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October 6, 2015

### MEMORANDUM

**TO:** Fish and Wildlife Committee Members

**FROM:** Lynn Palensky, Program Development Manager

**SUBJECT:** White Sturgeon: status and challenges for lower river populations

### BACKGROUND:

**Presenters:** Lynn Palensky, Brad James (Washington Department of Fish and Wildlife), Blaine Parker (Columbia River Inter-Tribal Fish Commission), and Tucker Jones (Oregon Department of Fish and Wildlife).

**Summary:** Lower Columbia white sturgeon have been in the news lately, most notably with the summer mortalities during the extreme summer water and air temperature conditions. We will hear from the lower river sturgeon managers on these issues and more including stock status for populations from the mouth up to the mid-Columbia PUD area and through the lower Snake River, including any new rules, this past summer's heat-related stress mortalities and thoughts on preparing for future incidents, and predation below Bonneville Dam.

**Relevance:** Based on the many and varied recommendations on white sturgeon submitted for the 2014 Program revision, the Council included sturgeon as one of the seven emerging program priority areas in the [Investment Strategy](#) chapter of the 2014 Fish and Wildlife Program. The language calls to expand the program in new or additional directions including *implement additional sturgeon and lamprey measures (passage and*

*research*). Our continued understanding of lower river populations is important as we consider new or expanded work for white sturgeon.

**Workplan:** The work is being tracked in the Division's annual work plan as a high-priority task, and in the Council's Annual Work Plan for 2015.

**Background:** Four projects focused on lower river white sturgeon are currently being funded in the program:

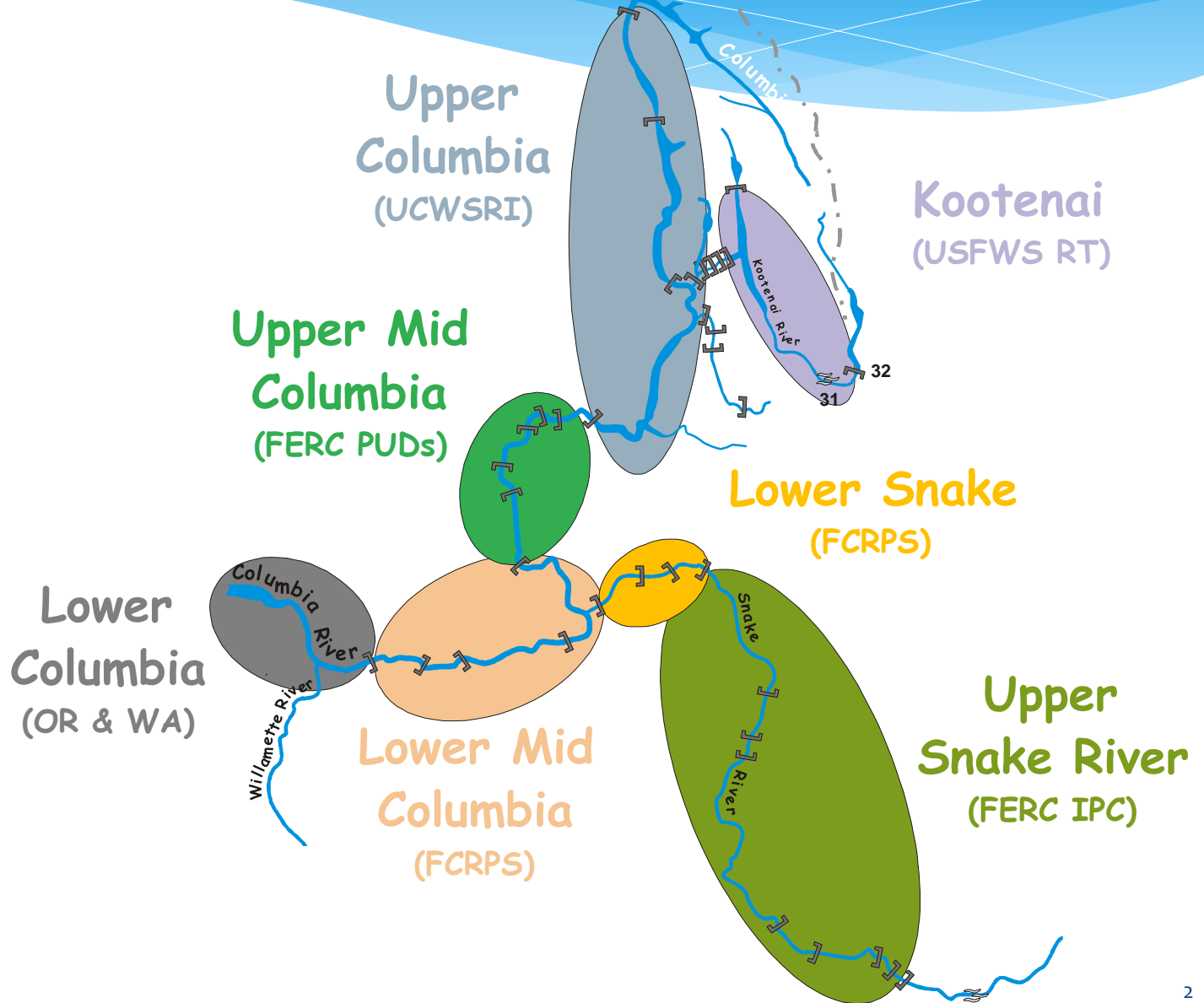
198605000	White Sturgeon Mitigation and Restoration in the Lower Columbia and Snake Rivers	Oregon Department Of Fish and Wildlife (ODFW)
200715500	Develop a Master Plan for a Rearing Facility to Enhance Selected Populations of White Sturgeon in the Columbia River Basin	Columbia River Inter-Tribal Fish Commission (CRITFC)
200845500	Sturgeon Management	Yakama Nation
200850400	Sturgeon Genetics	Columbia River Inter-Tribal Fish Commission (CRITFC)

**More Info:** The Council's [White Sturgeon page](#). Columbia Basin White Sturgeon Planning Framework.

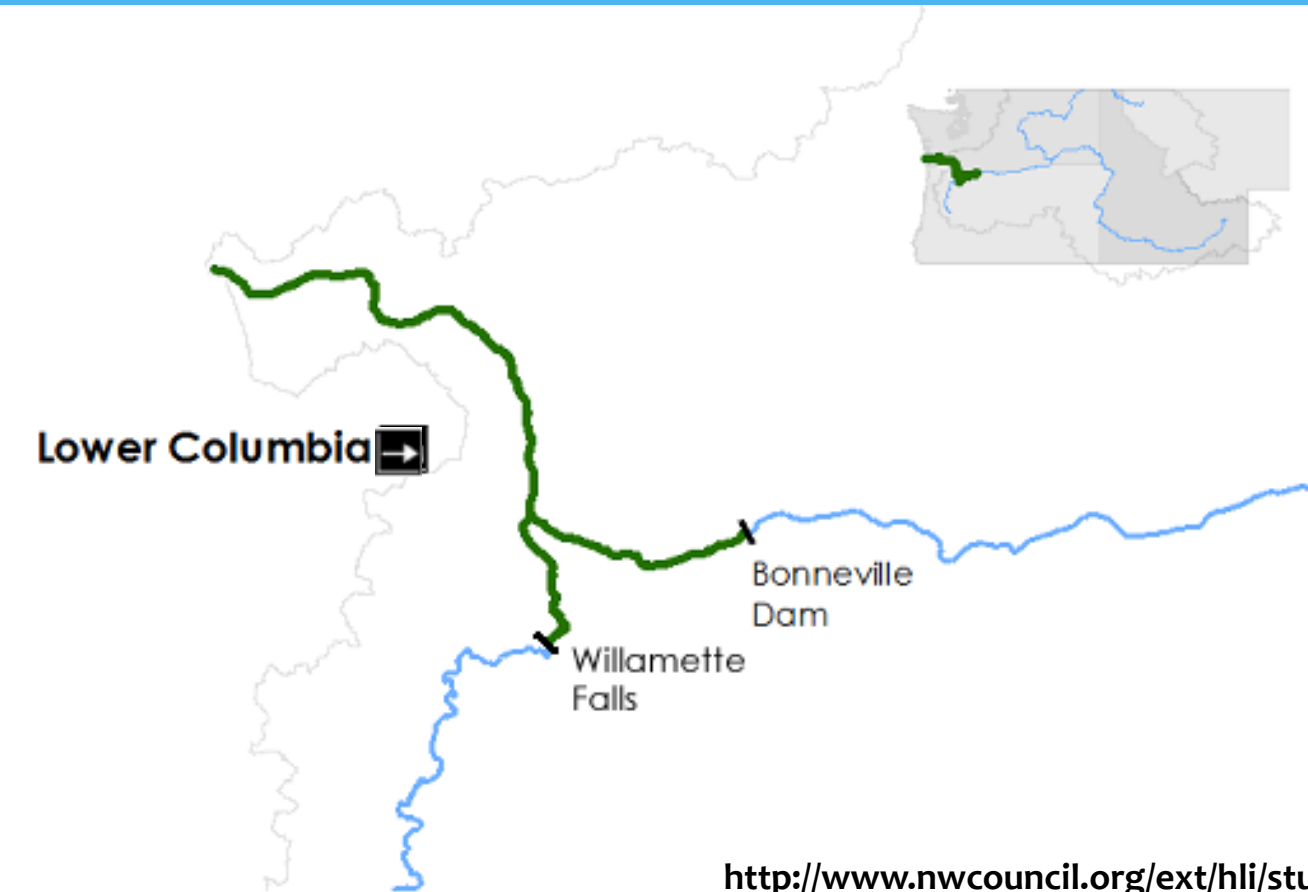
# White Sturgeon: Status and challenges for lower river populations

