Rule Development Workshop for Kissimmee Basin Water Reservations

July 30, 2014

Welcome

Photo: Kissimmee River

Rule Development Workshop For Kissimmee Basin Water Reservations
July, 2014

Purpose of Water Reservation

Don Medellin, Principal Scientist
Applied Sciences Bureau

Photo: Kissimmee River

Reservation Purpose

- On the approved 2014 Priority Water Body List
- Governing Board authorized Rule Development Process in June 2014
- To ensure protection of fish and wildlife within specified reservation water bodies
- Kissimmee River Restoration Project
- Protect existing public investment of >$900M in the restoration project

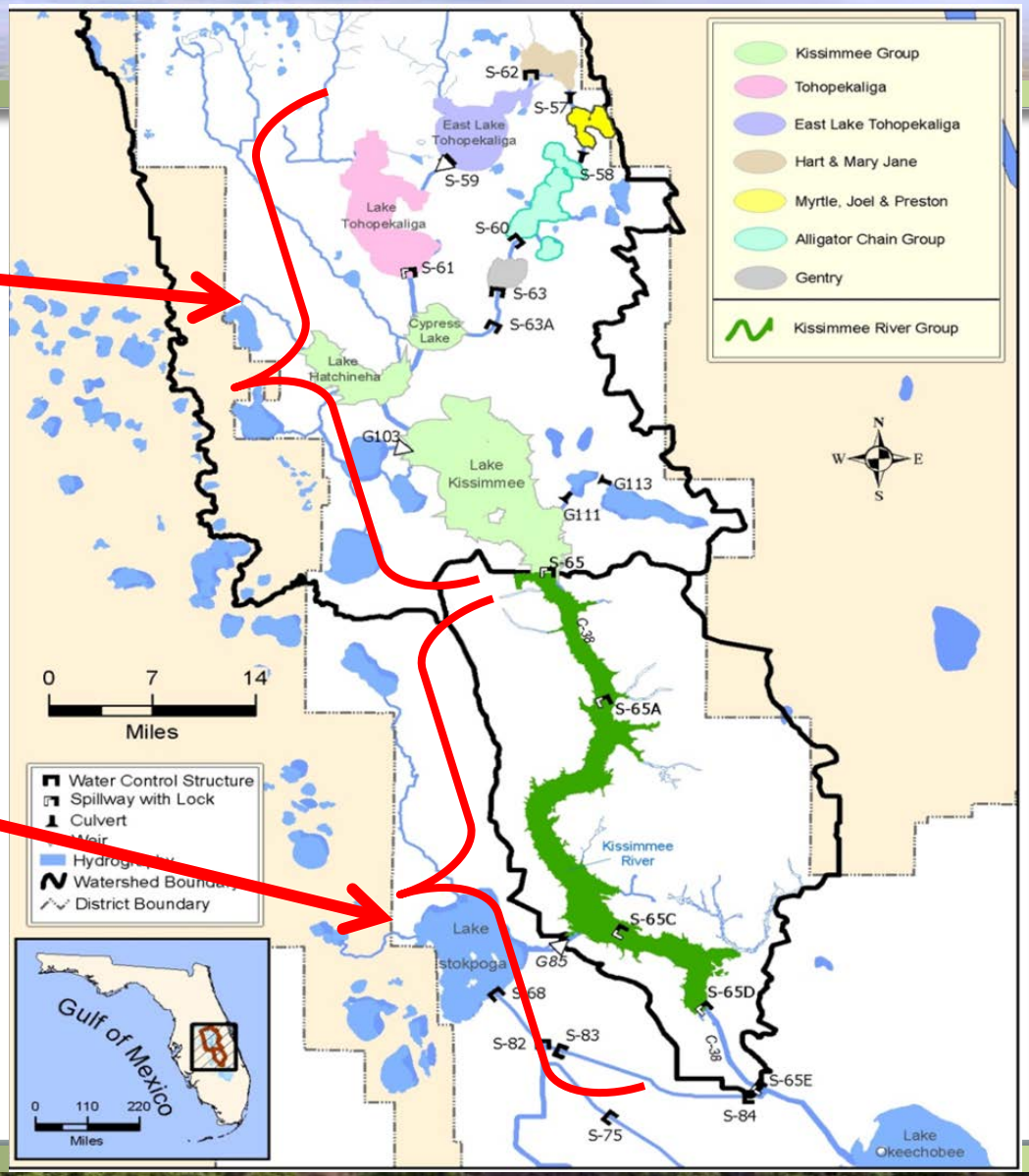
