

James T. Peterson

Oregon Cooperative Fish and Wildlife Research Unit



Background

IL – MO – ID – GA - OR

Assistant Unit Leader of GA Coop Unit 11 y

Assistant Unit Leader of OR Coop Unit, since 2/11

Research focus

Stream ecology

Structured Decision Making /

Adaptive management

Sample design and estimation

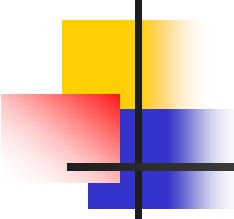
Ecological modeling

Instruction/training

graduate courses

workshops





Ongoing research projects

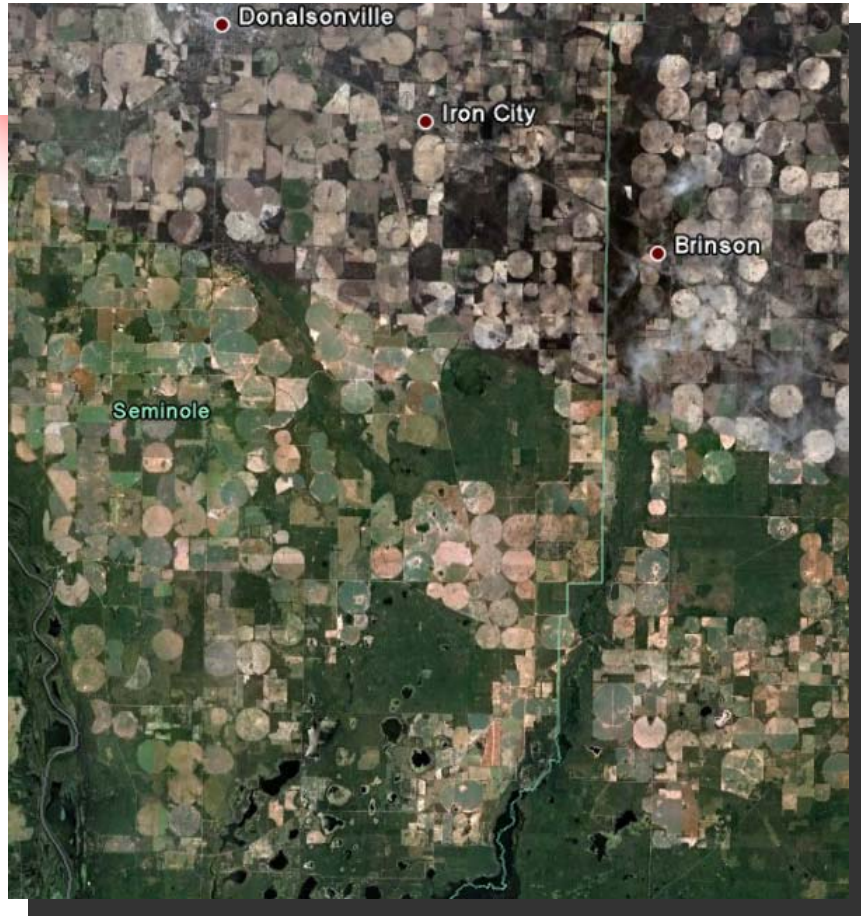
- Development of Adaptive Management Framework for the Conservation and Recovery of Imperiled Mussels
- The Development and Assessment of Tools for Evaluating Stream Fish Community Responses to Anthropogenic Changes along Thermal Gradients
- Development and evaluation of monitoring protocols for the rare and elusive Robust Redhorse
- Using decision models to assist vital signs monitoring in national parks, a prototype using sea otters (*Enhydra lutris*) in Coastal Alaska

Development of Adaptive Management Framework for the Conservation and Recovery of Imperiled Mussels

- Identify stakeholder and manager objectives
- Estimate mussel demographic rates (age, growth, survival)
- Develop culture techniques for at risk mussel species
- Build decision support models
- Develop monitoring protocol

