Non-native Species Impacts on Native Salmonids in the Columbia River Basin

Including Recommendations for Evaluating the Use of Non-native Species in Resident Fish Substitution Projects

Independent Scientific Advisory Board

ISAB 2008-4
July 15, 2008
Review Objectives

► Describe history of non-native species introductions and current status in the Columbia River Basin

► Document the biological impacts and risks to native salmonids

► Describe the current status of mgt. actions taken to reduce impacts
Review Objectives (cont.)

► Describe the changing cultural values and current federal and state laws, policies, and plans regarding non-native species

► Recommend strategies for detecting, preventing, and controlling non-native species

► Recommend scientific criteria for evaluating resident fish substitution projects
History of Non-native Species in the Columbia River Basin

- General pattern of introductions
- Early economic and cultural reasons
- History of American shad in the Columbia

Smallmouth bass
American shad

Bonneville Dam passage

American shad

Year


0 1,000,000 2,000,000 3,000,000 4,000,000 5,000,000

American shad
Role of Habitat Alteration in Facilitating Non-native Expansion

- Hydrosystem development
- Forestry practices
- Agricultural practices
- Urbanization

Eurasian milfoil
A recent survey of the occurrence of NNS in the PNW in 2007 (Sanderson et al) indicated that NNS made up 54%, 46%, and 60% of the resident fish species in WA, OR, and ID, respectively.

The survey also indicated that many of the subbasins in the CRB have from 20 to 38 species of non-native fishes – Figure 2
Current Non-native Fish Species Distribution in the PNW
Biological Impacts and Risks to Native Salmonids

- Predation
- Competition for food and habitat
- Food web alterations
- Interbreeding
- Disease transmission and parasites
- Non-native invertebrates
- Non-native plants
Current Status of Management Actions to Reduce Non-native Species Impacts

- Eradication or reduction
  - Hand-pulling or mechanical harvest (weeds)
  - Toxicants
  - Netting
  - Electrofishing
- Barriers
- Targeted sport-angling

Walleye
Changing Cultural Values, Laws, and Management Plans

► Changing cultural values

► Laws, policies, and plans
  ▪ Federal and state laws and regulations
  ▪ Management/action plans

► National Scientific Societies

Channel catfish
Future Concerns

- Climate change
- Human population growth and development

The latest climate model simulations show a +1 to +6 °C warming for the PNW by 2100.

Recommendations

► Exploratory Surveillance and Monitoring
► Enforcement
► Prevention
► Fisheries Management

Quagga Mussels from Lake Meade, CA
Recommendations (cont.)

- Habitat Restoration
- Planning
- Education
- Research

Northwest Power and Conservation Council
Dayton Creek
Evaluating the Use of Non-native Fish in Resident Fish Substitution Projects

► Background

- FWP mitigation for anadromous fish losses in blocked areas includes resident fish substitution which can be introduced species and artificial production can be used to sustain those species.
- The Program further states that those substitution species must be “compatible with the continued persistence of native resident fish species”; and “appropriate risk management needs to be maintained in using the tool of artificial propagation”.
Environmental Risk Assessment

- During proposal reviews the ISRP found that the FWP statements regarding risk to native species did not provide clear risk management criteria or methods to evaluate whether a proposed project may be able to provide benefits without undesirable consequences.

- As an alternative to conducting one or more lengthy research studies to determine level of risk to native species, an *environmental risk assessment* can be effective for determining risk prior to introducing a non-native species.
Risk Assessment Format

A list of 15 topics with associated questions asks for the documentation on rationale and risks needed to produce a thorough risk assessment.

Several of the more important topics include:

- interactions with other species in system
- genetic effects
- escape/dispersal
- carrier of disease/parasites
- monitoring for success or negative consequences.
ISAB Recommendation

► A thorough Environmental Risk Assessment of potential negative impacts on native fish species should be completed and submitted, concurrently with project proposals, for all resident fish substitution projects in which a non-native species is selected for substitution.

► The ISAB understands that the Council, ISRP, and fish and wildlife managers would need to be involved in development of a final ERA template and this recommendation is a starting point and not an endpoint.