Kissimmee River Restoration Project

Implement restoration hydrology

- Headwaters Revitalization Schedule

Restore the physical form of the river

- fill C-38 Canal
- remove water control structures
- reconnect river oxbows



Rule Development Workshop For Kissimmee Basin Water Reservations
July, 2014

Water Reservation Process Overview

Scott Burns, Chief Scientist
Applied Sciences Bureau

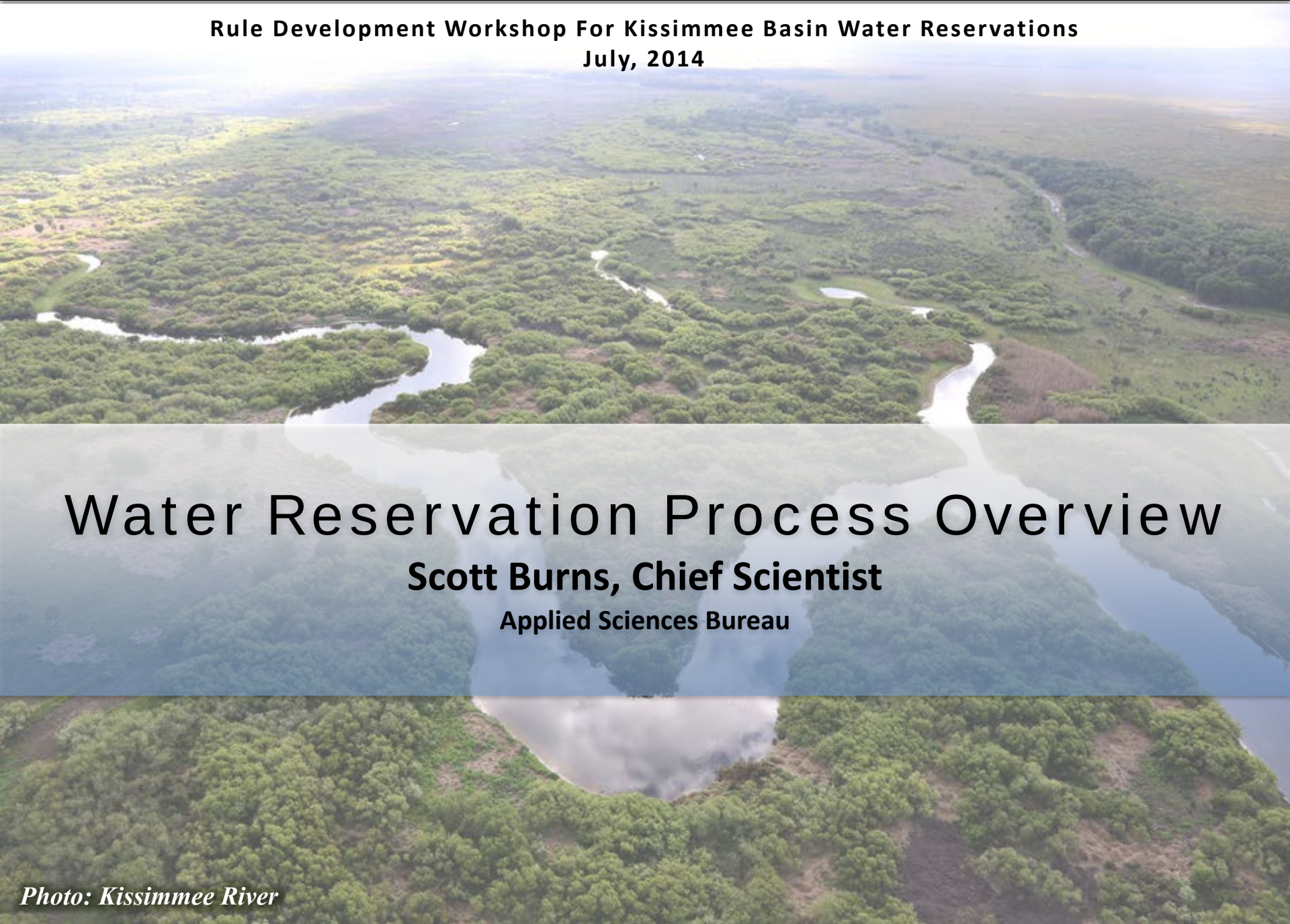
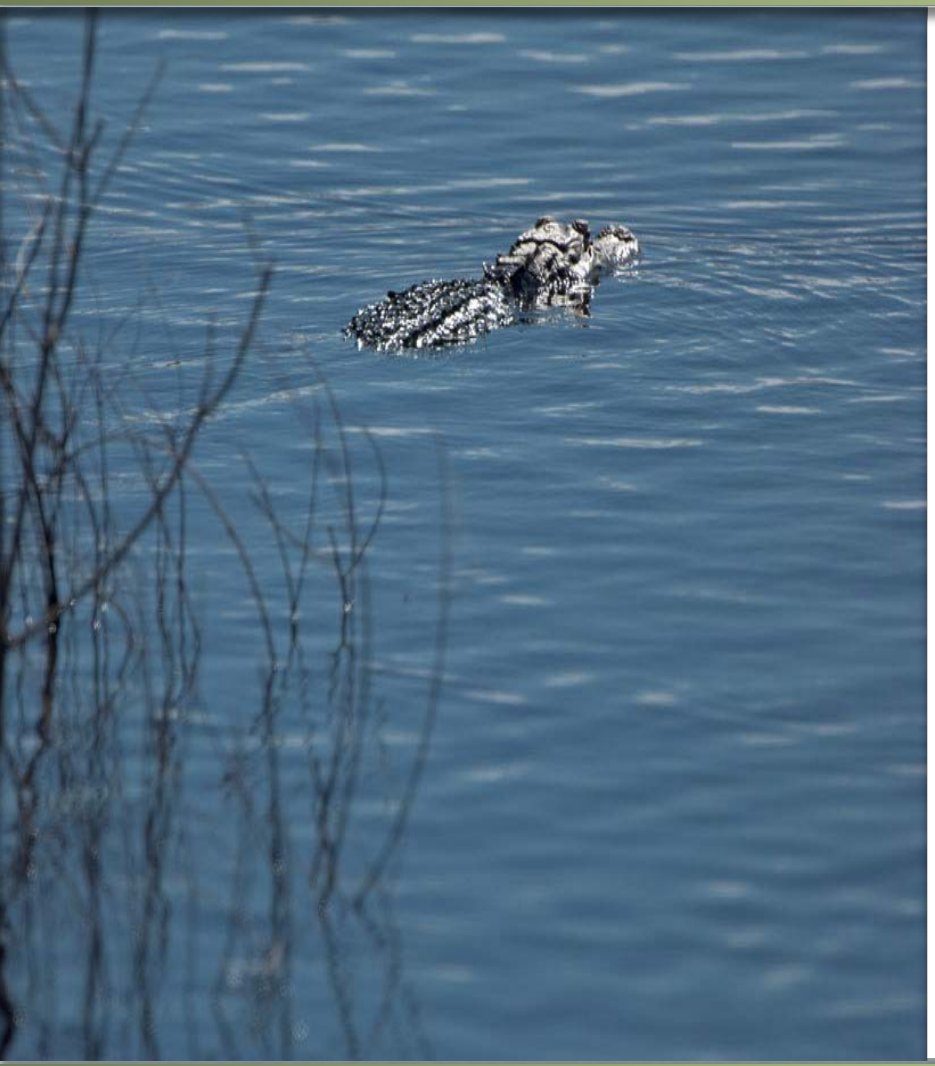


Photo: Kissimmee River

Presentation Overview



- **WHAT IS A RESERVATION?**
- TECHNICAL PROCEDURES FOR ESTABLISHING A RESERVATION
- RESERVATION RULE IMPLEMENTATION
- ADMINISTRATIVE ASPECTS OF RULEMAKING

What is a Water Reservation?

