

WALKING THE TIGHTROPE: BALANCING CERTAINTY OF ACTION FOR ESA COMPLIANCE AND SCIENTIFIC UNCERTAINTY THROUGH ADAPTIVE MANAGEMENT ON THE MISSOURI RIVER

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Building connections from the local to the landscape scale

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ADAPTIVE MANAGEMENT AND THE ESA



Adaptive Management

- Promotes flexible decision making in the face of uncertainty
- Adjust management as outcomes from actions become better understood
- Incorporates learning into management (i.e. learn by doing)

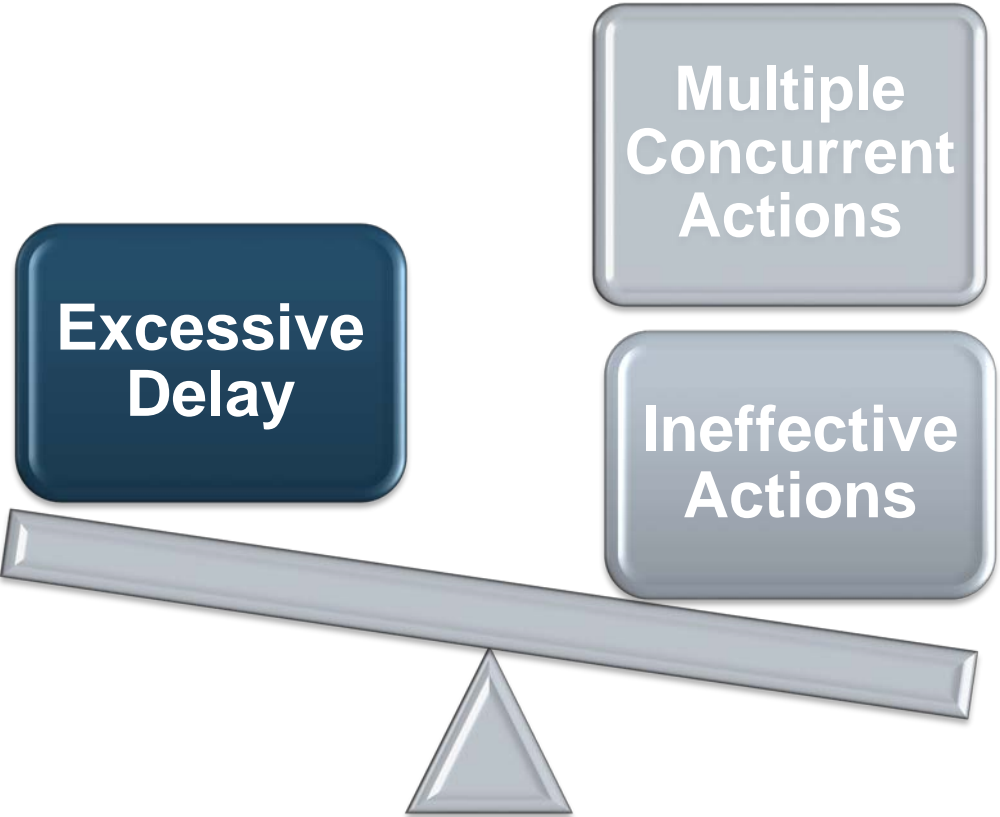
Endangered Species Act Regulations

- Reasonable Certainty Standard – never specifically defined but used throughout Regs and Handbook
- More than “a promise to plan, collaborate, or manage toward compliance...”
- USFWS must determine if take is “reasonably certain to occur”



BALANCING ACTION VS STUDY

Balancing Risks in Alternatives Development





SUMMARY OF PROPOSED ACTION



Pallid Sturgeon

- Propagation and Augmentation (Upper Basin/Lower Basin)
- Pallid Sturgeon Population Augmentation (Upper Basin/Lower Basin)
- Levels 1 and 2 Studies
Cue Test Flow (Upper Basin)
- Spawning Habitat
- Channel Reconfiguration (Lower Basin)
- Habitat Development and Land Management on MRRP Lands – O&M of existing SWH projects (Lower Basin)
- Habitat Development and Land Management on MRRP Lands – Rehab of existing SWH projects (Lower Basin)