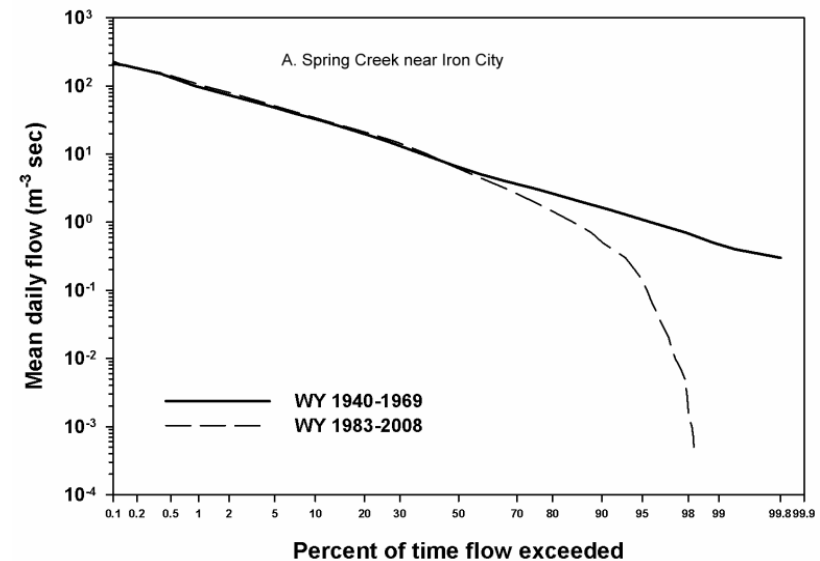


Context: Streamflows in the Coastal Plain SE



Extensive agricultural irrigation
1975 - present

Pre-irrigation (<1974) vs post-irrigation Changes in flows



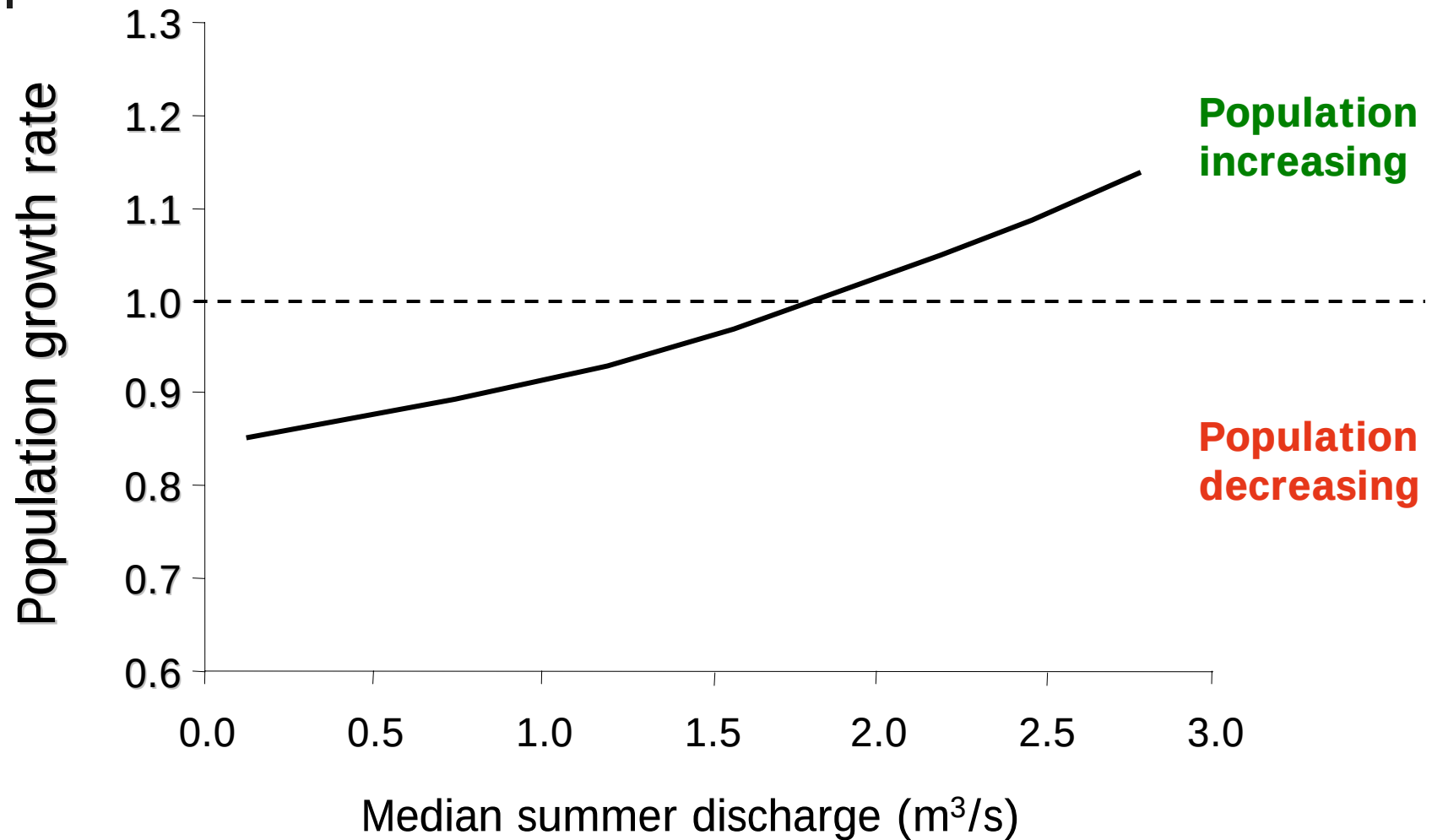
The Process: Stakeholders Meetings



- Identified conservation objectives
- Identified potential management actions
- Developed conceptual models
 - link management actions to objectives

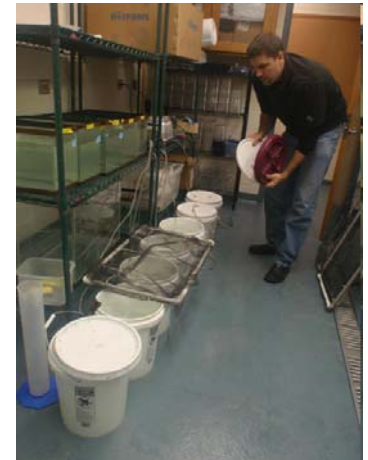
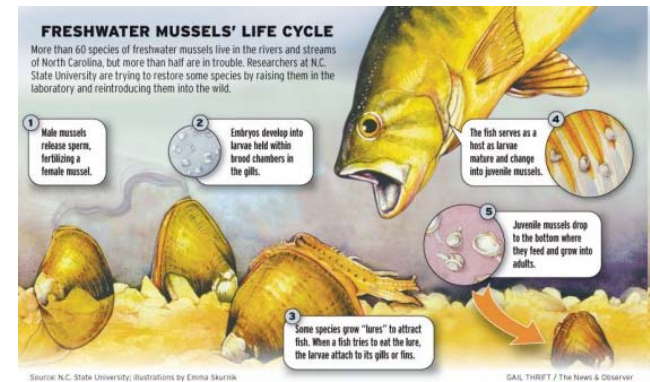
The Science:

Evaluating the factors affecting mussel populations

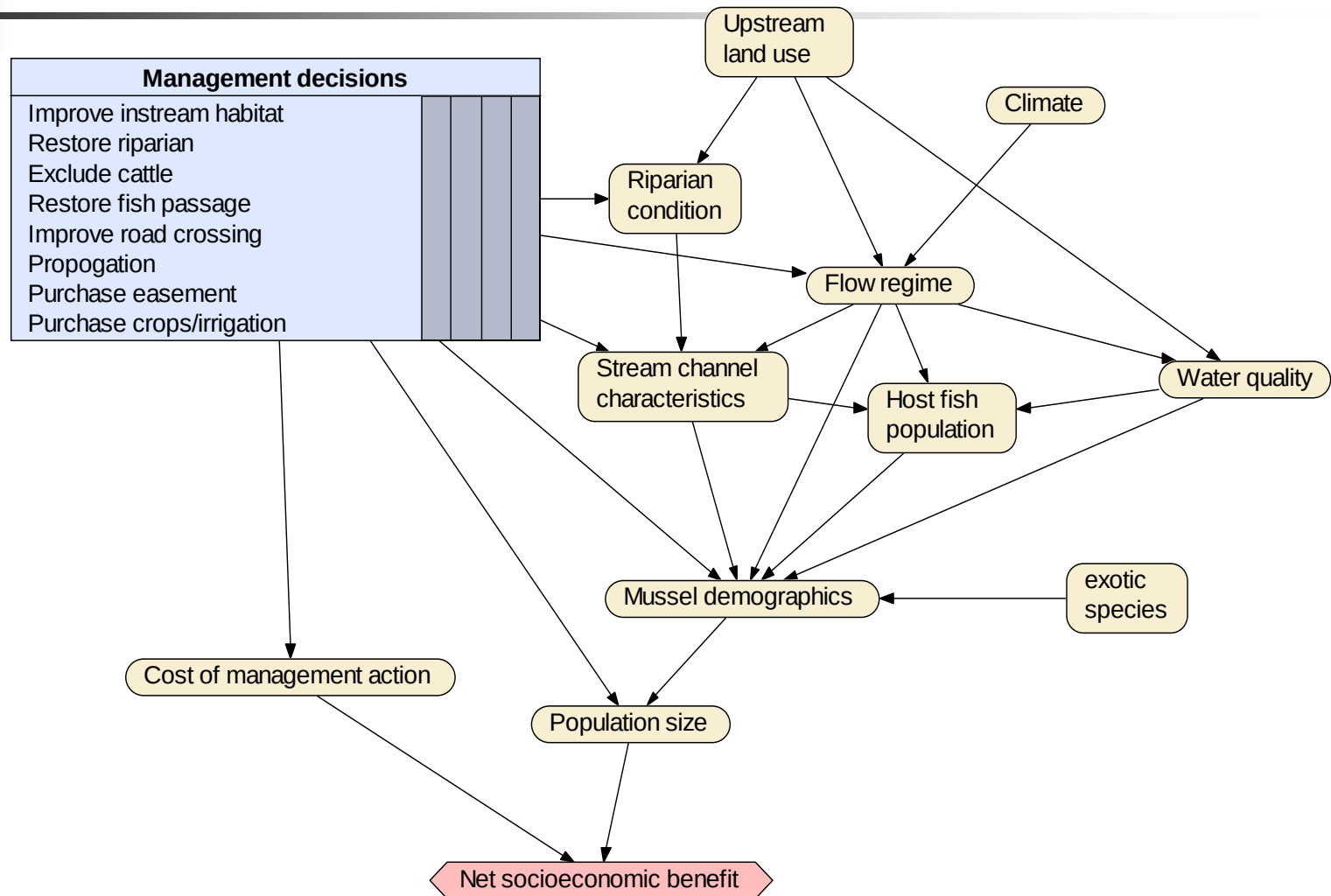


Mussel propagation

- Coordinated with FWS Warm Springs (GA) Hatchery
- Developed mussel propagation techniques
 - 4 listed species, 1 yet
 - Determined hosts
 - Efficiency and cost effectiveness
- Evaluating survival introduced mussels



Modeling the decision



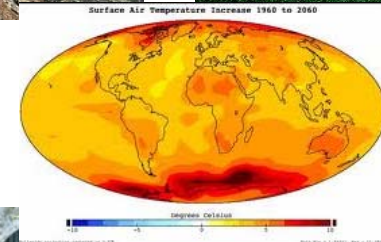
Monitoring protocol development

- Formally linked to decision making