- "The Governing Board or the department, by regulation, may reserve from use by permit applicants, water in such locations and quantities, and for such seasons of the year, as in its judgment may be required for the protection of fish and wildlife or the public health and safety.
- Such reservations shall be subject to periodic review and revision in the light of changed conditions.
- However, all presently existing legal uses of water shall be protected so long as such use is not contrary to the public interest." *s. 373.223(4), Fla. Stat.*

What Does a Reservation Rule Do?

- **Prevents new uses from accessing reserved water**
- **Protects existing legal uses that are not contrary to the public interest**

What a Reservation Rule Doesn't Do

- Direct operations of the C&SF system
- Drought proof the natural system
- Ensure wildlife proliferation
- Include a recovery or prevention strategy component

How is a Reservation Established?

- **BY RULE**
  - Rulemaking procedures per Section 120.54, F.S.
  - Public participation
  - State level review
    - Joint Administrative Procedures Committee
    - Office of Fiscal Accountability and Regulatory Review
    - DEP
    - Legislative ratification

Legal Standards Associated with Rule Development cond.

- **"PROTECTION OF FISH AND WILDLIFE"**
  - "Protection" means: ensuring a healthy & sustainable native fish & wildlife community
  - One that can remain healthy & viable through natural cycles of drought, flood, and population variation
- **NEED LINKAGE BETWEEN WATER RESERVED AND PROTECTION OF FISH AND WILDLIFE**
  - Use of best available information

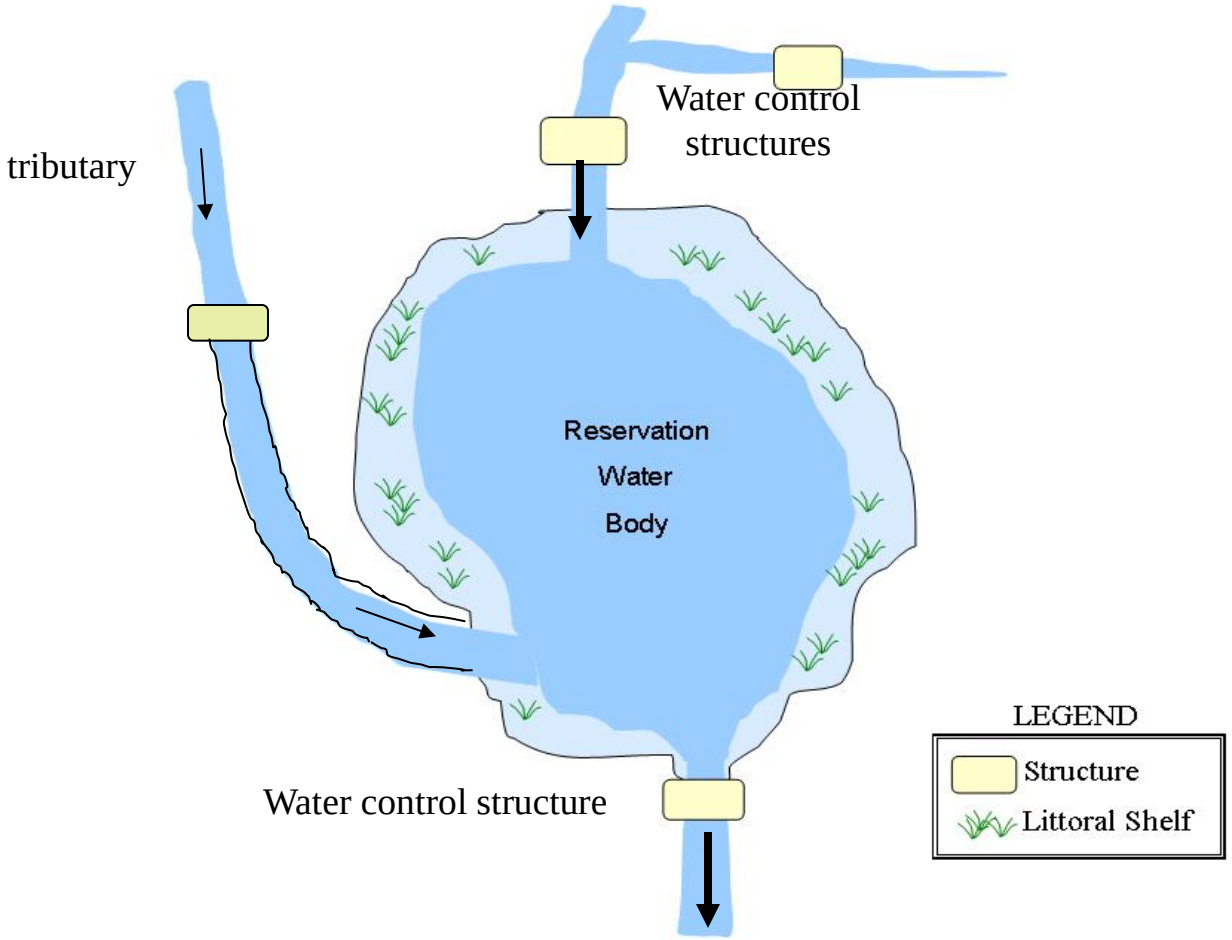
Technical Foundation

- WHAT IS A RESERVATION?
- **TECHNICAL PROCEDURES FOR ESTABLISHING A RESERVATION**
- RESERVATION RULE IMPLEMENTATION
- ADMINISTRATIVE ASPECTS OF RULEMAKING