13 October 2015

# Columbia River White Sturgeon



# Lower Columbia River Status



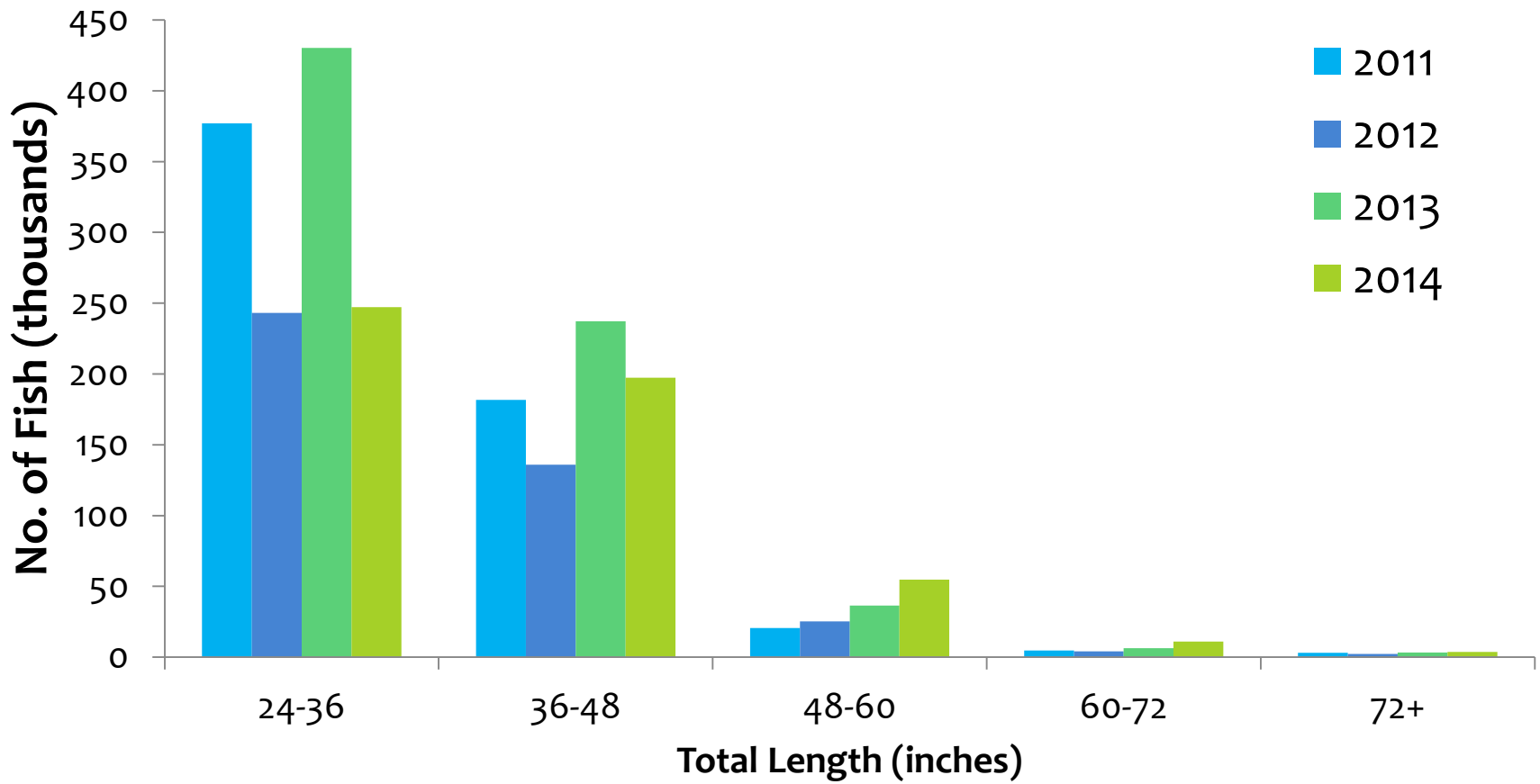
- Trend**
- Increasing
  - Decreasing
  - Stable

- Status**
- Large population, consistent annual recruitment, harvestable numbers
  - Significant population, consistent annual recruitment, limited harvest potential
  - Significant adult population, periodic recruitment, minimal sustainable fishery impact
  - Significant adult numbers, little or no recruitment, no sustainable fishery impact
  - Small remnant adult population, no significant recruitment
  - Functionally extirpated

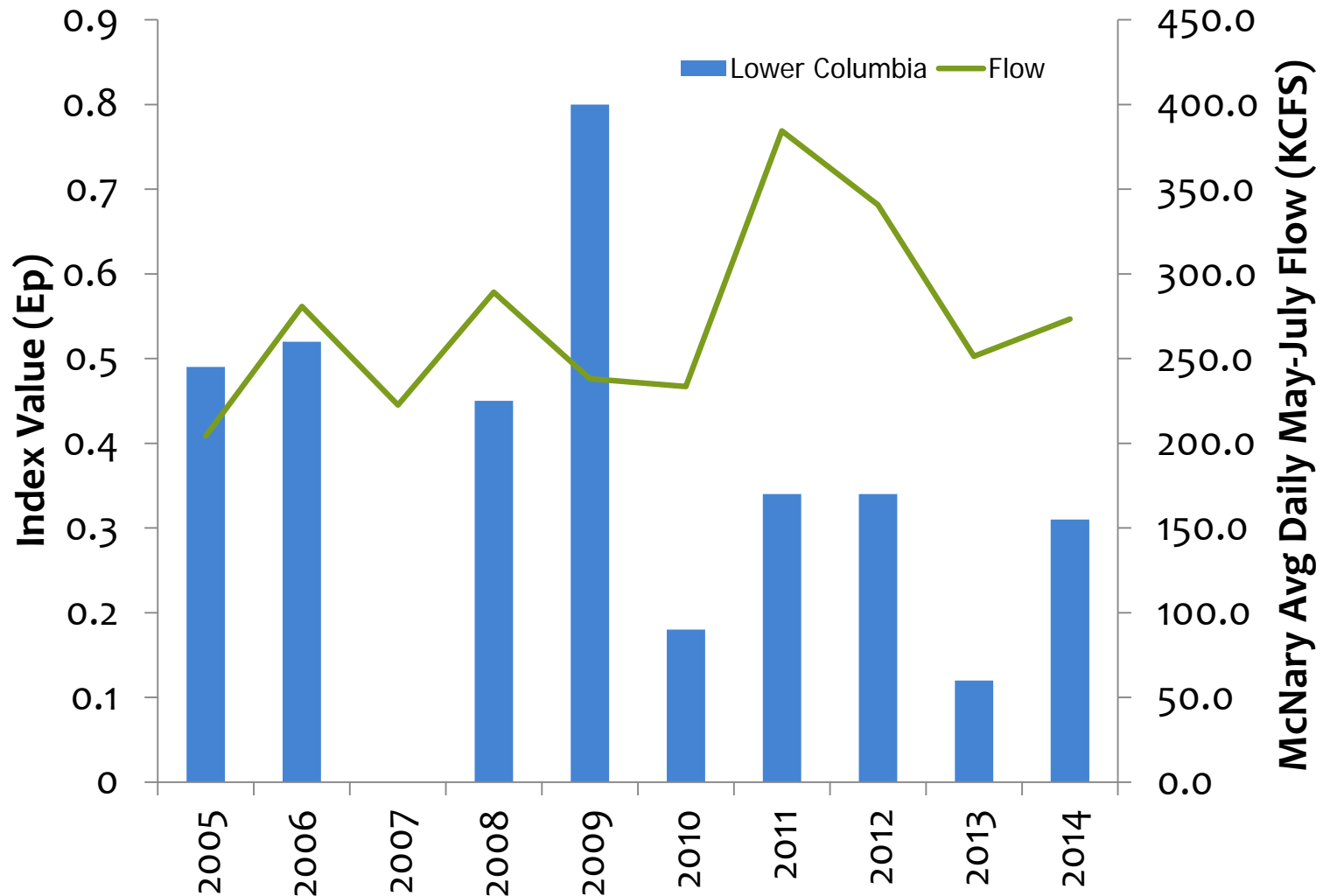
<http://www.nwcouncil.org/ext/hli/sturgeon.php>

