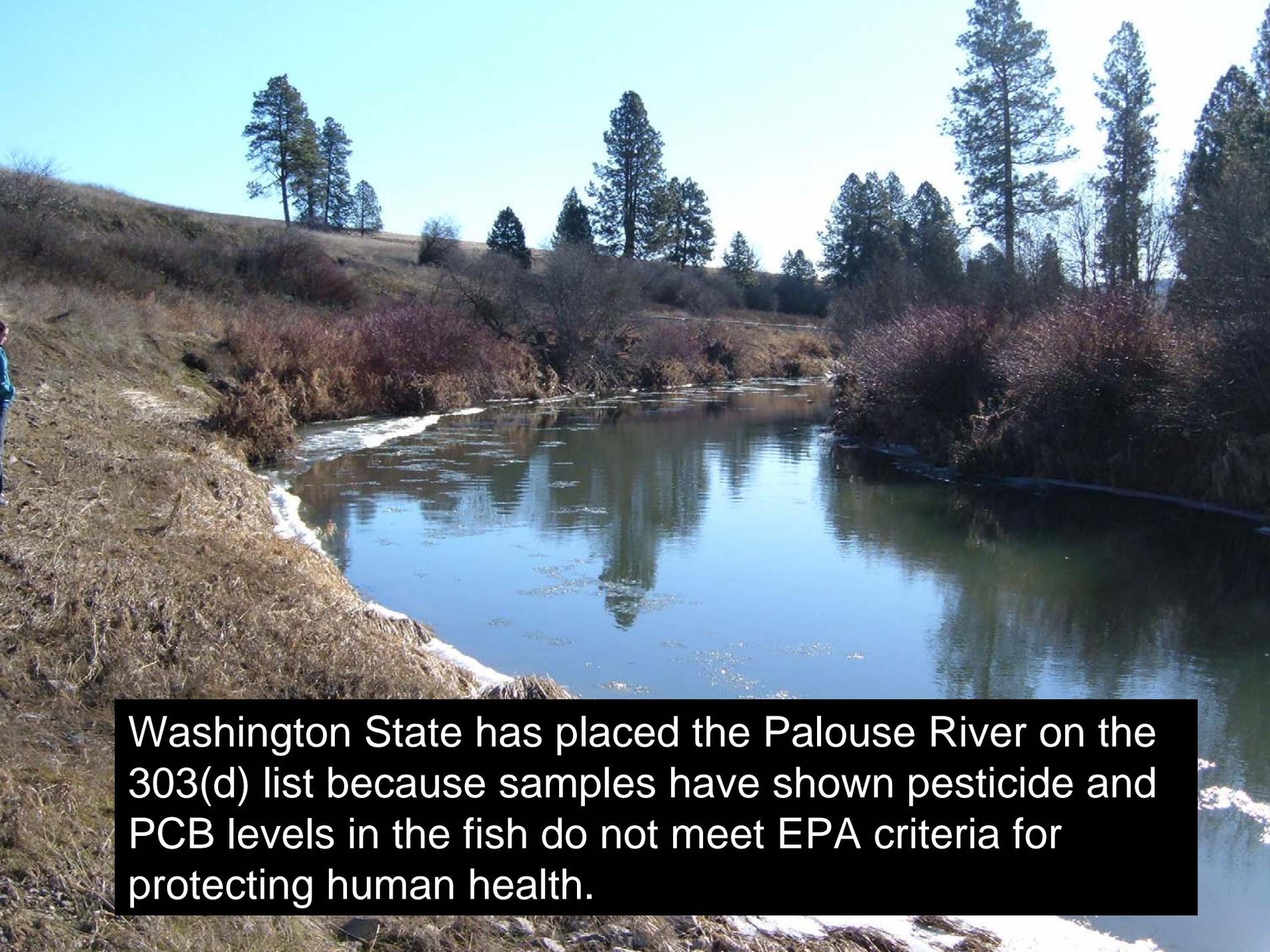


Palouse River Fish Contaminant Study 2005



WASHINGTON STATE
DEPARTMENT OF
E C O L O G Y



Washington State has placed the Palouse River on the 303(d) list because samples have shown pesticide and PCB levels in the fish do not meet EPA criteria for protecting human health.