Technical Procedures for Establishing a Reservation

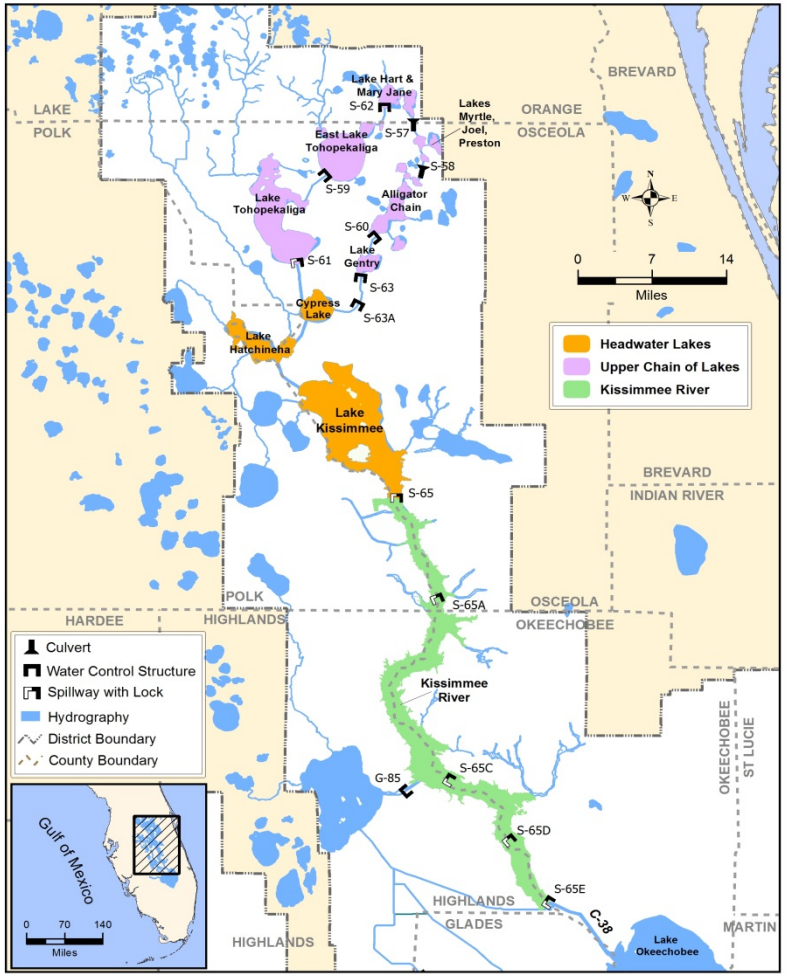
- **Step #1:** Identify the "Reservation Waterbodies"
- **Step #2:** Identify fish and wildlife species to be protected
- **Step #3:** Identify the hydrology of the reservation waterbody
- **Step #4:** Establish linkages between hydrology and biology
- **Step #5:** Identify water necessary for protection of fish and wildlife

Step 1: Identify Reservation Waterbodies



Step 1: Identify Reservation Waterbodies (cont.)

- Upper Chain of Lakes
- Headwater Lakes
- Connecting canals; historic regulation
- Fully restored Kissimmee River from S-65 to S-65E
- Restored Kissimmee River floodplain



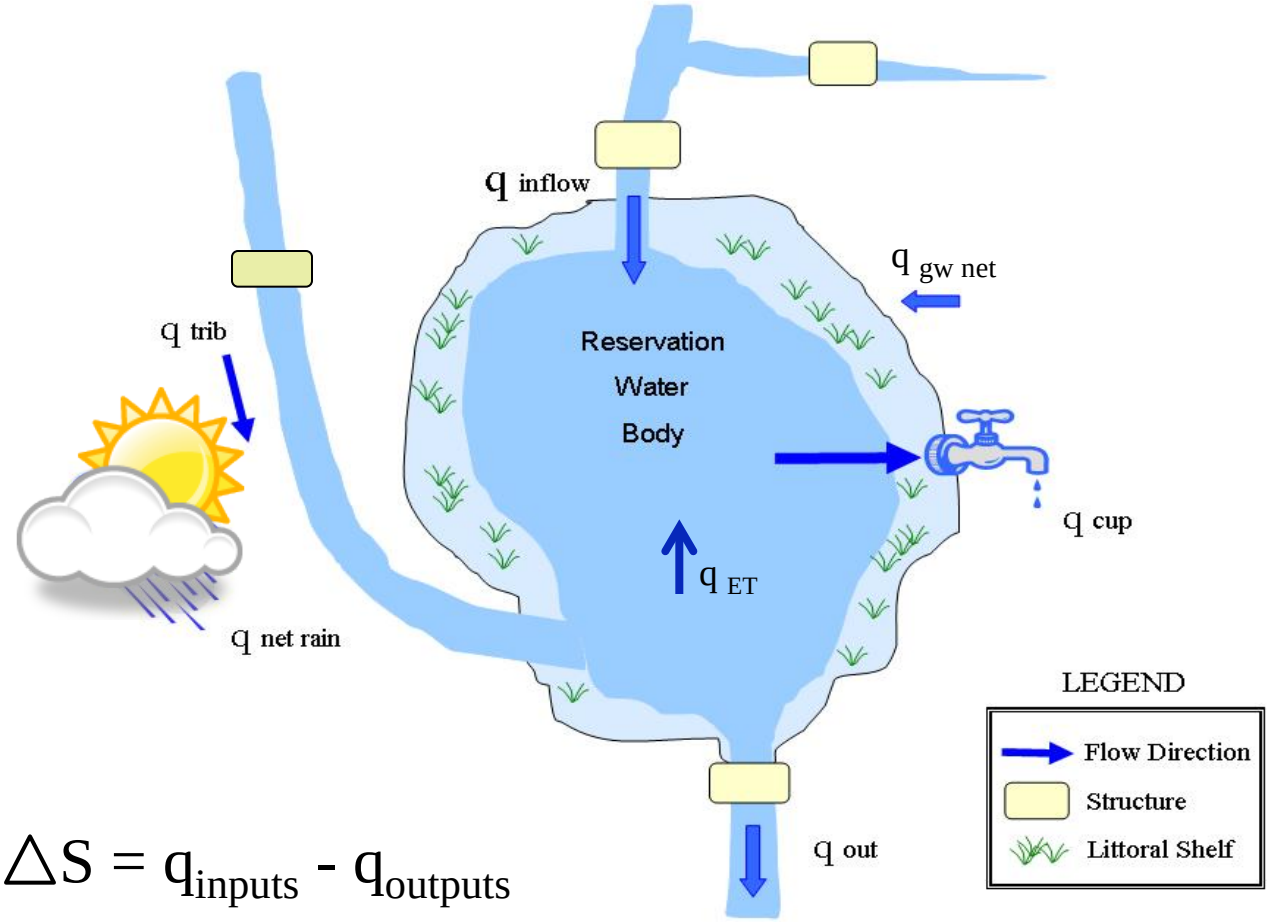
Step #2: Identify Fish and Wildlife Species to be Protected