# LCR white sturgeon abundance

Abundance by size category by year

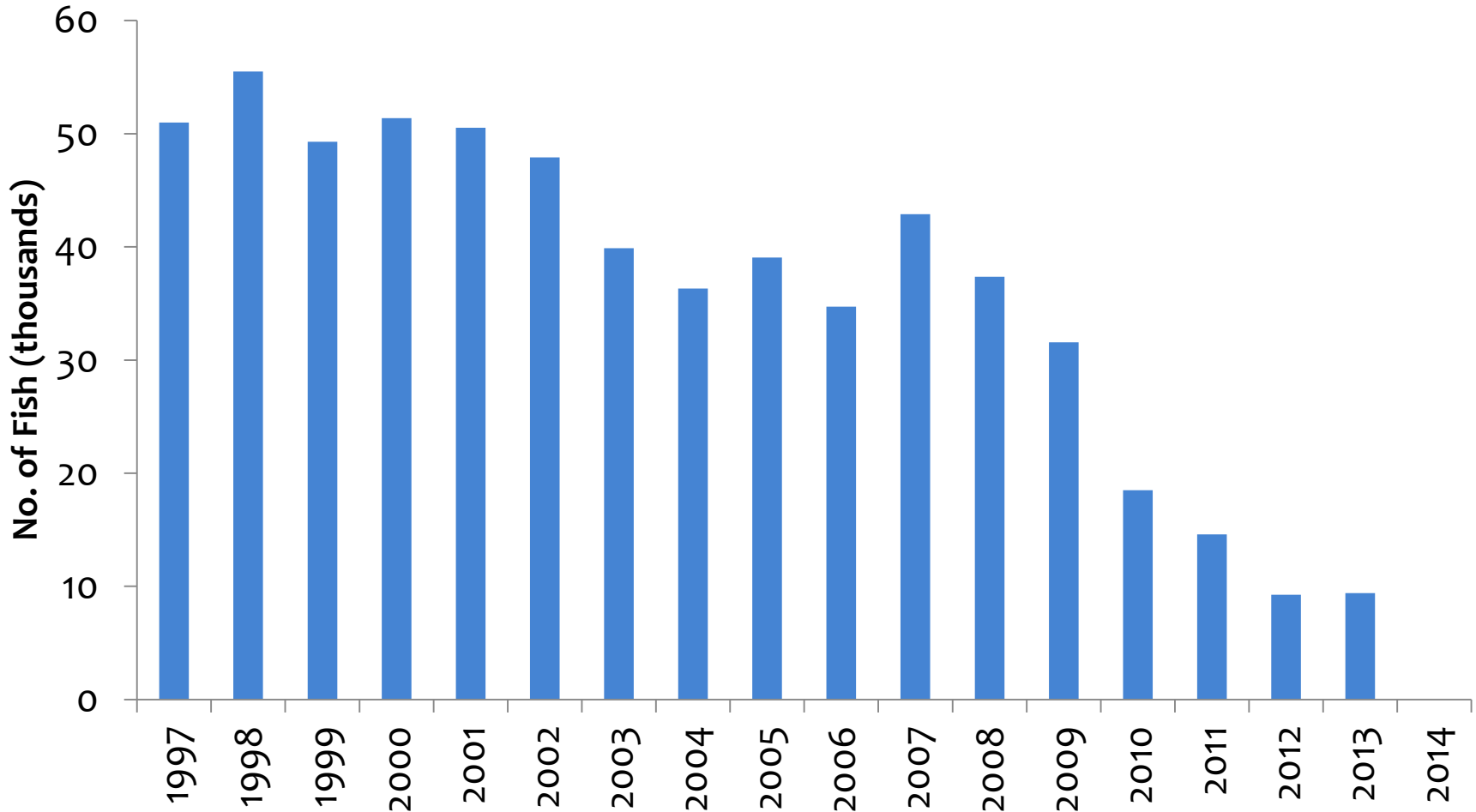


# LCR white sturgeon productivity



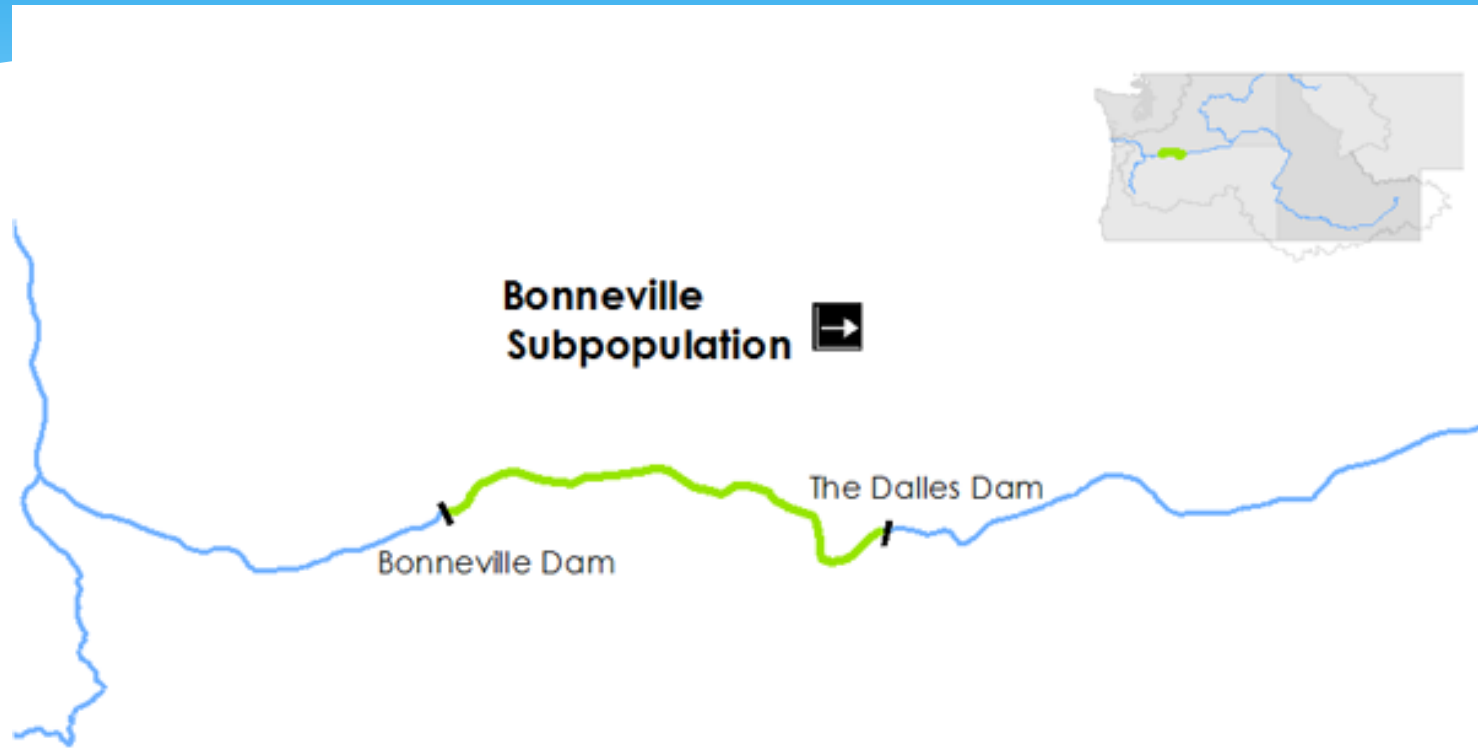
# LCR white sturgeon harvest

## Combined Recreational and Commercial Harvest