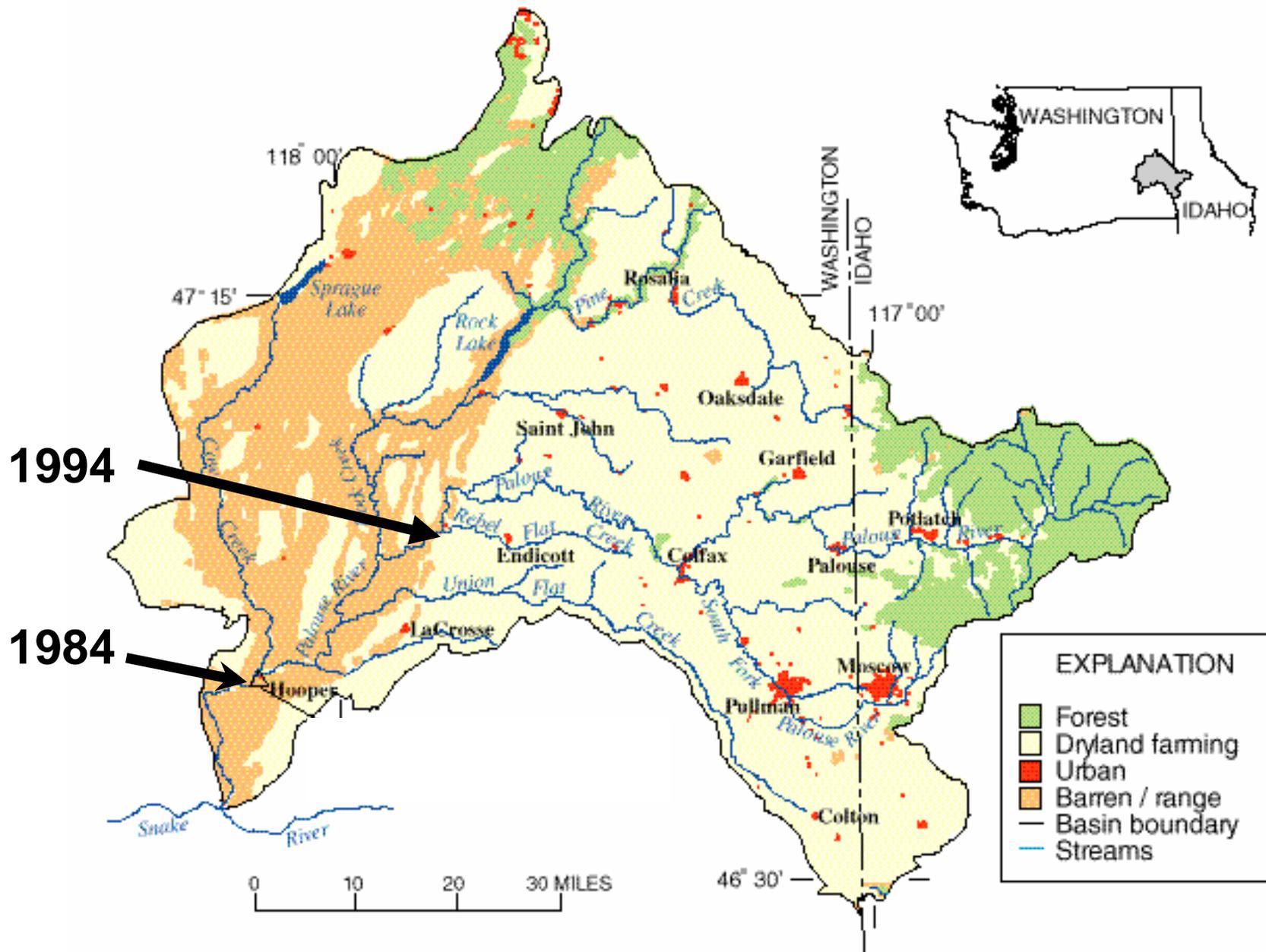
Topics to be Covered

- Explain basis for the 303 (d) listings
- Review the available pesticide and PCB data on Palouse River fish
- Describe the proposed fish contaminant study
- Provide a schedule for the study and results