 - Reduce uncertainty
 - Improve understanding/future decisions
- Need demographic information
 - Abundance, survival, recruitment
- Limited monitoring resources
- Developed hybrid design
 - Minimize effort
 - Maximize insight



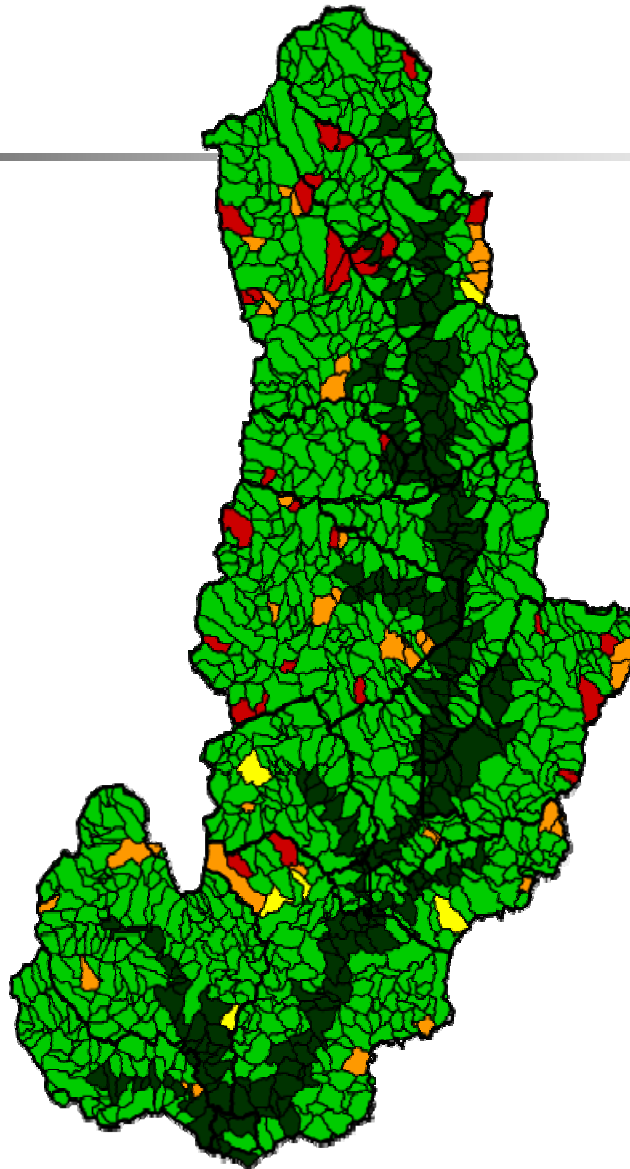
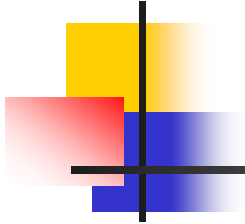
The Development and Assessment of Tools for Evaluating Stream Fish Community Responses to Anthropogenic Changes along Thermal Gradients