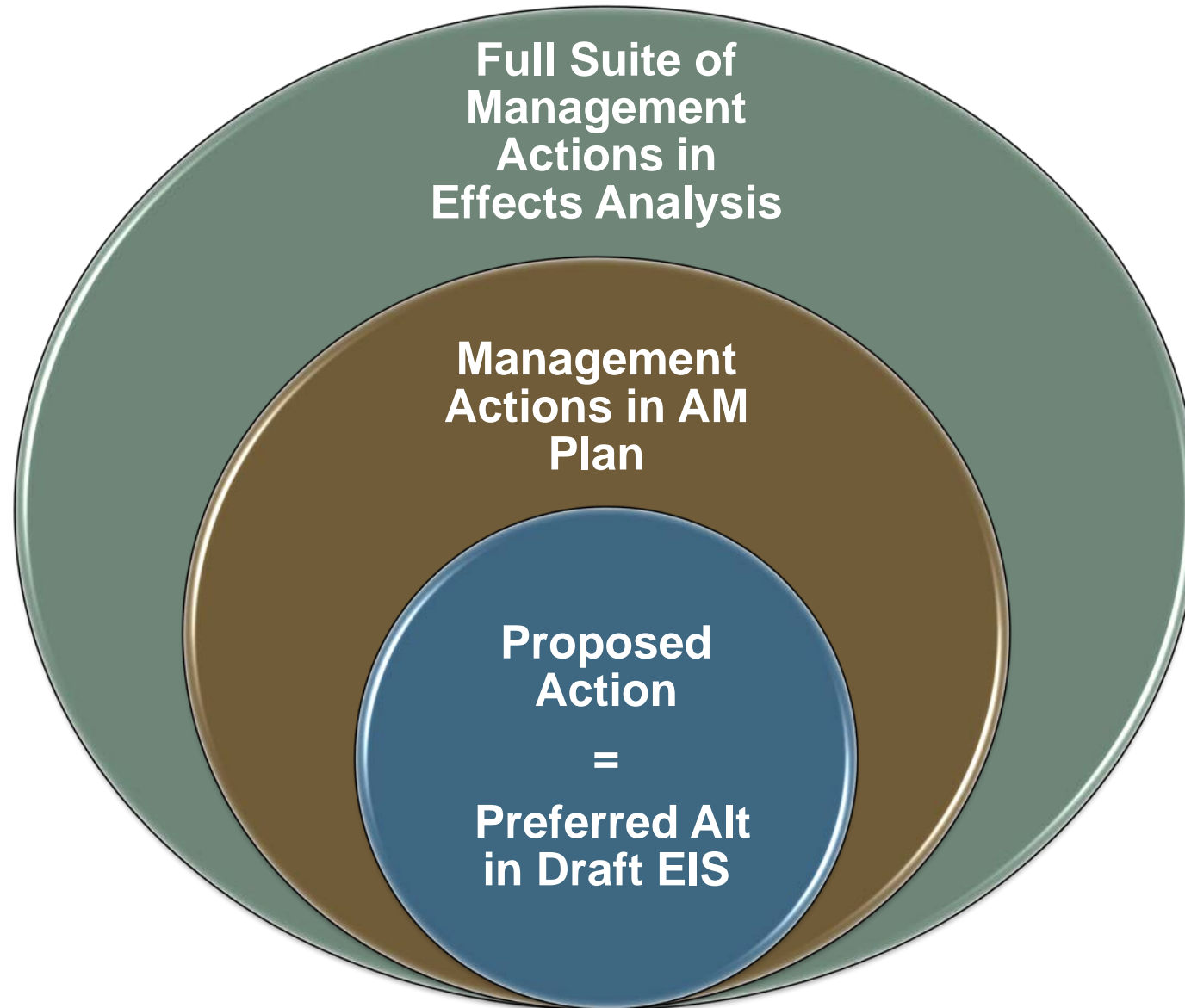
Least Tern and Piping Plover

- Mechanical Construction of Emergent Sandbar Habitat
- Sandbar Management
- Sandbar Management
- Restriction Measures
- Management to Reduce Take
- Monitoring and Research

Science and Adaptive Management Plan
“Critical Component of the Proposed Action” – 2017 BA



