



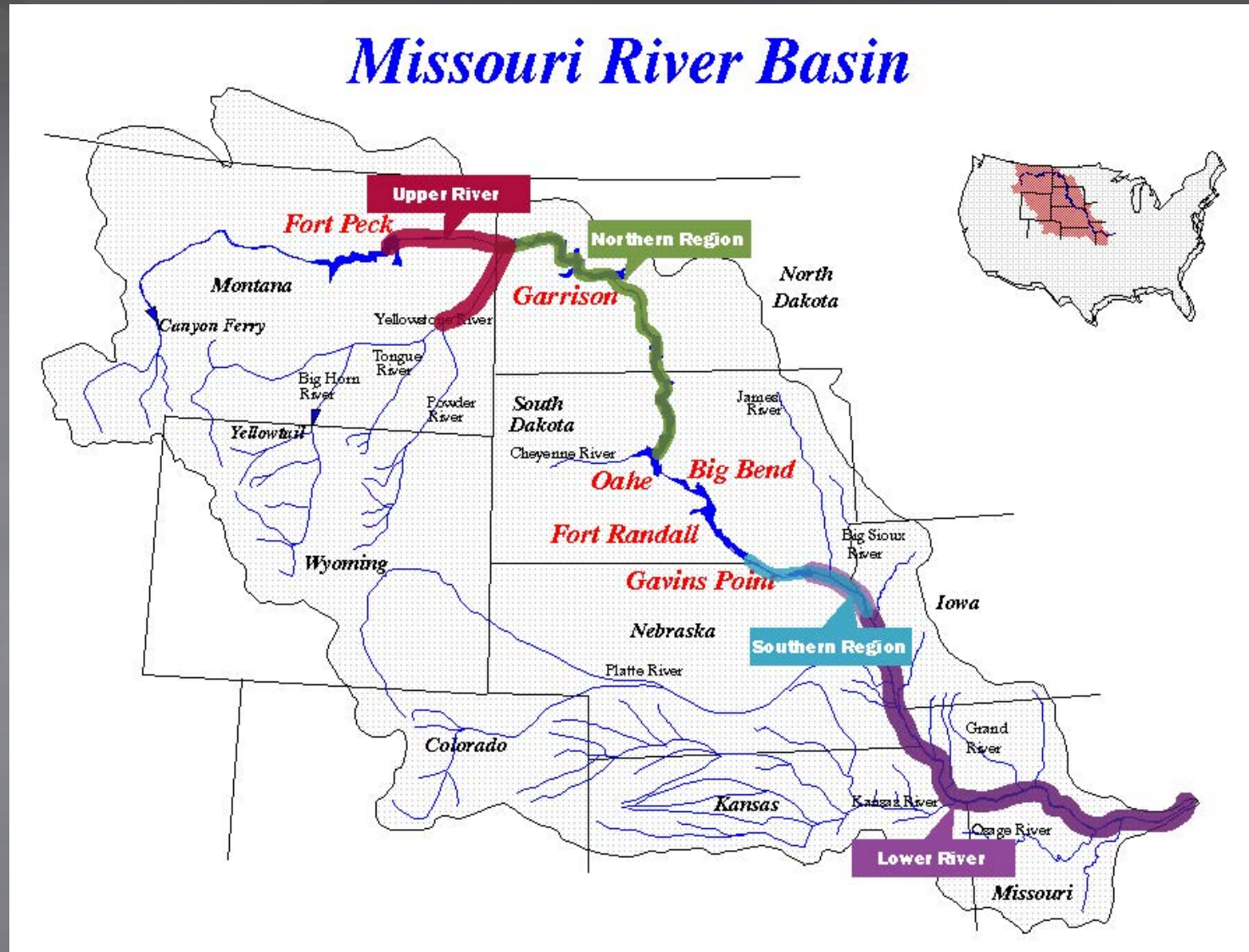
Missouri River Restoration: Science and Decision Strategies for Long-Term Recovery

Kate Buenau, Craig Fischenich, Craig Fleming, Robert Jacobson, David Marmorek

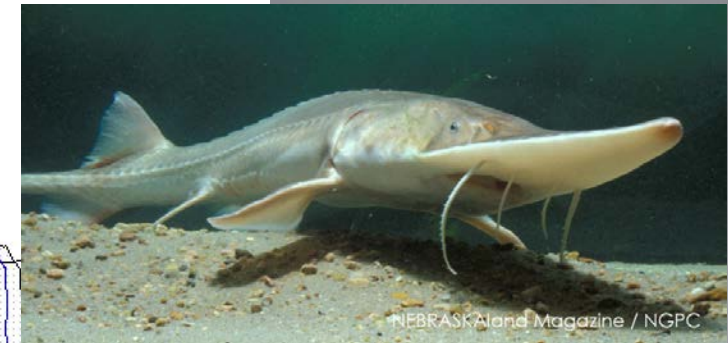
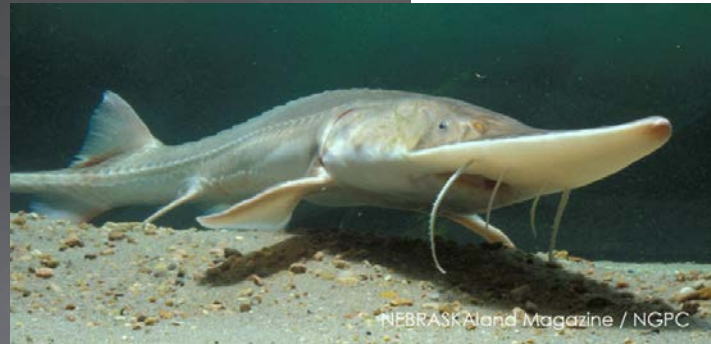
Pacific Northwest National Laboratory
USACE ERDC, USACE Omaha, USGS Columbia, ESSA Technologies

August 28, 2018

Missouri River Recovery Program



Missouri River Recovery Program



Obstacles to long term success

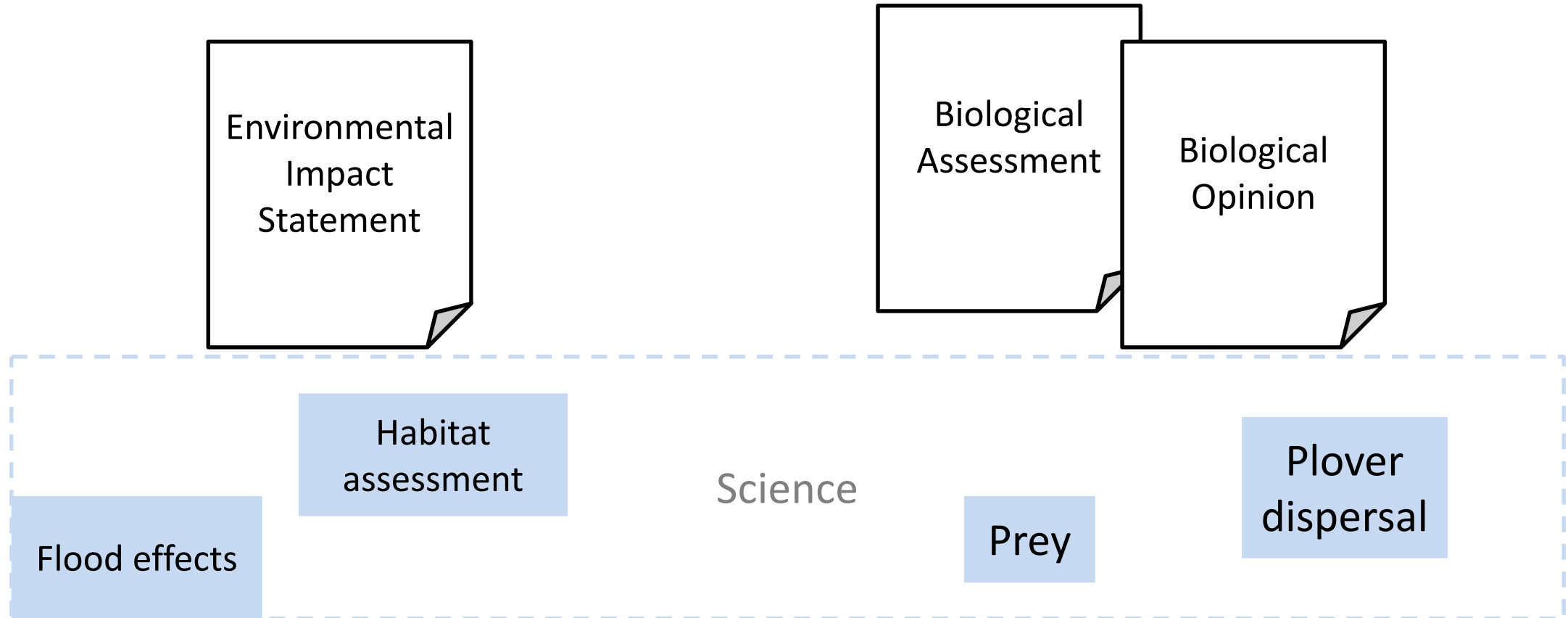
1. Lack of accountability for science-based decisions
2. Overly-narrow management focus
3. Inflexible planning and governance processes
4. Lack of stakeholder support

