Inland Fisheries Habitat Management: Lessons Learned from Wildlife Ecology and a Proposal for Change

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WISCONSIN DEPT. OF NATURAL RESOURCES

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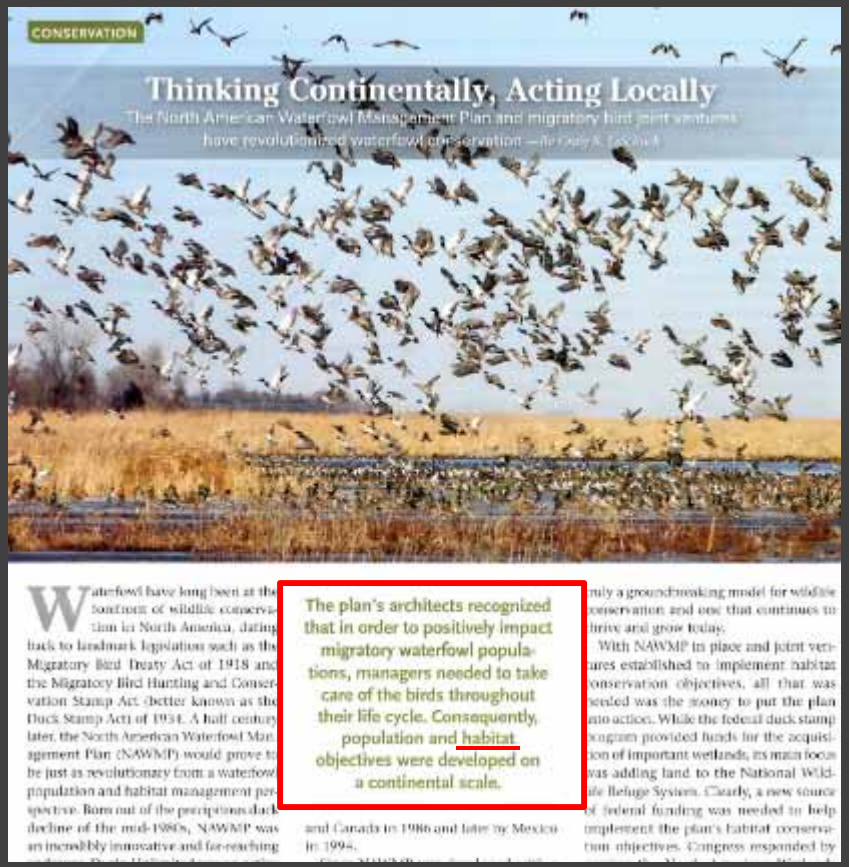


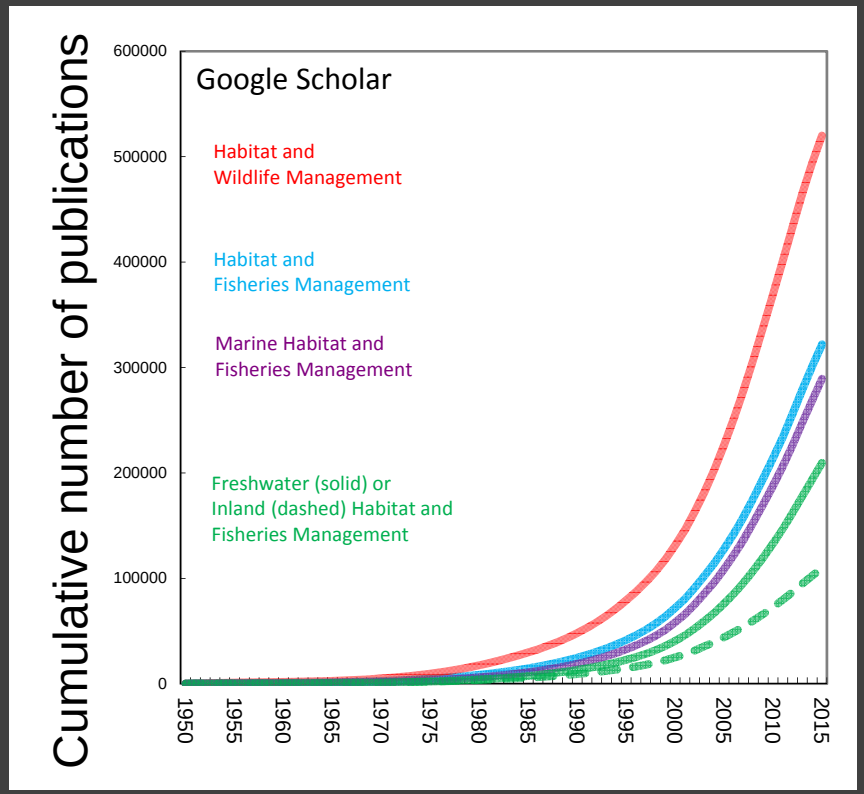
Where is the HABITAT in Inland Fisheries Management?

