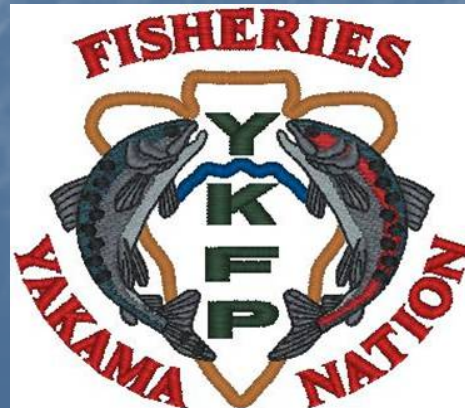
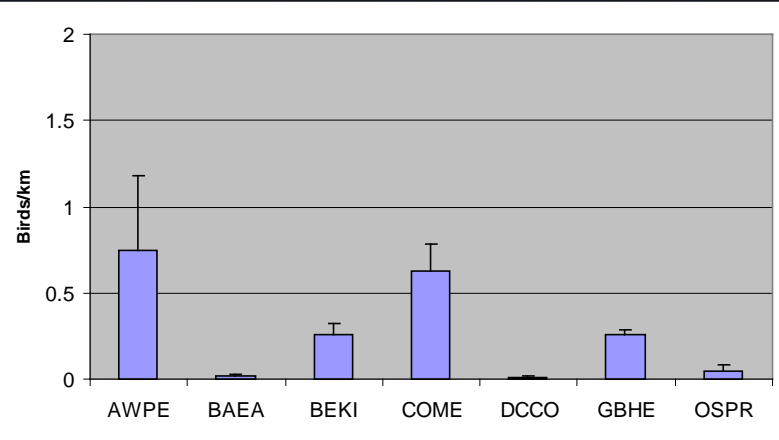
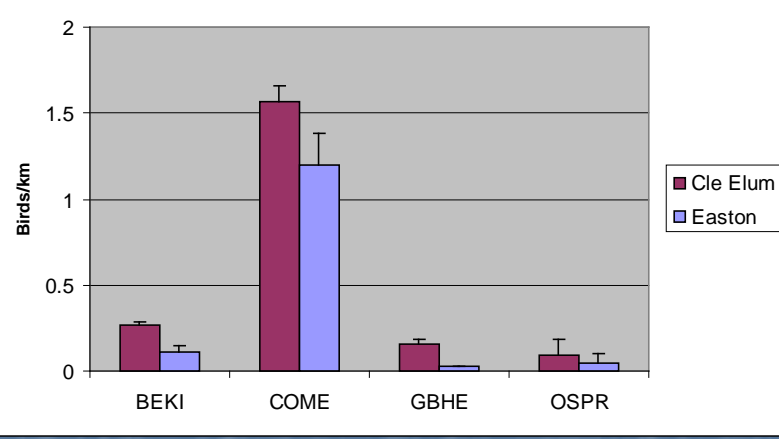


