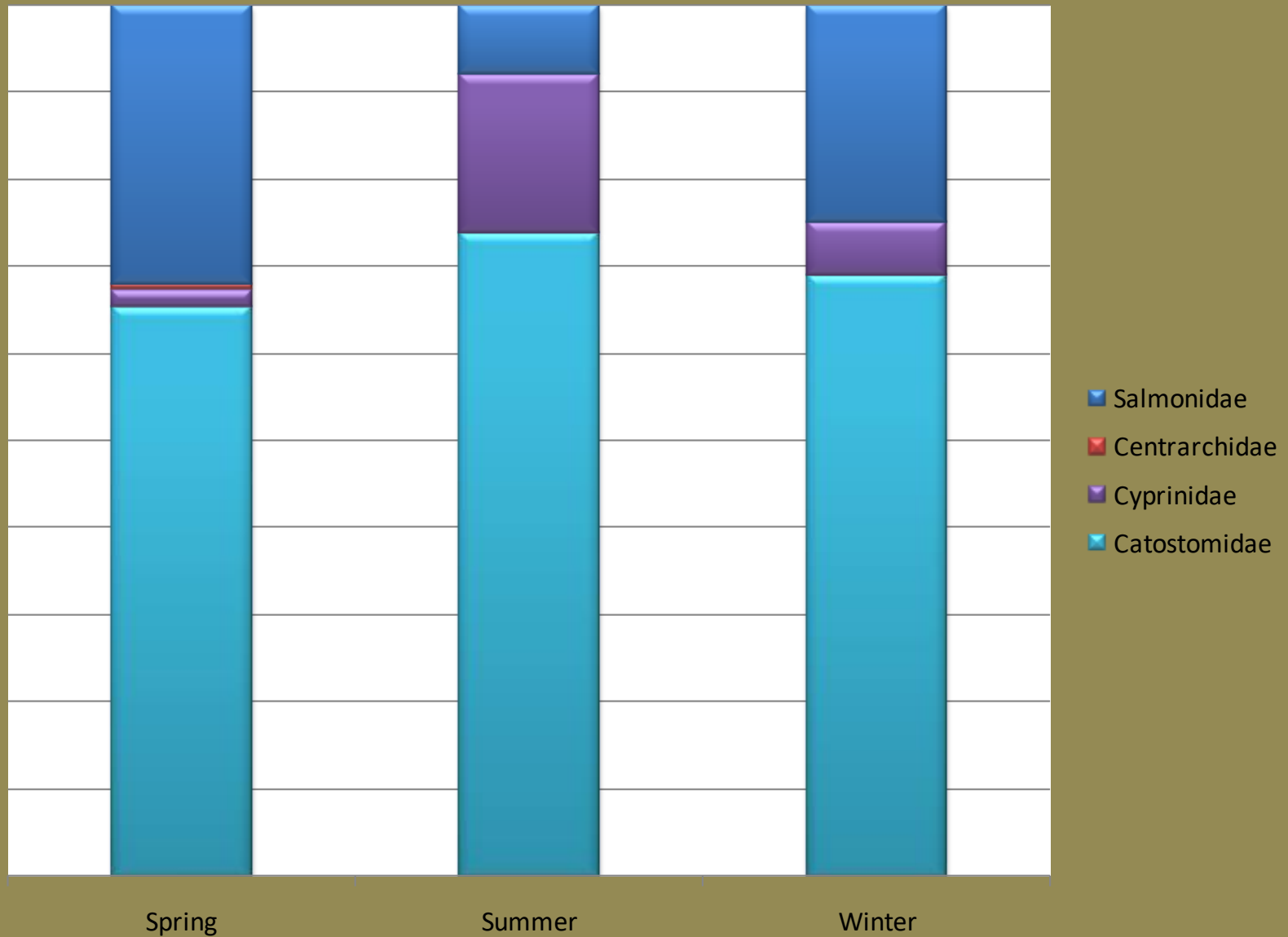
Fish Predator Wapato Reach

- ❑ Northern Pike Minnow
- ❑ CPUE 5 fish per minute in side channels
- ❑ Sub basin Drain showed extremely high numbers of NPM –
Toppenish Sewage Plant