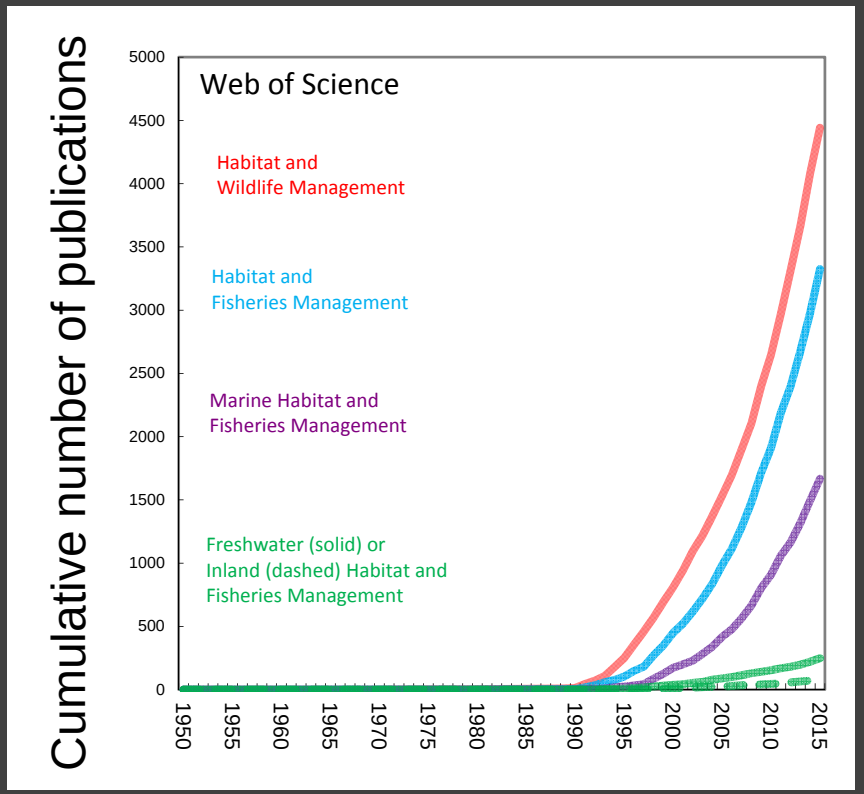
"We would like to accept ruffed grouse from Wisconsin for our reintroduction program; however, the habitat is not quite appropriate yet".

Kentucky Wildlife Biologist

Literature Search:

"Habitat and Wildlife Management" vs. "Freshwater or Inland Habitat and Fisheries Management "





-Since 1950, the cumulative number of publications about "freshwater or inland habitat and fisheries management" has been 60-95% less than those considering "habitat and wildlife management".

Sass et al. (2017). Fisheries

Perspective

- Compare and contrast inland fish and wildlife habitat management systems and highlight lessons from wildlife ecology that could benefit inland fisheries

-Wildlife habitat management generally includes direct consideration of the quantity, quality, and juxtaposition of habitats (Block and Brennan 1993)

What is Habitat?