Obstacles to long term success

1. Lack of accountability for science-based decisions
2. Overly-narrow management focus
3. Inflexible planning and governance processes
4. Lack of stakeholder support

(hint: good science helps)

Obstacle: Lack of accountability for science-based decisions



Solution: Effects Analysis and Science & AM Plan

Environmental
Impact
Statement

Biological
Assessment

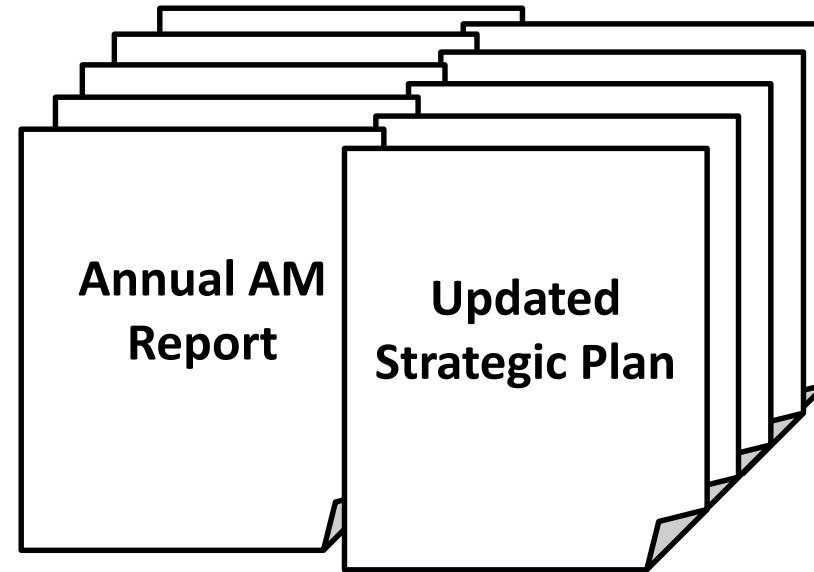
Biological
Opinion

FOUNDATIONAL SCIENCE

Effects Analysis

Conceptual Models → Hypotheses → Information Review → Predictive Models

Solution: Effects Analysis and Science & AM Plan



ONGOING SCIENCE

- Predictive models
- 4-level research and implementation plans
- Study design for habitat creation
- Effectiveness monitoring
- Decision trees
- Annual science review cycle
- Research prioritization
- Technical Team
- Independent review