SCOPE OF AM PLAN VS EIS



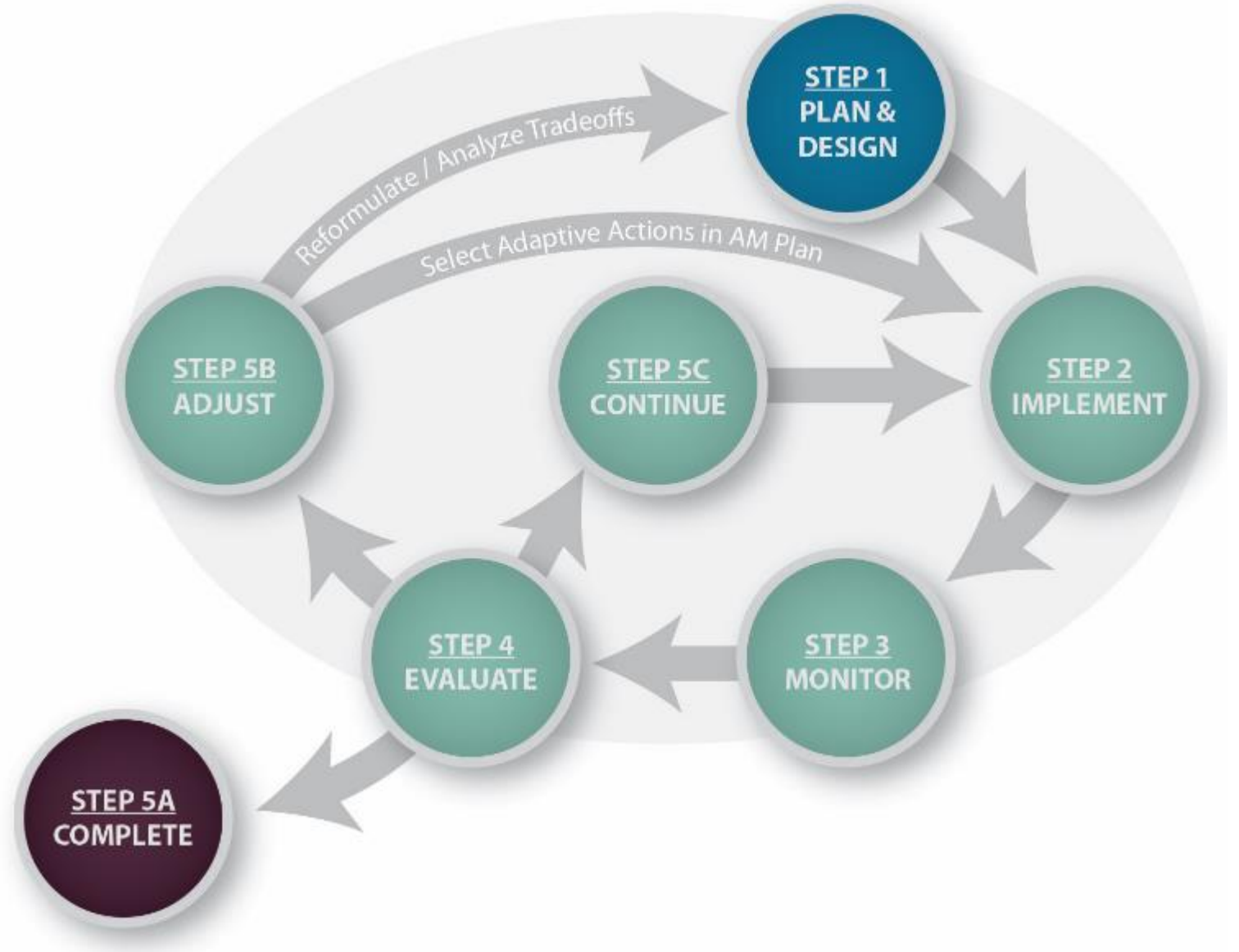


ESA AND ADAPTIVE MANAGEMENT



Typical Shortcomings Found During Judicial Review (Fischman and Ruhl 2015)

1. Failure to establish objectives or to determine monitoring protocols for a plan.
2. Failure to define decision thresholds in monitoring
3. Failure to identify specific actions that will be triggered when thresholds are crossed.





SPECIES OBJECTIVES



MRRP Goal: develop a suite of actions that meets ESA responsibilities for pallid sturgeon (PS), while continuing to operate the Missouri River System to meet its authorized purposes

FWS Fundamental Objective for Pallid Sturgeon: Avoid jeopardizing the continued existence of the pallid sturgeon from the USACE actions on the Missouri River.