- Engaged managers to identify management priorities.
- Develop models to assess changes:
 - climate
 - water use/ impoundment
 - land use
- Evaluate effectiveness of management actions



Example modeling

Fish species richness change in response to drought



Number of fish species



User friendly software for managers

Flint River Project

Program Control Results Map Results graph Species graph Options

2 processors/cores available.

☒ Display results Number of iterations

☒ Calculate standard deviation

☒ Write results to file

☐ Write probabilities to file

Get shed data Get probability file

Get discharge data

Get priors Click to use direct urban effect

Type of model to use

☐ Species specific ☐ Species traits

☐ Load new files

Species traits

Colonization parameters

Extinction parameters

Reproduction parameters

Process data

Quit

Species used in simulation

Watersheds

☐ Select all ☐ Select none

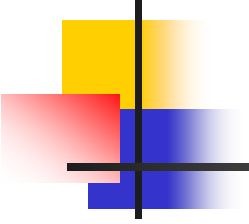
☐ All ☐ None

Type of Simulation

☐ Mainland

☒ Classic Metapopulation

☐ Combined



Recently initiated research projects

The Development of an Adaptive, Decision-Support Tool for the Conservation and Recovery of Least Chub, *Lotichthys Phlegethontis*

Collaboration with BLM, FWS, UDWR

Evaluate potential success actions: reintroduction, restoration, exotics

Integrate with monitoring

Adaptive decision-support models for Coastal salmon management

Elk River north, excluding Columbia

Collaboration with ODFW

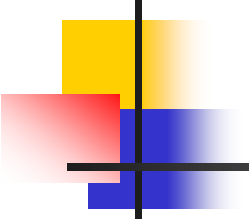
Develop adaptive management framework non-listed stocks

Integrate with monitoring protocols

Using decision models to manage brown bears in National Parks lands

Collaboration with NPS & ADFG

Harvest management and conservation



Future research?

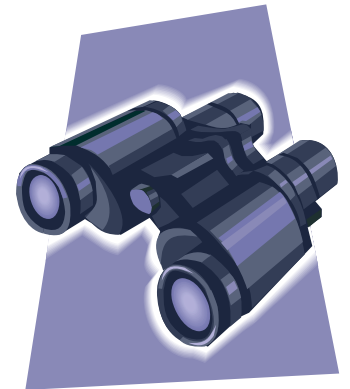
Decision modeling spring Chinook pre-spawn mortality

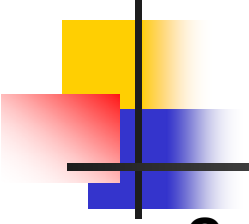
Monitoring fish community attributes in Blitzen River

Bull trout reintroduction efforts

Integrating redband trout management, modeling, and monitoring

Others





Instruction and training

Graduate courses

Structured Decision Making in Natural Resource Management

E-course

Lecture and computer lab

Quantitative decision analysis

advanced ecological modeling

focus on natural resource management decision-making

Professional training

ODFW Workshop on Occupancy Estimation and Modeling

An Introduction to Structured Decision Making for Natural Resources Management

AFS Continuing Education Course

Brief Introduction to Capture-Recapture Methods

ODFW Biologist meeting