# Bonneville Reservoir Status



## Trend

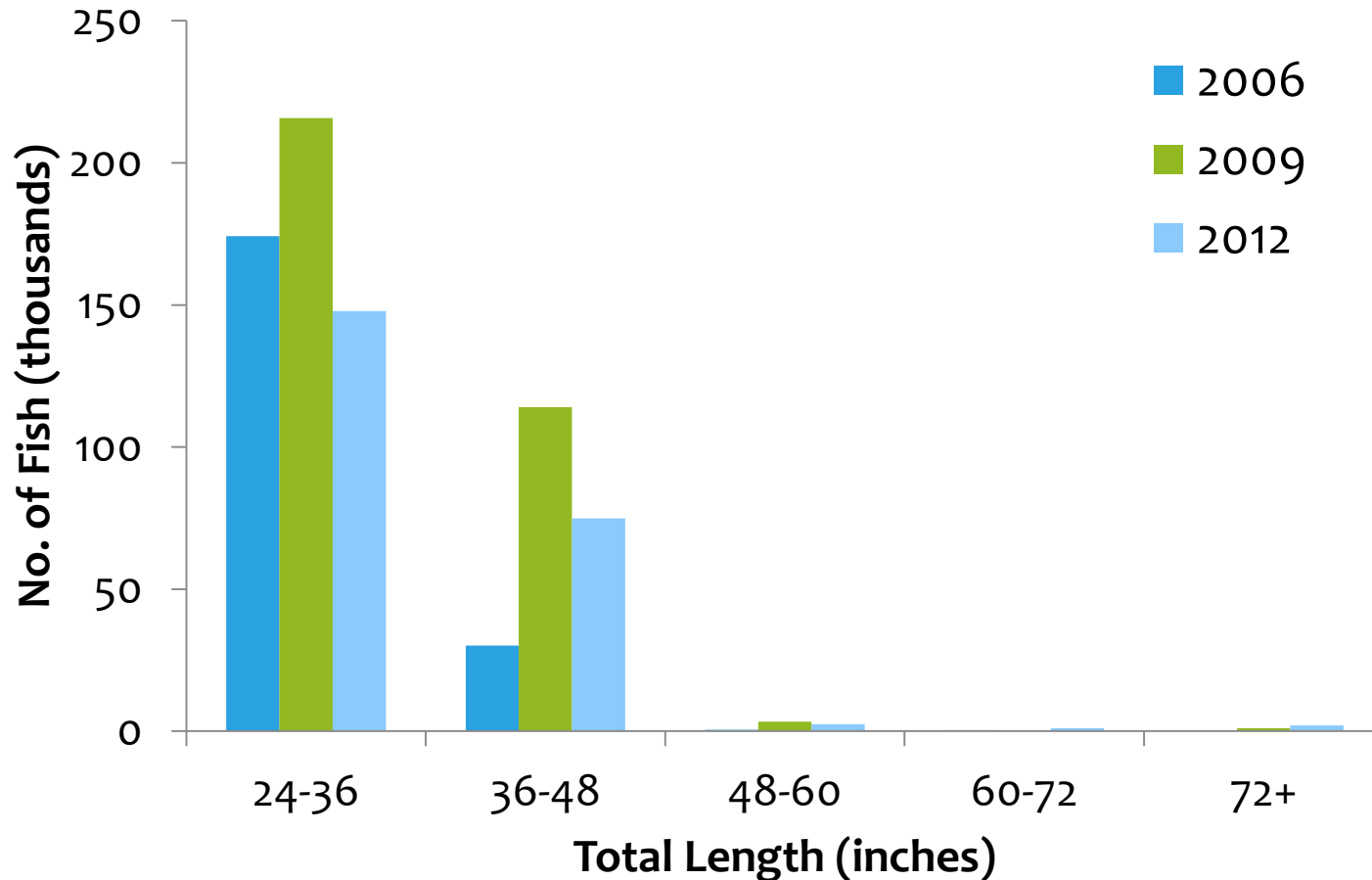
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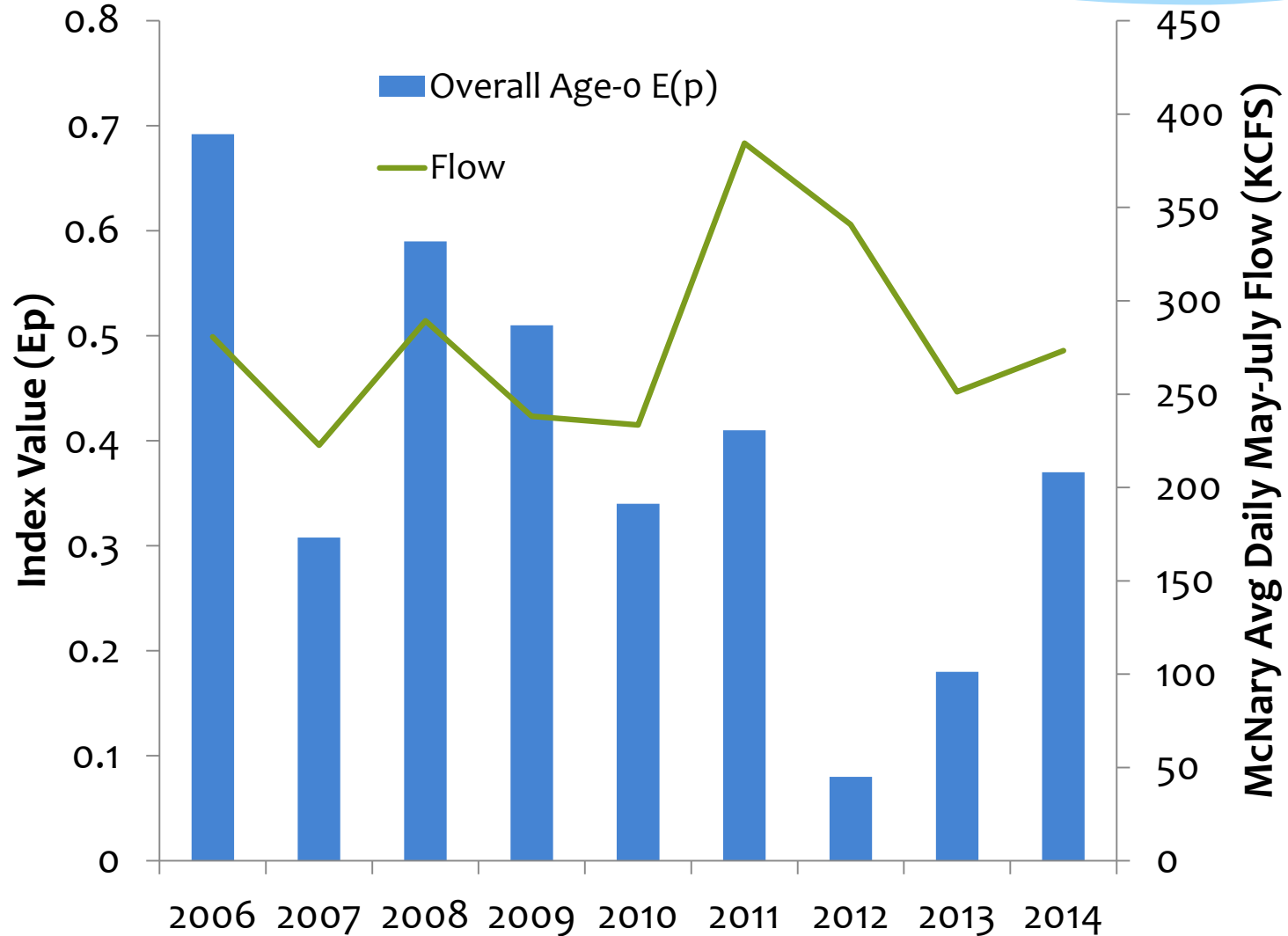
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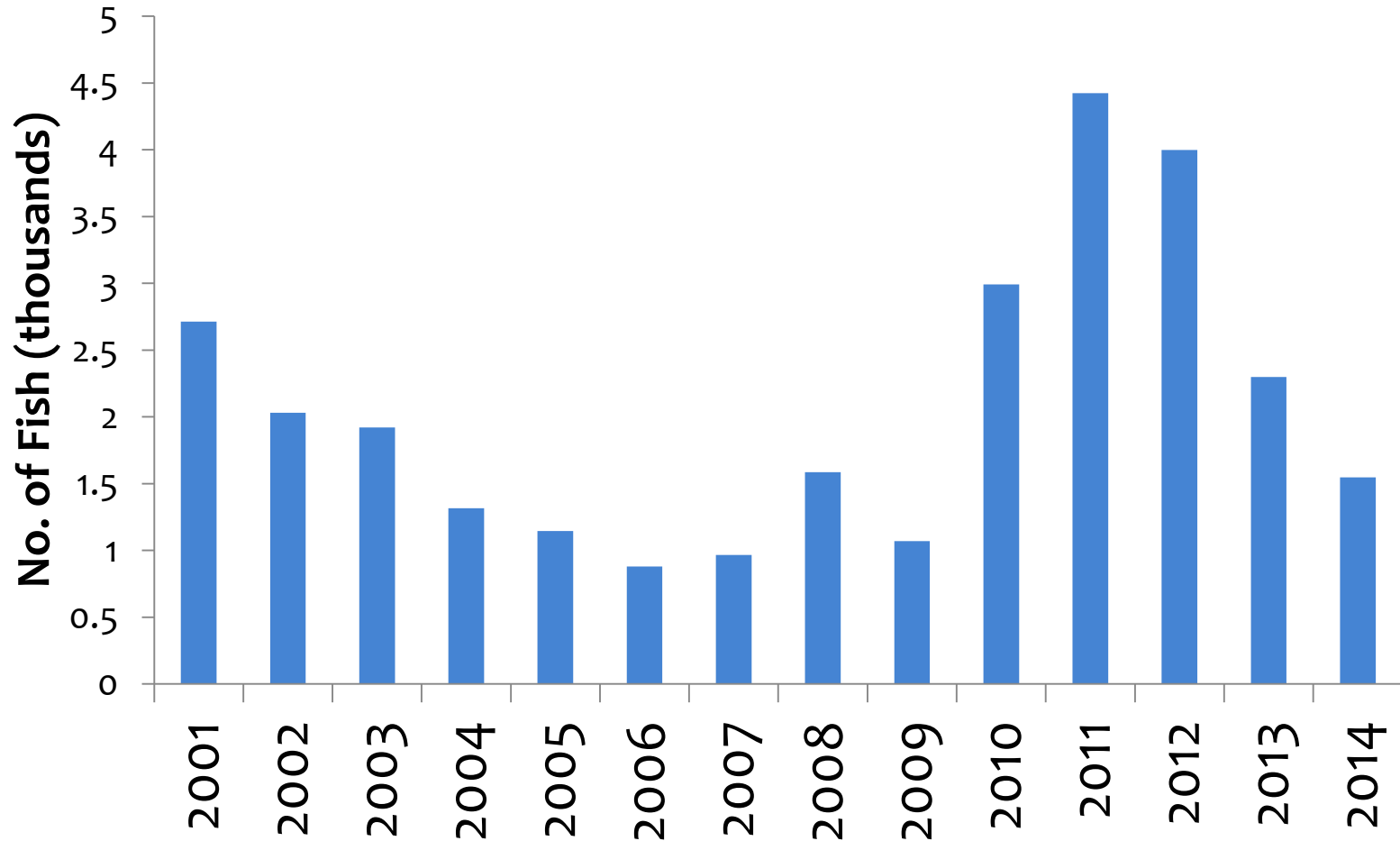