Sass et al. (2017) definition

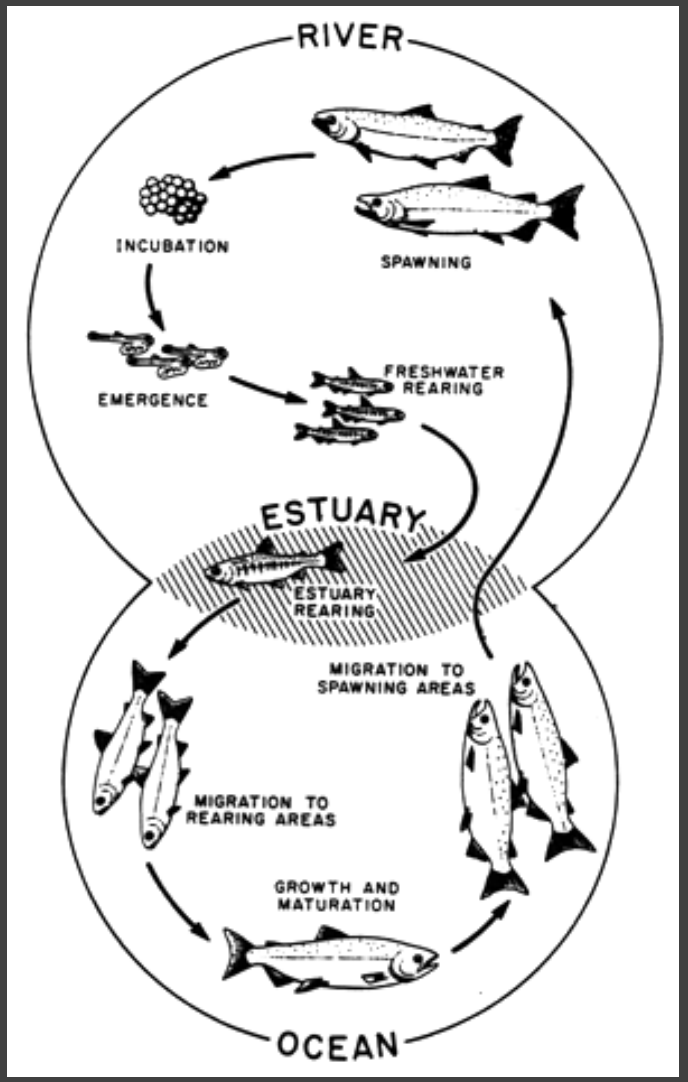
- "Adequate abiotic and biotic conditions required to complete all aspects of a species life history during a generation or lifespan, which results in fitness"."
- Acknowledges that habitat conditions can wax and wane over time and that fitness may correspond with those changes in the long-term

Previous definitions

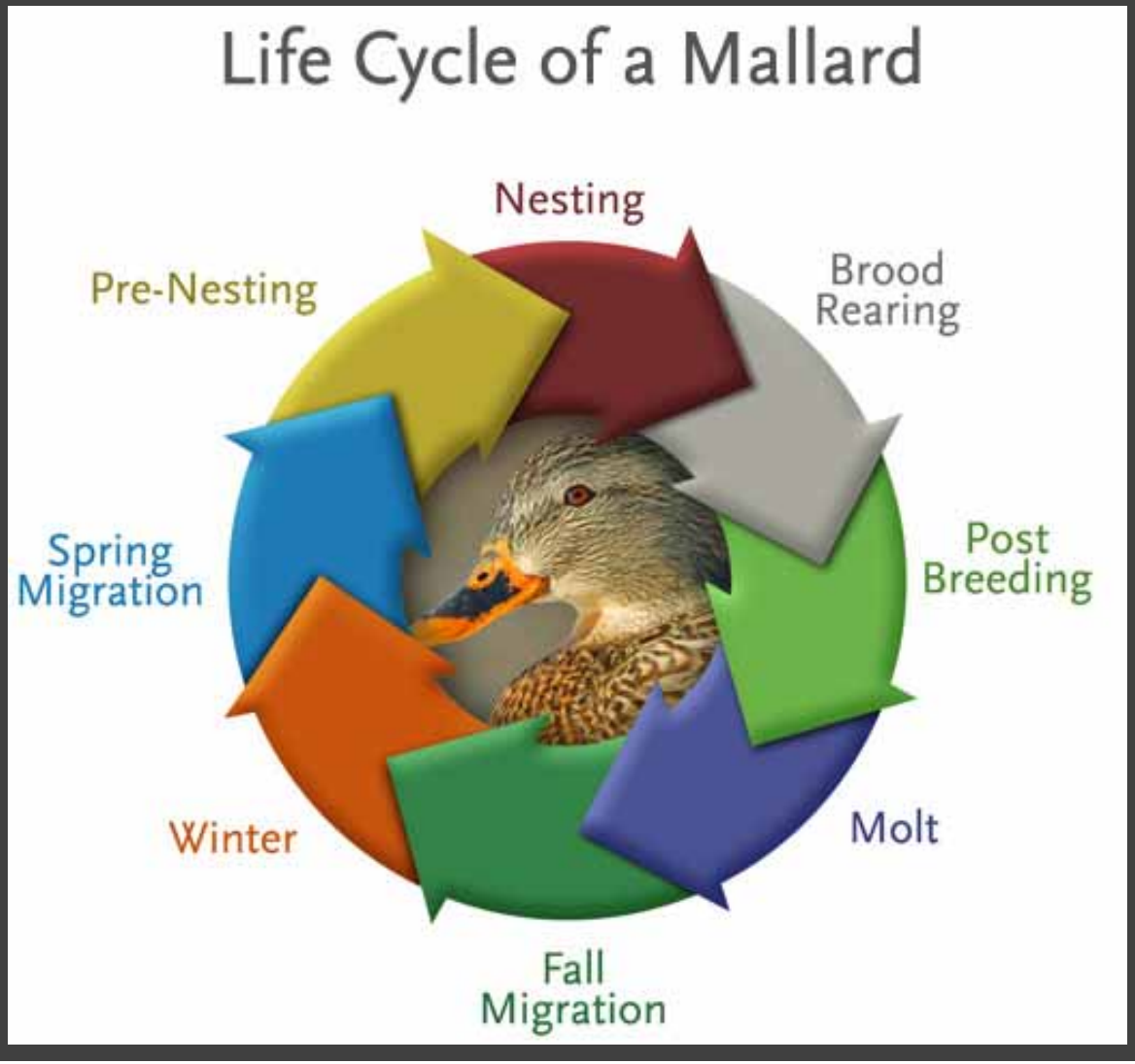
- Habitat is simply the place where an organism lives. Physical, chemical, and biological variables (the environment) define the place where an organism lives (Hudson et al. 1992; Hayes et al. 1999).
- Fundamentally similar definition to a "niche".