Obstacle: Overly narrow focus



ESH
AM
Plan

USACE



USACE

SWH
AM
Plan

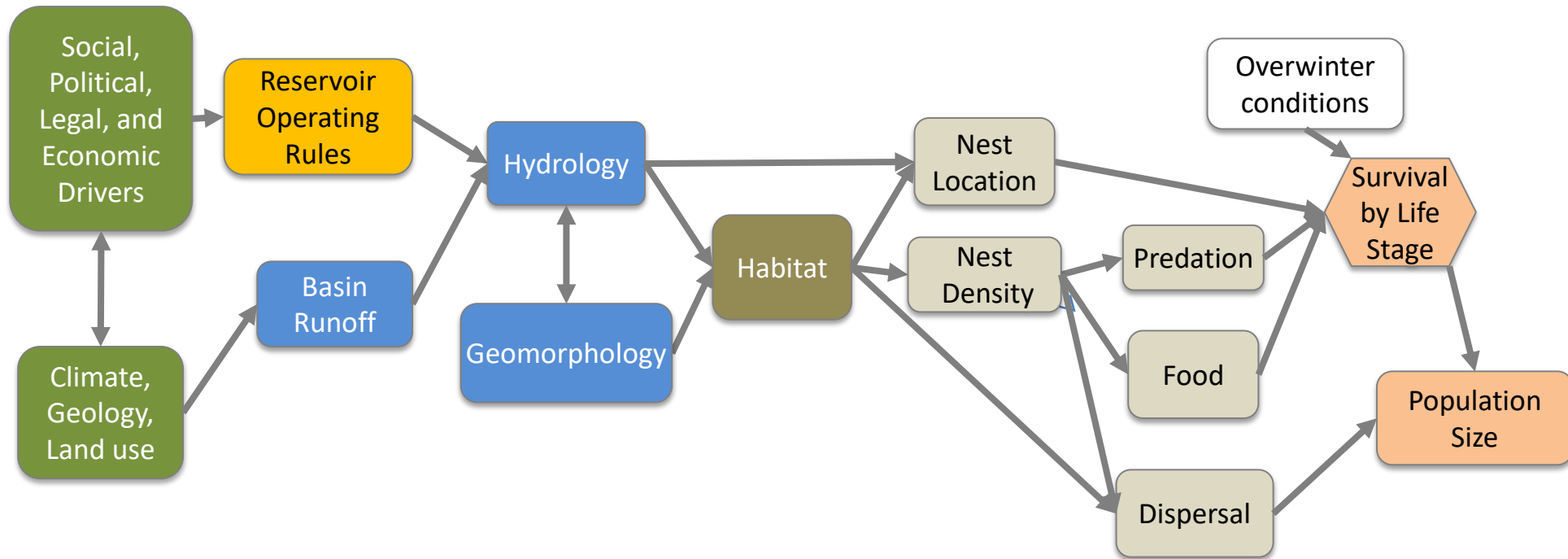


USACE

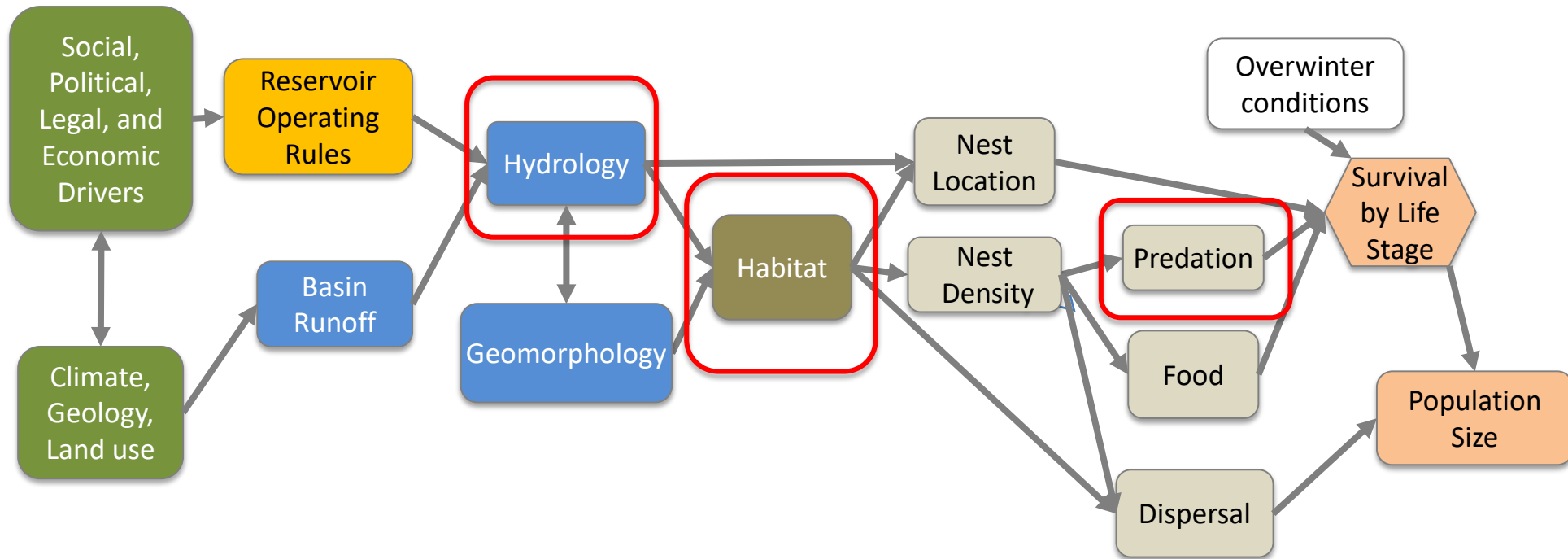


USFWS

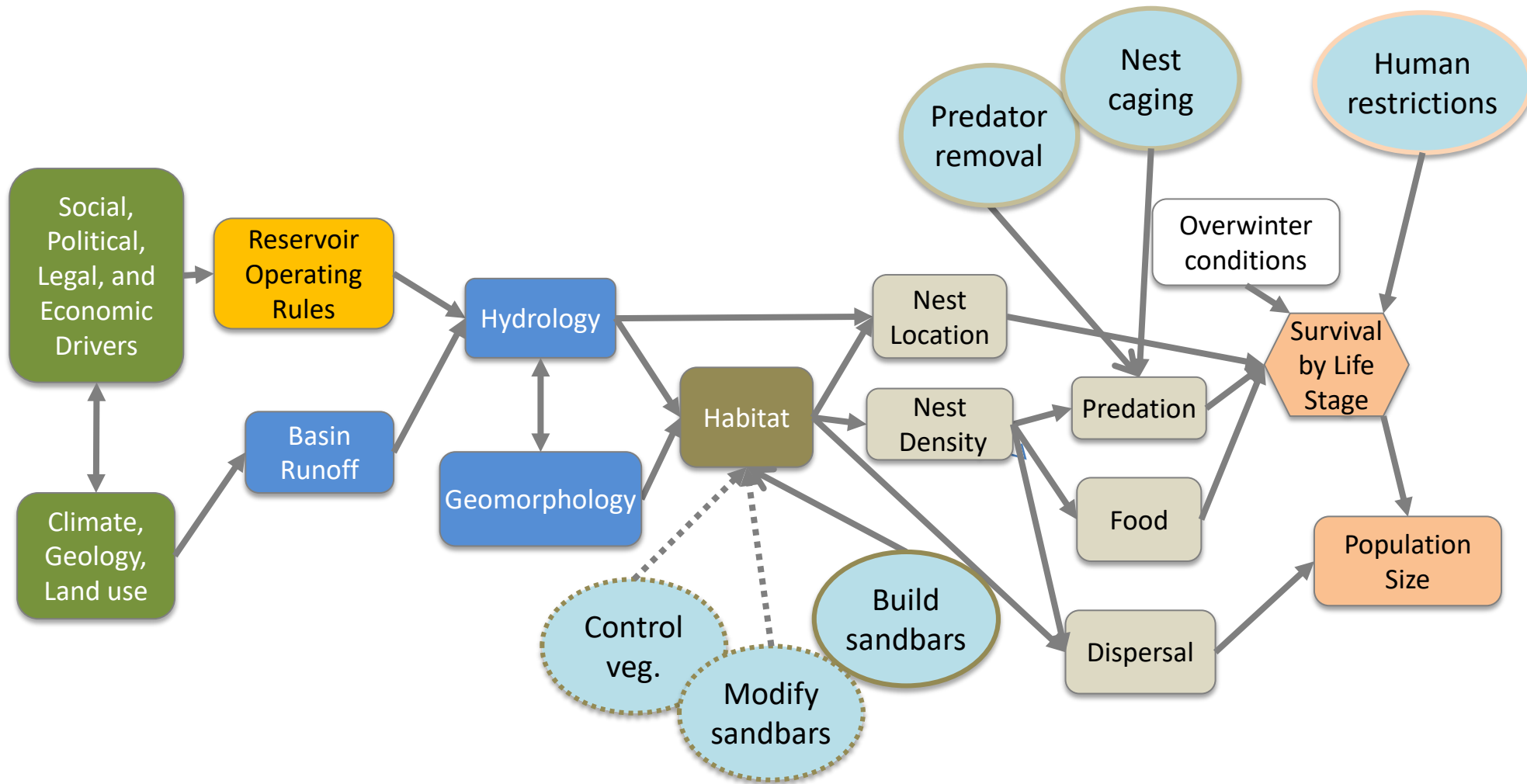
Solution: broaden and evaluate potential actions



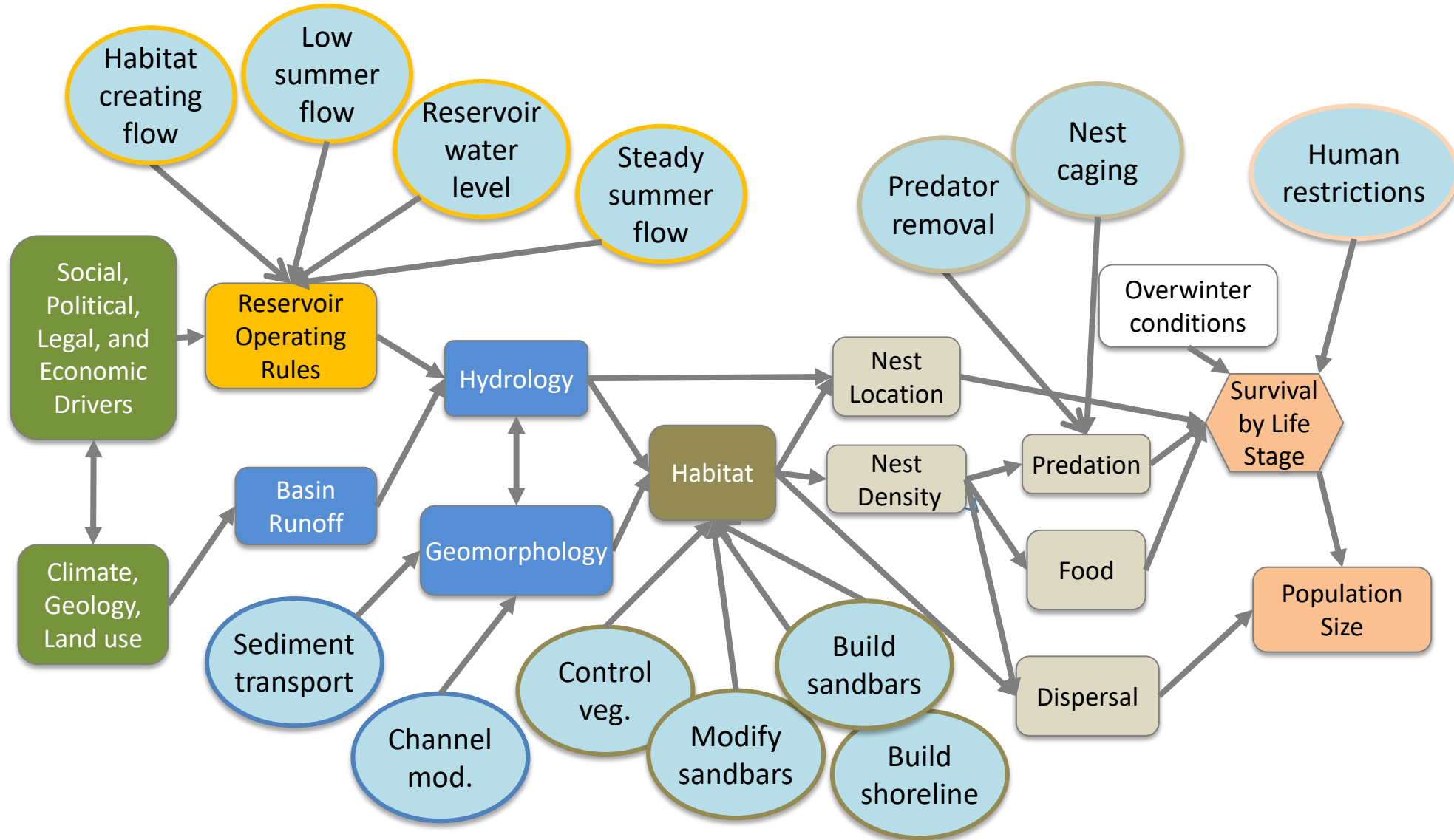
Solution: broaden and evaluate potential actions