# BON white sturgeon productivity

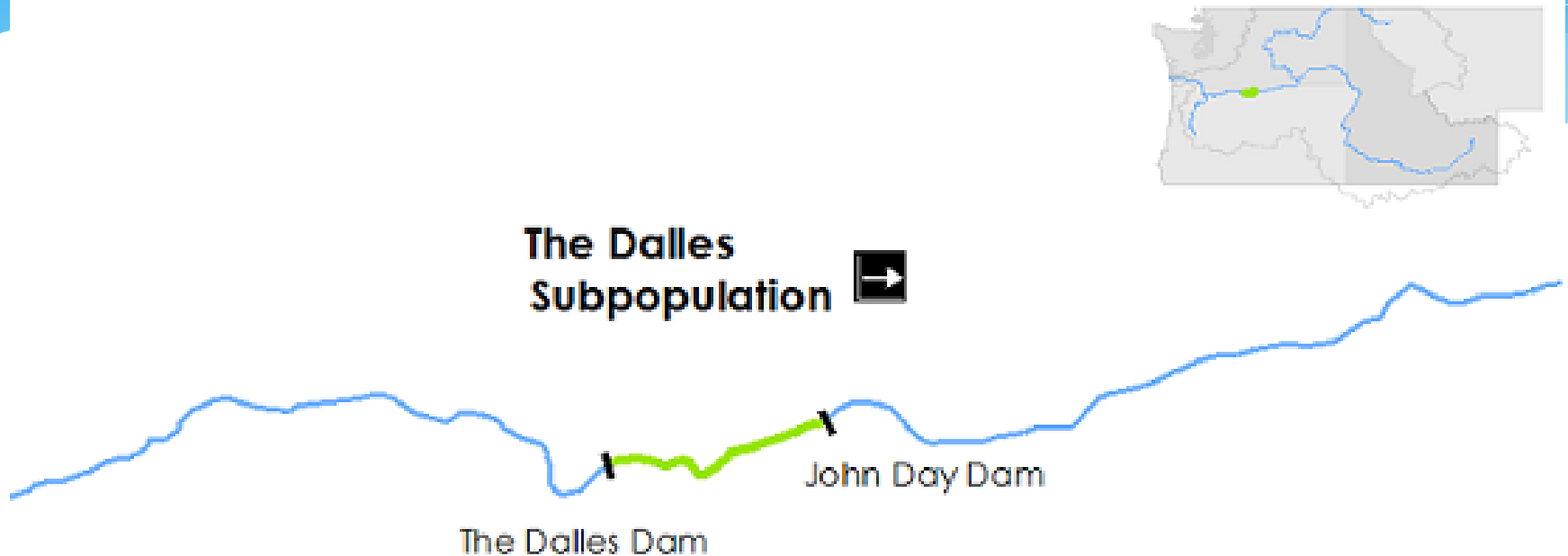


# BON white sturgeon harvest

Combined Recreational and Tribal Commercial Harvest



# The Dalles Reservoir Status



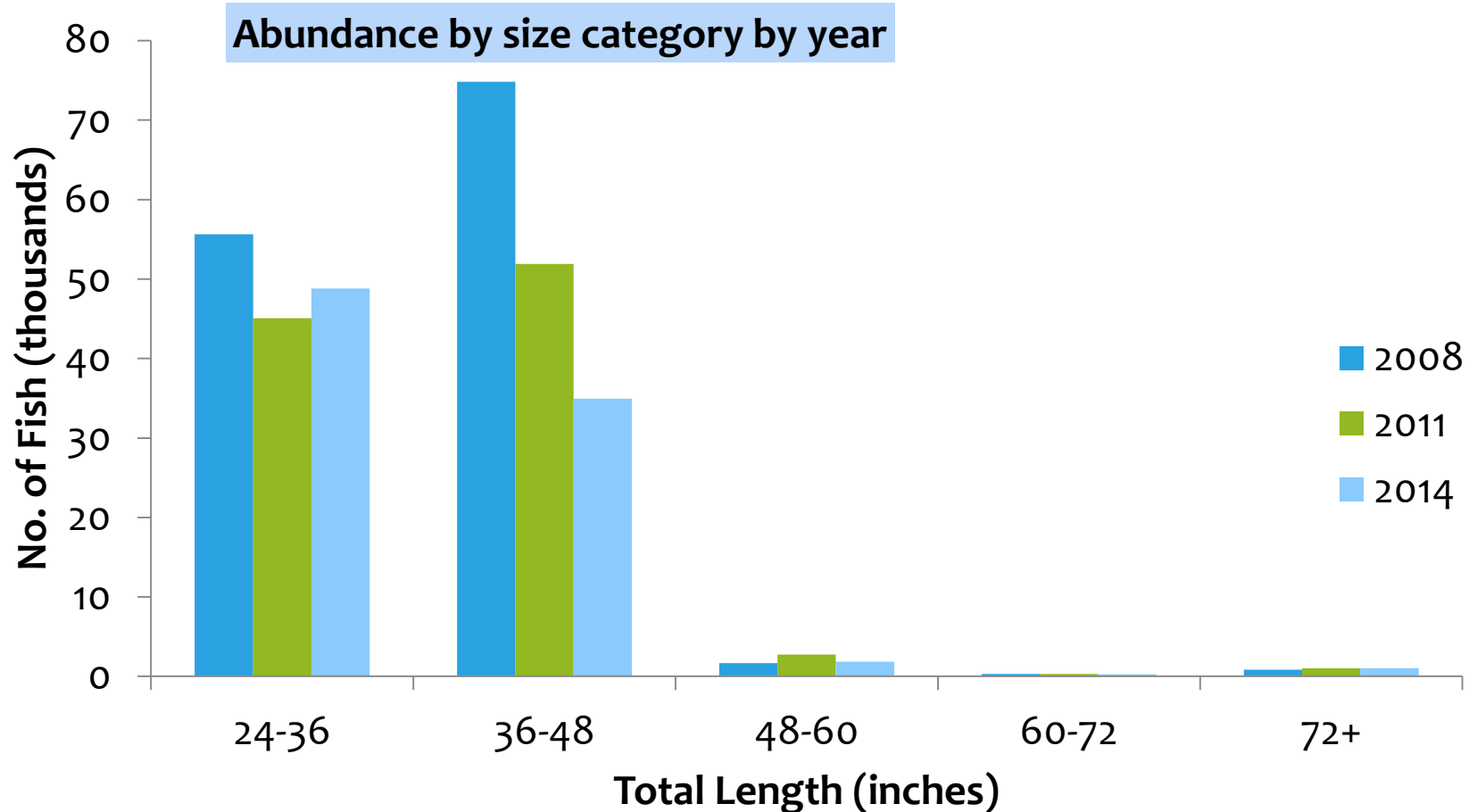
## Trend

- ↗ Increasing
- ↘ Decreasing
- ↕ Stable

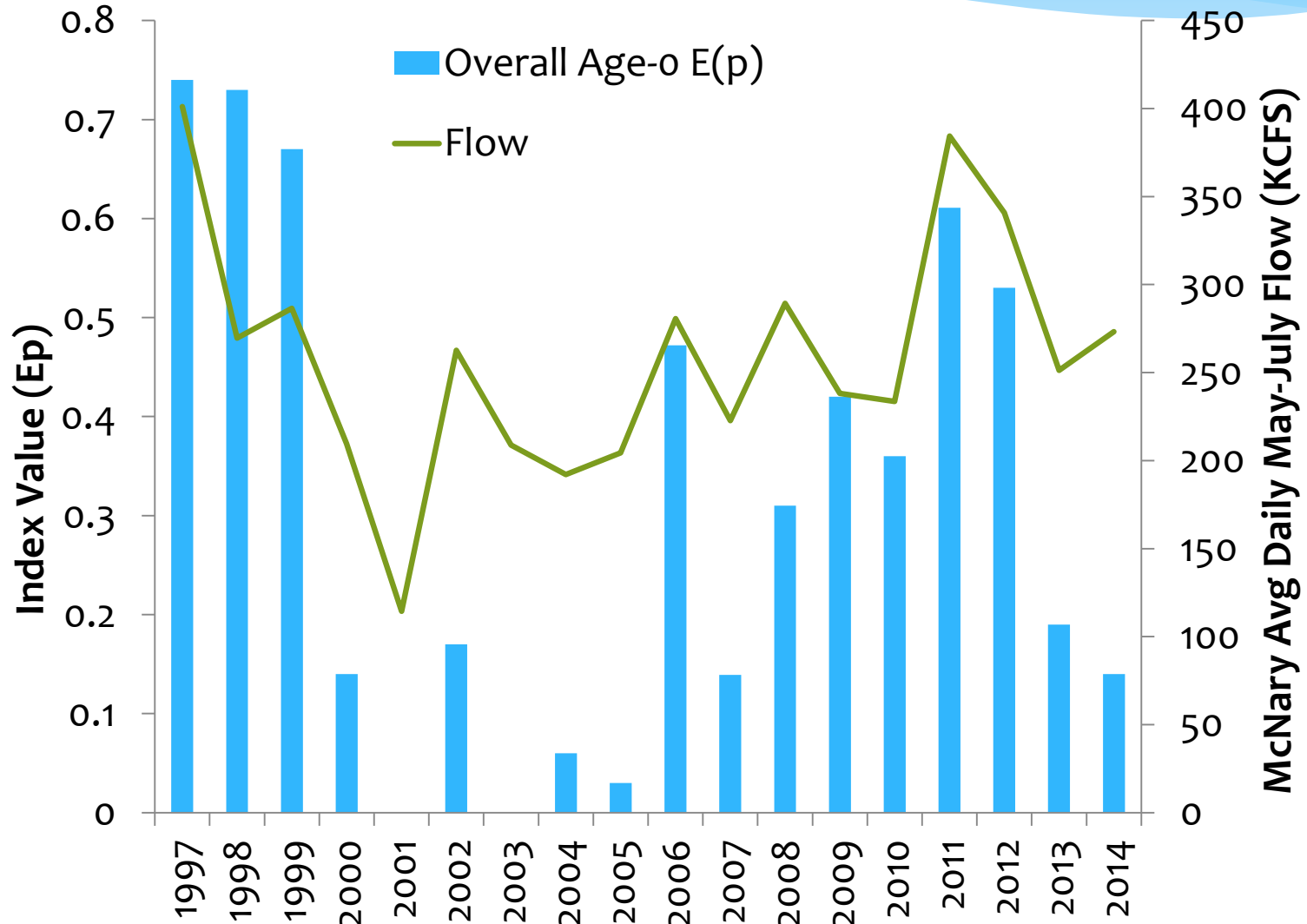
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# TDS white sturgeon abundance