# An analysis of smolt PIT tags collected at 6 predatory bird sites on the Yakima River

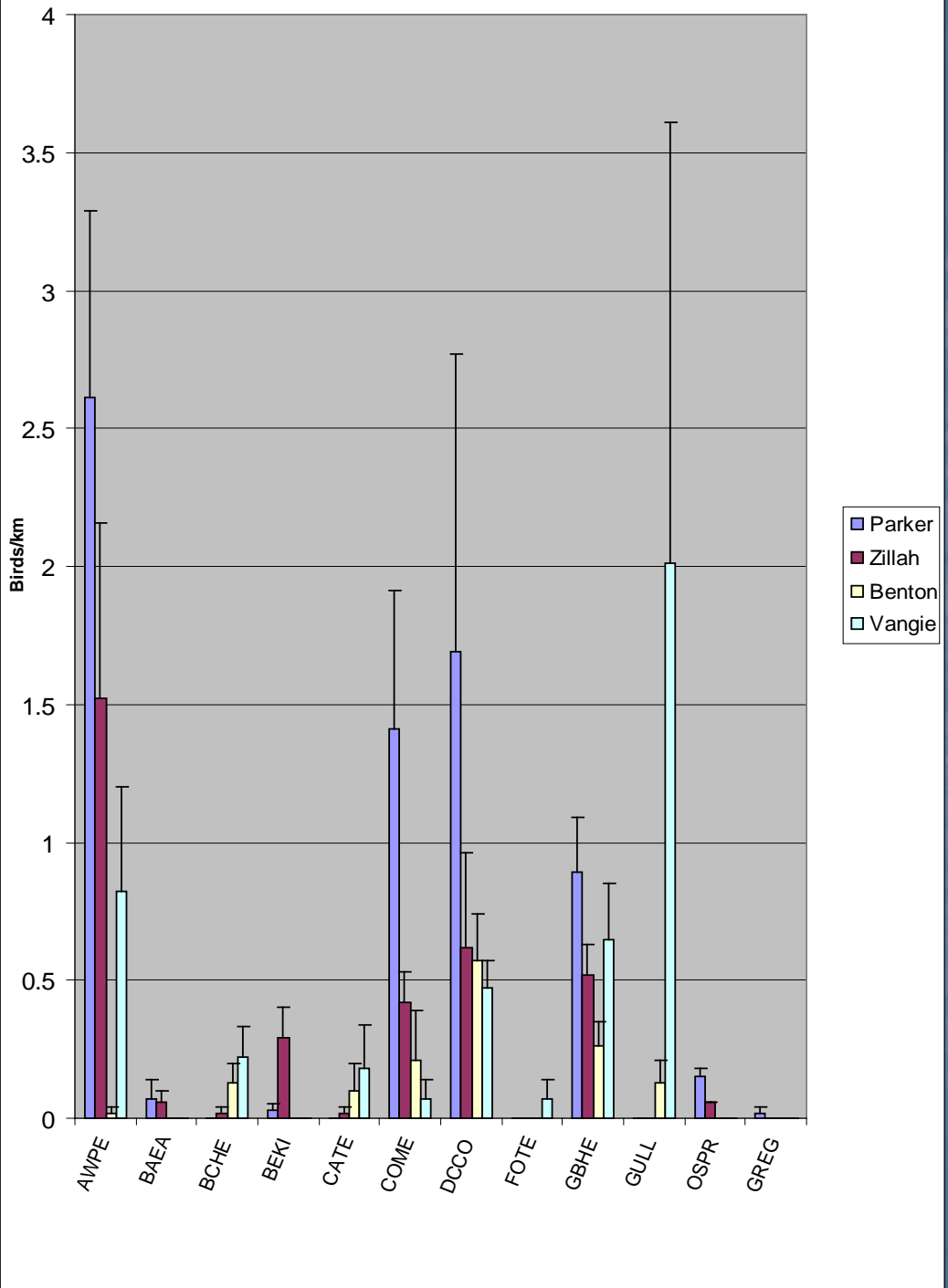
Jim Siegel

Yakima Klickitat Fisheries Project





Upper & middle Yakima dominated by mergansers, but pelicans and cormorants are moving northward. The lower Yakima is dominated by pelicans and cormorants with high overall bird species diversity.



# Primary Avian Small Fish Predators in Spring

(Modeled estimated % of small fish (all species) biomass consumed by birds, 2006)