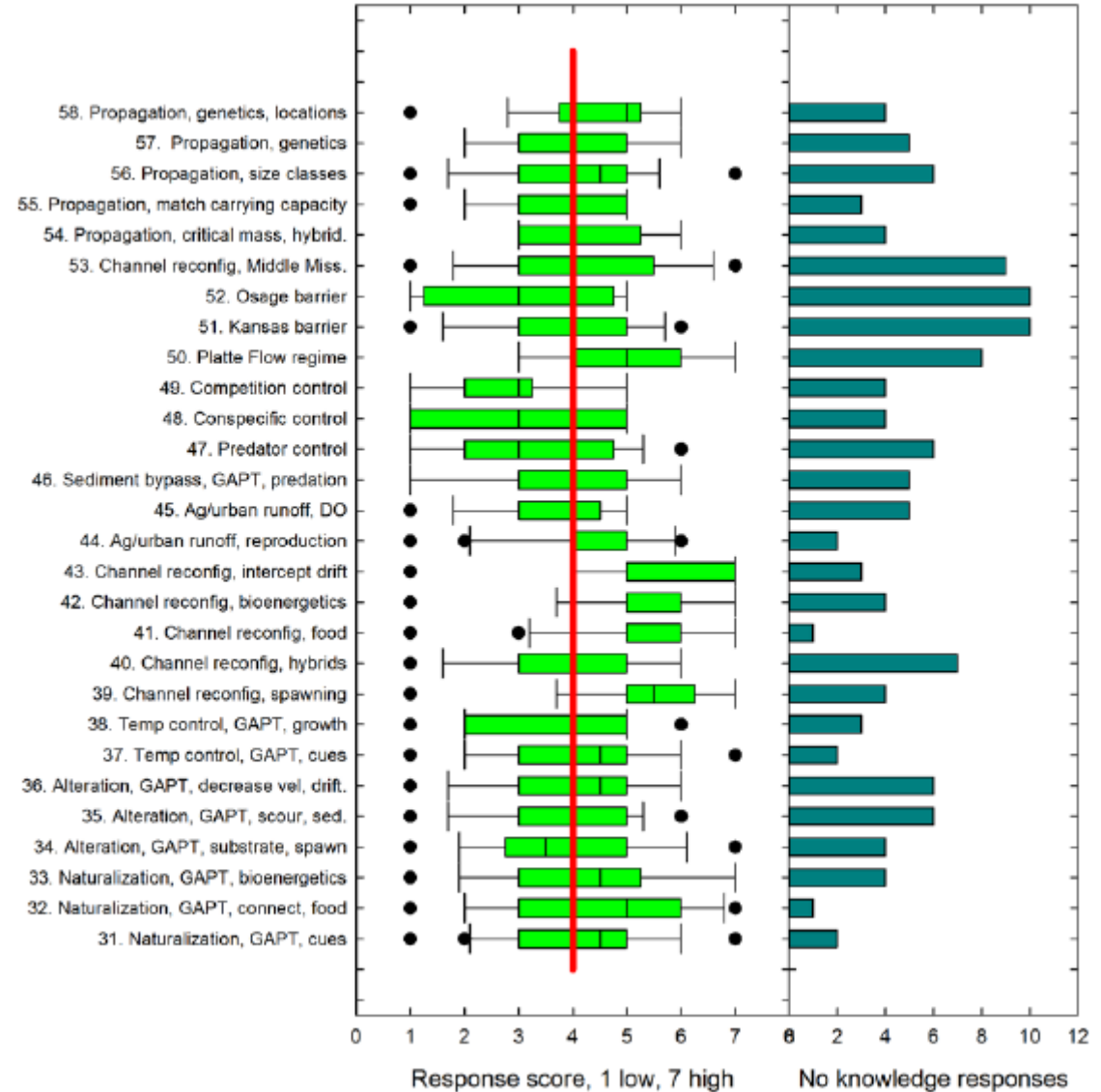
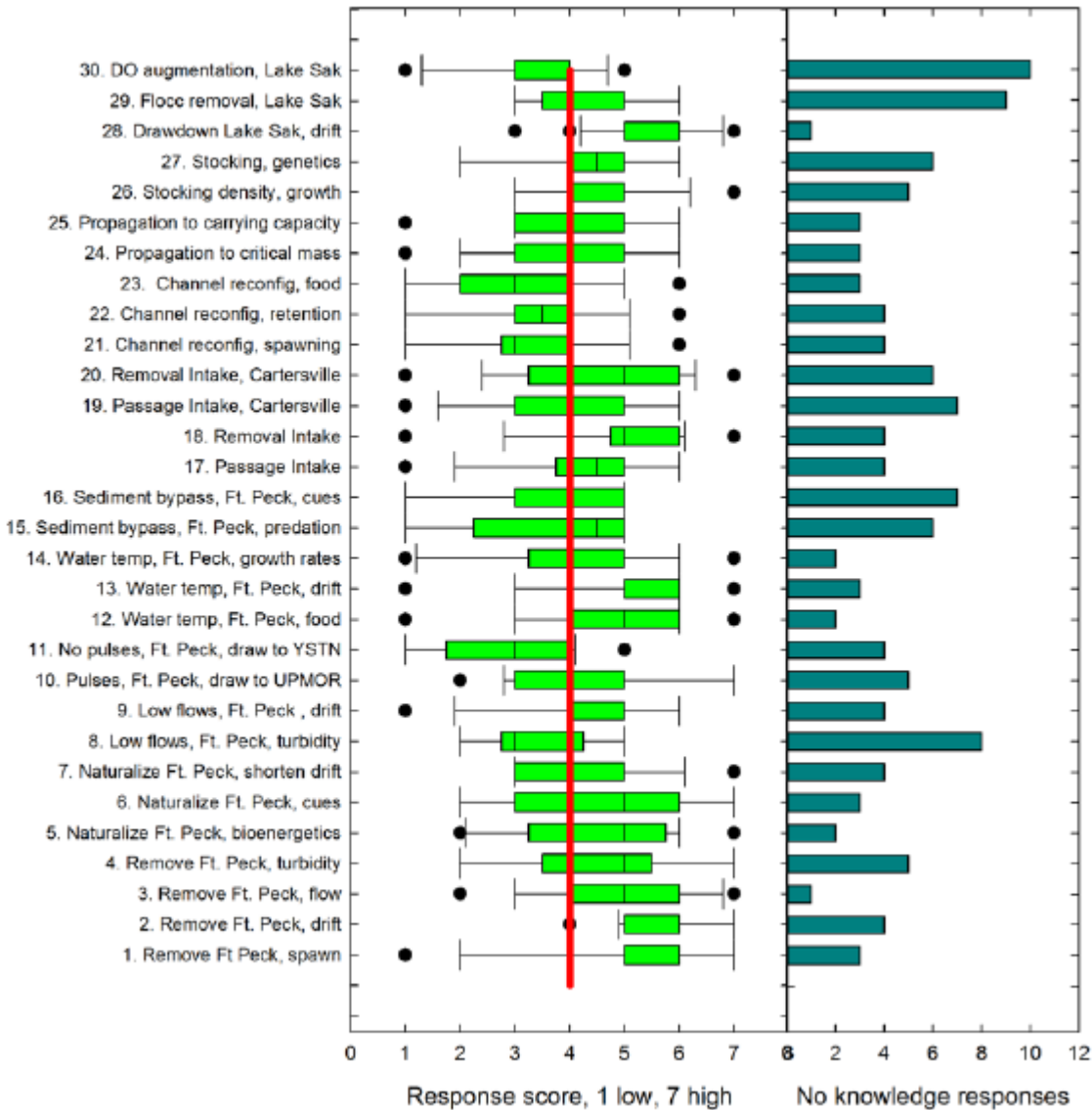
Solution: broaden and evaluate potential actions