- Species and habitat with well defined linkages to hydrology
- Listed species
- Habitat associated with nesting and foraging

Step #3: Identify hydrology of the reservation waterbody

- Defines ‘how much water is there’
- Covers a wide range of hydrologic variability (wet, dry and everything in between years)
- Consideration of operations and physical constraints of the project
  - Fully restored Kissimmee River and floodplain (S-65 to S-65E)
  - Headwaters Revitalization regulation schedule for Kissimmee, Hatchineha, and Cypress
  - Existing operations for remaining lakes in the upper chain

Step #3: Identify hydrology of the reservation waterbody (cont.)



$$\Delta S = q_{inputs} - q_{outputs}$$

Step #4: Establish Linkages Between Hydrology and Biology

- Relates water flow/stage to nesting/foraging needs of fish and wildlife
- Performance measures identified
  - Recession/ascension rates
  - Wetland hydroperiods
  - Floodplain inundation

Step #5: Identify Water Necessary for Protection of Fish and Wildlife

- Combine Steps 3 & 4 to identify water necessary for protection of fish and wildlife
- What is needed for fish and wildlife is reserved
- Not needed for fish and wildlife is available for allocation

Presentation Overview

- WHAT IS A RESERVATION?
- TECHNICAL PROCEDURES FOR ESTABLISHING A RESERVATION
- **RESERVATION RULE IMPLEMENTATION**
- ADMINISTRATIVE ASPECTS OF RULEMAKING

Rule Implementation

- Proposed withdrawals from reservation waterbodies
  - Applicants shall provide reasonable assurances reserved water will not be withdrawn
    - *e.g., Modeling / operational constraints, etc.*
  - Non-reserved water can be allocated
- Existing Legal Users
  - Shall be protected so long as not contrary to public interest (s. 373.223(4), F.S.)

What Will the Rules Look Like?

- Ch. 40E-10, F.A.C., Protection of Natural Systems Water from Consumptive Use
  - Chapter containing reservations by planning area
  - Describes the reserved water
- Ch. 40E- 2, F.A.C., Consumptive Use
  - Conditions of permit issuance
- Applicant's Handbook for Water Use
  - Criteria used by permit applicants to demonstrate compliance with rule

Defining the Waters to be Reserved

40E-10 F.A.C.

- Reservation waterbodies defined:
  - Direct (lakes, river, floodplain)
  - Indirect (contributing waterbodies)

- Timing and amounts of water reserved
  - –Stage or flow

Water Use Permit Criteria

- **'Will not withdraw water reserved under Chapter 40E-10, F.A.C.' (40E-2.301(1)(k))**
- **Specific criteria; Applicant's Handbook for Water Use, (section 3.11)**
  - Direct withdrawals
    - Reservation waterbody lakes and connecting canals
    - Kissimmee River and floodplain
  - Indirect withdrawals
    - Significant contributing source to reservation waterbodies
      - Groundwater
      - Surface water (e.g., Boggy, Shingle and Reedy Creeks, etc.)

Presentation Overview

- WHAT IS A RESERVATION?
- TECHNICAL PROCEDURES FOR ESTABLISHING A RESERVATION
- RESERVATION RULE IMPLEMENTATION
- **ADMINISTRATIVE ASPECTS OF RULEMAKING**

Scope of Rulemaking

- Builds on original technical analysis from the 2008-2009 rulemaking
- Identify and reserve from allocation water for protection of fish and wildlife in
  - Upper Chain of Lakes
  - Headwater Lakes
  - Restored Kissimmee River and Floodplain
- Adopt water use permit rules to protect reserved water from allocation

Stakeholders

River Interests, Lake Interests, Water Users, Local Governments, USACE, USFWS, DEP, WMD's, & FFWCC

Major Milestones

- Initiate rule development: **June, 2014**
- Complete technical support document update
- Workshop draft rule language & criteria
- Prepare Statement of Estimated Regulatory Costs
- State-level coordination and review
- Board rule adoption proceedings
- Legislative ratification / rule effective

Rule Development Workshop For Kissimmee Basin Water Reservations
July, 2014

Fish and Wildlife Considered for the Reservation

David Anderson, Lead Scientist
Lakes and River Ecosystems Section
Applied Sciences Bureau