64%



13.5%

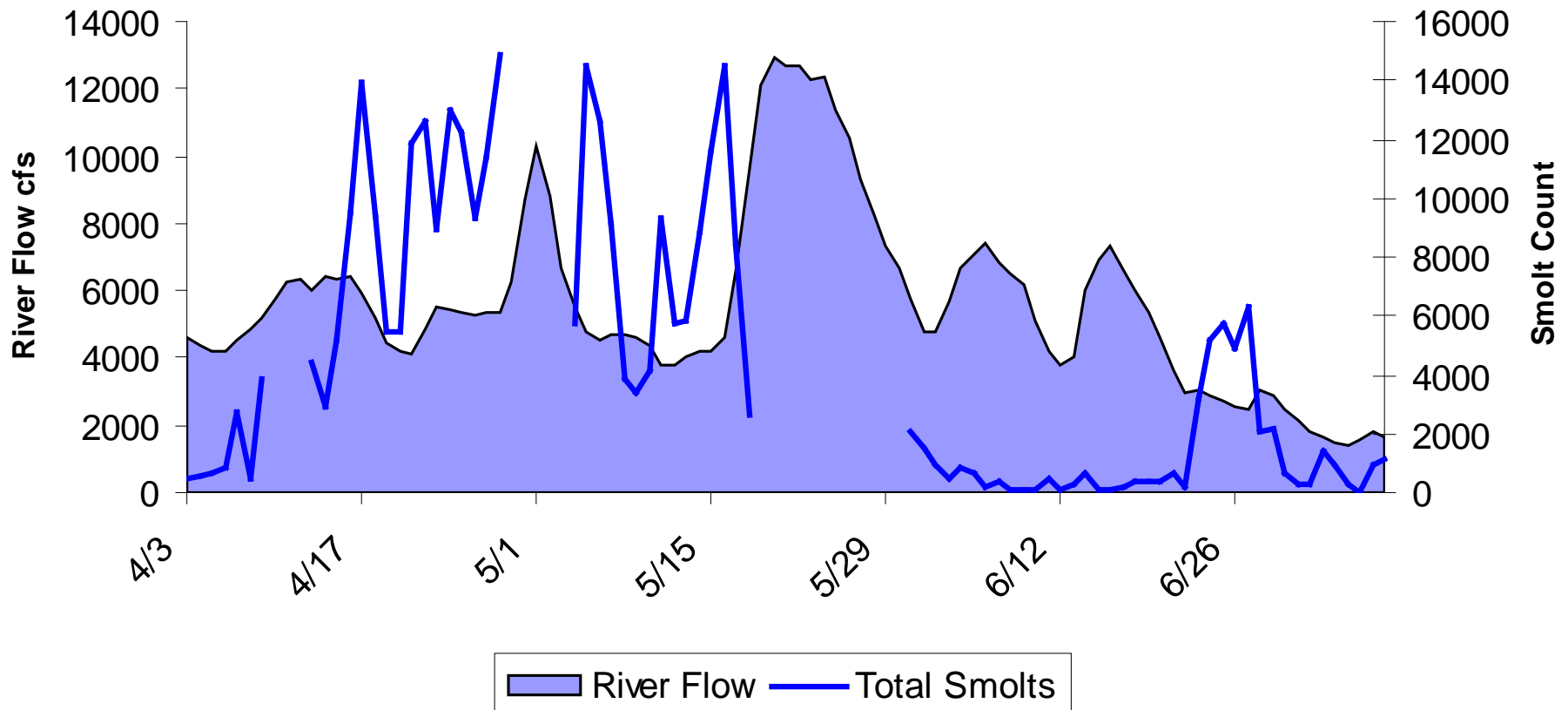


12%

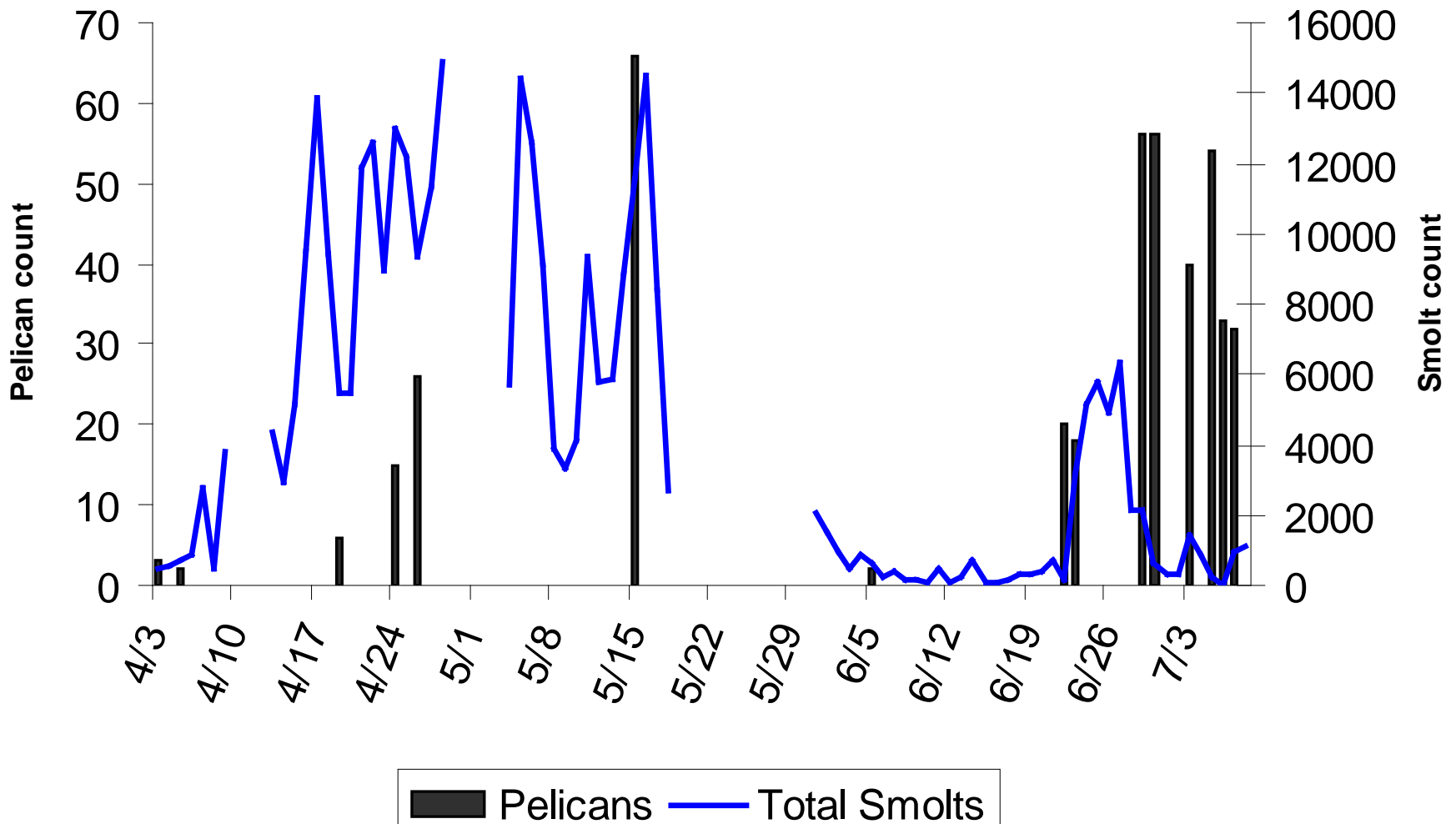


8%

# Chandler Fish Bypass, 2006



# Pelican – Smolt Passage correlations at Chandler Fish Bypass, 2006



# Pelican & Gull – Smolt Passage Correlations, Chandler & Horn Rapids (2004-2006).

- Consistent moderate to strong correlations with wild and hatchery coho passage (0.49 - 0.83).
- Little or no correlation with spring or fall chinook passage, wild or hatchery (-0.4 - 0.58).
- Little or no correlation with wild steelhead passage (-0.09 – 0.50).
- Hotspot model estimated 93,000 smolts consumed by Horn Rapid gulls, over 90% fall chinook (small data set, assumes all fish are smolts, up 400% from 2005).
- If Chandler pelicans are supporting themselves on smolts alone they would have to consume between 247,000 and 286,000 fish in 2006 (worst case scenario – high unlikely).