Sass et al. (2017). Fisheries

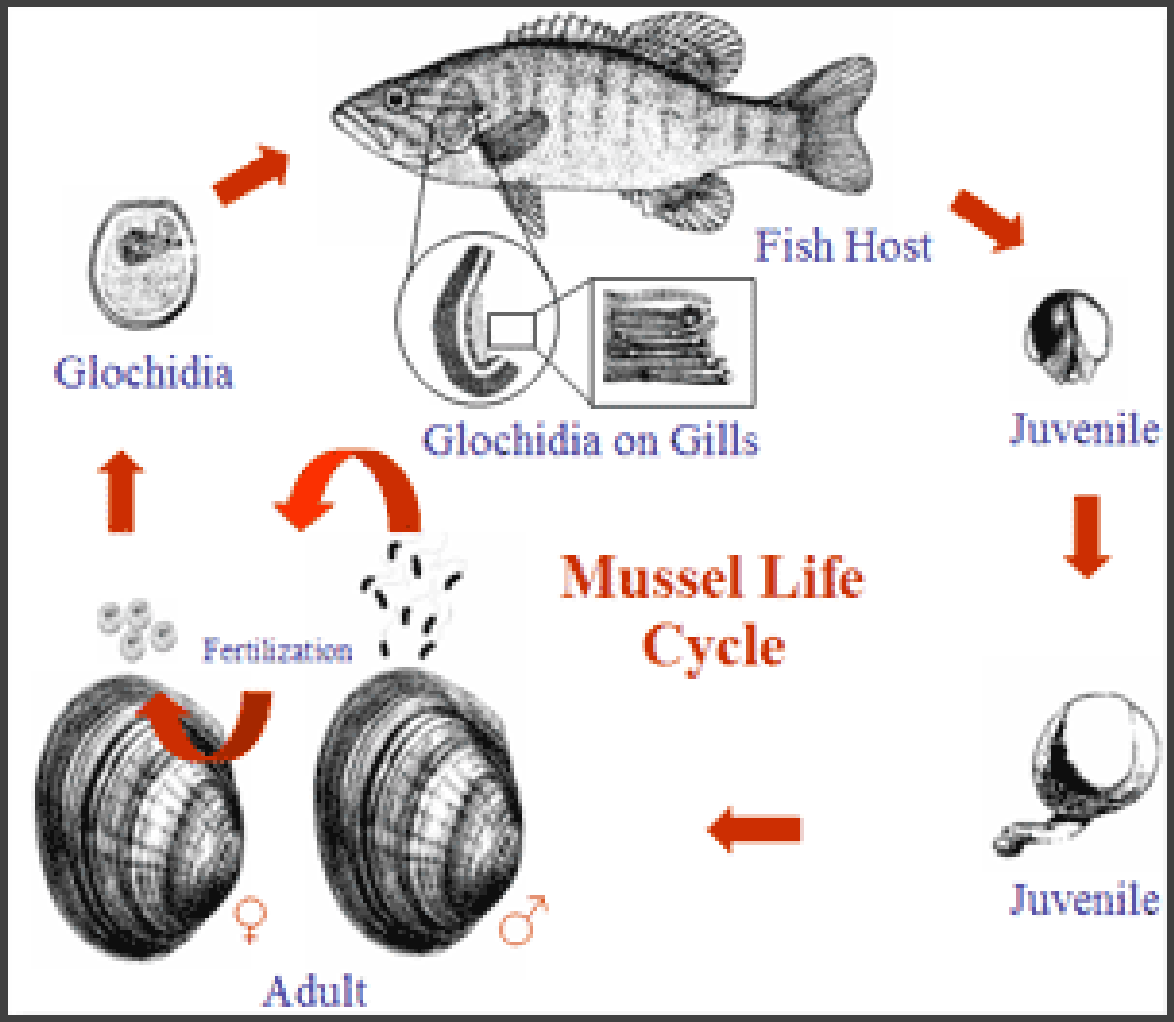
Complex Life Histories: Pacific Salmonids



