



**U.S. Fish & Wildlife Service**



# **USFWS Fish Health Centers and their Science Capacity**



OSA Webinar Series: January 19, 2012

# USFWS Fish Health Mission

Working with partners to provide state of the art aquatic animal health services to protect and enhance the health of aquatic animal resources for the continuing benefit of the American public.

**USFWS partners**

**USGS**

**BOR**

**BLM**

**NPS**

**NFS**

**Tribes, Tribal Commissions**

**State Agencies**

**Recovery Programs**

**Commercial Aquaculture**

**Colleges and Universities**

**International Partner Agencies**

***USDA APHIS***

***NOAA NMFS***



# Policy Based Fish Health Program

USFWS Aquatic Animal Health Policy 713fw 1-5 Section 1.5

“prevent spread of AA pathogens” ..... “eradicate when feasible”

“provide leadership, direction, and technical assistance”

“stock only AA not posing health threat to natural resources”

Preventative medicine maintains NFH quality, ability to transport / release production fish, and the safety of ESA species reared at NFHs

Environmental and political aspects to fish disease are minimized with FHC actions

# FHC Efforts

Facility certification/diagnostics for USFWS and cooperators

National emphasis – NAAHP, Title 50, international AAH

Maintain diagnostic laboratory capacity

Quality Improvement Programs / assay validation

National Wild Fish Health Survey

Aquatic Nuisance Species

Provide technical fish health support to multiple publics

Education and training

National and regional fish health organizations (AFS-FHS Bluebook)

**Applied** research

Field surveys in priority waters

Laboratory studies



# Nine FHCs

Support:

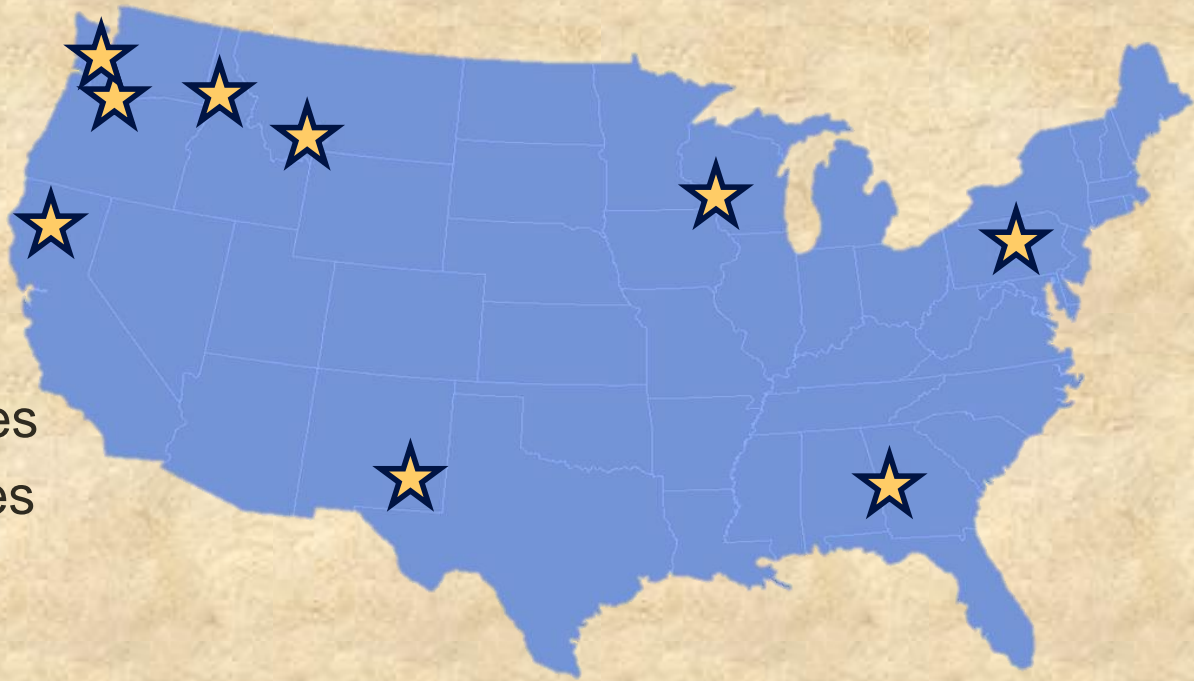
70 NFHs

> 131 cooperator facilities

> 48 T&E aquatic species

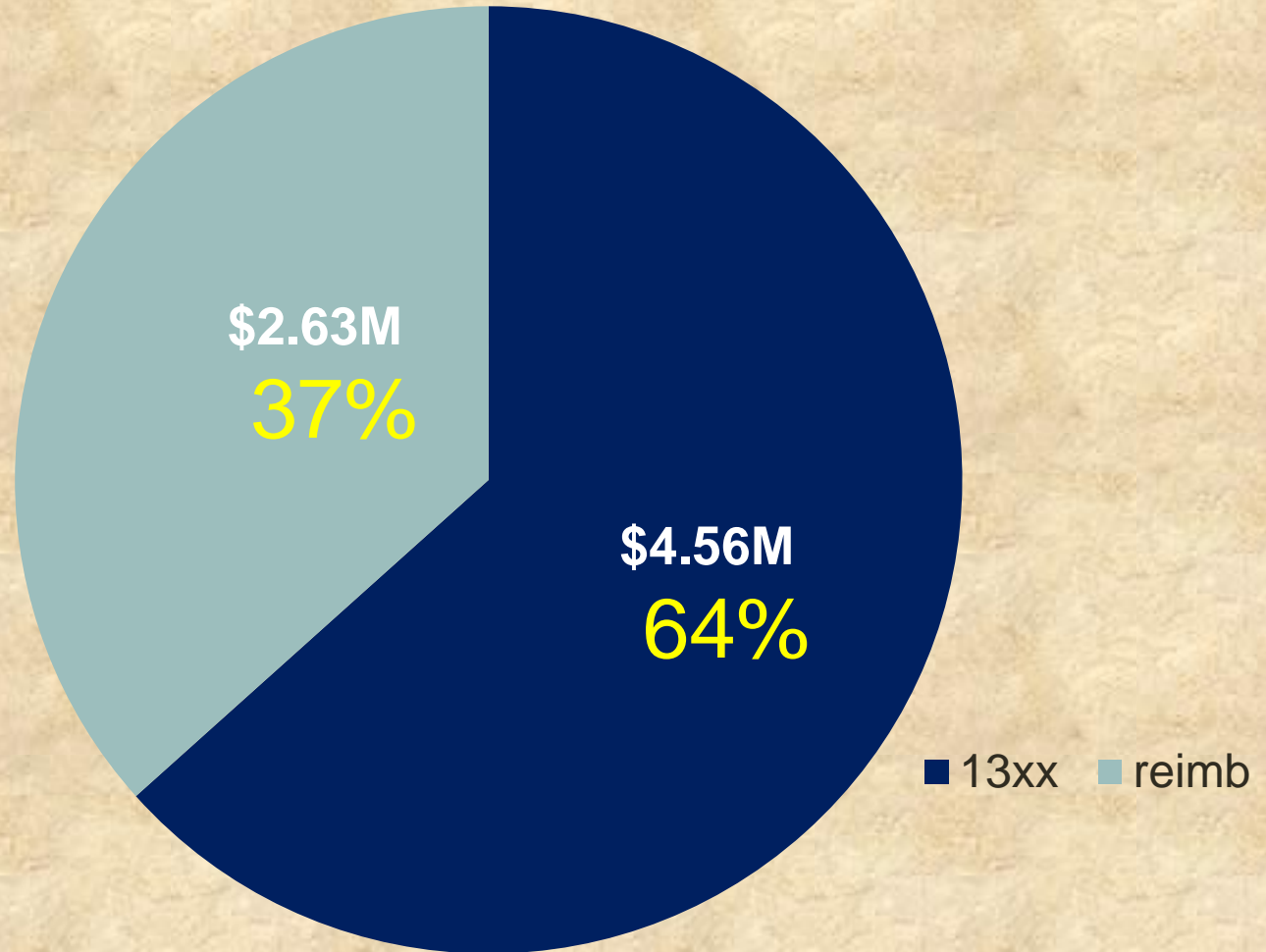
~ 60 employees

National Aquatic Animal  
Health Coordinator (WO),  
varied staff composition  
at FHCs