Why is the Palouse River Water Quality Limited for Toxics?

- Palouse River listing based on fish samples collected by the Dept. of Ecology in 1984 and 1994
- Chlorinated pesticides and PCBs detected
- Five compounds exceeded EPA human health criteria
- Palouse River placed on 303(d) list in 1996

Location of Dept. of Ecology Fish Samples



Chemicals of Potential Concern

Chlorinated Pesticides

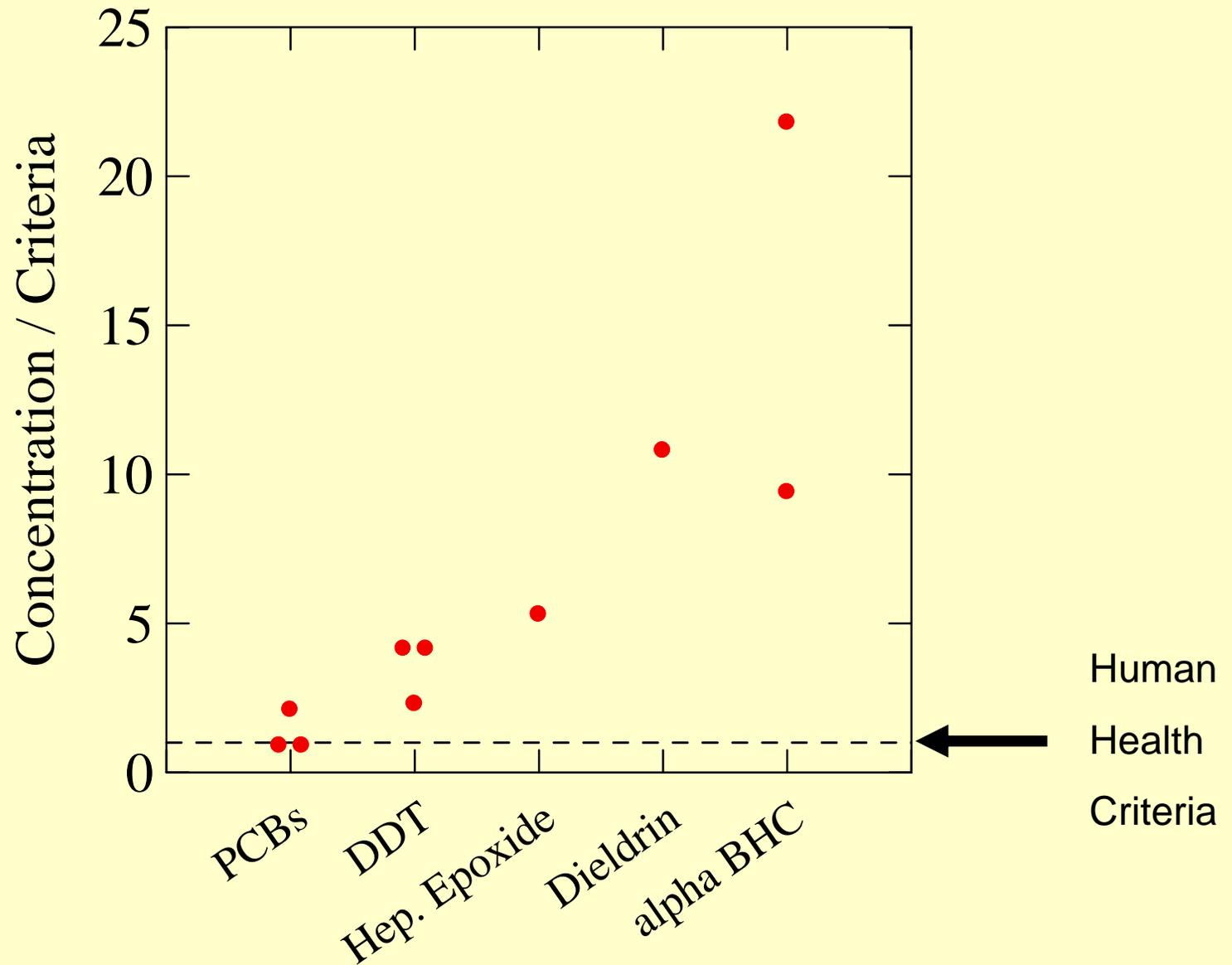
- DDT
- Dieldrin
- alpha-BHC
- Heptachlor epoxide