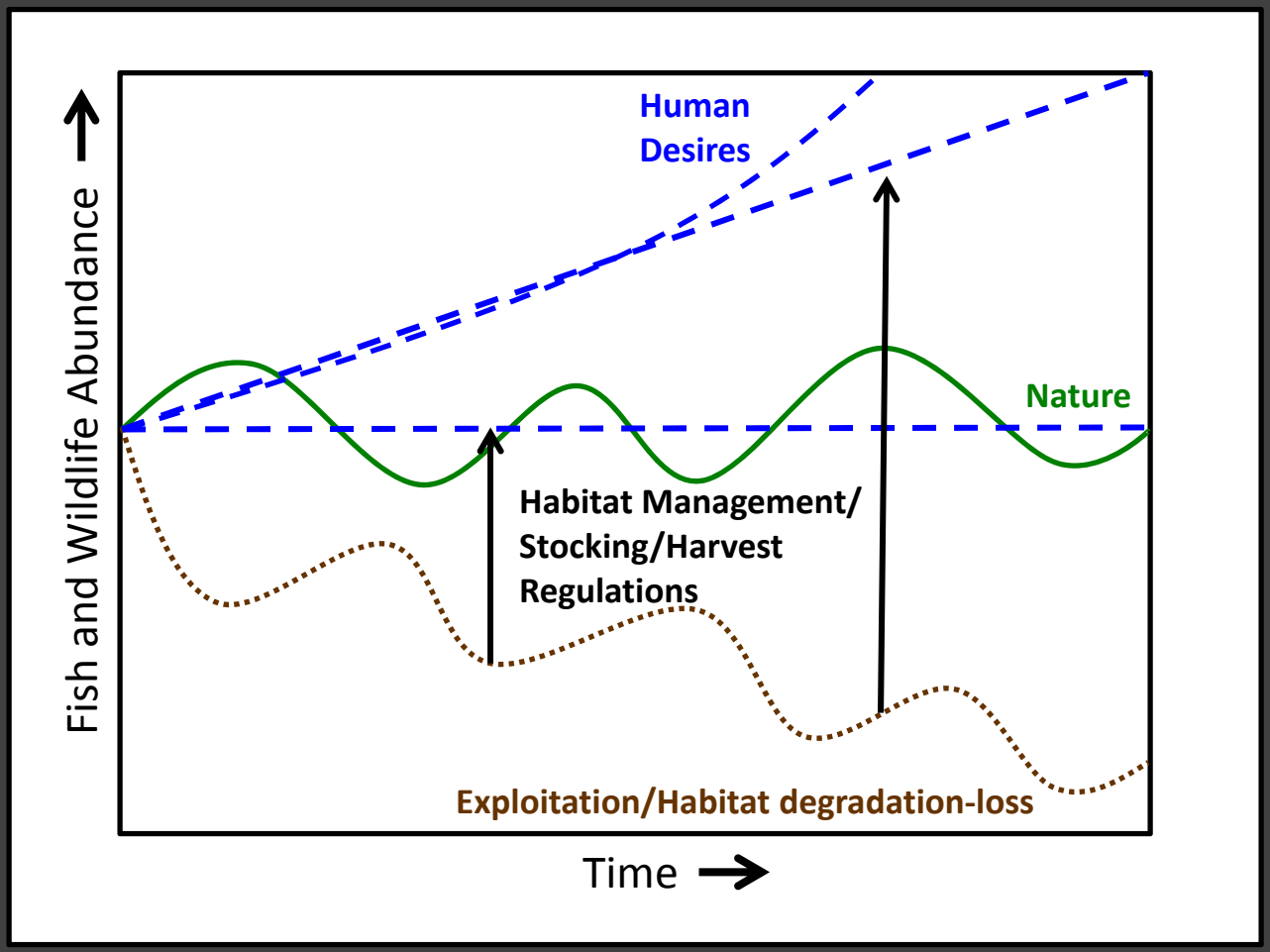
Complex Life Histories: Dabbling Ducks



Complex Life Histories: Mussels



Humans: Immediate vs. Delayed Gratification



-Wildlife stocking is expensive and usually not feasible; emphasis placed on habitat.
-Fish stocking is feasible; greater emphasis on stocking versus habitat.

Differences between Fisheries and Wildlife Management Systems

- Fishing has a voluntary catch-and-release option, hunting does not

-Catch-and-release fishing promoted over habitat management

- Humans share habitat with wildlife

-Positive/negative effects of wildlife habitat restoration/degradation are directly observable by humans; underwater world remains opaque to humans

- Segregation of natural resource professionals

-Increase communication between disciplines; habitat management can be mutually beneficial to fish and wildlife

- Valuation of habitat and funding

-In contrast to fisheries, stocking is not feasible, monetary incentives exist to preserve habitat, established funding sources maintain wildlife habitat, positive outcomes of habitat management are directly observable by humans