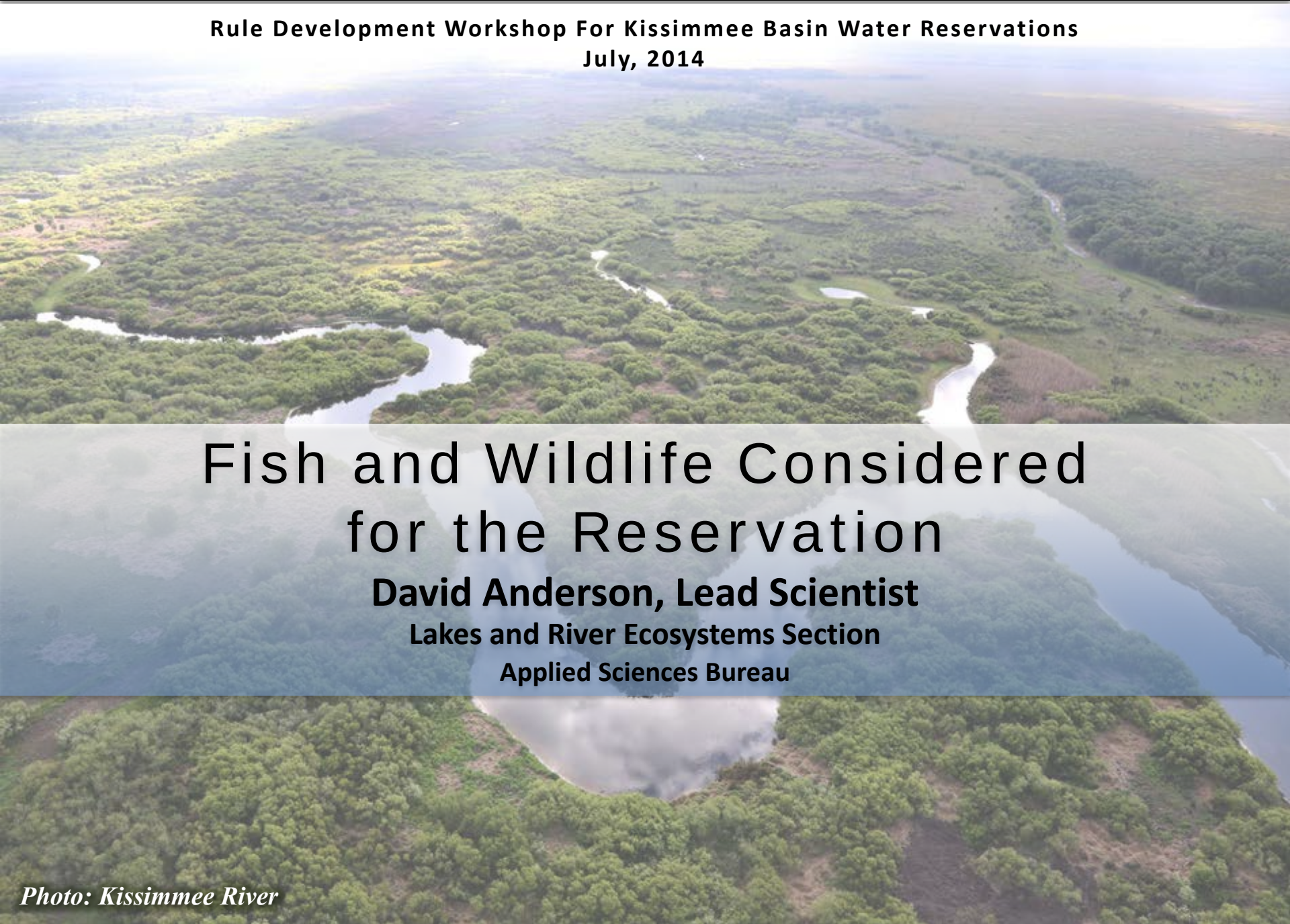
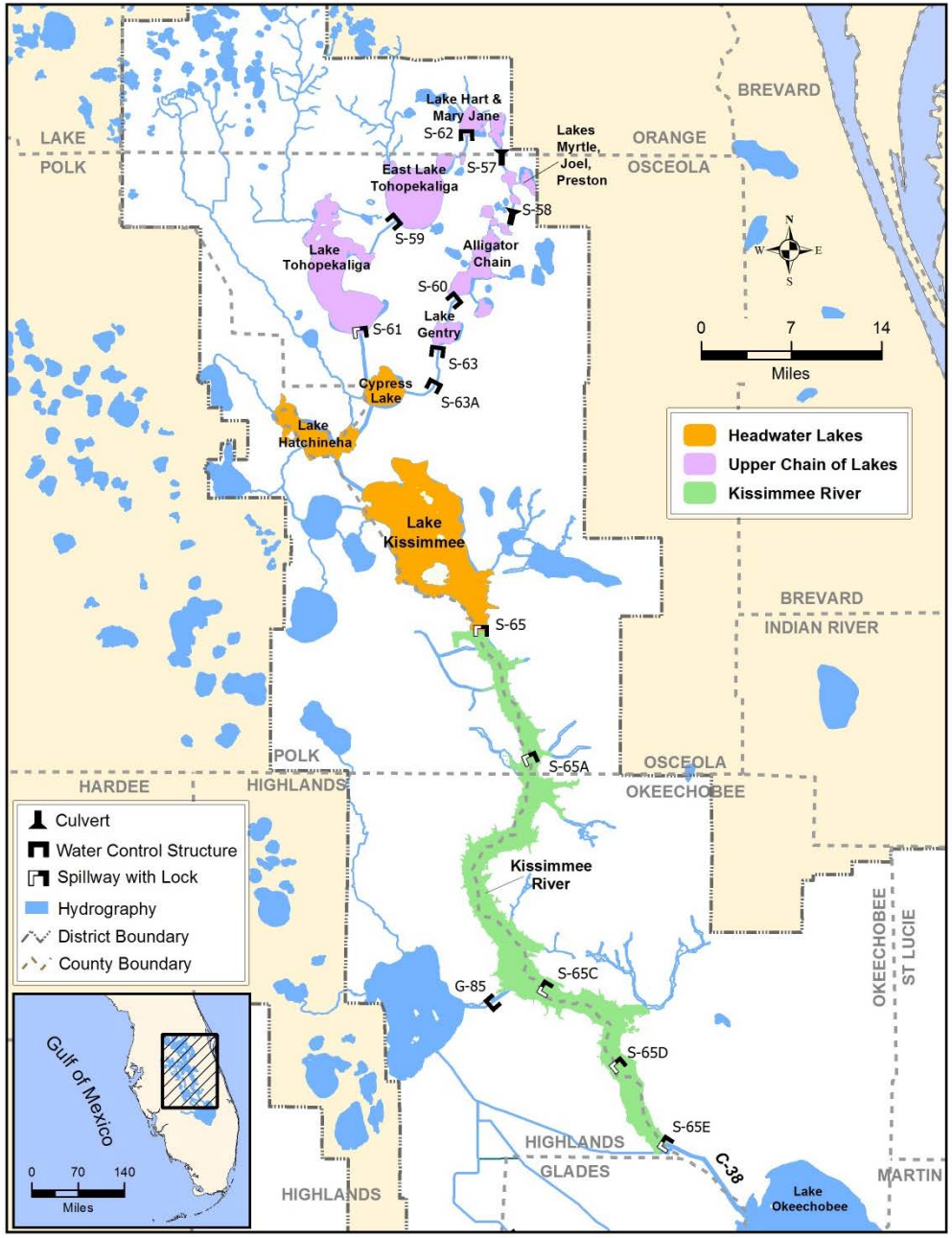