Sub-objective 1: Increase pallid sturgeon recruitment to age 1.

Metric_1.1: catch rates of naturally produced age 0 and age 1 PS

Metric_1.2: model-based estimates of abundance of naturally produced age 0 and age 1 PS using data for age 0-4 fish

Metric_1.3: model-based estimates of survival of naturally produced PS to age 1, using data for age 0-4 fish

Target: measurable recruitment to age 1

Sub-objective 2: Maintain or increase numbers of pallid sturgeon as an interim measure until sufficient and sustained natural recruitment occurs.

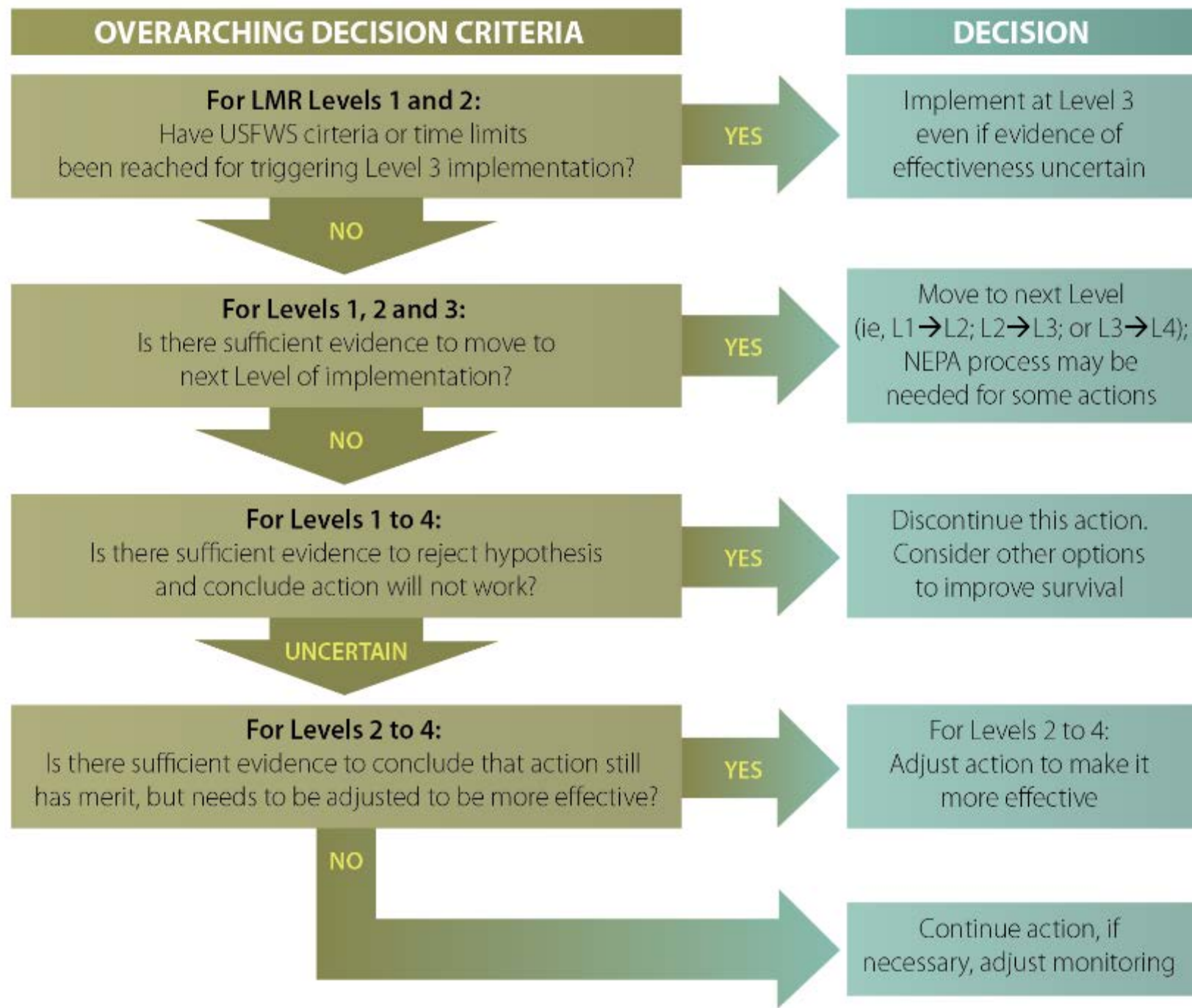
Metric_2.1: population estimates for PS by size class, age (particularly ages 2 to 3) and origin