Polychlorinated Biphenyls

- PCB-1260

Chlorinated Pesticides and PCBs

- Banned in the 1970s and 1980s
- Ecological and human health concerns
- Classed as probable human carcinogens by EPA
- Persistent and bioaccumulate in fish



Pesticide and PCB Concentrations in Dept. of Ecology Fish Samples Compared to EPA Human Health Criteria (values > 1 exceed criteria)

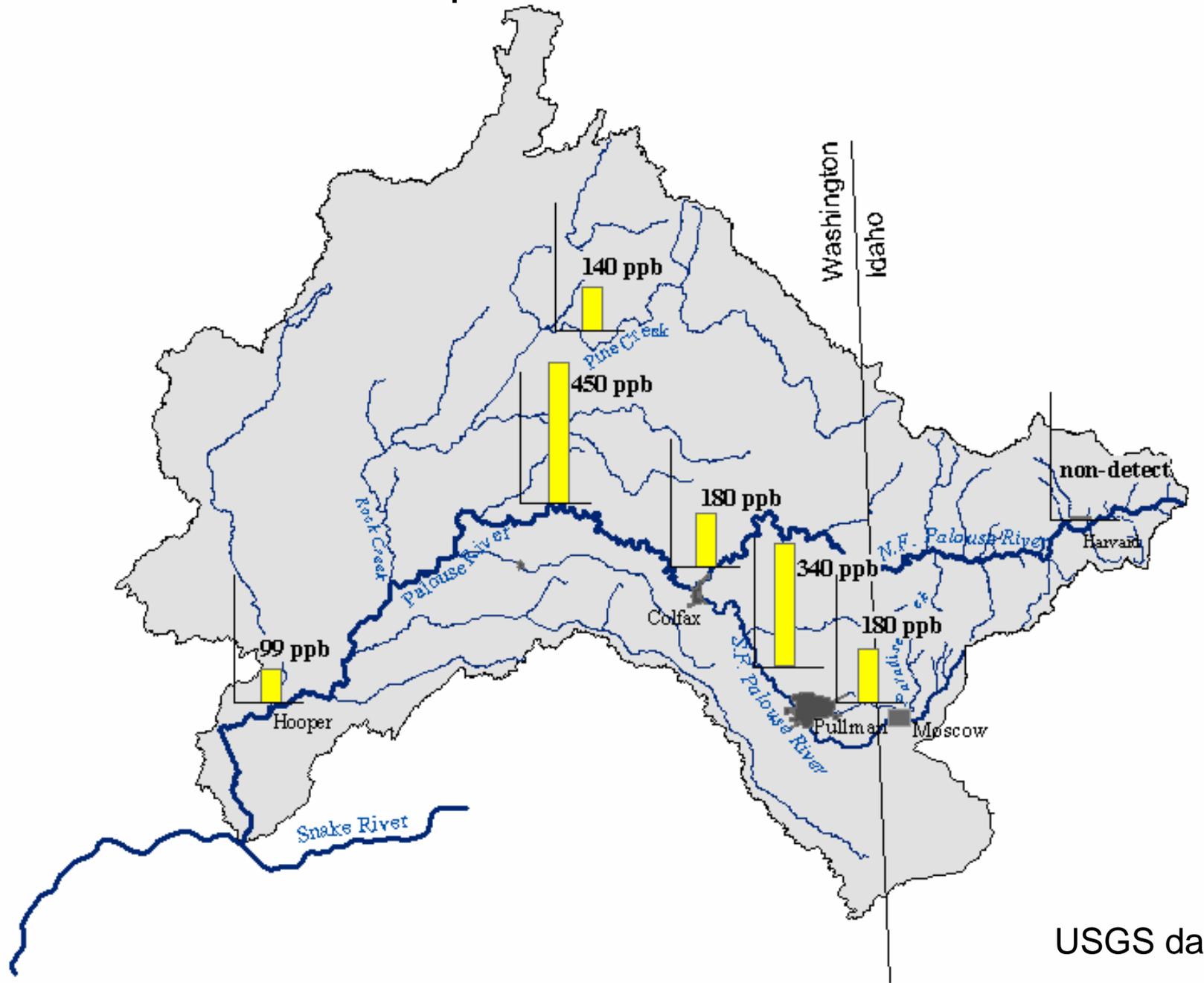