Solution: broaden and evaluate potential actions

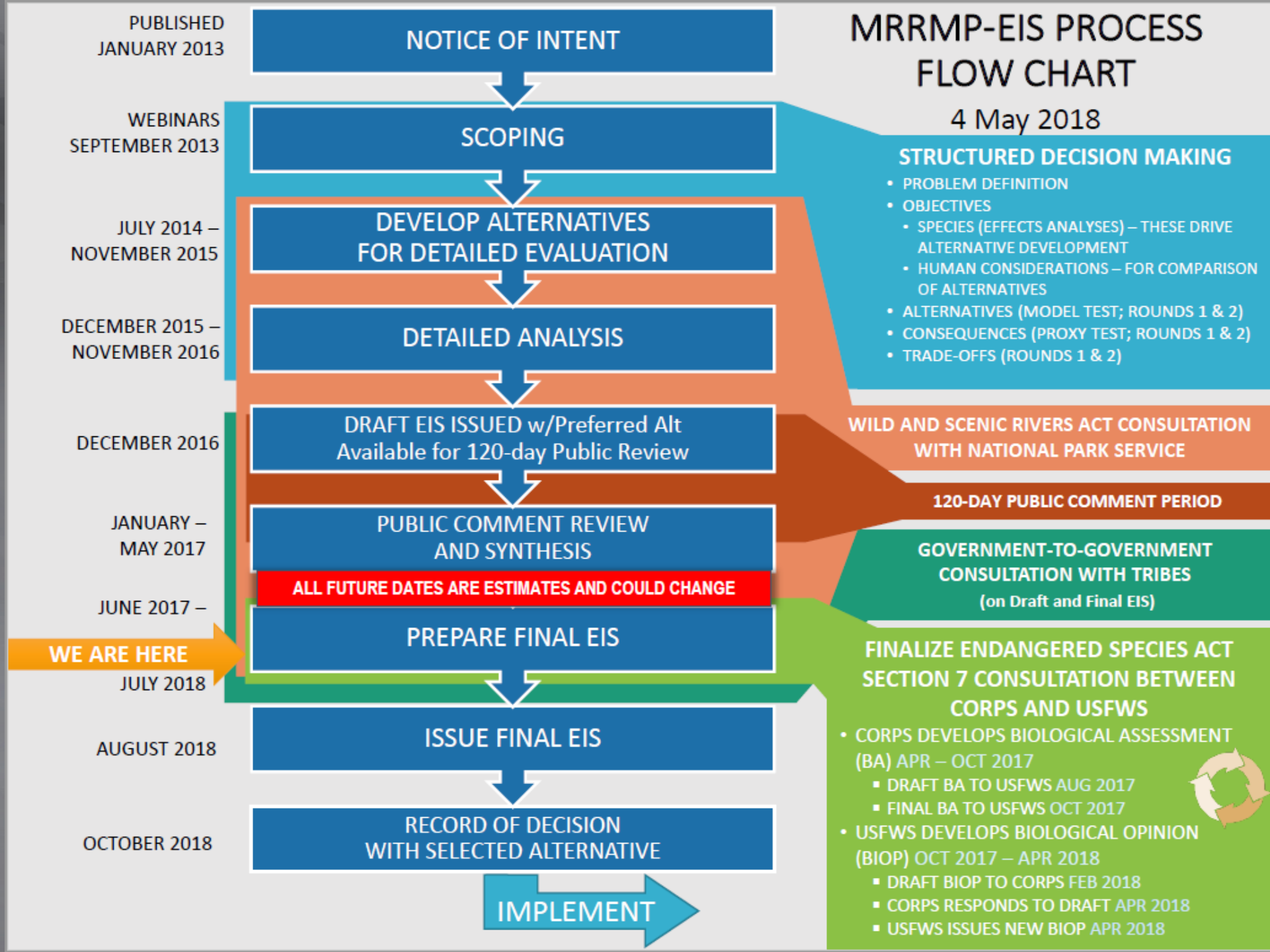


Solution: broaden and evaluate potential actions



MRRMP-EIS PROCESS FLOW CHART

4 May 2018



JAN

SEPTEMBER

JULY
NOVEMBER

DECEMBER
NOVEMBER

DECEMBER

JANUARY
MAY

JUNE

WE ARE

JULY

AUGUST

OCTOBER



DECISION MAKING

– THESE DRIVE
FOR COMPARISON
ROUNDS 1 & 2)
; ROUNDS 1 & 2)

CONSULTATION
SERVICE

COMMENT PERIOD

AGREEMENT
TRIBES
(EIS)