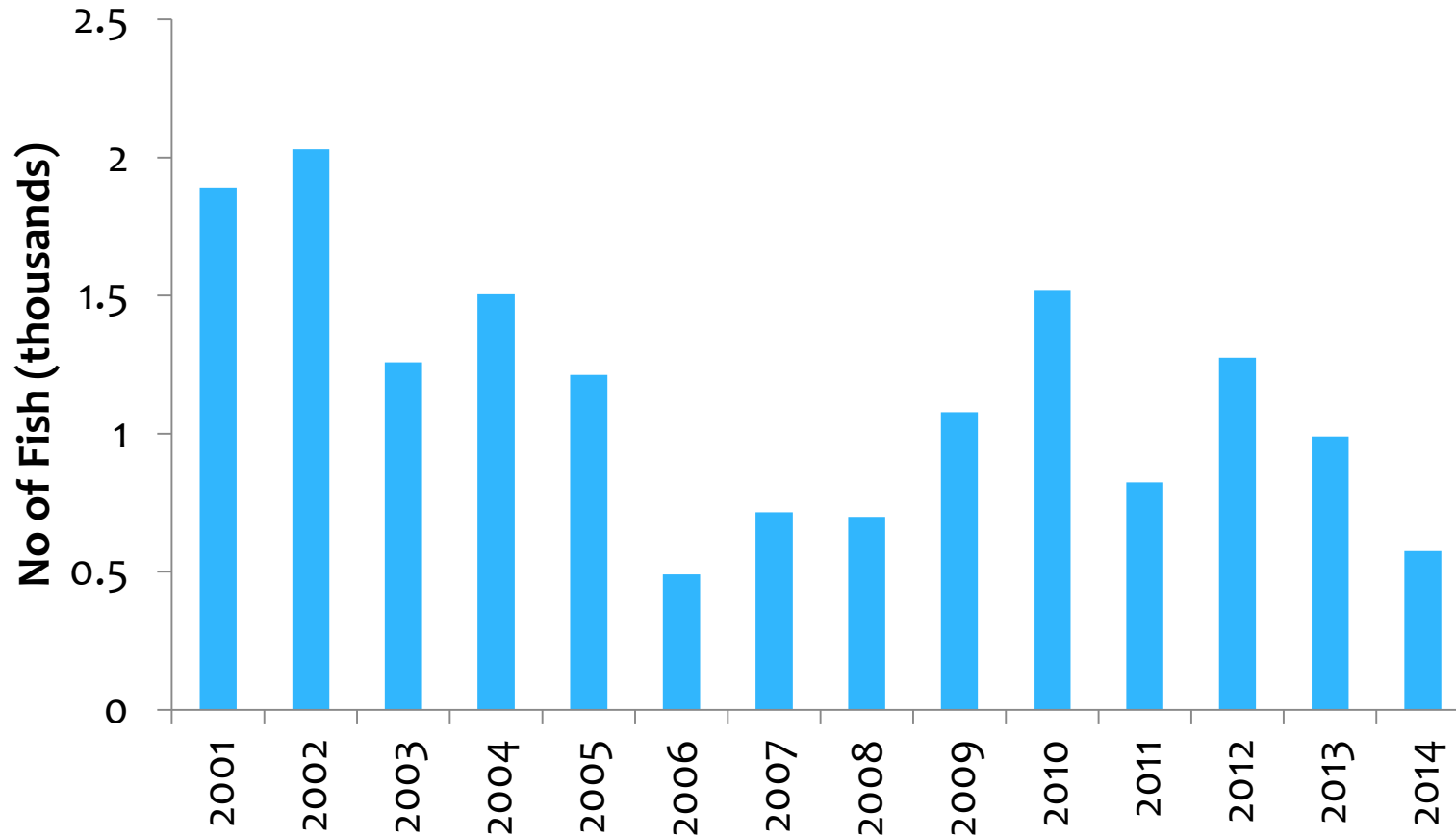


# TDS white sturgeon productivity



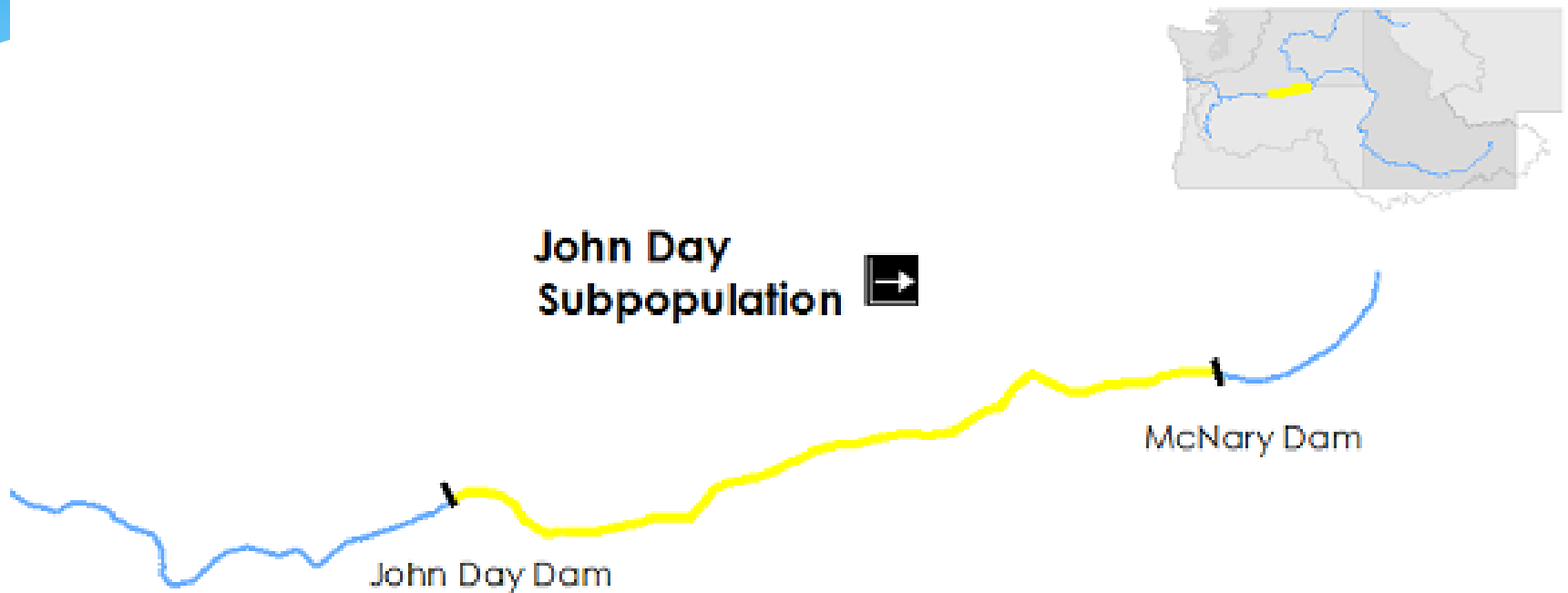
# TDS white sturgeon harvest

**Combined Recreational and Tribal Commercial Harvest**












# John Day Reservoir Status



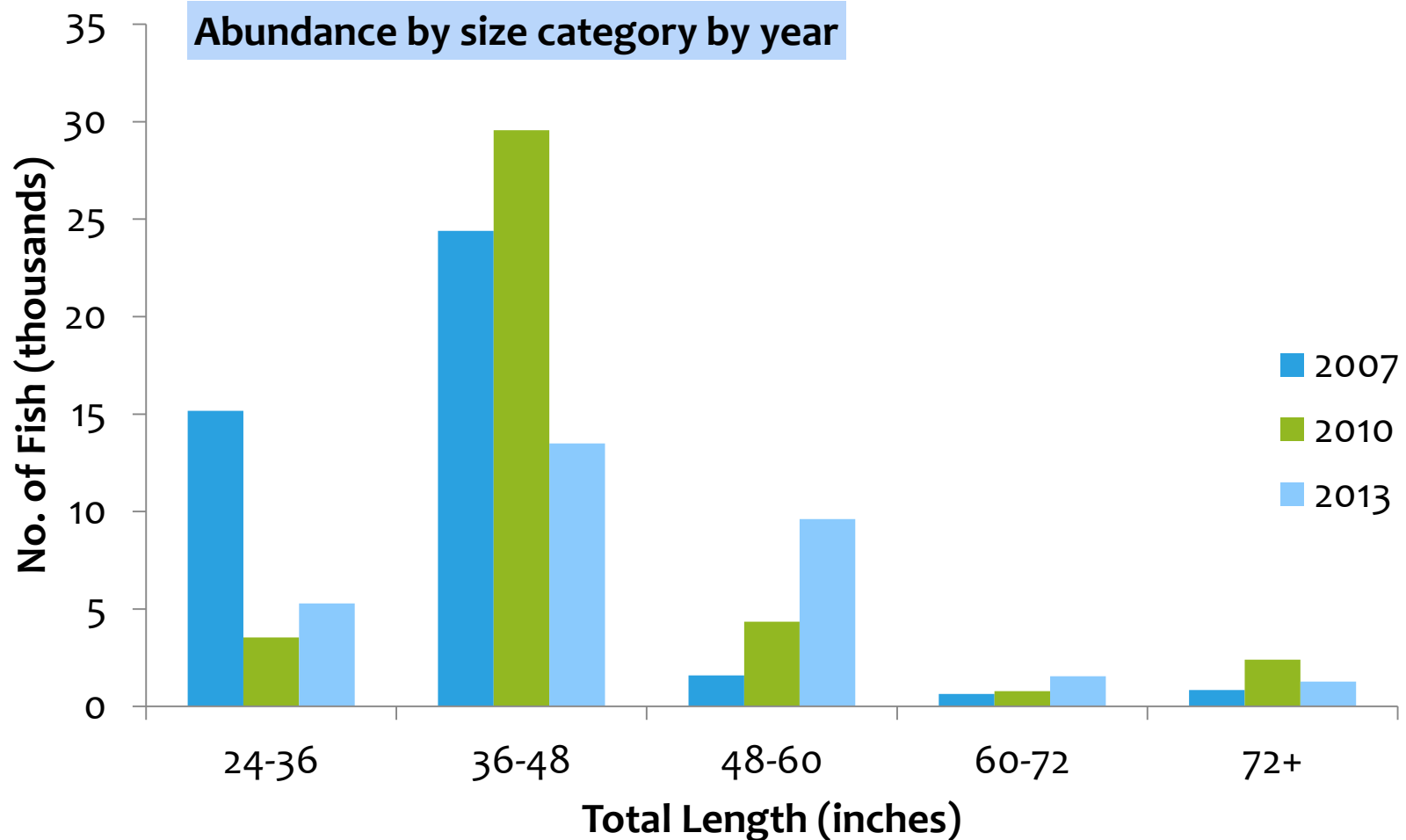
## Trend

-  Increasing
-  Decreasing
-  Stable

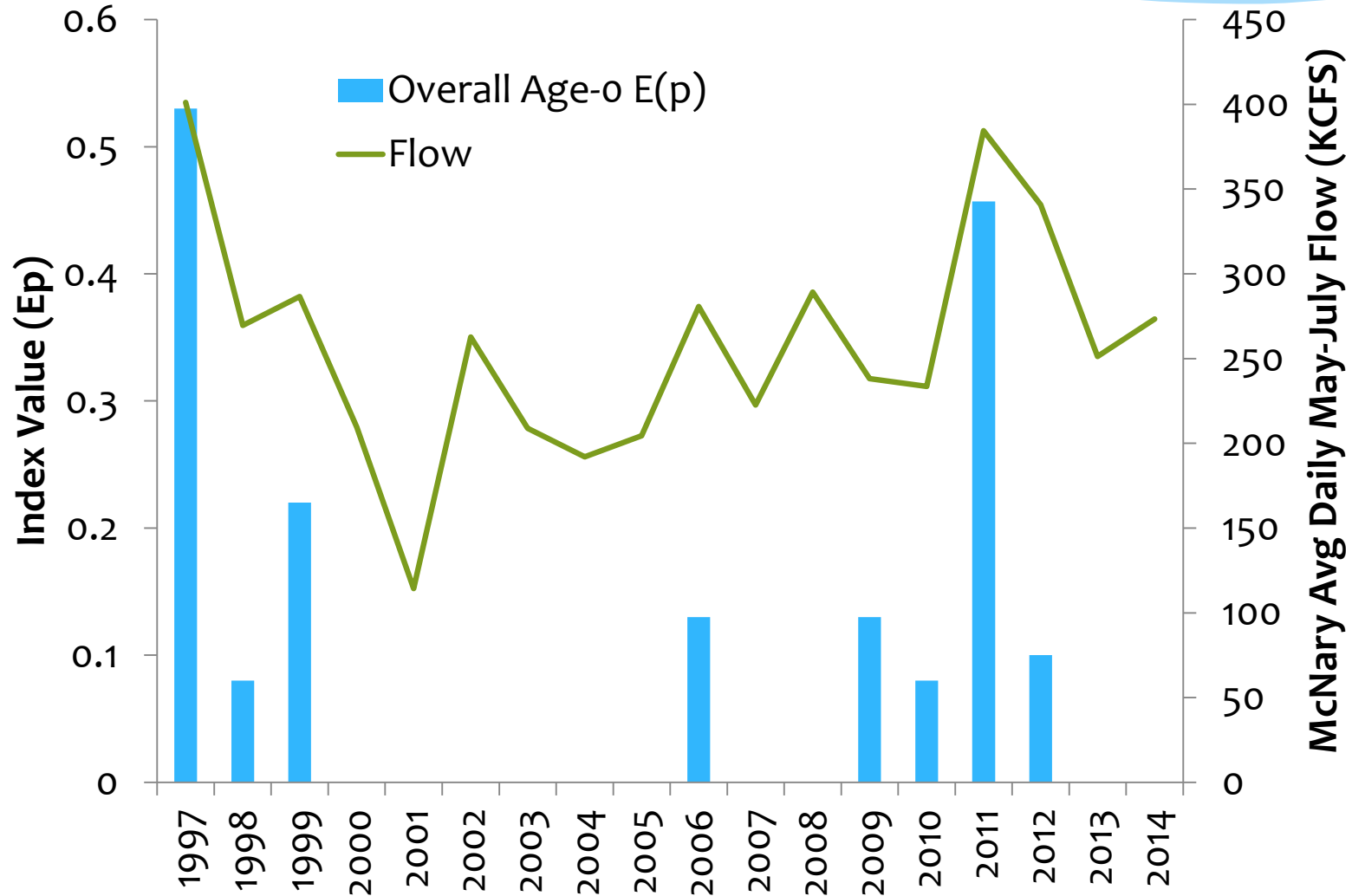
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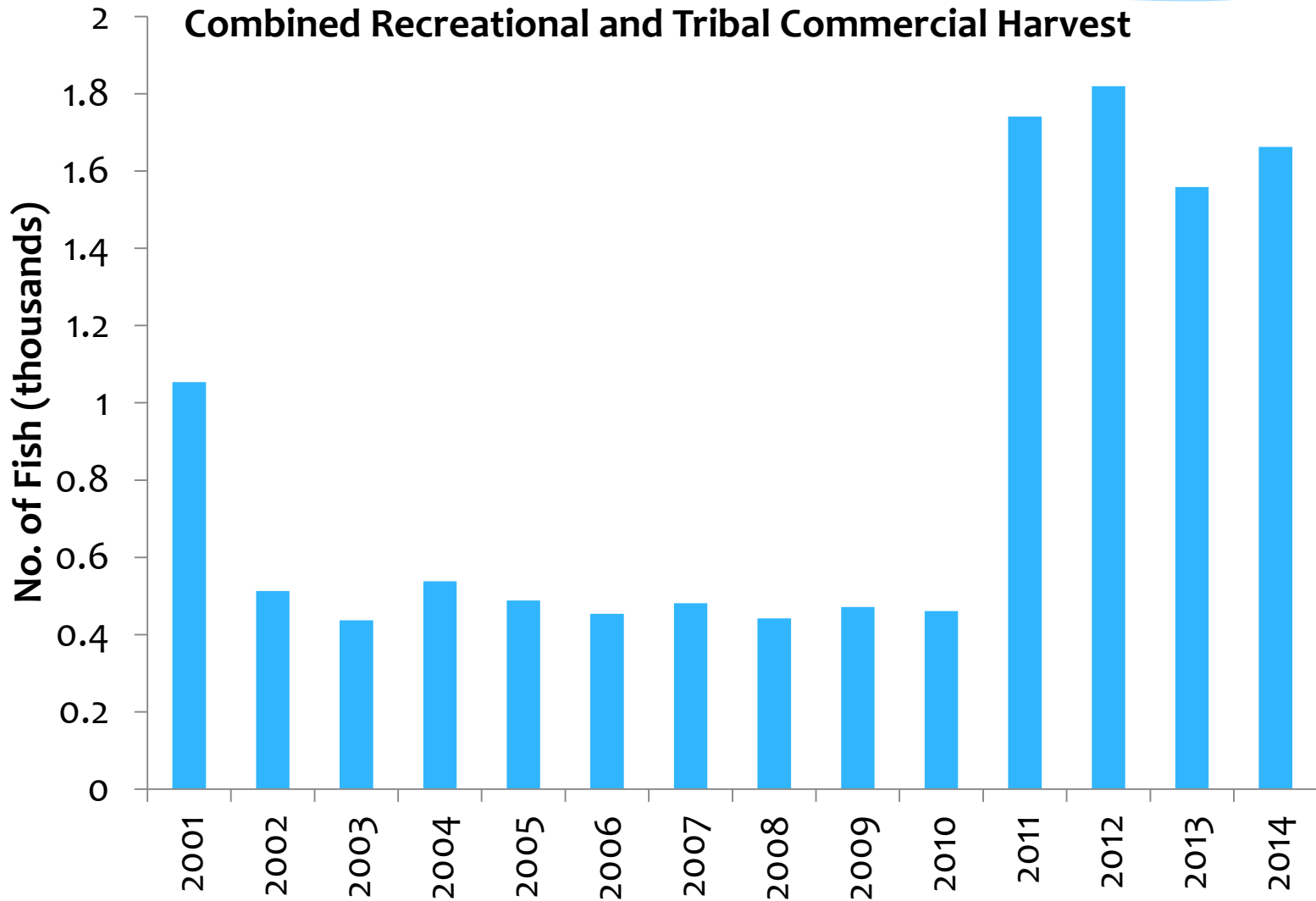
# JDY white sturgeon abundance



