Pacific NorthWest Economic Region (PNWER) Annual Summit

Invasive Species Session
Non-Native Invasive Fish and Potential Economic Impacts

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July 26, 2017: Portland, OR

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What are Non-Native Invasive Species?

- *"…invasive species include non-native organisms that cause economic or environmental harm and are capable of spreading to new areas of the state."* *(Revised Code of Washington 79A.25.310*

- *"…an "alien species" whose introduction does or is likely to cause economic or environmental harm or harm to human health."* *(Executive Order 13112: February 3, 1999)*

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- *"……species that establish and reproduce rapidly outside of their native range and may threaten the diversity or abundance of native species through competition for resources, predation, parasitism, hybridization with native populations, introduction of pathogens, or physical or chemical alteration of the invaded habitat."* (**California Aquatic Invasive Species Management Plan, Department of Fish and Game; January 2008**)

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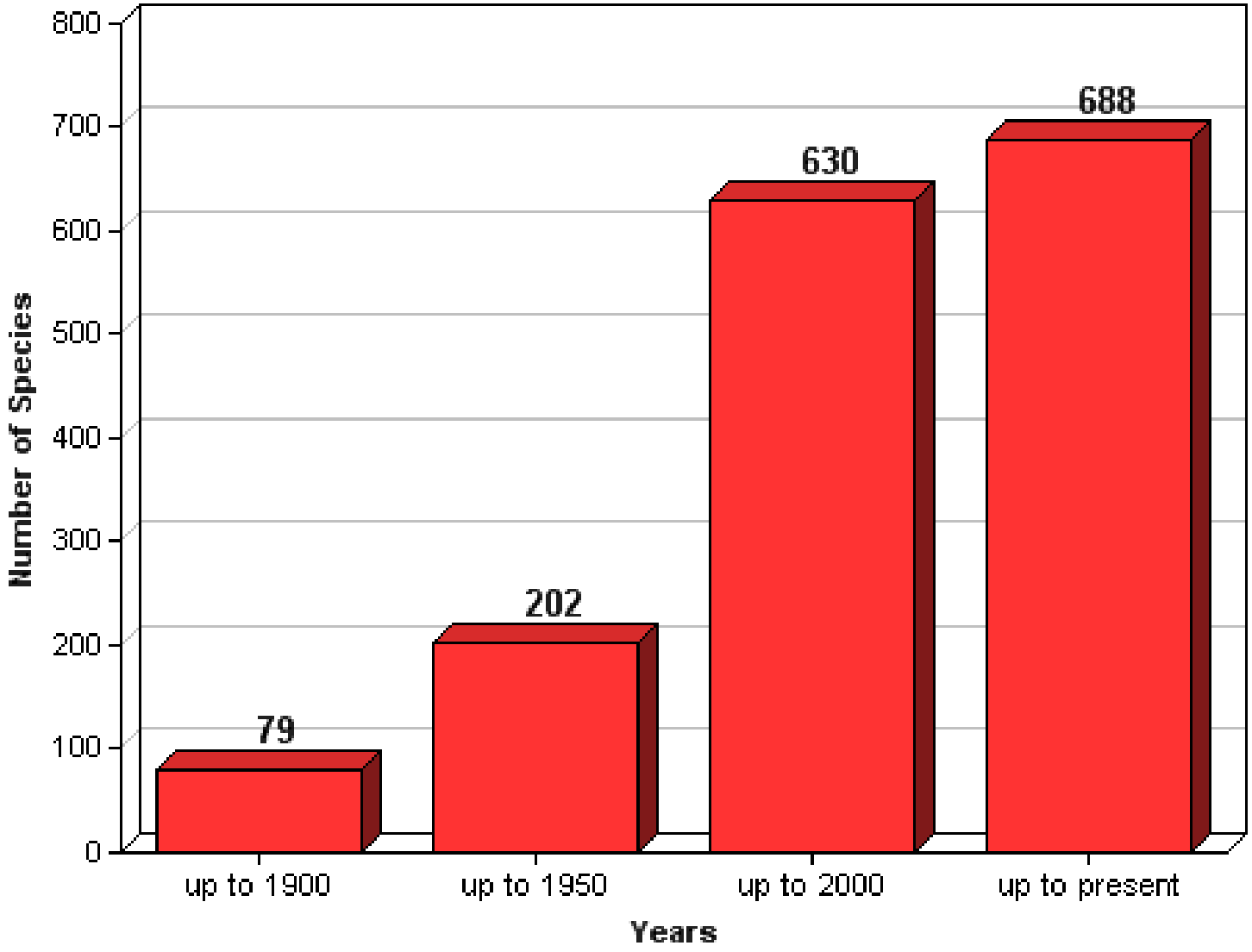
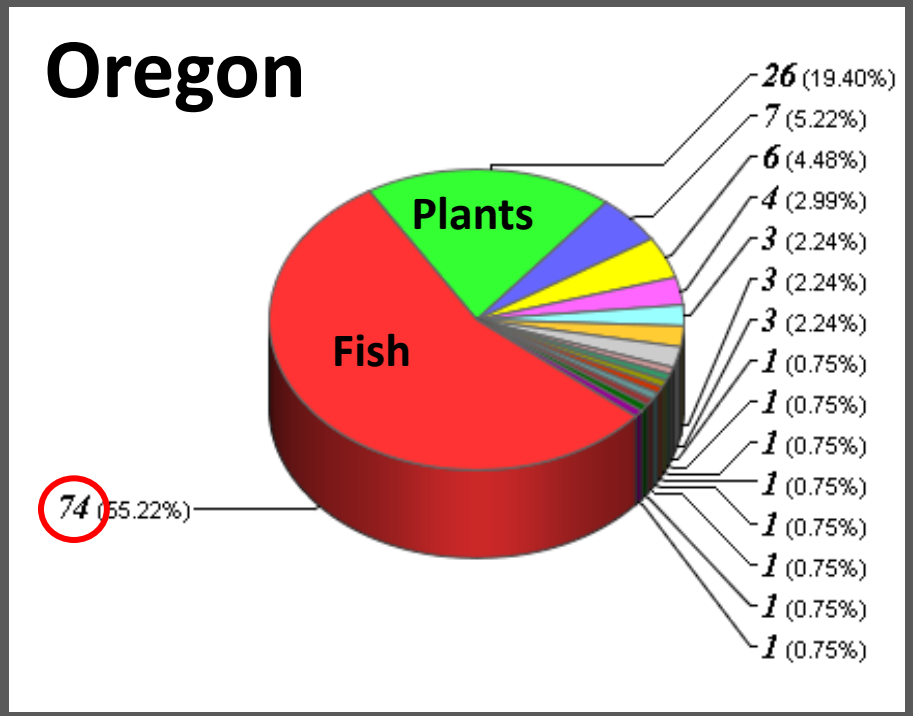
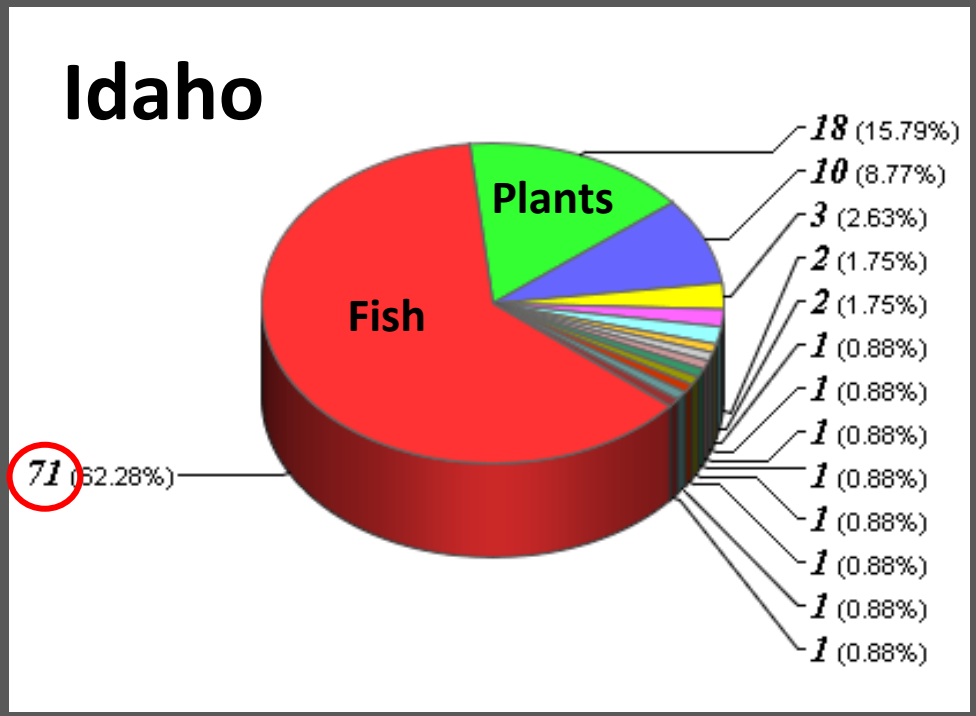
Introduction of Fishes in the United States