SPECIES ACT
I BETWEEN
VS
ASSESSMENT



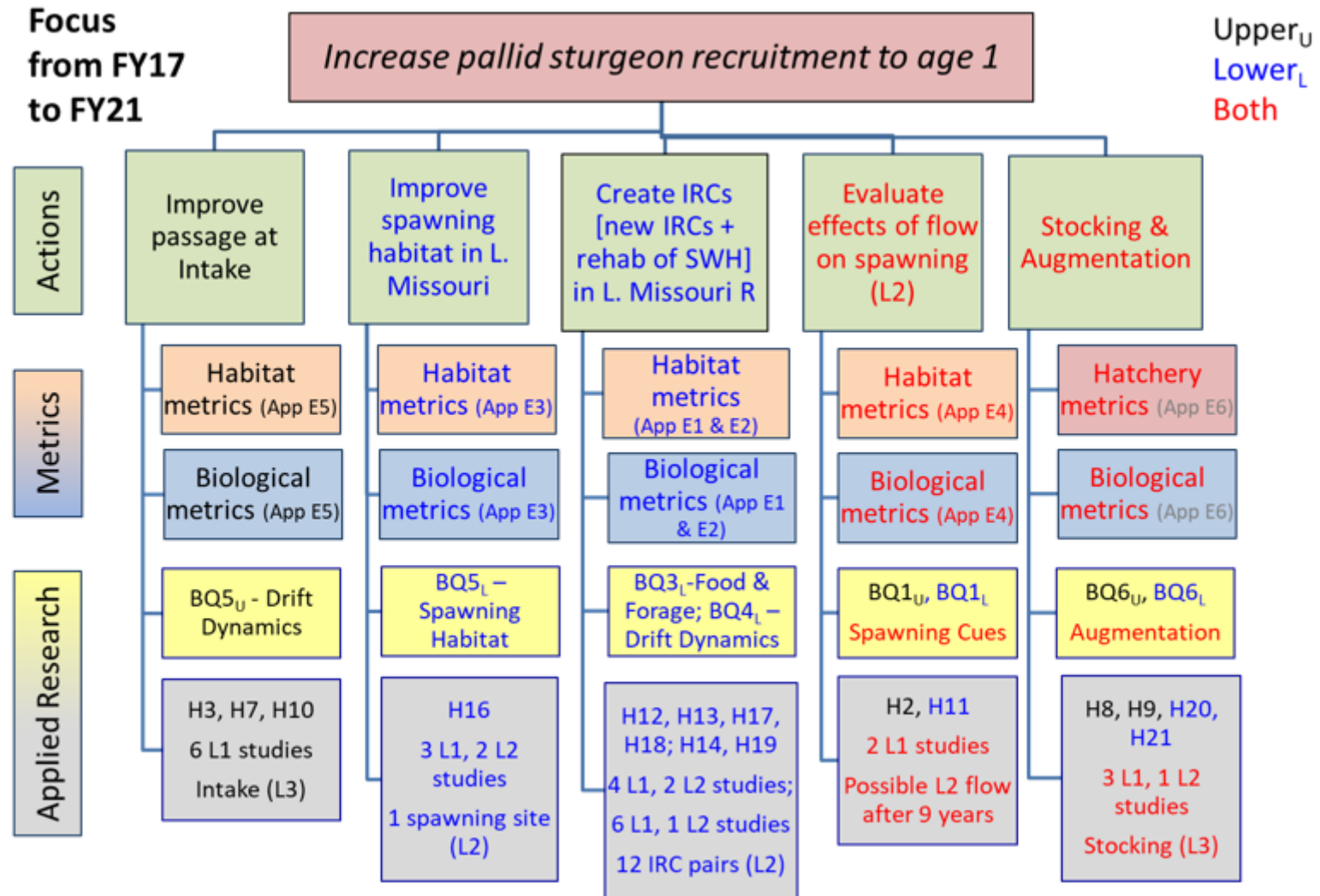
FINAL
OPINION

APRIL 2018

IMPLEMENTATION

USFWS ISSUES NEW BIOP APR 2018

Solution: Integrated science and implementation plans



Obstacle: Inflexible Governance Structure

Missouri River
Basin Water
Management

Recovery Program
Manager and
Exec. Committee

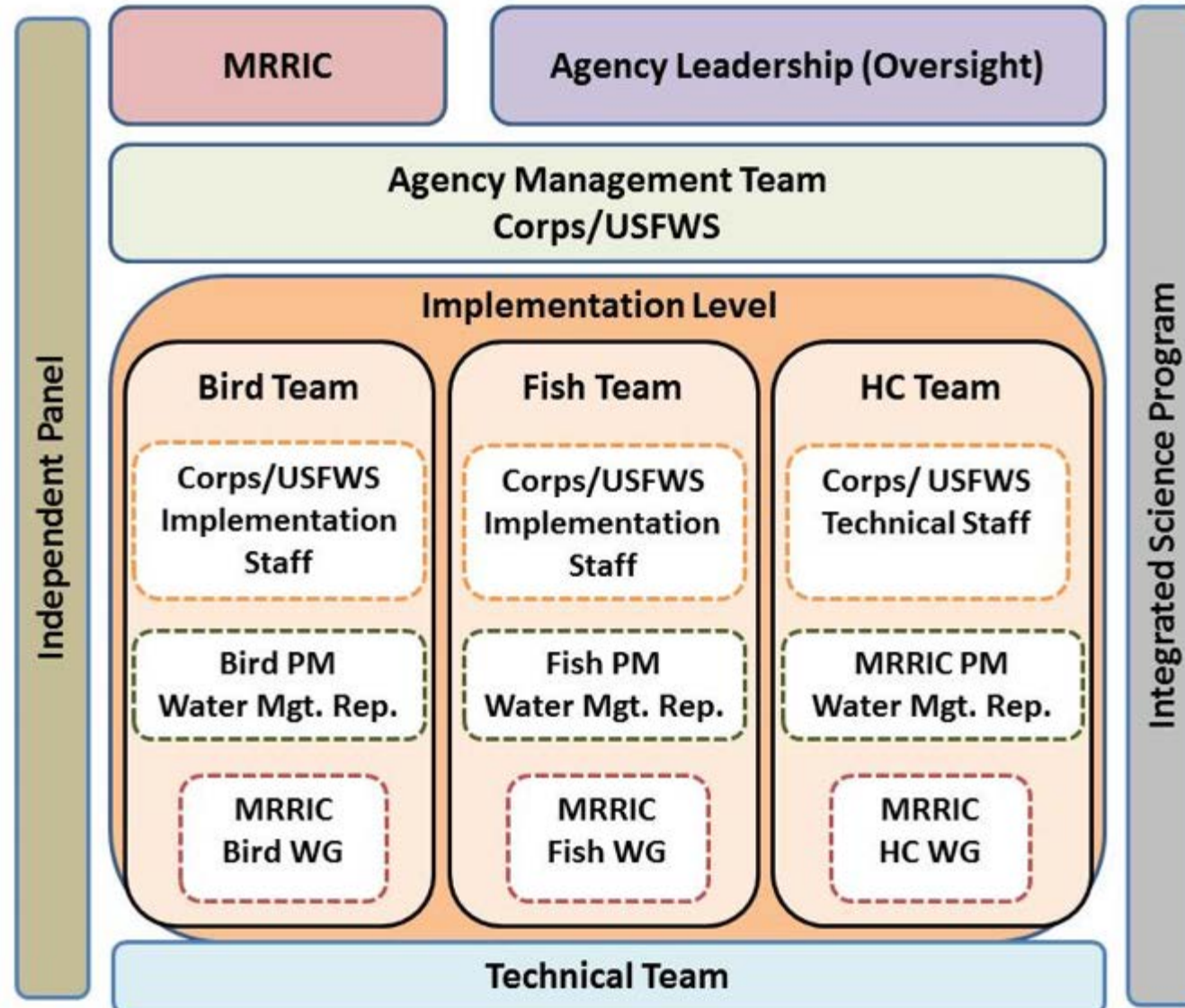
Emergent Sandbar
Habitat Team

Shallow Water Habitat
Team—Omaha