# Total FHC Budget

FY2011 = \$7.1M



Importance of reimbursable / contracts / grants

# Expertise

Sample collection



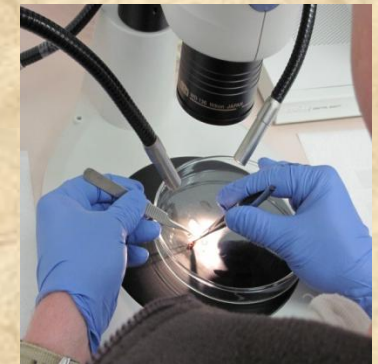
Microbiology

Histopathology

Molecular diagnostics (PCR, RT-PCR, QPCR)

Clinical chemistry including biomarker assays

Physiological measurements of fish



Database management

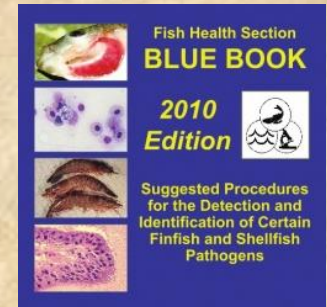
Test records, inspection reports, NWFHS



# Testing

USFWS Handbook of Aquatic Animal Health Procedures & Protocols, AFS-FHS Blue Book, NWFHS Manual

FHC-wide validation of (new) published protocols



World Organization for Animal Health (OIE) (178 member countries)