Graph created: 5/7/2015 by the United States Geological Survey

Non-Native Aquatic Groups Introduced into Oregon and Idaho





Graph created: 6/26/2017 by the United States Geological Survey

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Impact of Invasive Species

- $137 billion annually in the U.S. (Pimentel 2003)
  - Includes $5.4 billion related to invasive fish
- Tied mainly to economic damages and cost of control measures
- Nationwide, non-native fish species have been a contributing factor in 70% of ESA fish listings (Lassuy 1995)

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Asian Carp

- Introduced through the aquaculture industry
- Voracious eaters that threaten native fisheries, including the $7 billion Great Lakes fisheries.
- In 2010 alone, the federal government committed $78.5 million in investments to prevent the introduction of Asian carp to the Great Lakes

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Distribution of Bighead Carp

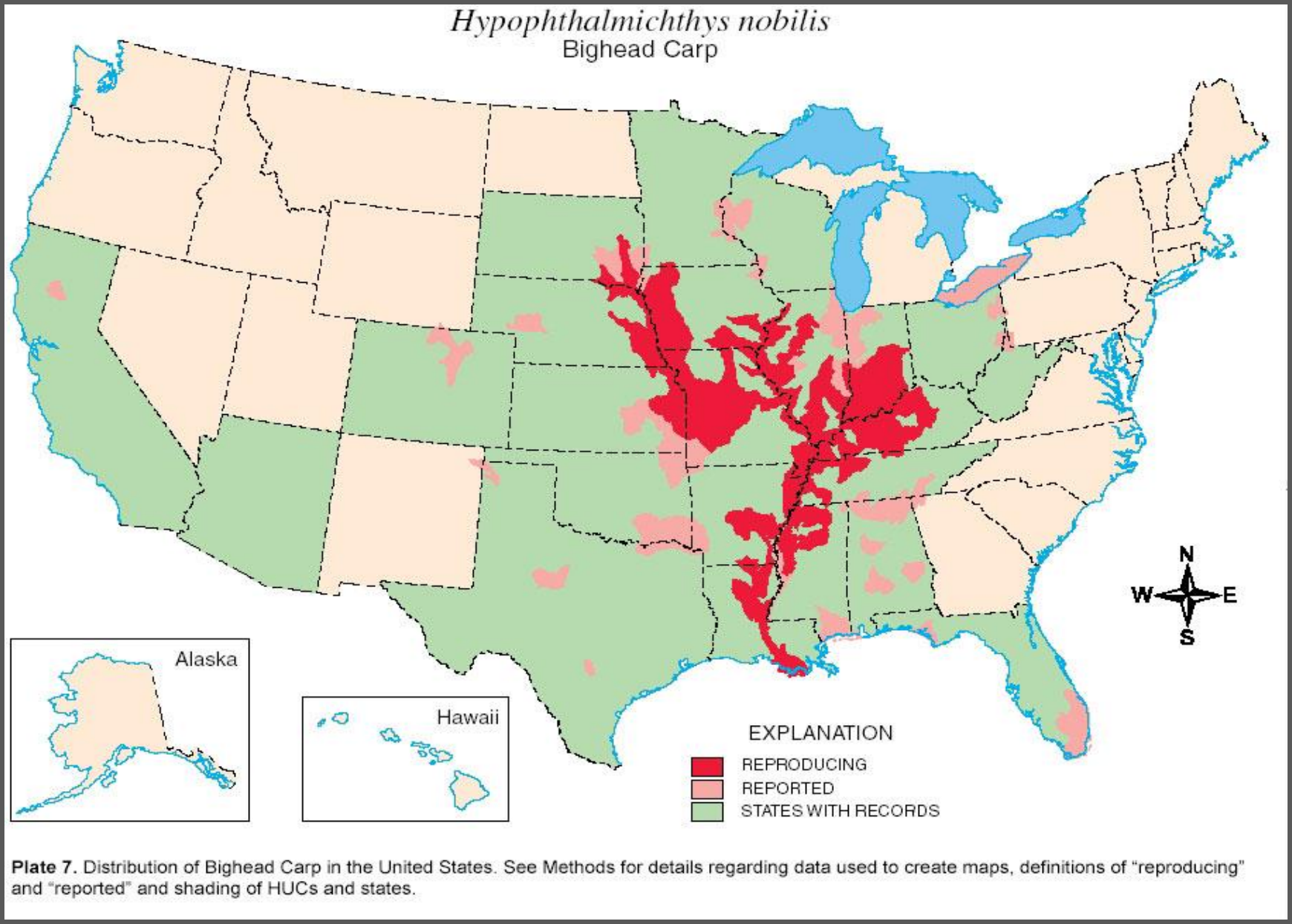

Plate 7. Distribution of Bighead Carp in the United States. See Methods for details regarding data used to create maps, definitions of "reproducing" and "reported" and shading of HUCs and states.