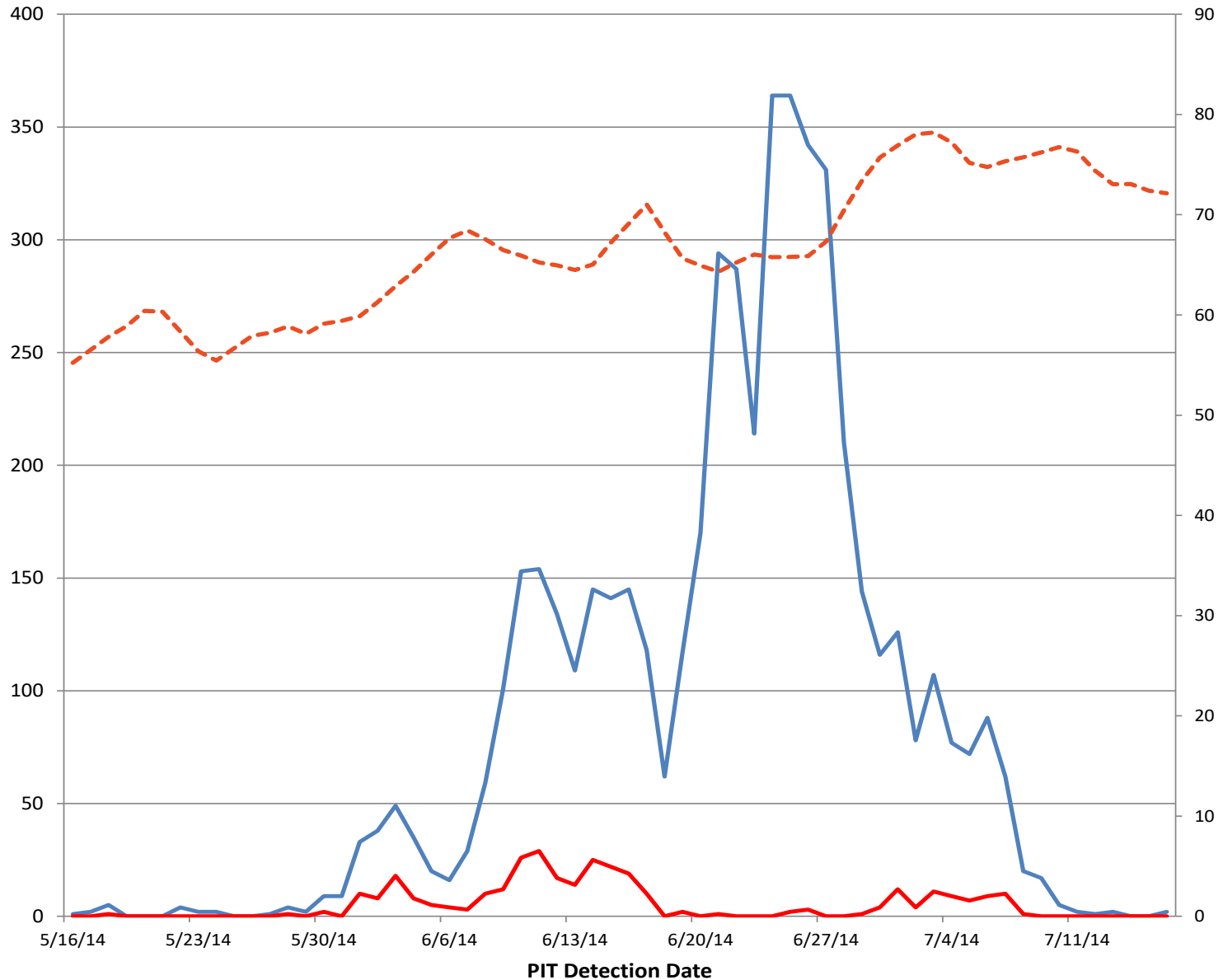




RelativeCatch Per Unit Effort, Wapato Reach



Summer Chinook PIT Detections 2014

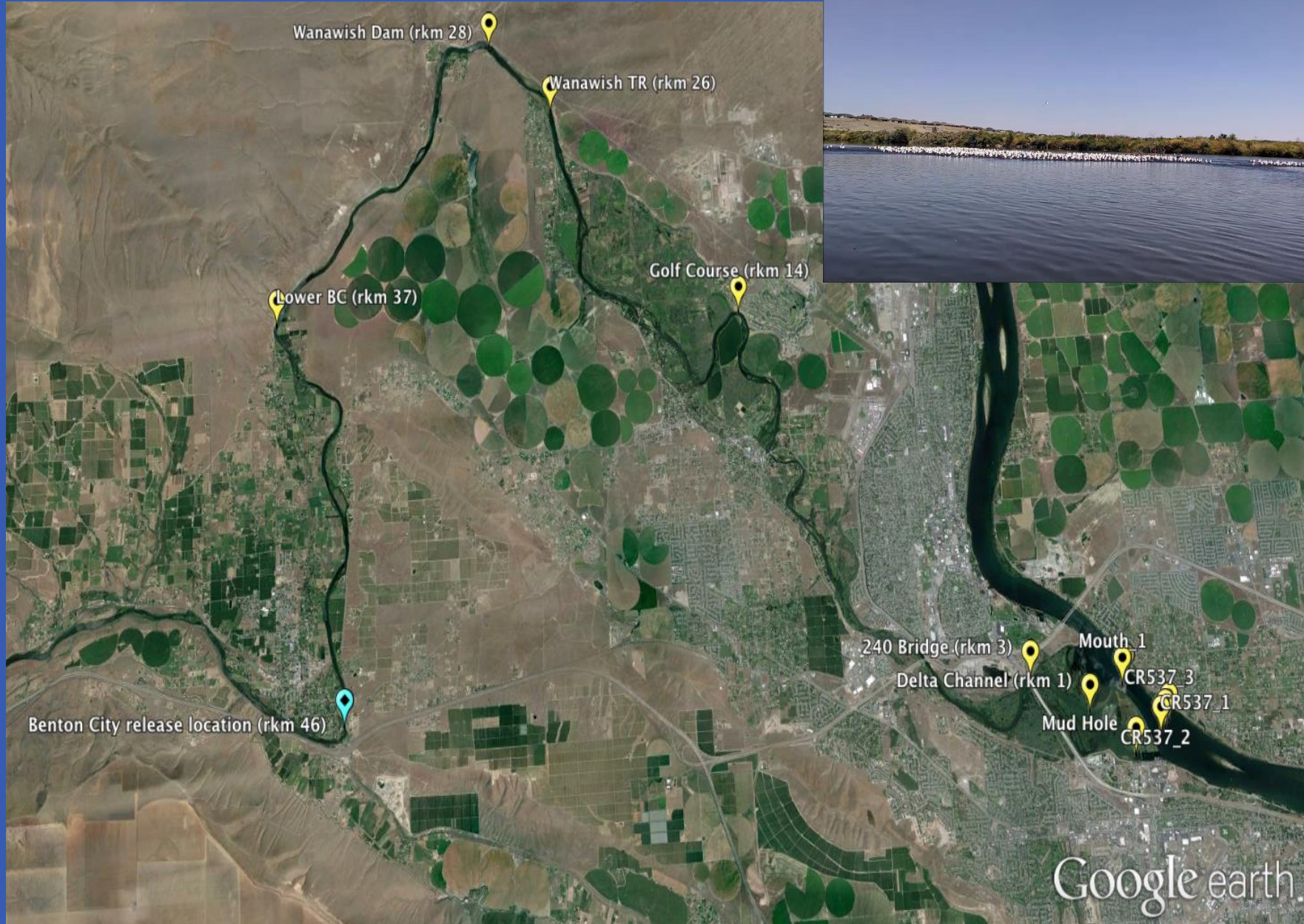


— Detected Per Day at Prosser

— Also Detected Downstream (Any Site, Any Date)

- - - River Temp Kiona Fahrenheit

2016 - Pilot Study- Lower Yakima River JV Salmon Survival YN & Mainstem Fisheries





- A - ATS acoustic tag side view
- B - ATS acoustic tag top view
- C - PIT tag



- June 2nd, 2016 release date
- In river near Benton City
- Combined with a release of 2000 PIT tagged only sub-yearling Chinook



2016 – Pilot Study- Lower Yakima River JV Salmon Survival

- ▣ Release Location Benton Boat Launch
- ▣ 100% Mortality of 92 sub-yearling chinook in Lower Yakima River
- ▣ 8% Tagging Mortality (8 out of 100) high river temps, extended holding, double tagged (PIT)
- ▣ Only 13 valid detections of 91 tags (one removed from analysis due to error in detections).
- ▣ Minimum survival of from release to Horn Rapids 14.3%

Questions?