# JDY white sturgeon productivity



# JDY white sturgeon harvest

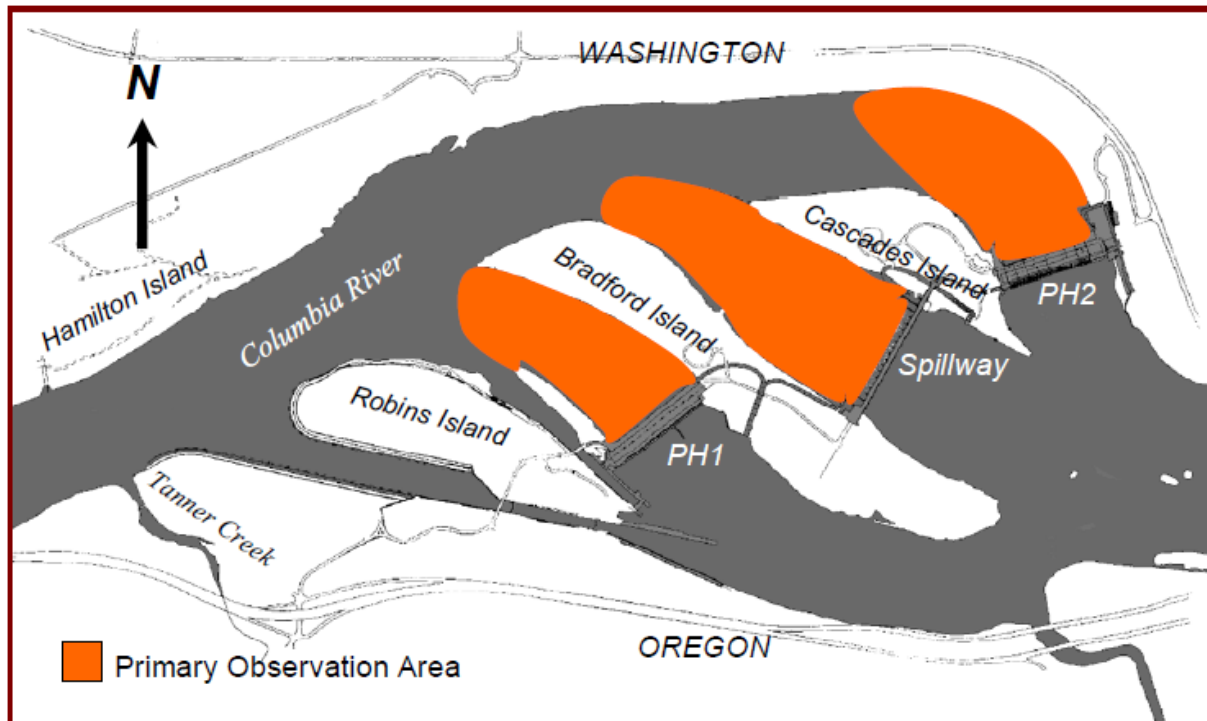


# Predation by Steller sea lions



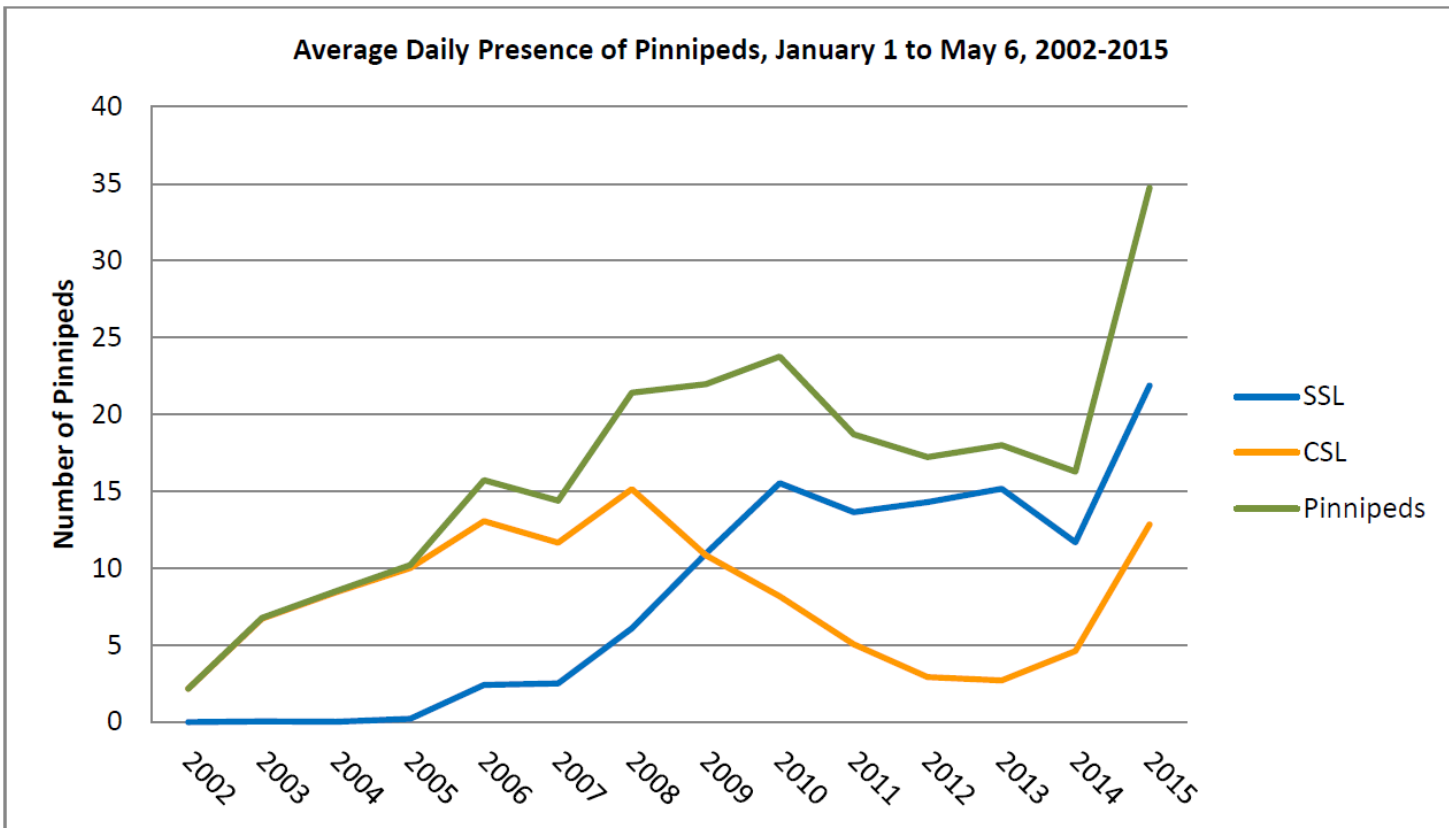
# Sea lion predation

- \* Historically pinnipeds were recorded as far up as Celilo Falls
- \* The 2000 FCRPS BiOp required USACE to evaluate marine mammal predation in the tailrace of Bonneville Dam
- \* Since 2002 the ACE has monitored pinniped activity during the 1 January – 31 May salmon passage season



# Sea lion predation

- \* Sea Lion presence grew and by 2005 a hazing program was initiated
- \* With the arrival that year of the larger Steller Sea Lion, sturgeon were being deliberately targeted



# Sea lion predation

- \* Seasonal consumption within the observation area grew to thousands of sturgeon
- \* The States conducted their own observations downriver of the Corps' observation area for several miles
- \* At the peak, the states estimated that sea lions consumed over 10,000 sturgeon in one season throughout the 145 miles of the lower Columbia River

Year	Total Hours Observed	Observed Sturgeon Catch	Expanded Sturgeon Consumption Estimate	Adjusted Sturgeon Consumption Estimate
2005	1,108	1	N/A	N/A
2006	3,647	265	315	413
2007	4,433	360	467	664
2008	5,131	606	792	1,139
2009	3,455	758	1,241	1,710
2010	3,609	1,100	1,879	2,172
2011	3,315	1,353	2,178	3,003
2012	3,404	1,342	2,227	2,498
2013	3,247	314	552	635
2014	2,947	79	127	147