Photo: Kissimmee River

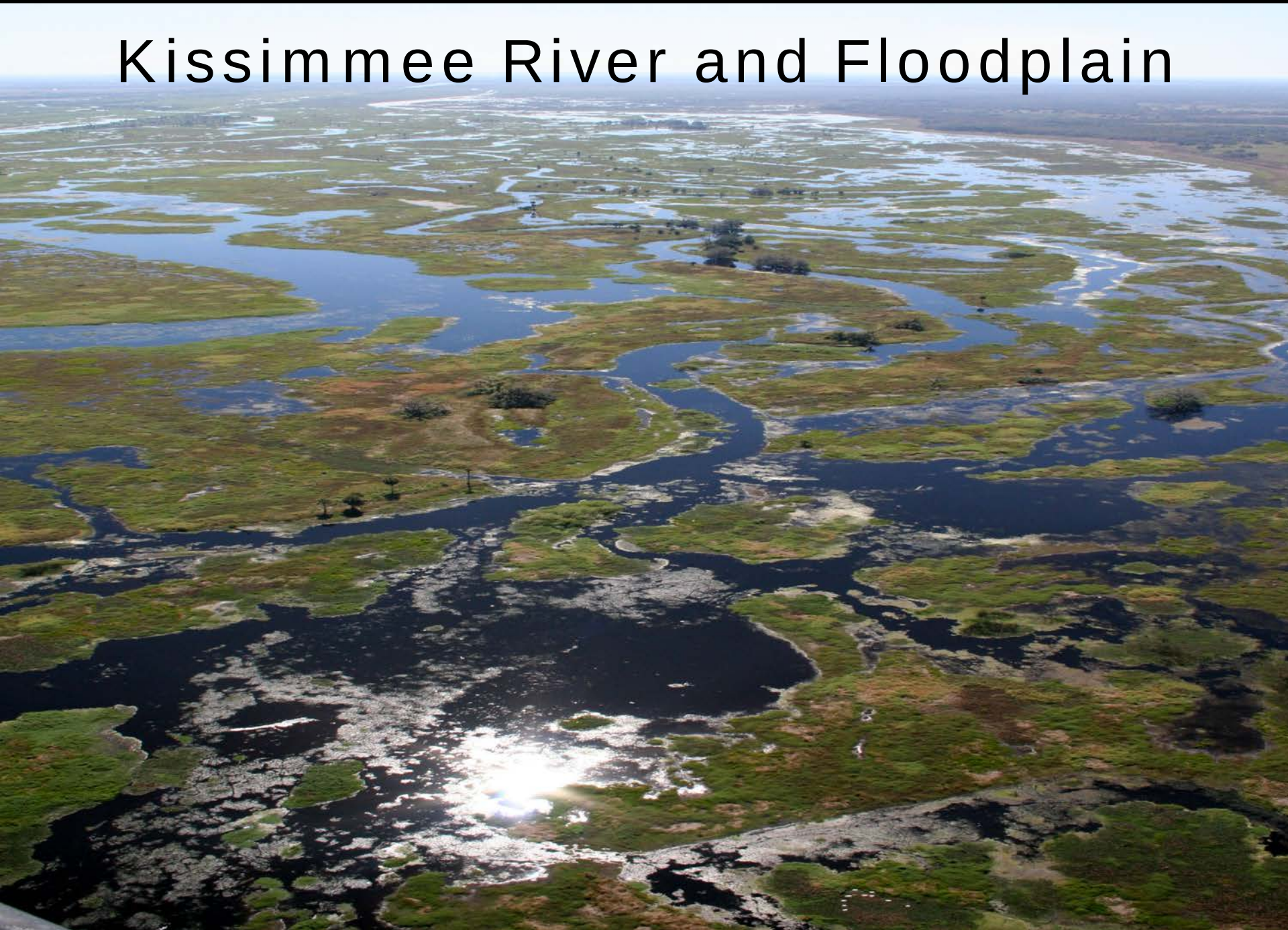


Reservation Water Bodies

Objectives

- **Identify specific fish & wildlife associated with the Kissimmee River and floodplain**
- **Identify their hydrologic requirements**
- **Express these as performance measures and targets**