U.S. Geological Survey

Fish Tissue Data

(Munn and Gruber, 1997)

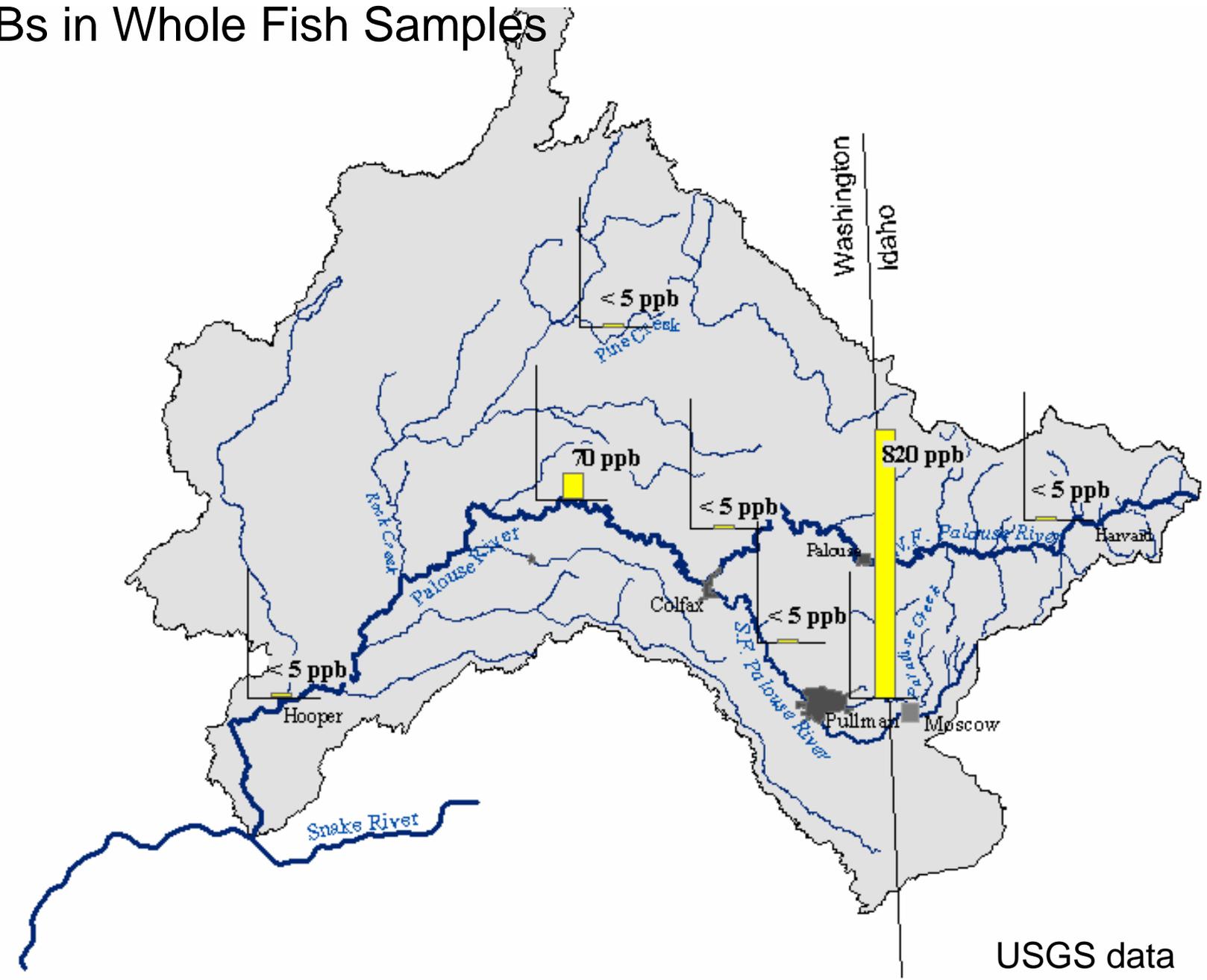
- Fish samples collected in 1992 and 1994
- Seven sampling sites from Idaho to Hooper
- DDT, hexachlorobenzene, dieldrin, endrin, chlordane, and PCBs detected
- Results not directly comparable to human health criteria because whole body analyzed rather than fillets