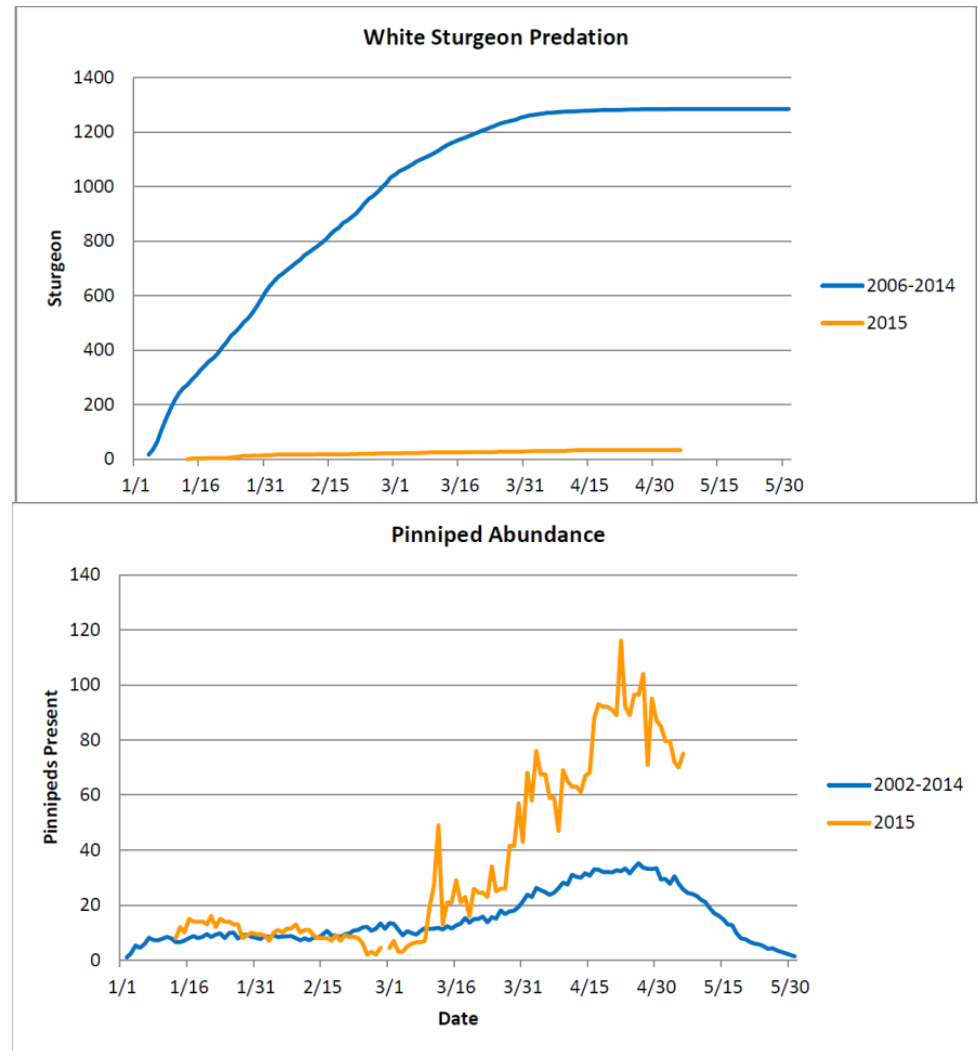
# Sea lion predation

- \* What is the current pinniped population status?



# Sea lion predation

- \* The good (or perhaps alarming) news is that consumption of white sturgeon is way down despite a greater pinniped abundance this year
- \* For more reports go to: <http://www.nwd-wc.usace.army.mil/tmt/documents/fish/>



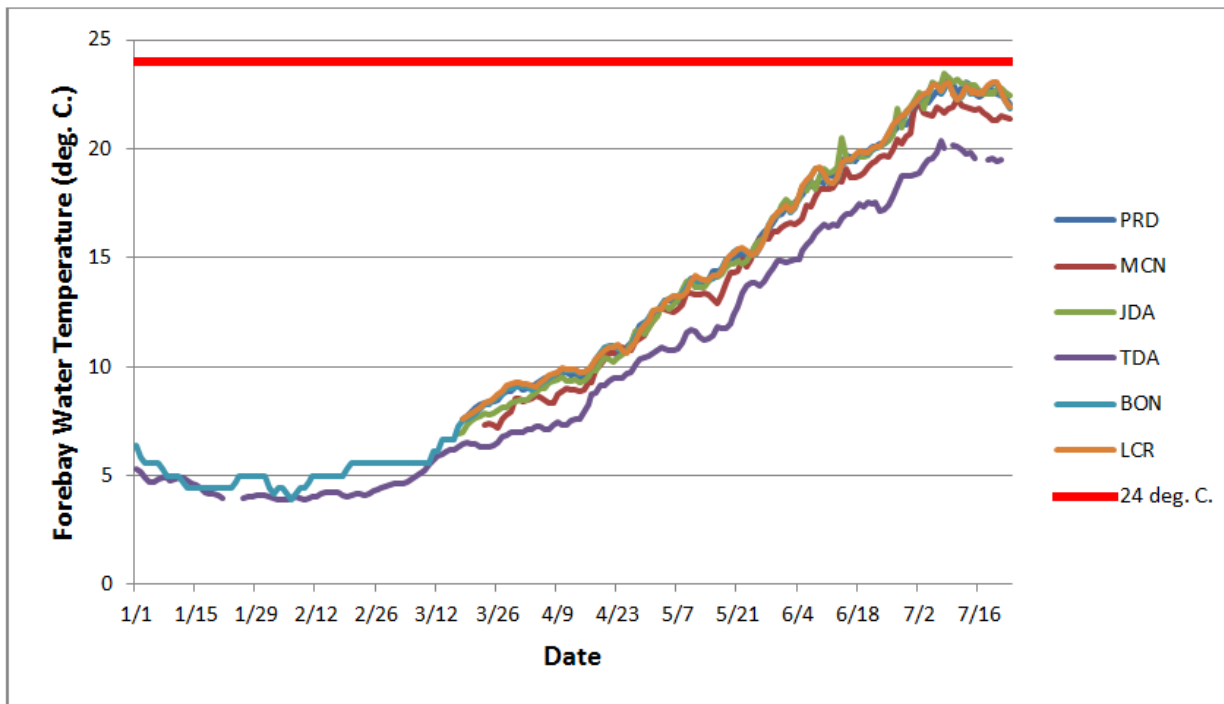
# Summer mortality events

- \* Unexplained die-offs have occurred in 2013 and 2015 in the impounded Columbia River
  - \* 2013 The Dalles Pool (Columbia River) 25 fish
  - \* 2015 The Dalles, John Day, and McNary Pools (Col. R.) 169 fish



# Summer mortality events

- \* The scenarios are similar
  - \* High and rapidly increasing water temperatures
  - \* Poor spawning conditions
  - \* Abundant in-river sockeye
  - \* Die-off almost exclusively sexually mature fish



# Summer mortality events

- \* What have we done?
  - \* Shut down catch and release fisheries
  - \* Validated public sightings with fish staff or enforcement officer conducting routine carcass surveys
  - \* Examined carcasses for cause of death
  - \* Monitor water temperatures during tagging operations
  - \* Collected blood samples to analyze stress hormones



# Summer mortality events

- \* What do we need to do?
  - \* Have a plan for future events
  - \* Establish a regular monitoring program for water temperature and dissolved oxygen levels
  - \* Temperature, stress and pathology research



# Illegal harvest (aka poaching)

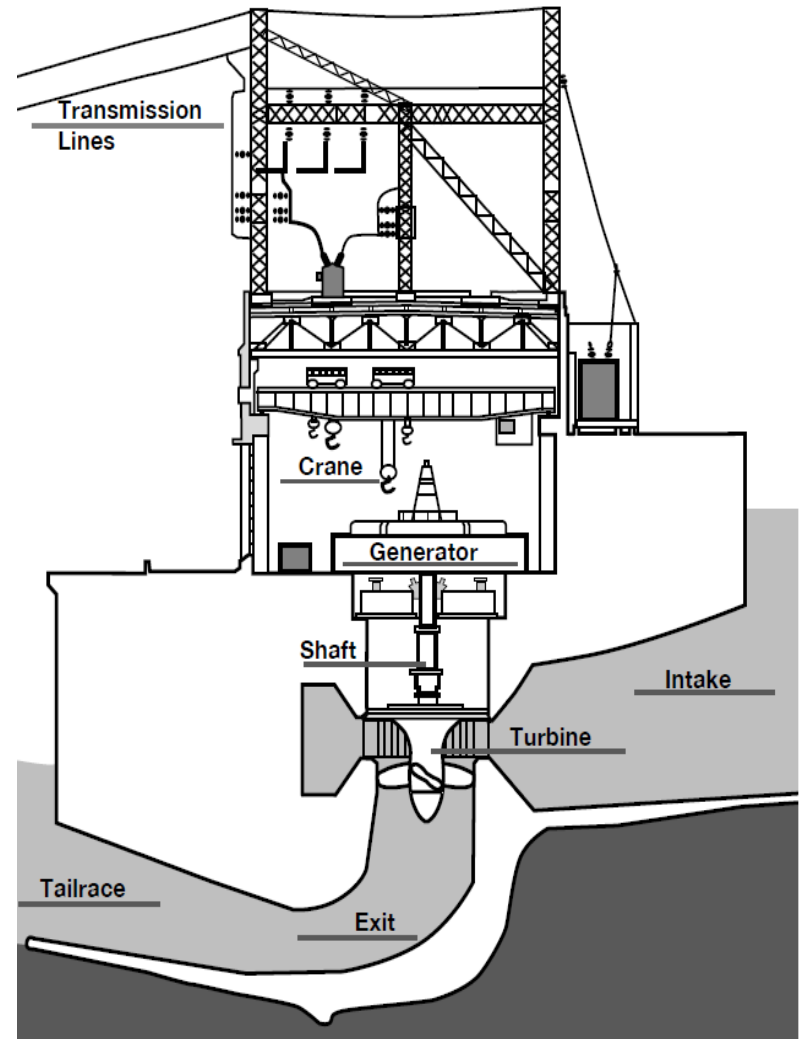


Image courtesy of MacGregor Campbell, OPB



# Direct hydrosystem interactions

- \* Sturgeon enter turbine draft tubes, penstocks and other orifices
- \* Without proper deterrence fish can be exposed to blade strikes, blunt force injuries or barometric trauma
- \* Fish are vulnerable during dewatering activities
  - \* Proper dewatering protocol
  - \* Problem recognition
  - \* Slow-roll at startup





# Thanks



Washington Department  
of Fish & Wildlife