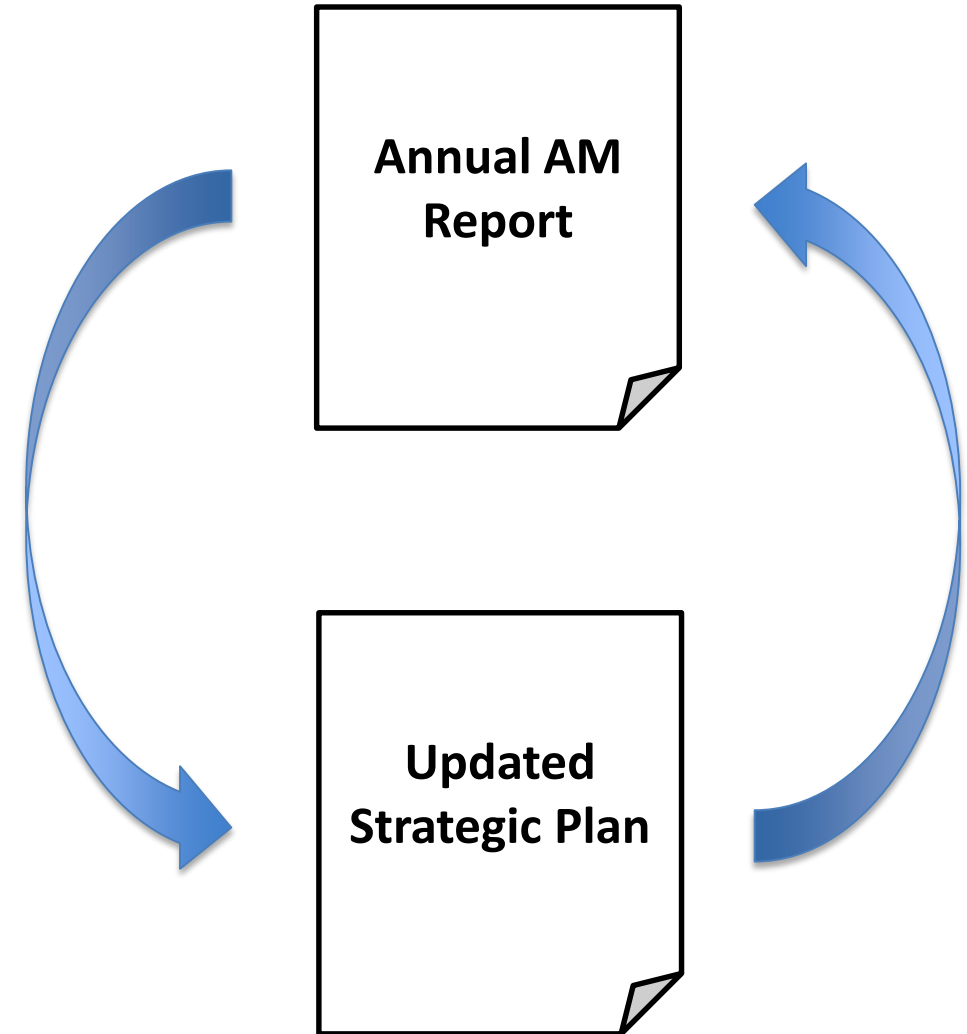
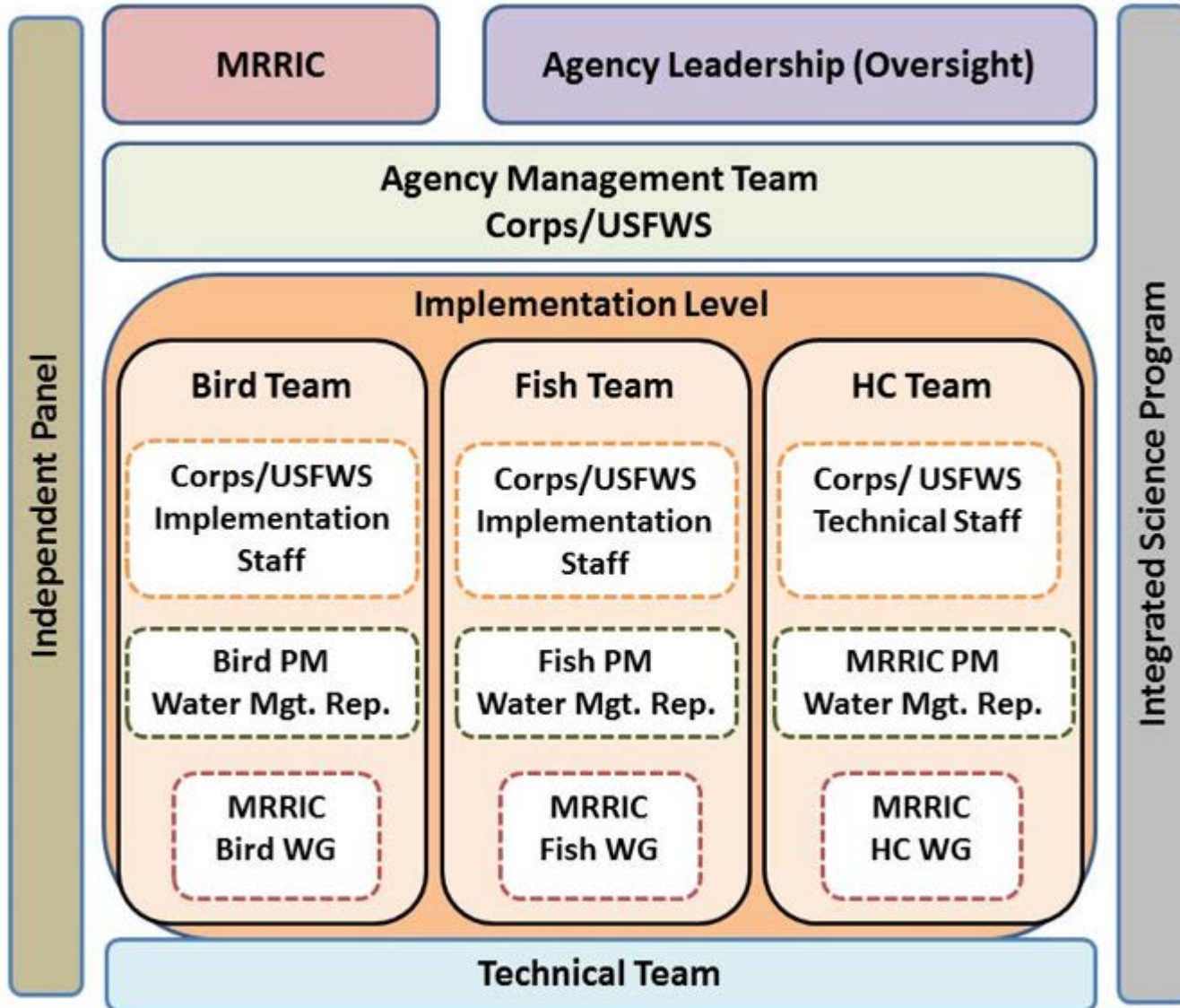
Warning!
Ridiculous
Oversimplification
Ahead

Shallow Water Habitat
Team—Kansas City

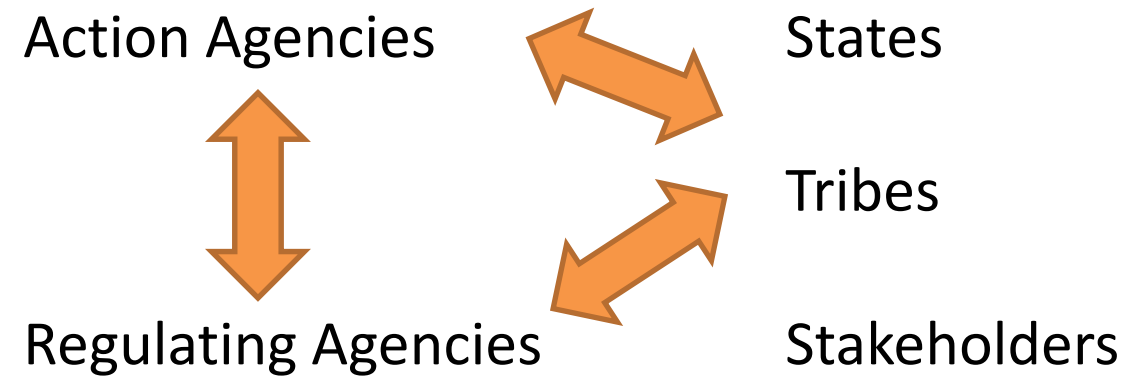
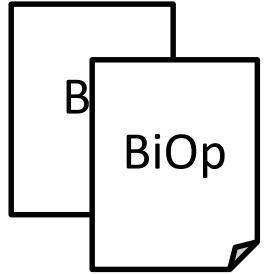
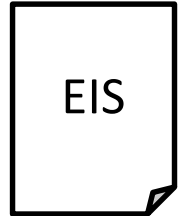
Solution: Integrated Governance



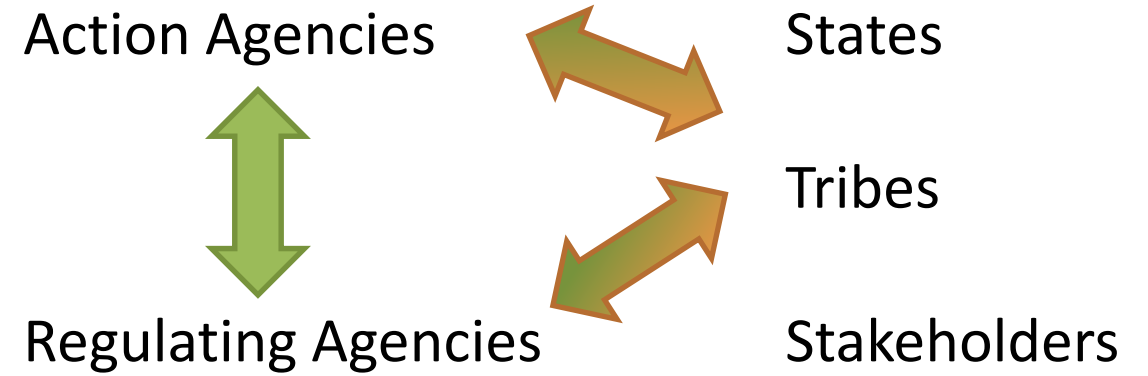
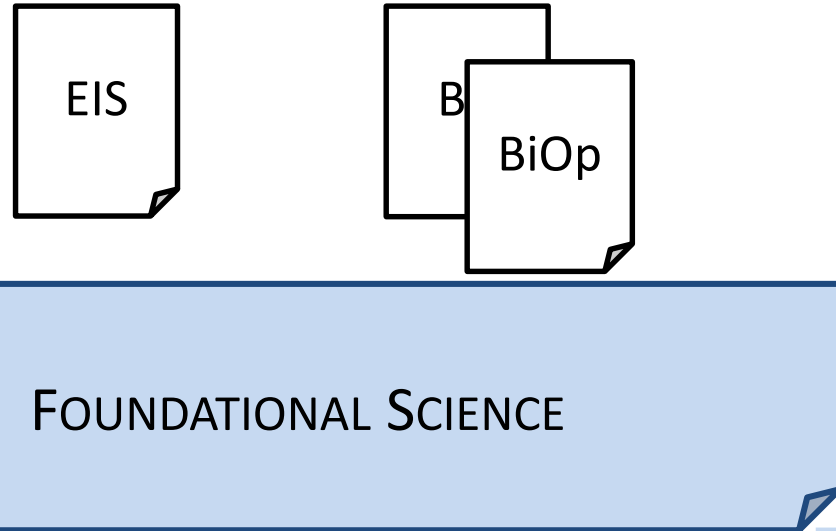
Solution: Integrated Governance