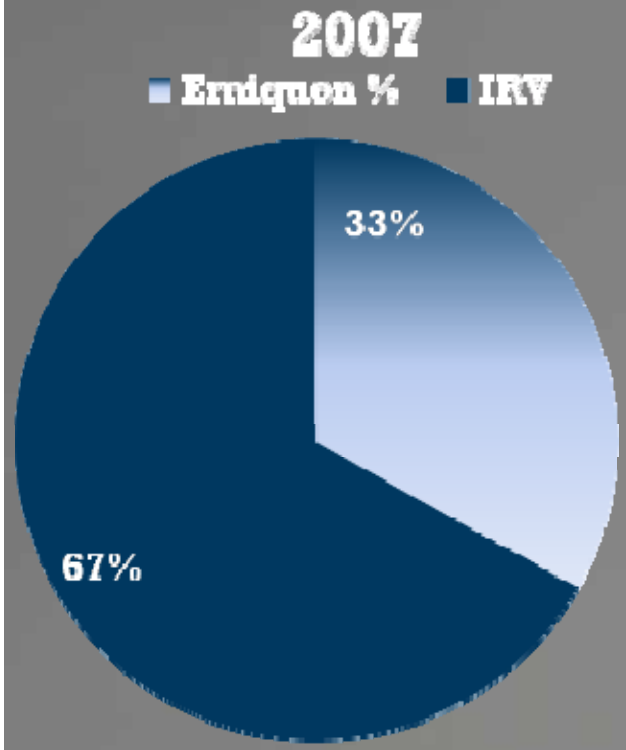
Observable Outcomes

Wildlife

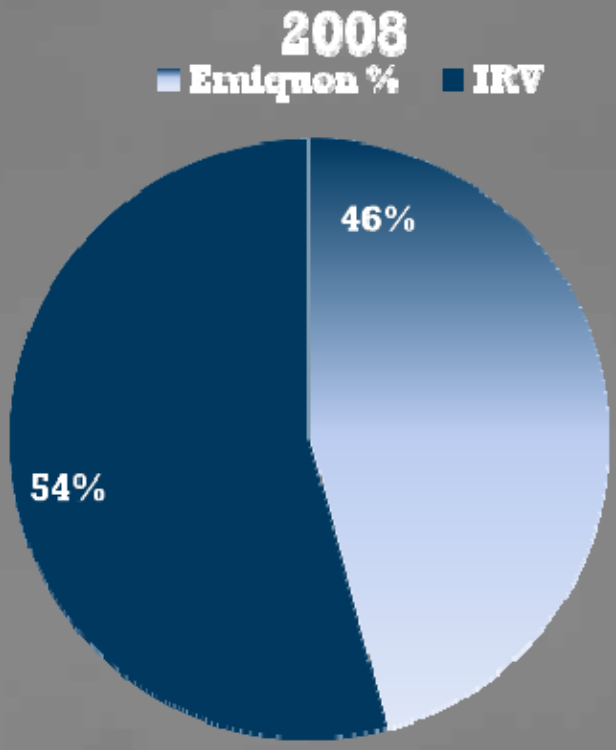
Fisheries

TNC Emiquon Preserve

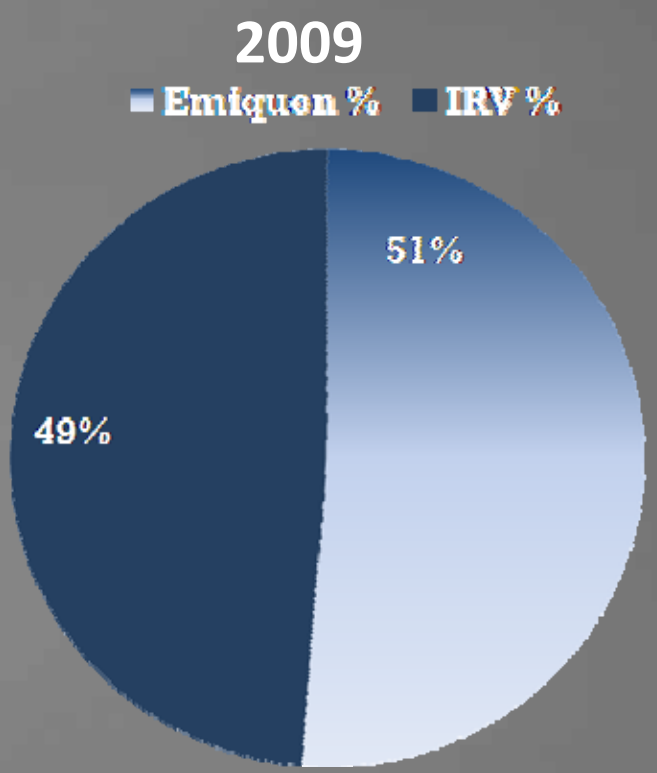
- Non-mallard Dabbling Duck UDs



3,364,017 UDs



3,033,720 UDs



3,890,830 UDs

Fish Stocking: Is perception reality and when should it be used?

- To create put-and-take recreational opportunities (e.g., urban ponds)
- Biomanipulation
- To rehabilitate former naturally reproducing populations
- Augment poorly recruiting desirable populations

-Although stocking will always be an important tool in inland fisheries management, it should not be conducted on top of sufficient natural reproductions, potential loss of local genetic adaptations should be considered, and habitat management considerations should be coupled with it or equally considered

Lesson Learned and Proposed Change

Lesson Learned from Wildlife Ecology	Proposed Change for Fisheries Management
-Critical habitat needs should be established prior to wildlife reintroduction	-Greater consideration of critical habitat, probability of success, and genetic concerns needed prior to stocking
-Dedicated funding sources are essential to conserve, restore, and enhance wildlife habitat	-Establish dedicated funding sources to conserve, restore, and enhance inland fisheries habitat
-Wildlife responses to habitat restoration and degradation have been visible to the public	-Create new opportunities for the public to directly observe the benefits of inland fisheries habitat management
-Wildlife ecologists have long understood that wildlife habitat is affected by the quantity, quality, distribution, and juxtaposition of resources. This has resulted in defined models for wildlife management that explicitly incorporate habitat.	-Establish a North American Model of Fisheries Conservation similar to the North American Model of Wildlife Conservation
-Many wildlife species have the ability to disperse to alternative habitats	-Inland fishes have limited dispersal potential, thus habitat management may be more critical for sustainability and resilience of fisheries

Conclusions

- Wildlife habitat management has likely become more widespread and accepted because humans share habitats with wildlife and positive/negative responses to habitat restorations/loss are directly observable
- Inland fisheries habitat studies and restorations should include opportunities for humans to directly observe the ecological benefits
- Dedicated funding solutions should be considered to mitigate aquatic habitat loss (e.g., private entities, state and federal stamps)
- ***Although aquatic habitat conservation and restoration may not solve management issues as rapidly, it will promote long-term sustainability and resiliency of diverse inland fish populations***

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