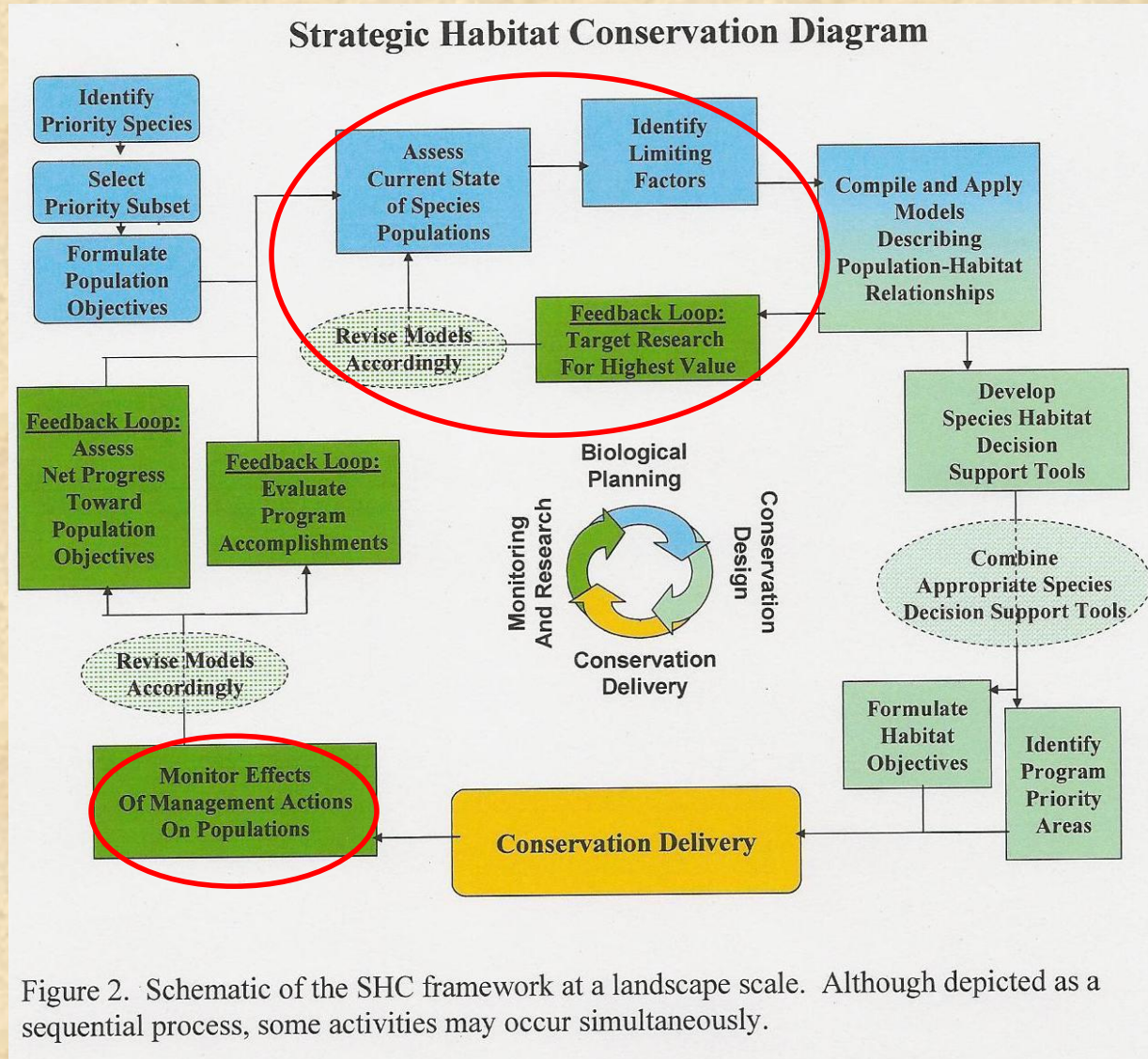
Research protocols



# Facilities, Instrumentation



# FHCs and SHC - Applied research and monitoring



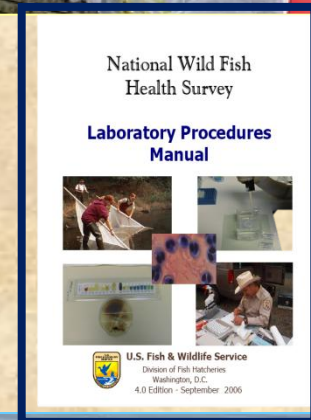
# National Wild Fish Health Survey

USFWS sponsored program that examines free-ranging fish to determine distribution of specific fish pathogens

Increases knowledge of the distribution of pathogens in wild fish

Uses standardized laboratory methods to allow comparisons between species, areas, and watersheds

Provides scientific information needed for management decisions regarding stocking and fish translocation activities



# NWFHS scope

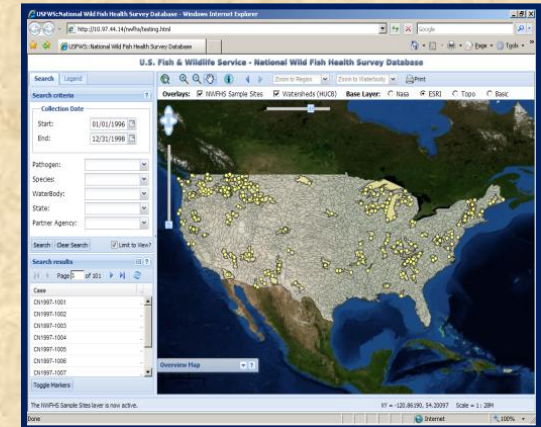
FHCs have partnered with 79 different agencies to date to conduct surveys

- > 245,000 fish sampled
- > 5,000 discrete sites
- > 2,700 water bodies

# NWFHS database

Open access database that stores, compiles, and can for queried for survey data.

Has potential, via overlaying with other GIS-based systems, to better understand the inter-relatedness of pathogens, diseases, and overall ecosystem fitness.

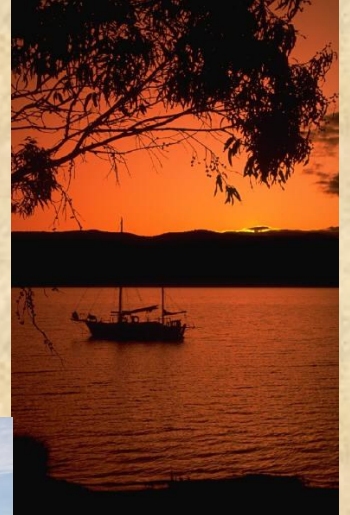
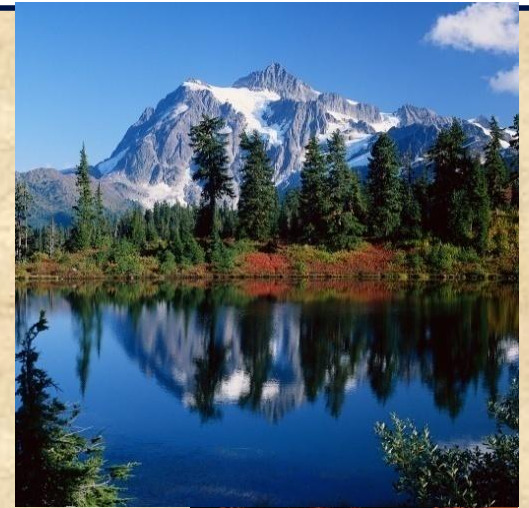