"The Economic Impact on Plumas County of Alternative Northern Pike Eradication and Management Scenarios for Lake Davis, California"
August 2006

- Measure the potential statewide economic effects of pike escapement
- Inform decision-makers about the potential consequences of not implementing a pike eradication project

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Direct and Regional Economic Effects

Measure	Direct	Indirect	Induced	TOTAL
Recreational Fishing (Freshwater)				
Output ($ million)	-$10.00	-$3.73	-$4.02	-$17.75
Income ($million)	-$3.47	-$1.22	-$1.42	-$6.12
Employment (jobs)	-166	-24.4	-34.3	-174.7
Recreational Fishing (Marine)				
Output ($ million)	-$0.86	-$0.30	-$0.34	-$1.49
Income ($million)	-$0.30	-$0.10	-$0.12	-$0.51
Employment (jobs)	-9.1	-1.9	-2.9	-13.9
Commercial Fishing				
Output ($ million)	-$1.81	-$0.58	-$1.08	-$3.47
Income ($million)	-$1.01	-$0.21	-$0.38	-$1.60
Employment (jobs)	-46.2	-3.7	-9.2	-59.2

Source: Lake Davis Eradication Project EIR/EIS 2006

Net economic values generated by Washington Fisheries in 2006

- Commercial Salmon = $7,091,000
- Recreational Salmon (freshwater and saltwater) = $129,419,300
- Recreational Steelhead = $51,260,500
- Recreational Trout = $145,903,900
- Combine for almost 71% of all recreational fisheries in Washington

Economic Analysis of the Non-Treaty Commercial and Recreational Fisheries in Washington State 2008

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Questions?

