"Evaluation of Avian Predation Management Efforts in the Columbia River and the Need for a **Direction Change**" Blaine L. Parker, Avian Predation Coordinator **Columbia River Inter-Tribal Fish** Commission IWUA Water Law & Resource Issue Seminar Sun Valley, Idaho August 17, 2021

Todays Presentation

- Avian predation-What is it?
- Magnitude of the problem
- Definitions
- The Predators and the Prey
- Columbia River Basin
- Case studies of Caspian terns and DCC
- Directional Changes Necessary

Avian Predation

- Significant source of juvenile outmigration mortality, cumulative loss of 50% for some stocks
- Basin-wide problem
- Significant issue at hydropower projects, millions spent annually to protect smolts, marginal results
- Decades of research, millions of dollars spent, failed management actions, still lose millions of smolts annually
- Complex issue, management failed to protect, needs fresh perspective

Key Words

• Avian Predator



Impoundments vs Free-flowing



• Migratory Bird Treaty Act 1918



• Piscivorous







Colonial Nesting Waterbirds

Why is Avian Predation Such a Problem?

- Permanent changes to flowing water habitat
- Stable Habitat and Prey Resources
- Federal Protection MBTA
- Under the radar
- Alternative food sources feedlots, landfills, agriculture waste
- Complex Data Analysis/Interpretation Issues

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• Inconsistent Agency Direction

Magnitude of Avian Predation

- If only Caspian tern impacts were eliminated; returning adult steelhead increase 2-3fold (Evans et. al. 2019)
- From 2003-2013, Double crested Cormorants at East Sand Island consumed average of 12 million smolts annually, with individual years topping 21 million smolts!
- Combined impacts of CT and DCC estuary population were 20 to 25% of the entire Basin outmigration from 2003-2013
- Hundreds of millions of dollars in capital & habitat improvements, hydro modifications, and hatcheries; yet avian predation annually negate much of this work
- No focused regional plan to address the issue

The Columbia River Basin



Predators and Prey



Caspian Tern

- Most deadly predator of juvenile salmonids
- Plunge divers within 1m of surface
- Upwards of 90% of their prey can be salmonids
- Favor prey size ~20cm (steelhead smolt)
- Foraging range can exceed 50+ miles from colony
- Nest on ground, sand to fine gravel, generally with view of water
- High fidelity to nest locations

Caspian Tern Management-Inland Population

- Focus on 2 colonies Goose Island and Crescent Island
- Prey Species of Greatest Concern Upper Columbia Steelhead
- Goose Island colony ~ 400 pairs prior to management, consumed ~ 15% of entire Upper Col. Steelhead
- Management efforts focused on non-lethal habitat modifications
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Caspian Tern Management-Crescent Island

- From 2005 to 2013 ~ 400+ pairs nested on the island, 15% impact on Upper Columbia Steelhead
- Management effort began in 2016 with ~12k willows and other native shrubs, additional deterrents of rope and flagging, and active hazing
- By 2018, no CT's nested on the island, but relocated downriver to the Blalock Islands to nest, smolt impacts continue at high levels
- Blalock islands are USFWS Federal Wildlife Refuge, manager refused to allow hazing, although Comprehensive Conservation Plan (CCP) requires such efforts to protect threatened salmon and steelhead from avian predators
- The 2020 Biological Opinion by NMFS utilizes higher spring flows to flood the Blalock Island to prevent nesting on Blalock Islands
- In 2021 over 100 terns have relocated upriver to Badger Island

Crescent Island Habitat Work



Blalock Island Terns



Caspian Tern Management- Goose Island

- From 2005-2013, average of 367 pairs nested annually
- Goose Island mostly rock. Rope, flagging, hazing and egg removal were the primary deterrent to nesting CT's.
- Gulls were not affected by the flagging and other dissaution efforts, which lured back CT back to Goose Island
- Annual efforts to restrict CT from Goose Island mostly successful, impacts to steelhead reduced, but persistent CT's continue nesting attempts
- Recent changes in field contractors has resulted in a greater number of terns nesting on the island.

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• Egg take has been annually permitted as additional population control measure

Goose Island

Goose Island Tern Colony, Potholes Reservoir



Island created by reservoir Much larger gull colony shares the isla

Goose Island Terns





Columbia River Estuary Avian Management

- Estuary greatly modified from historic conditions
- Management effort focus on DCC and CT's, both protected by MBTA
- Multiple stocks of Federally listed salmonids, transitioning to the ocean, survivors of the journey downstream
- Multiple juristictions; Tribal, States, Federal
- Dynamic estuarine environment



Lower Columbia River Estuary



East Sand Island





Rice Island



Estuary Management Efforts -Caspian Terns

- Early 1990's a small population quickly increased to a 1,000 pairs on East Sand Island (ESI), then to Rice Island.
- In 1997-98, Rice Island colony consumed an 5-15% of all smolts in the estuary, 5 to 14 million smolts annually.
- In 1999, 13 stocks of salmon and steelhead were listed under ESA
- Between 1999-2001, managers relocated birds from Rice Island to ESI, more diverse prey and lessen smolt impact
- However, CT population grew and by 2007 was nearly 11,000 pairs
- Management efforts from 2007 2018 used habitat reductions on ESI to reach Mgt Plan goal of fewer than 3,750 pairs.
- Population remains at ~ 5,000 pairs, double the management goal, federal managers consider the Plan a success; 3-5 million smolts still consumed annually; Tribes think otherwise.

East Sand Island Caspian Tern Colony



Double crested Cormorants

- Generalist and opportunistic predator, but highly effective on smolts
- Diving predator to 75 feet deep
- Upwards of 30% of their prey can be salmonids
- Large body size, consumes 11b/bird /day
- Foraging range can exceed 15 miles from colony
- Nests on ground, trees, bridges, transmission line towers, and navigational aids
- High fidelity to nest locations

Estuary Management Efforts-Double crested Cormorants

- Few hundred pairs late 1980's,to 12,900 pairs by 2012
- From 2005 to 2013, smolt consumption averaged 12+ million, peaking with over 20 million in 2011!
- Management action required an EIS and began in 2015, but successive years of management were stymied by bird movements, nesting failures from bald eagle attacks, an the exodus to the Astoria-Megler bridge
- Few DCC's use ESI, but nearly 8,000 birds and over 3,000 nest have taken up residence on the Astoria Megler Bridge, an interstate bridge between Oregon and Washington, difficult to manage.
- Currently, staff from the Oregon Department of Fish and Wildlife (ODFW) and the Oregon Department of *Tribal Fish Commission* Transportation and the USFWS are working to address this

DCC ESI – Pre-Management



DCC- AMB- Post Management



Possible Explanations





Predation on Predators by Predators



Adopt a "Safe Passage" Strategy

- Re-evaluate existing deterrent measures and adjust accordingly
- Investigate new and innovate tools via literature search
- Fund, create, and implement "Avian Management Patrols" during spring outmigration
- Avian Predation is a "Low-Hanging Fruit". It's time to pick it!

Summary

- Bird management is very complex biologically, legally, and socio-politically
- Management efforts and non-lethal capital deterrents to date have largely failed and/or are ineffective
- Avian predation management in the CRB is reminiscent of the "Wack a Mole" game, with salmon being the loser in this game
- Federal agencies have failed in their responsibilities to protect salmon and to the Tribes with Treaty rights to those fish
- Climate change makes reducing these in-river losses to avian predation more critical than ever

Future Concerns