Metric_2.2: catch rates of all PS by size class and origin (to maintain legacy data)

Target: TBD. Possible targets: 1) $\lambda > 1$ for PS age 2 and older; 2) survival rates of all size/age classes sufficient to provide stable population of PS age 2 and older; 3) acceptable probabilities of persistence and recovery (> 0.95) over 50 years (utilizing population models); and 4) > 5000 self-sustaining, genetically diverse PS in each adult population unit.



PALLID STURGEON DECISION CRITERIA





TIME LIMIT SUMMARY FOR PALLID STURGEON



Action Category	Time Limit	Minimum Scope	Maximum Scope
Population augmentation (Level 3)	Immediate	Current stocking rate as directed by USFWS Range-wide Stocking and Augmentation Plan	Variable over time as directed by USFWS Range-wide Stocking and Augmentation Plan
IRC habitat development (Levels 2 to 4)	Stage 1: study phase (years 1-3 post-ROD)	Build 2 IRC sites per year (paired with control sites), adding 33,000 ac-d/yr of suitable habitat, using staircase design ¹ . Assess potential for refurbishing existing SWH sites as IRCs	
	Stage 2 – continue study phase (years 4-6 post-ROD)	Build 2 IRC sites per year (paired with control sites), adding 33,000 ac-d/yr ¹ of suitable habitat. Refurbish SWH sites in addition to study sites (rate TBD).	
	Stage 3 - Level 3 implementation (years 7-10 post-ROD)	Continue assessing IRC sites and refurbishing new SWH sites, adding at least 66,000 ac-d/yr ¹ of suitable habitat. Determine required rate of Level 3 implementation based on stages 1 and 2.	
	Stage 4 – Level 4 implementation	Remove IRC habitat limitations to pallid sturgeon survival by implementation at Level 4.	
Spawning habitat ² (Level 2)	2 years	1 spawning site	See decision tree in Figure 54
Spawning cue flows at Gavins Point Dam (Level 2) ³	9 years	Requirement for spawning cue flows (and appropriate scope) depends on the outcome of Level 1 monitoring and modeling studies during years 1-9. ³	



SECTION 7(A)(1) CONSERVATION PLAN



Missouri River Reservoir System Operations

1. Identify opportunities to operate the System to benefit listed species.
2. Support Pallid Sturgeon Propagation and Augmentation Program in addition to the BA Proposed Action.

BSNP Maintenance

3. Identify opportunities to maintain the BSNP in a manner that could contribute beneficially to aquatic habitat.

BSNP Fish and Wildlife Mitigation Project

4. Prioritize lands for acquisition that contribute to meeting pallid sturgeon habitat requirements when consistent with BSNP Fish and Wildlife Mitigation Program authority.
5. Consider Indiana bat and northern long-eared bat habitat needs in planning of site-specific habitat development for Mitigation Program lands.
6. Evaluate potential for levee modifications at existing and future mitigation sites.



SECTION 7(A)(1) CONSERVATION PLAN



Kansas River Operations

7. Determine if there is potential to operate the Kansas River projects in a manner that would increase benefits to native species (Sustainable Rivers Program).

Lake Projects

8. Avoid adverse impacts to gray bat, Indiana bat, and northern long-eared bat while maintaining District projects.

Partnerships and Information Sharing

9. Coordinate, communicate, and cooperate among entities responsible for conserving pallid sturgeon, least tern, and piping plover.