Northern Pike are coming and you should be afraid…….be very afraid

Joe Maroney
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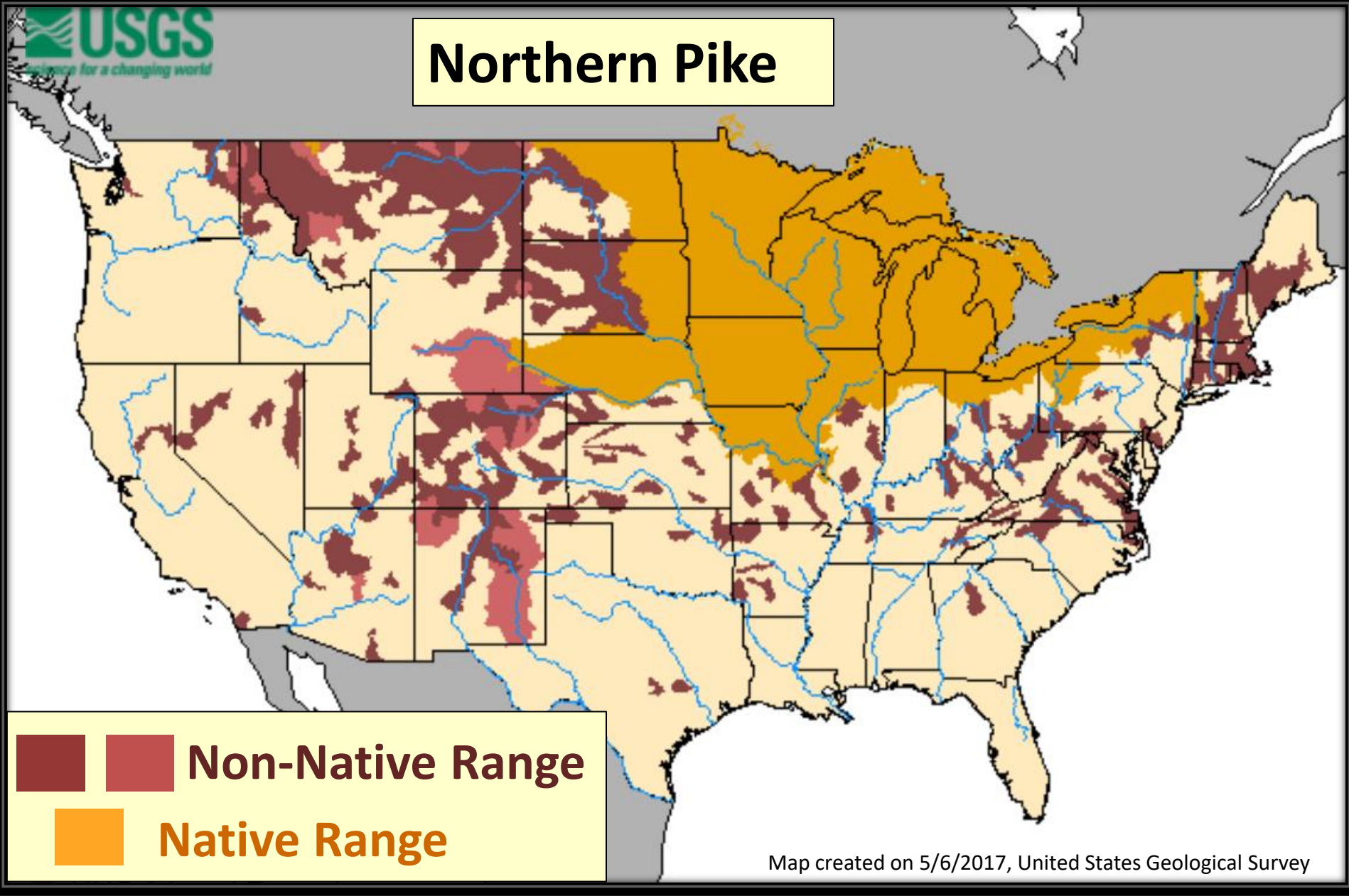
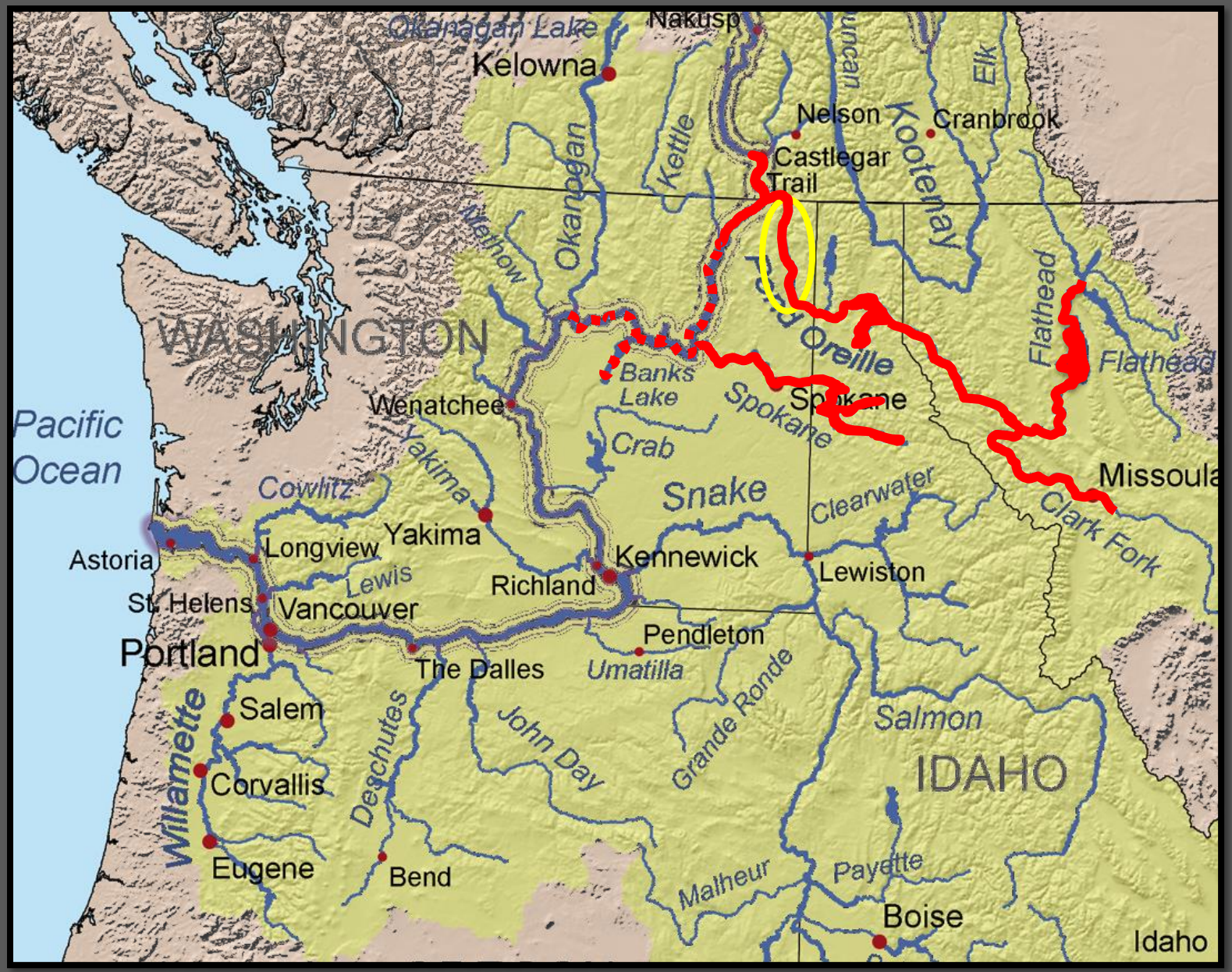
Kalispel Natural Resource Department
Member, Washington Invasive Species Council