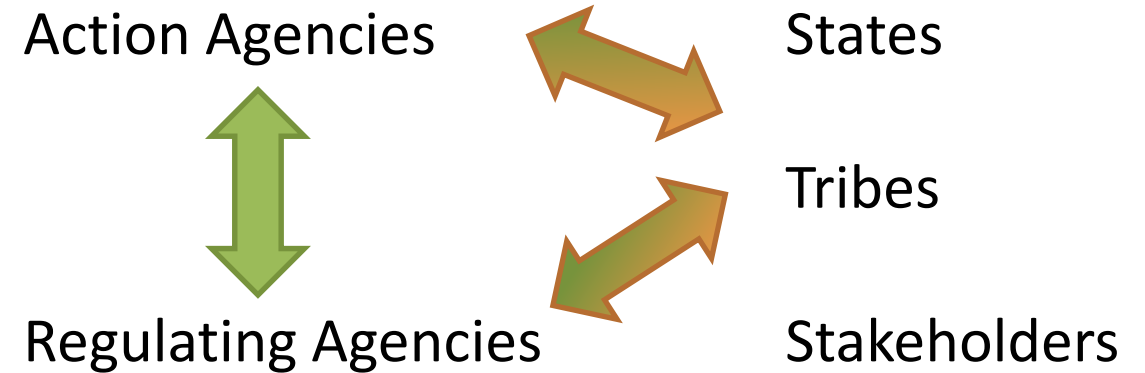
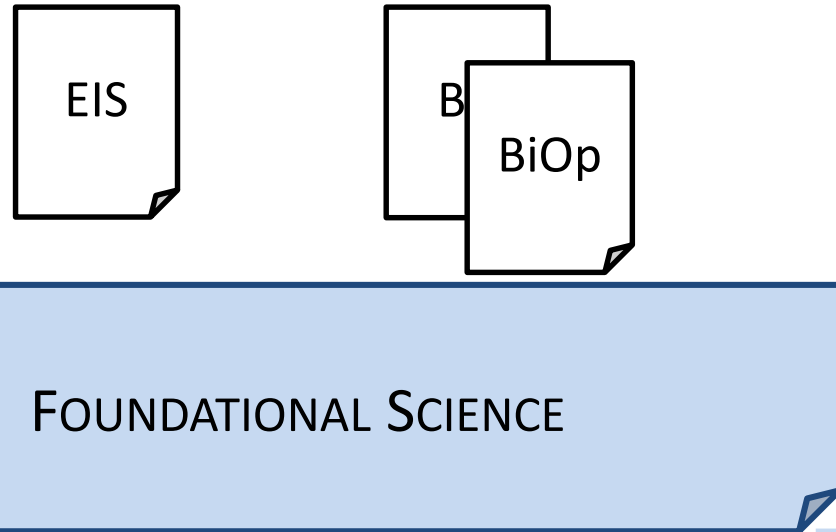
Obstacle: Lack of stakeholder support



Solution: Common foundation



Solution: Common foundation



- Document and communicate science
- Modeling management scenarios
- Collaborative adaptive management

- Build trust:
 - Transparency
 - External expertise

Solution: field trips!



Obstacles → Strengths

1. Lack of accountability for science-based decisions
Rigorous, transparent science framework & reporting
2. Overly-narrow management focus
Managing species, not projects
3. Inflexible planning and governance processes
Integrated governance structure, rolling Strategic Plan
4. Lack of stakeholder support
Science as a common foundation, building trust

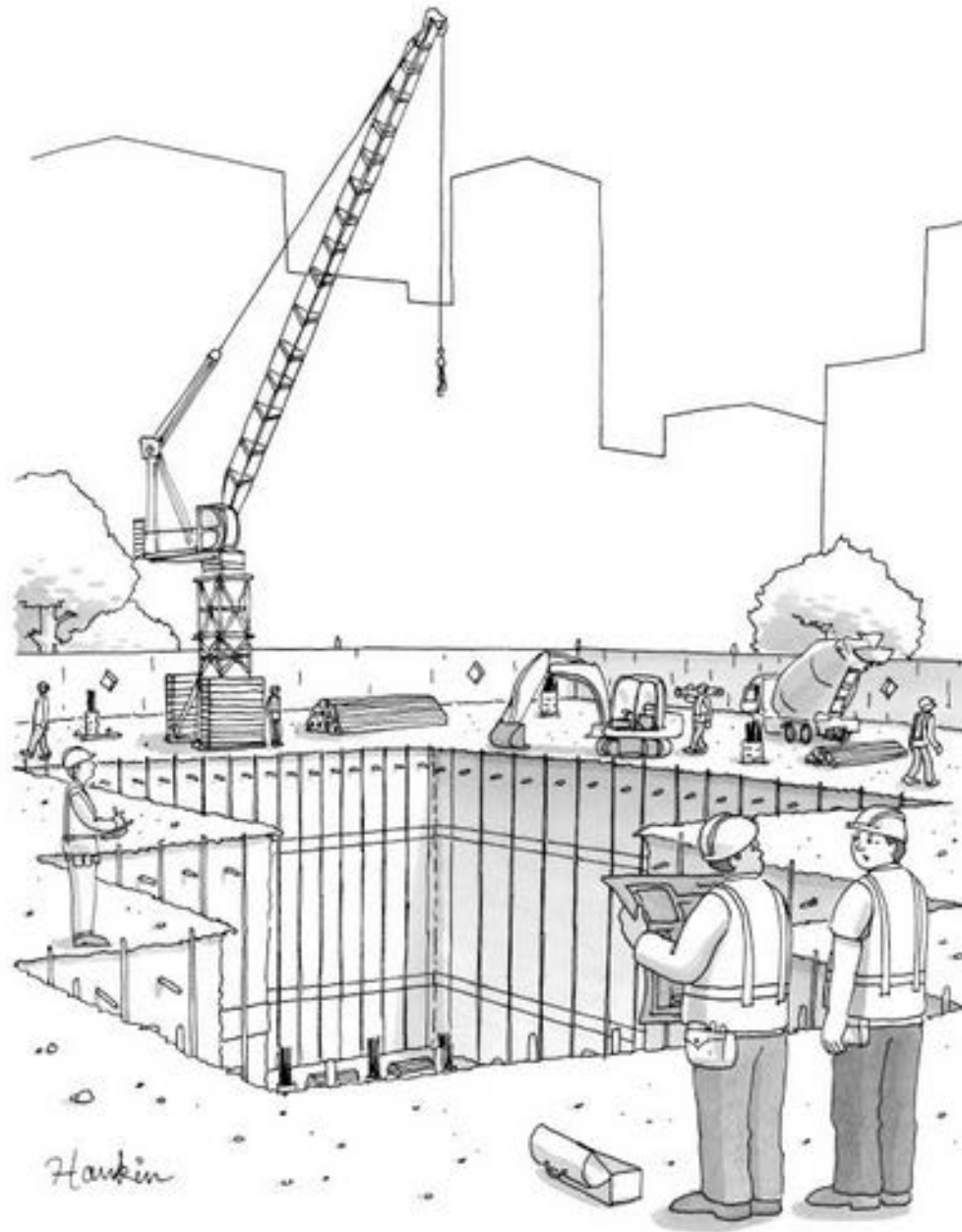
Questions?



US Army Corps
of Engineers®

ERDC
Engineer Research and
Development Center


Pacific Northwest
NATIONAL LABORATORY
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“I don’t know—seems like a lot of work.”


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 **USGS**
science for a changing world

 **ESSA**