DDT in Whole Fish Samples



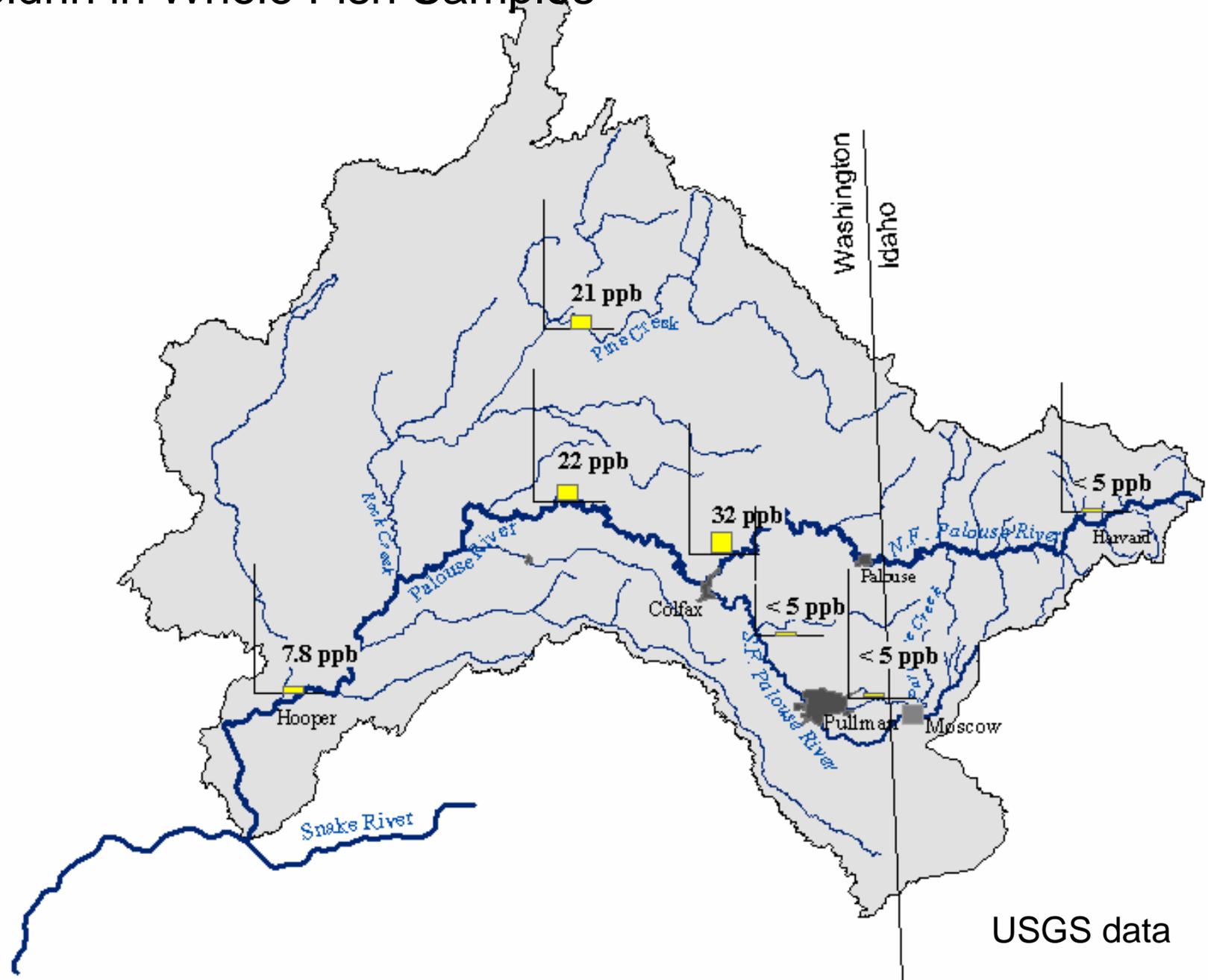
USGS data

PCBs in Whole Fish Samples



USGS data