July 25, 2017: Portland, OR


USGS
science for a changing world
Northern Pike
Non-Native Range
Native Range
Map created on 5/6/2017, United States Geological Survey

Northern Pike Expansion in Upper Columbia




Box Canyon Reservoir

Background

- **Established in 2004; Monitored 2005 to present**
  - Exponential increase from ~400 in 2006 to >5,500 in 2010
  - Range expanded throughout reservoir as well as downstream
  - Most species except smallmouth bass & tench declined significantly
- **Threats: Local and Downstream (Columbia River)**
  - Native species recovery in Lower Pend Oreille
  - FERC license implementation
  - Illegal introductions
  - ESA recovery; Tribal, recreational, commercial salmon and steelhead fisheries
  - Lake Roosevelt Fisheries

Kalispel Tribe and Washington Dept. of Fish & Wildlife Thinking

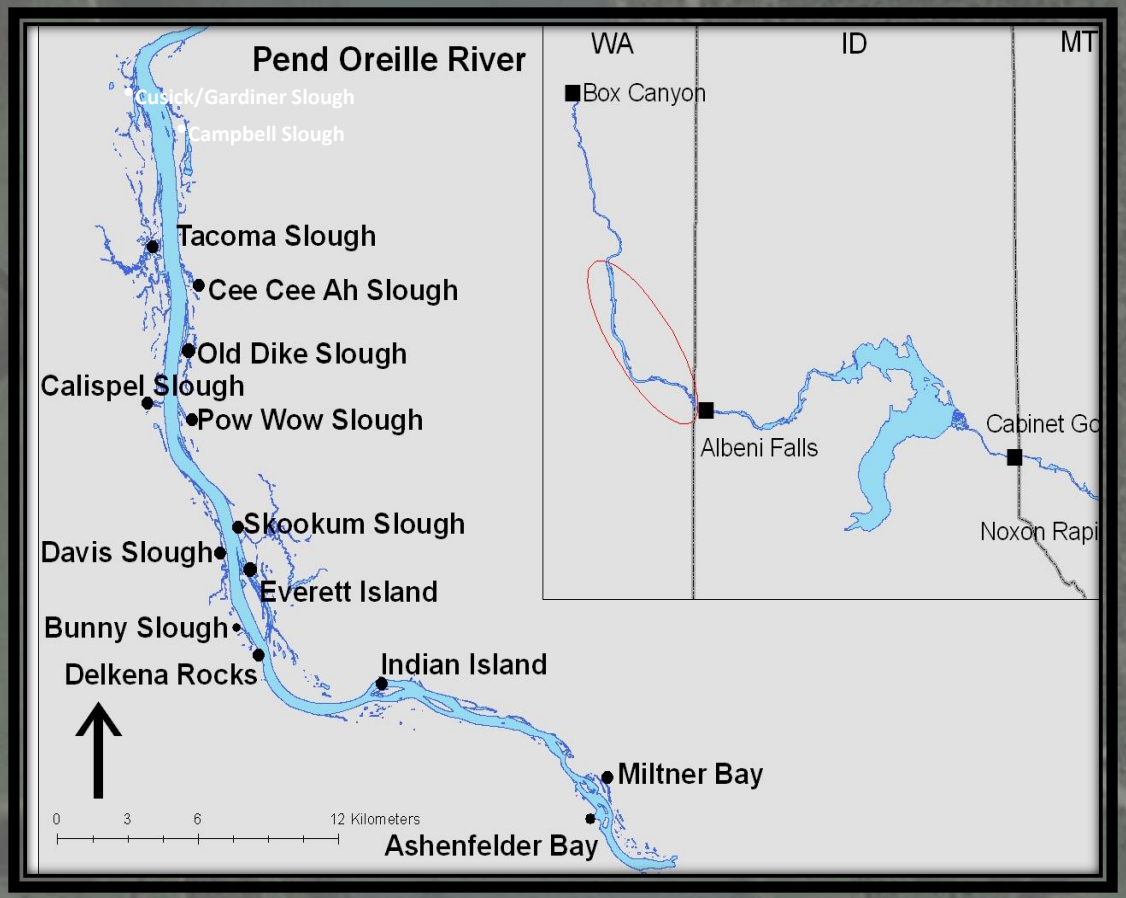
Pike are a problem, not an opportunity

Management goals:

- Minimize impact to native species
- Reduce spread of pike to other waters, including the Columbia River
- Reduce numbers of pike in Box Canyon Reservoir

Photo by Jim Lavakras, Compliments of Anchorage Daily News

Mechanical Suppression: Location



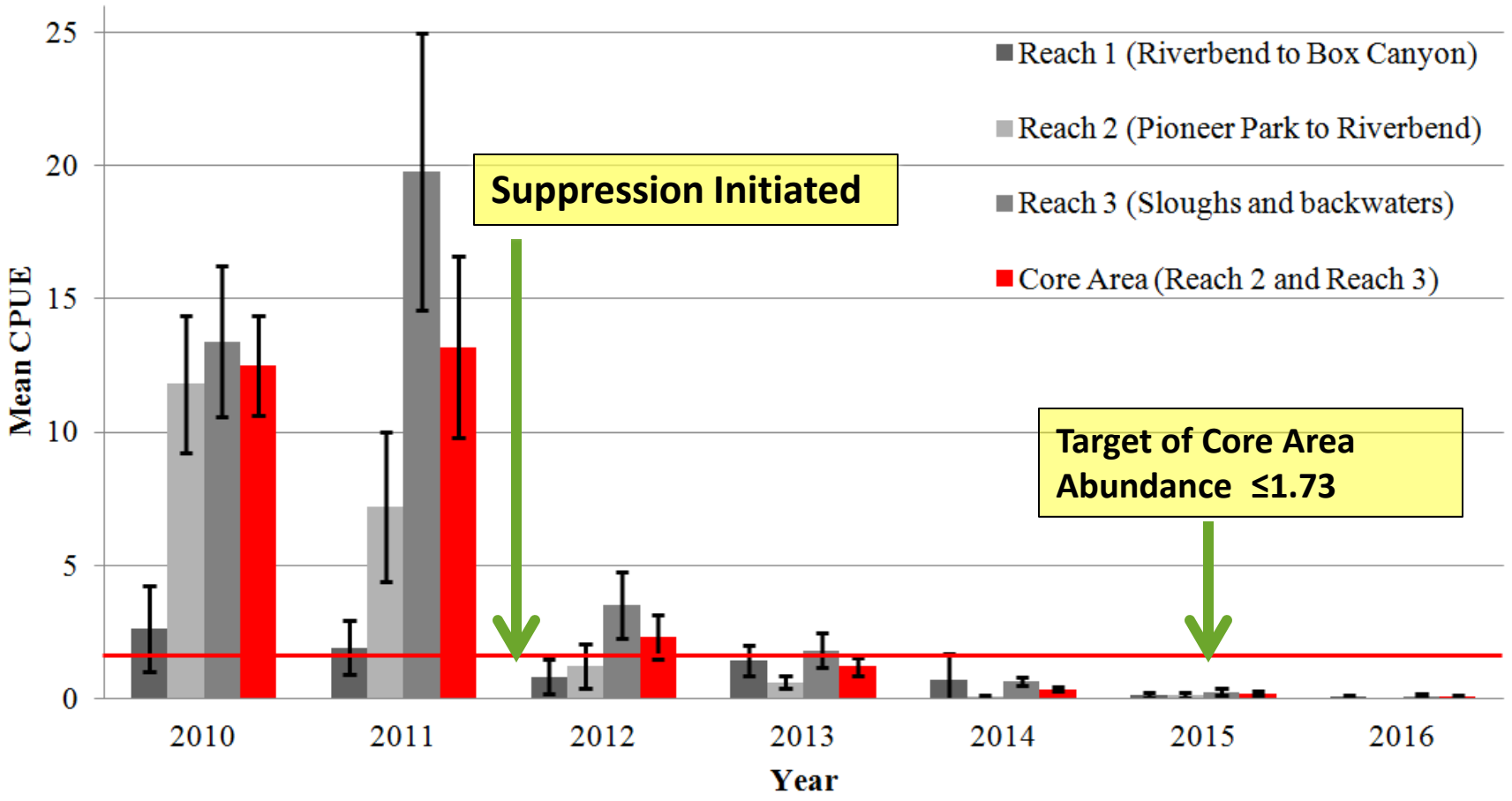
- 55 mile long reservoir
- 8,788 surface acres

Suppression Results: 2012 - 2017

	Gillnets Set/Pulled			Northern Pike Removed			
Year	Phase I	Phase II	Total	Phase I	Phase II	Total	CPUE
2012	524	507	1,031	4,552	1,256	5,808	5.6
2013	1,027	190	1,217	5,953	499	6,452	5.3
2014	862	0	862	3,967	0	3,967	4.6
2015	854	0	854	751	0	751	0.88
2016	419		419	181	0	181	0.43
2017	219		219	34	0	34	0.15
Total	**3,905**	**697**	**4,602**	**15,438**	**1,755**	**17,193**	

- 124.3 miles of gilllnet
- 2012-14 bycatch: 21 fish species, 38,749 individuals, >90 % survival
- 2016 bycatch: 7,741 individuals (tench, pumpkinseed and yellow perch made up 62%)

Northern Pike Spring Pike Index Netting Survey (SPIN) 2010-2016



Where do we go from here?