FINAL USFWS BIOLOGICAL OPINION



- No jeopardy determination
- *“The Proposed Action is not likely to reduce the current reproduction, abundance or distribution of the pallid sturgeon. In fact, the overall effect of the Proposed Action including the emphasis on the **7(a)(1) program**, and **Science and Adaptive Management Plan** are likely to lead to an improvement in each of those factors.”*
- “Mixed Programmatic Action” (50 CFR § 402)
- Anticipates “Tiered” or “stepdown” biological opinions for future adaptive actions
- Annual Reporting

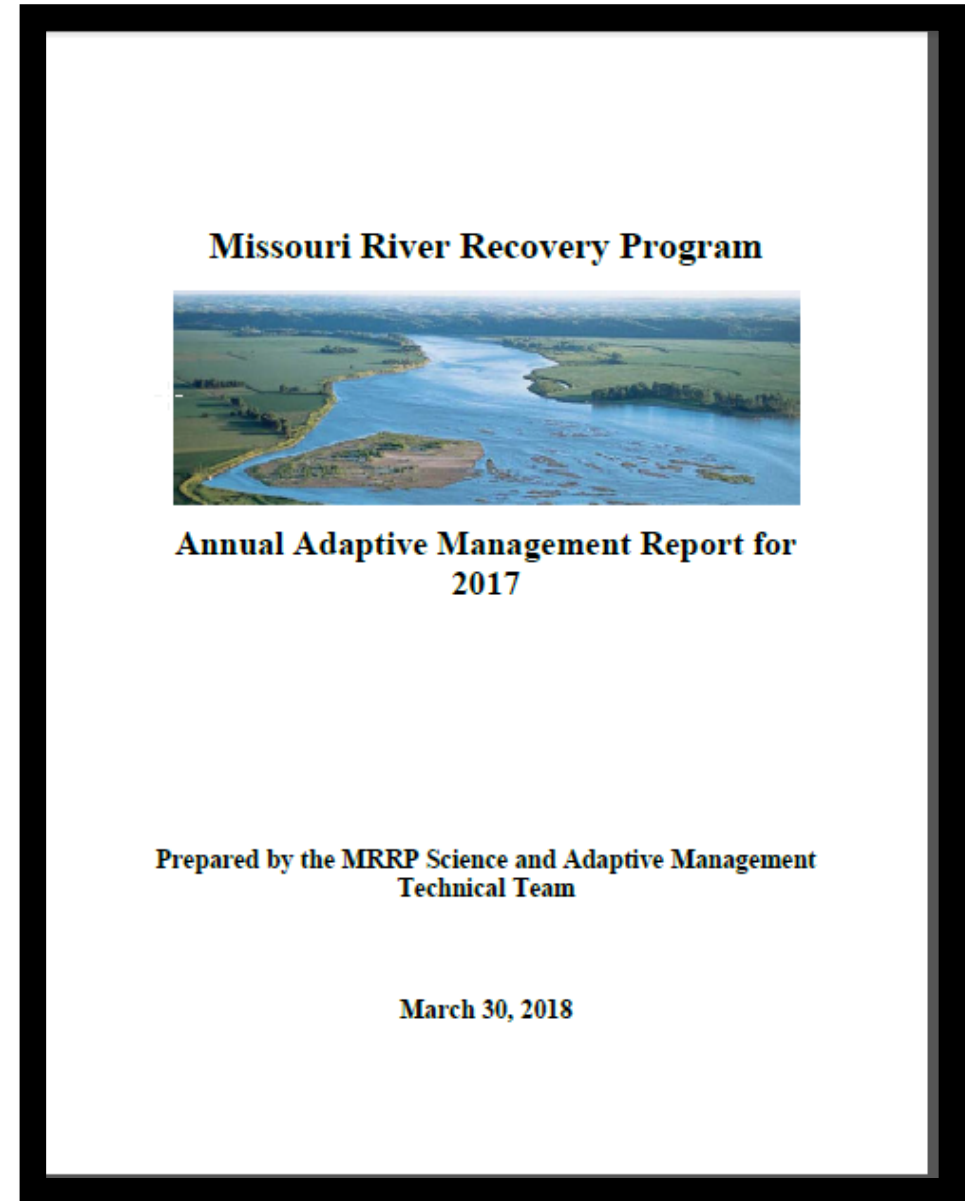




ANNUAL REPORTING/SITE-SPECIFIC COMPLIANCE



- Process Documents
 - Annual Reporting
 - Site-Specific Process & Procedures
- Continued collaboration with USFWS via AM Process and 7(a)(1)
- Section 7(a)(1) Plan – annual meeting with USFWS to incorporate new information and discuss progress.





TAKE AWAY POINTS

- Effects Analysis provided concurrence on best available science
- Up-front investment in modeling tools
- Collaboration with USFWS
- Embraced Independent Review
- Transparent process with stakeholders
- AM Plan with objectives, metrics, targets, and action-forcing decision criteria