Dieldrin in Whole Fish Samples



USGS data

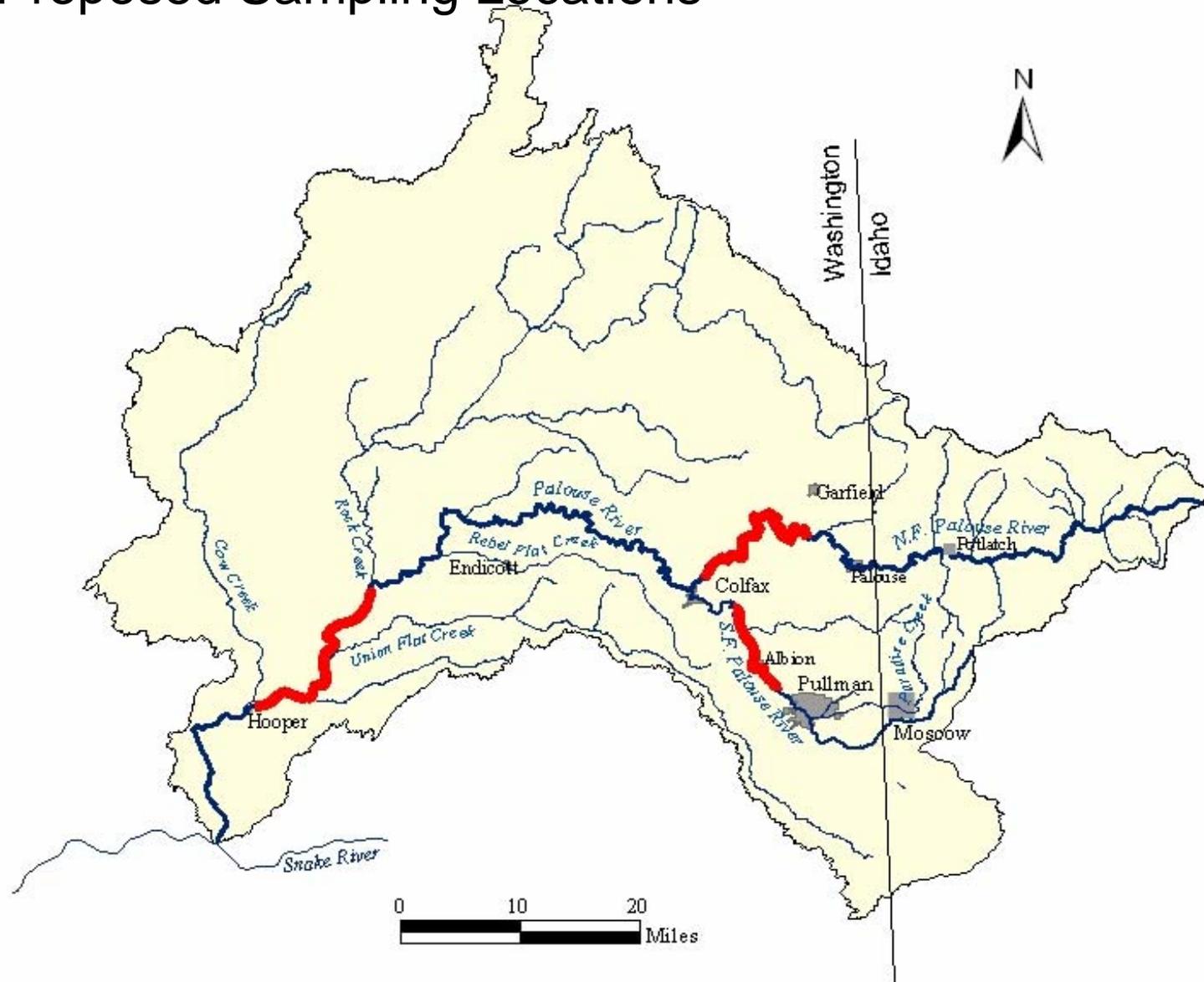
Why a Fish Contaminant Study is Needed in the Palouse River