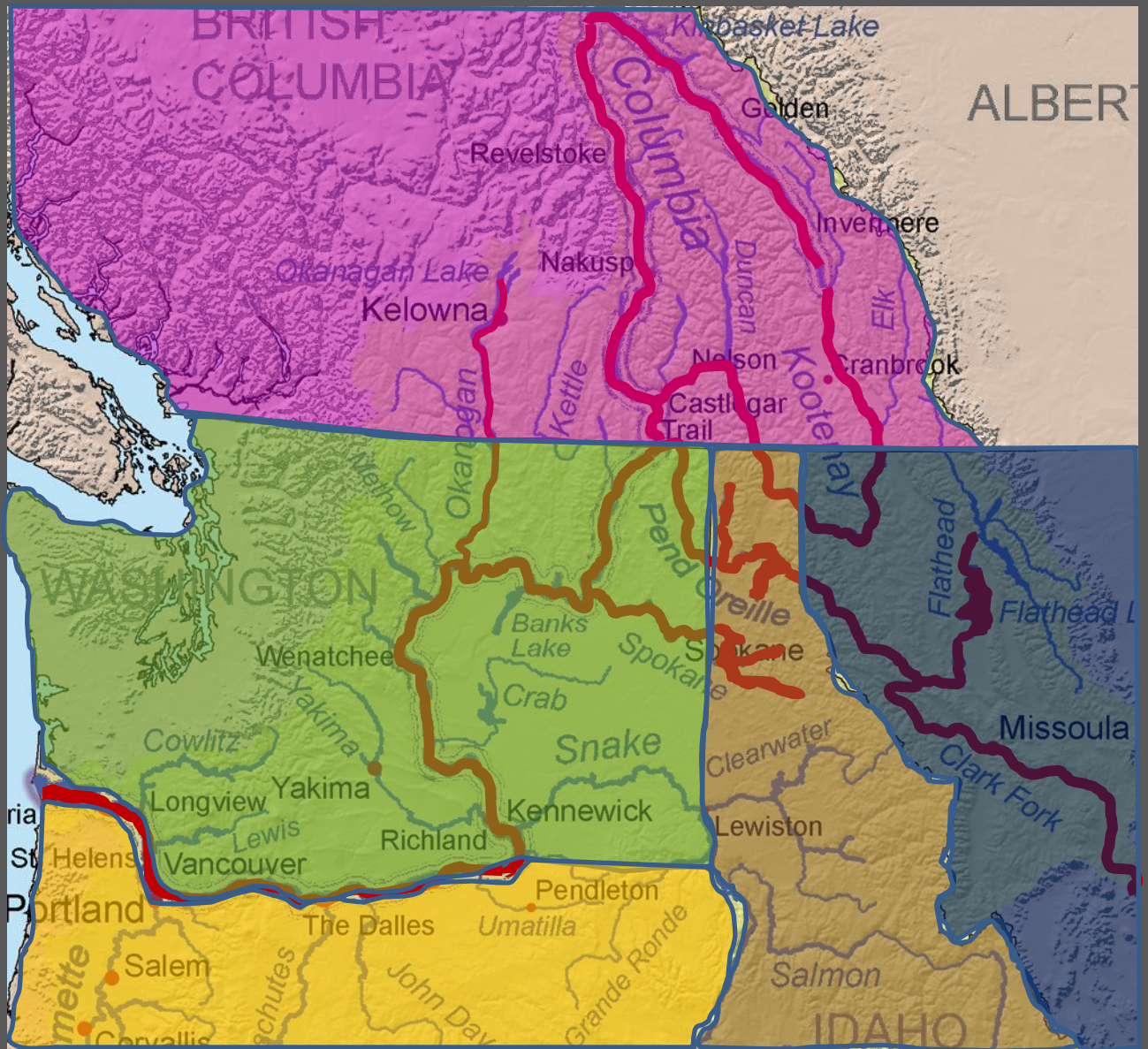
Mowing the grass

Four H's: habitat, hatcheries, harvest and hydropower

I ....INVASIVE SPECIES

Non-Native

Water flows downhill & so do fish



Mouth of Okanogan River

Acknowledgements

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- Avista Corporation
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- Kalispel Tribe of Indians
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