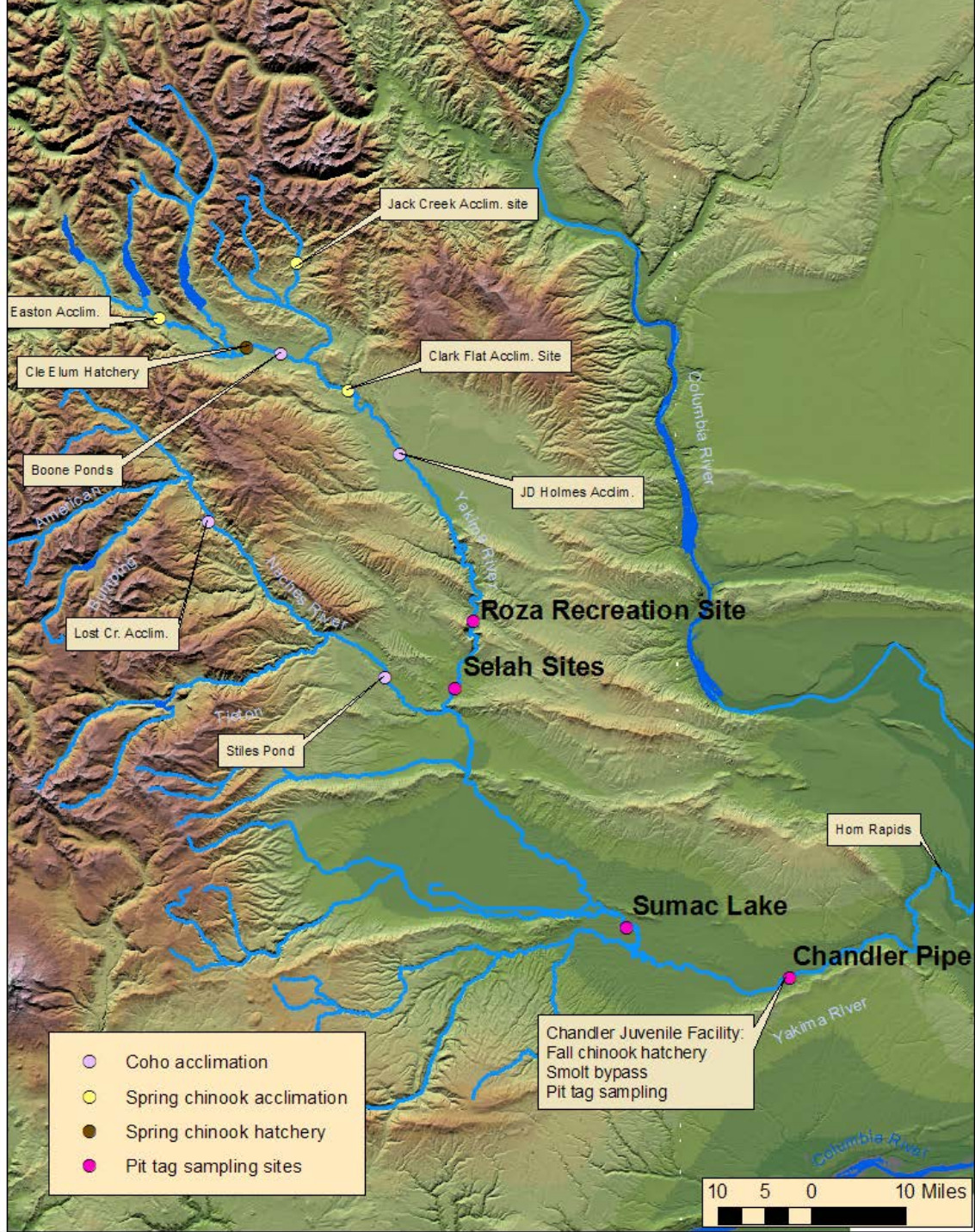


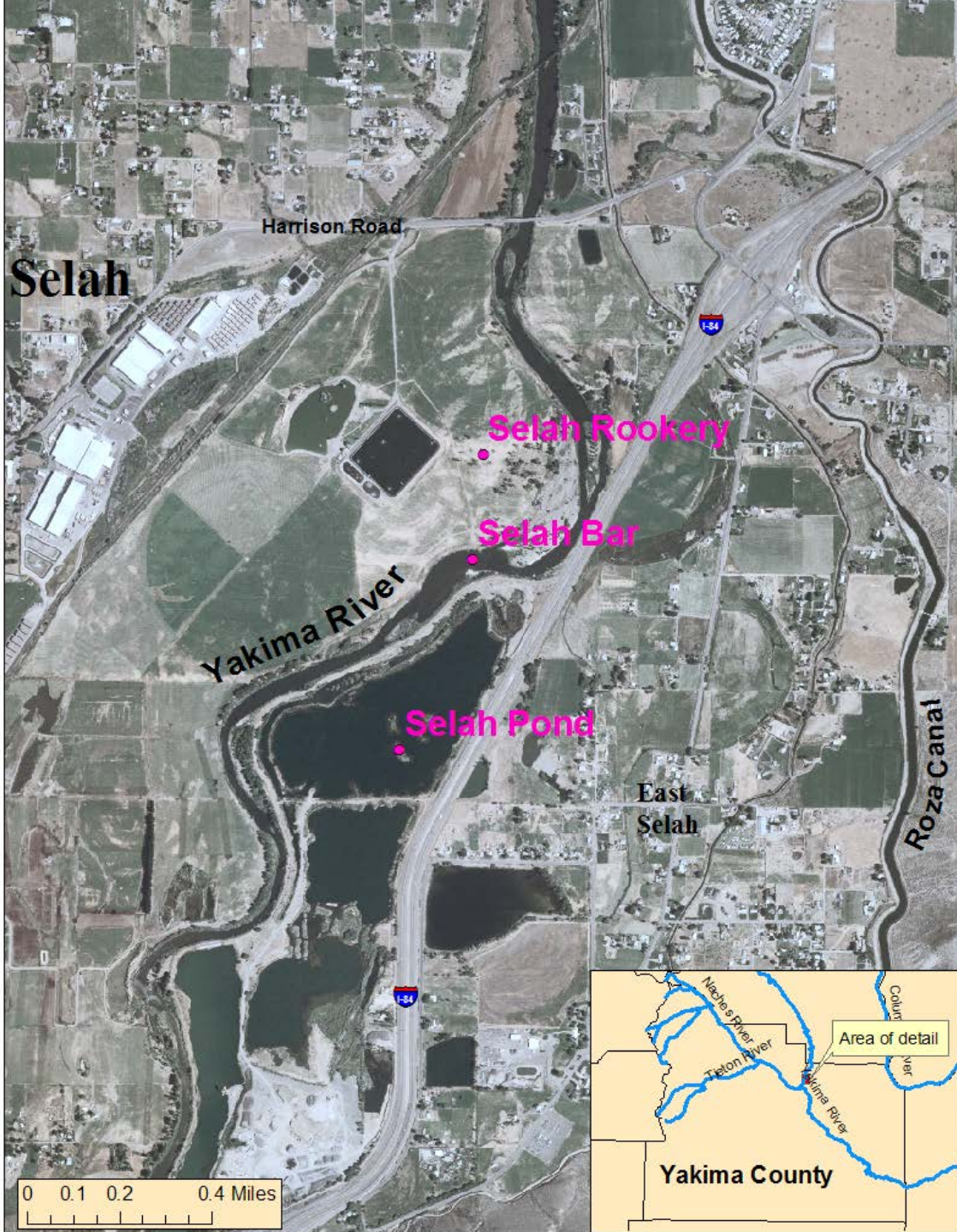
BREAK







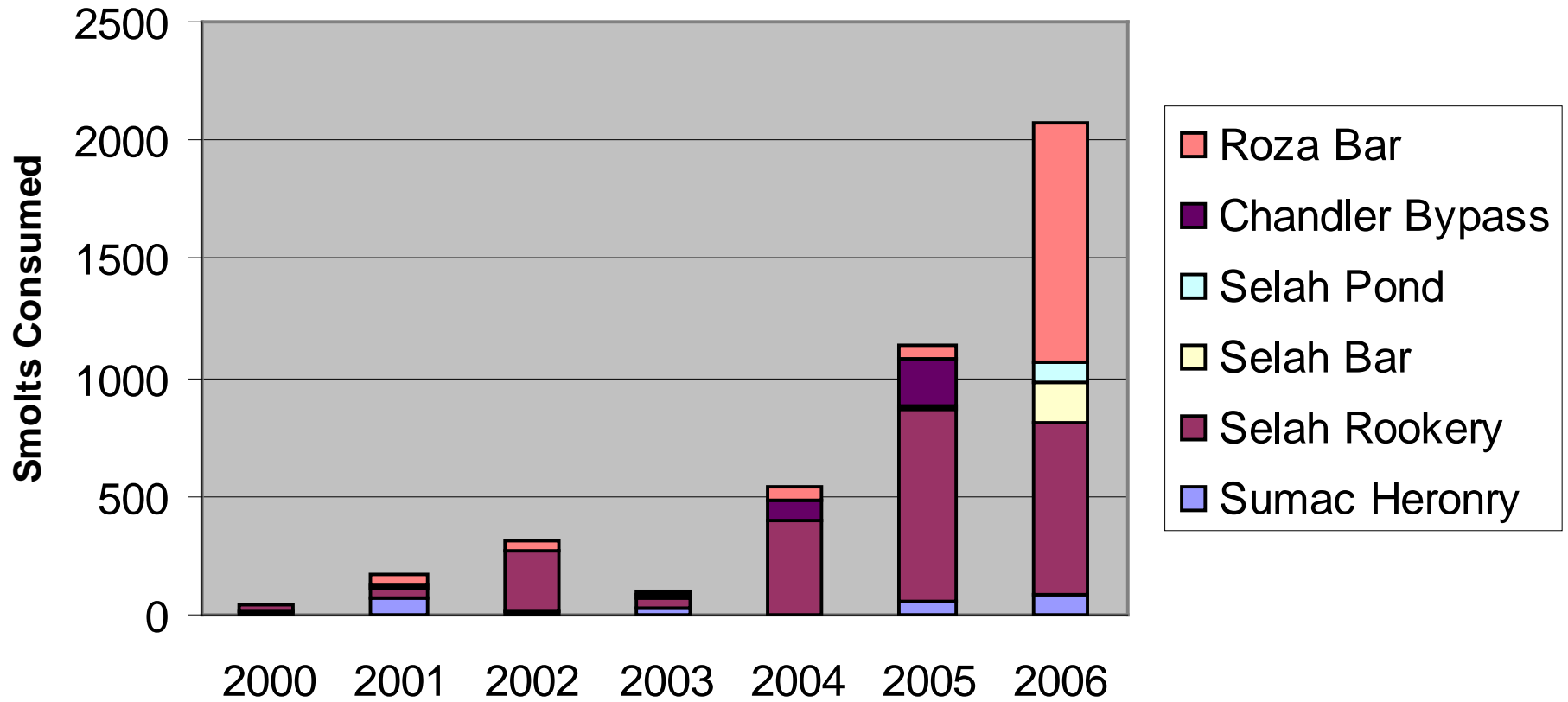




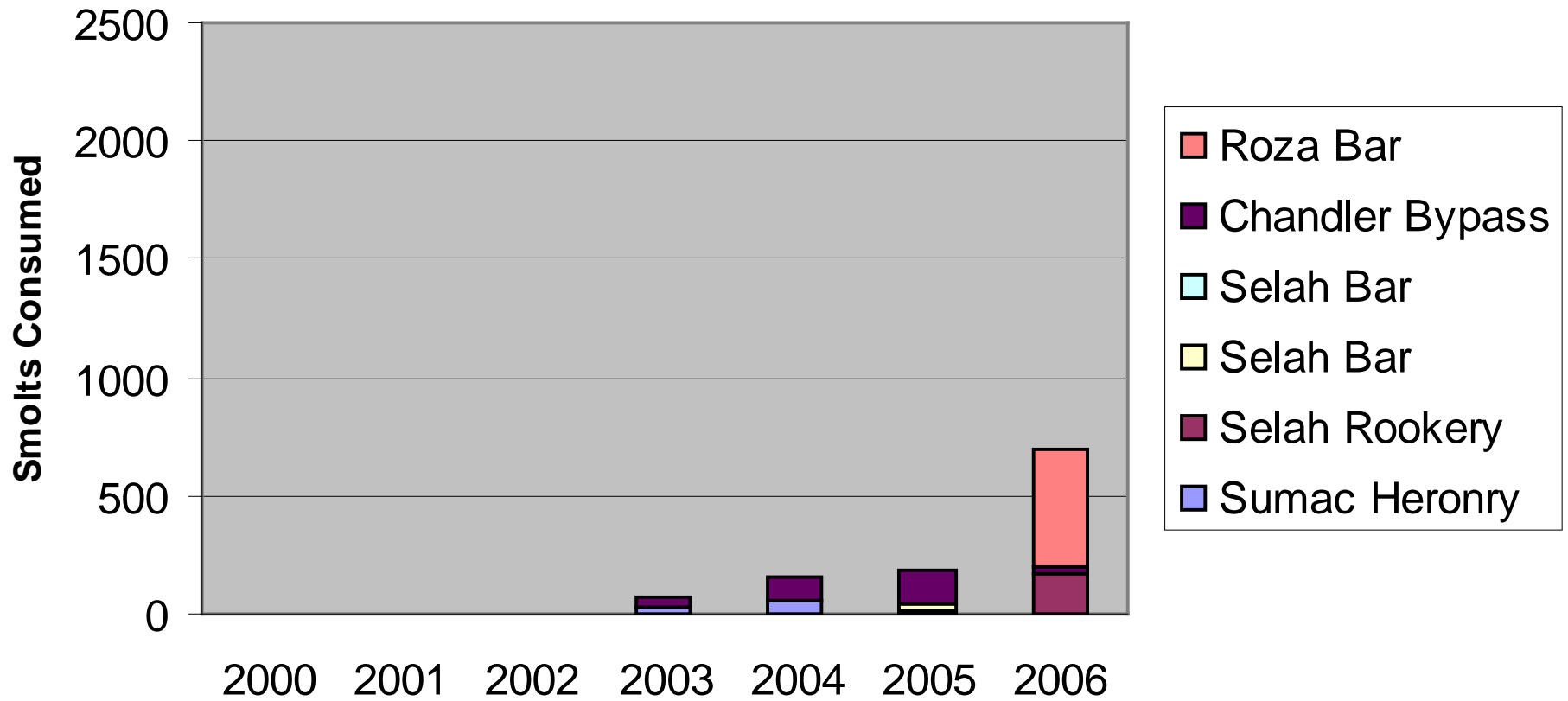
# Analysis of PIT tags

- 559 tags found at 6 sites: Roza (103 tags), Selah (283 tags at 3 sites – 252 tags at rookery), Sumac Heronry (53 tags) and Chandler (120 tags).
- 69% were from 2005-2006, but tags went back to year 2000, representing a total of at least 11,771 estimated smolts consumed 2000-2006.
  - 171 coho tags representing 6,240 estimated smolts (53%)
  - 276 spring chinook tags representing 4,388 estimated smolts (37%)
  - 95 fall chinook tags representing 1,100 estimated smolts (9%). Yakima River, Columbia River (Priest Rapids) and Umatilla River represented.
  - 6 steelhead tags representing at least 31 estimated smolts (Toppenish & Ahtanum Creeks, Snake & Methow Rivers, Chandler reconditioned kelts). 12 tags unidentified to species (possibly reused tags).
- Further analysis assumes equal biases across sampling sites: tag deposition and recovery rates, other assumptions.