# LCC-based Index Sites

NWFHS Index Sites could serve as core reference sites and address specific monitoring needs

LCC partners could select Index Site(s) that meet agreed upon criteria

Data collected at multiple time points to address questions related to seasonal changes as well as multi-year surveys when appropriate



# Applied Science Support by FHCs

## Surveys addressing NR management questions

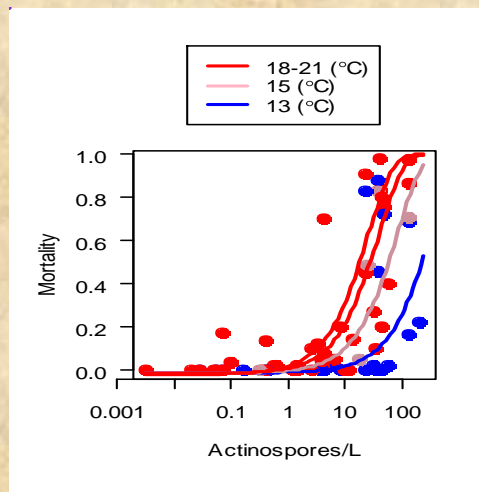
- VHSV IVb in Great Lakes and other waters
- Devil's Lake – biota transfer risk assessment between US-Canada
- Pre-post dam removal - Elwha River WA
- Virus baseline surveys in the Southwest
- Health monitoring - 10(j) RGSM in BBNP



# Applied Science Support by FHCs

## Surveys addressing NR management questions

- Pacific lamprey assessment in the CRB
- Pacific lamprey and Hg in the Trinity River
- IHNV genotypes in the Clearwater River
- Pathogens in WI baitfish
- Ceratomyxosis in the Klamath River



# Applied Science Support by FHCs

## Validation and Laboratory Studies

- Non-lethal sampling for testing in T&E species
- Pooling of tissues for bacterial inspections
- Characterization of Blue Gill Virus in WI
- Vertical transmission of CTV
- Viral replication in Pacific lamprey



Photo: Matt Mesa, USGS, CRRL





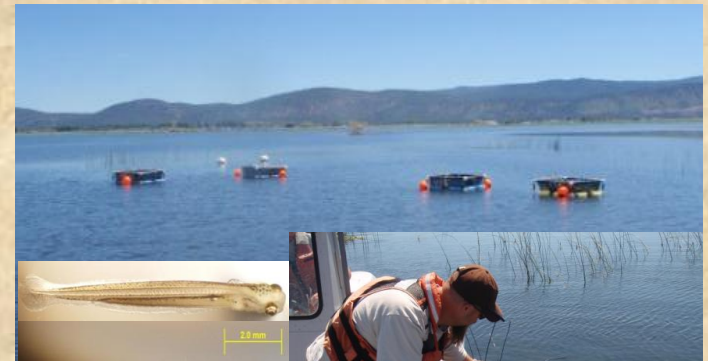
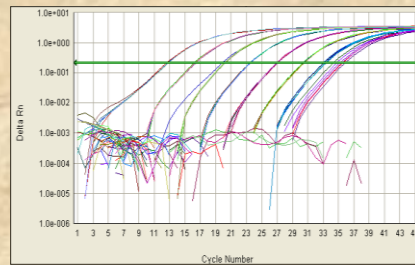
# Applied Science Support by FHCs

## Validation and Laboratory Studies

- Elevated temperature effect on salmon immune function
- Larval delta smelt feeding response
- Upper Klamath Lake sucker mortality
- QPCR validation for *R. salmoninarum*



Photo: Brian Weidel, USGS, LOSB





**U.S. Fish & Wildlife Service**



# **Science Capacity in the USFWS: Fish Technology Centers and Fish Health Centers**

**Michael J. Millard, Ph. D., USFWS - Northeast Fishery Center**  
**Teresa D. Lewis, Ph. D., USFWS - Dexter Fish Health Center**

OSA Webinar Series: January 19, 2012