- Clean Water Act requires a Total Maximum Daily Load evaluation for waterbodies on the 303(d) list, however...
- Available fish tissue data are old.
- Only a few samples were analyzed.
- Exceedances of human health criteria were modest for DDT and PCBs.
- Pesticide and PCB levels unknown in edible tissues from North and South fork fish.
- Additional fish samples needed to determine the magnitude and extent of the problem.

Objectives of the 2005 Fish Study

- Measure chlorinated pesticide and PCB concentrations in edible tissues of Palouse River fish
- Screen a subset of samples for a wider range of bioaccumulative chemicals
- Provide the data to Washington State Dept. of Health
- Determine where 303(d) criteria are exceeded and by how much
- Decide what additional TMDL studies are needed to identify sources

Proposed Sampling Locations



Target Species

Smallmouth Bass

Carp

Channel Catfish

Largescale Suckers

Northern Pike Minnow

Brown Trout

Rainbow Trout



Sample Size

- 17 samples per reach
- 51 samples total
- Each sample a 5-fish composite
- 255 individual fish analyzed

Chemicals to be Analyzed

24 Pesticides 8 PCB mixtures

4,4'-DDE

heptachlor

PCB-1016

4,4'-DDT

heptachlor epoxide

PCB-1221

4,4'-DDD

endosulfan I

PCB-1232

gamma-BHC

endosulfan II

PCB-1242

alpha-BHC

endosulfan sulfate

PCB-1248

beta-BHC

hexachlorobenzene

PCB-1254

delta-BHC

oxychlordane

PCB-1260

dieldrin

trans-chlordane

PCB-1268

endrin

trans-nonachlor

endrin aldehyde

cis-chlordane

endrin ketone

cis-nonachlor

aldrin

methoxychlor

Wider Chemical Screening for a Subset of Samples

- 34 chlorinated pesticides
- 209 individual PCB compounds
- 17 dioxin compounds
- 11 brominated flame retardants
- mercury



Sampling Plan: <http://www.ecy.wa.gov/biblio/0503106.html>

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