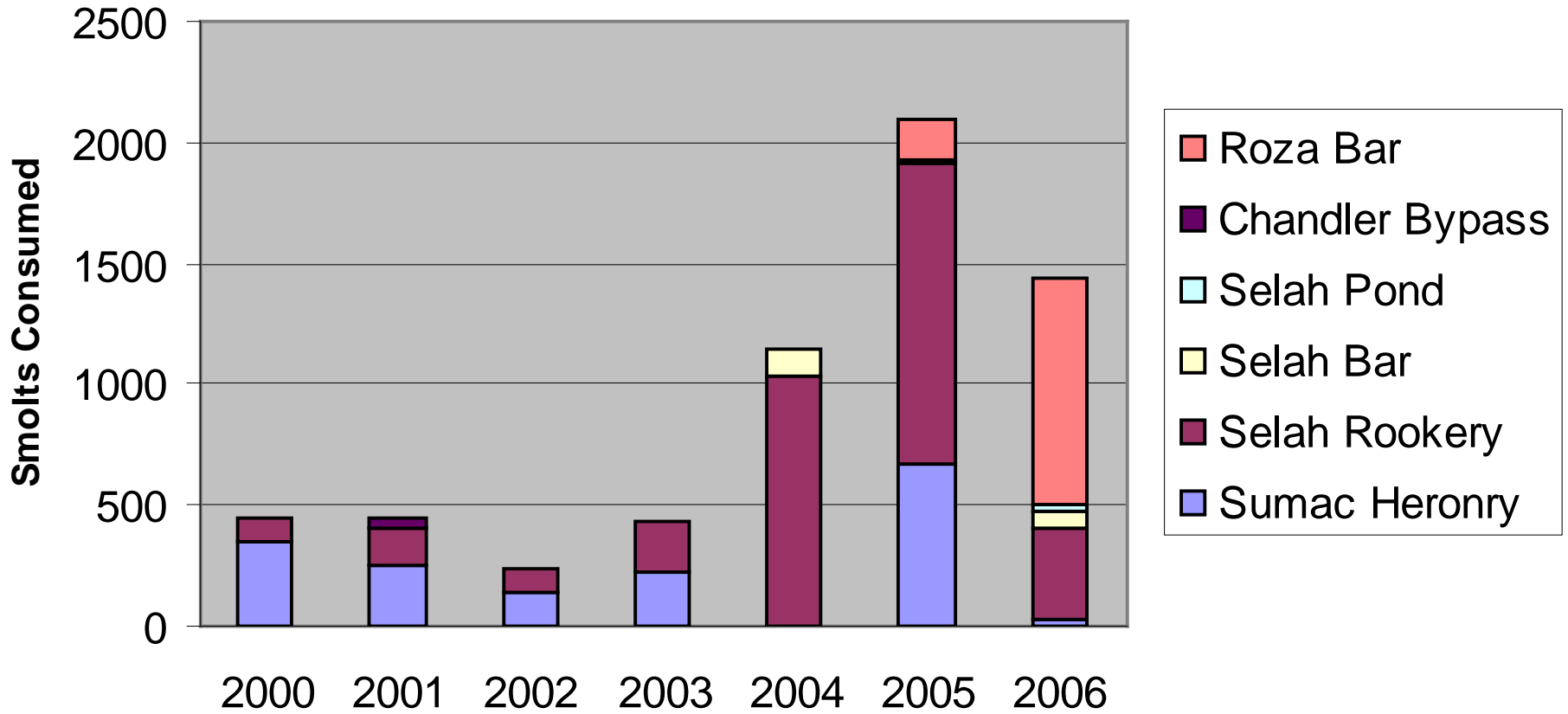
# Spring Chinook Smolts



# Fall Chinook Smolts



# Coho Smolts





# Conclusions

- Growing population of cormorants in middle and lower river. Pelicans more common at Roza and Selah. Cormorants more significant smolt predators than pelicans and herons. Coho preferred prey followed by spring chinook and fall chinook.

- Based on PIT sampling higher number of heron predated smolts were found than anticipated.

- Are coho smolts vulnerable to herons in river sloughs during low water periods?

- Presence of steelhead and fall chinook tags from the lower Yakima, Columbia and Snake Rivers, indicate some pelicans move between the Columbia and Yakima Rivers, and up/down the Yakima River.



# Preliminary Findings: 2007

- Few pelicans in Yakima Basin (count May 30th – 126), comparable to lower populations prior to 2003.
- Cormorants not breeding at Selah Rookery, but remain abundant in area.