Kissimmee River and Floodplain



Kissimmee River Fish & Wildlife

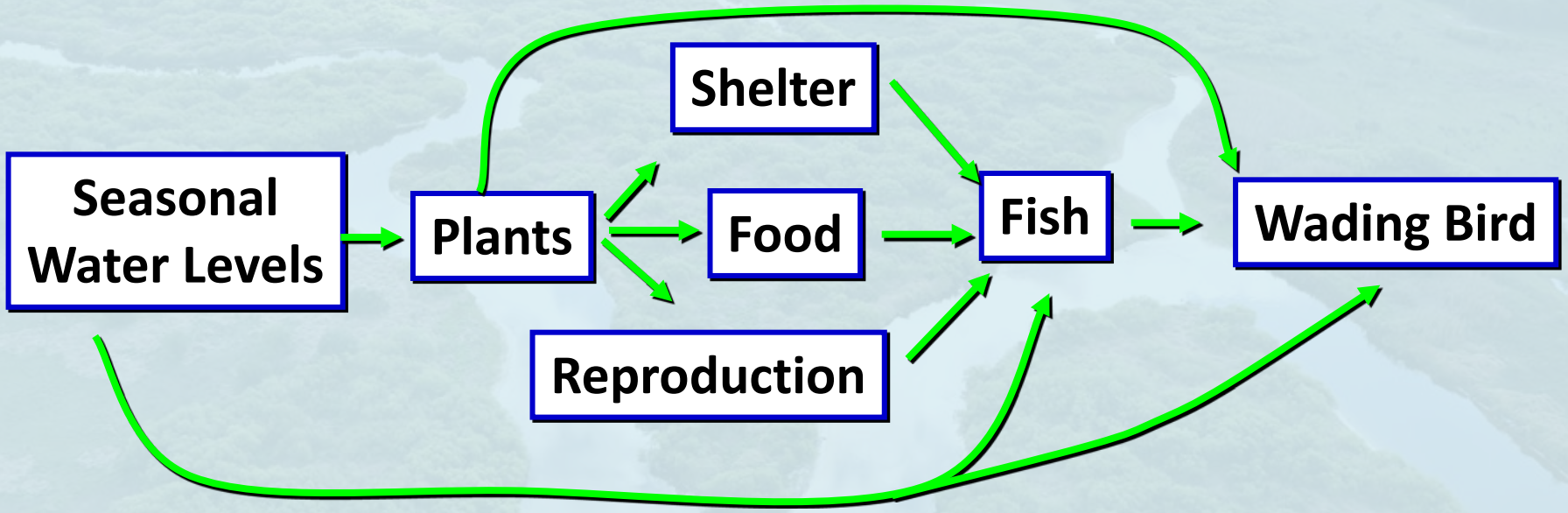
- **Fish Community**
  - 52 species of fish use the river channel or floodplain (includes 6 exotic species)
  - 28 species are off-channel dependents for reproduction
  - 15 species are off-channel specialists
- **Water Birds**
  - 68 species of wetland dependent birds
  - 14 species of wading birds including Federally threatened wood stork
  - 16 species of ducks
- **Amphibians and Reptiles – 24 species**
- **Mammals – 4 species wetland river/dependent**

Identify Fish and Wildlife Hydrologic Requirements

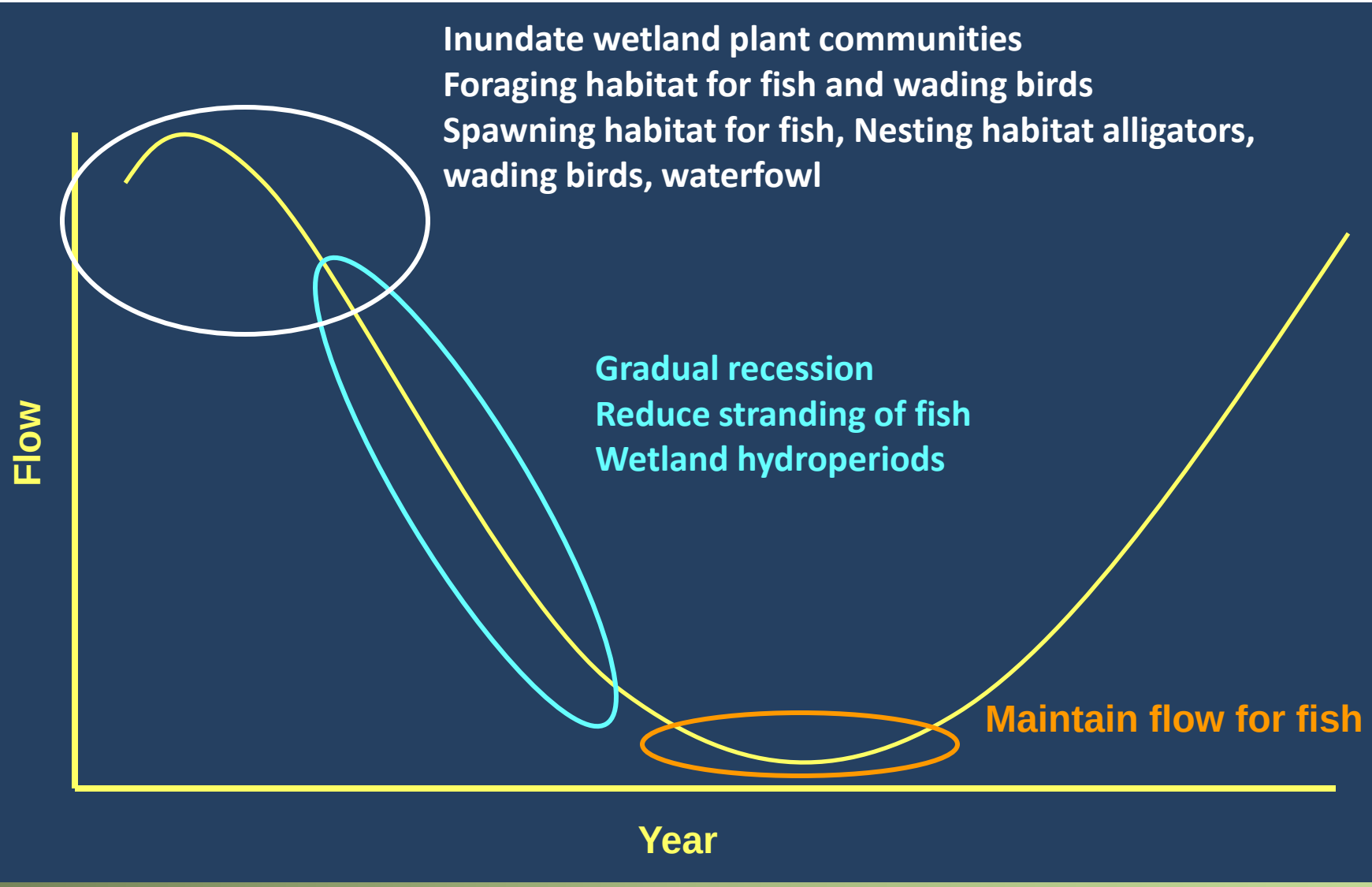
- **Best available data**
  - Restoration Demonstration Project studies
  - Interim responses to Phase I of the restoration project
  - Analysis of pre-channelization stage and flow data
  - Literature review

- **For many species, hydrologic requirements are related to maintaining a mosaic of wetland plant communities, especially Broadleaf Marsh, on the river floodplain and inundating the floodplain so that fish and wildlife species have access**

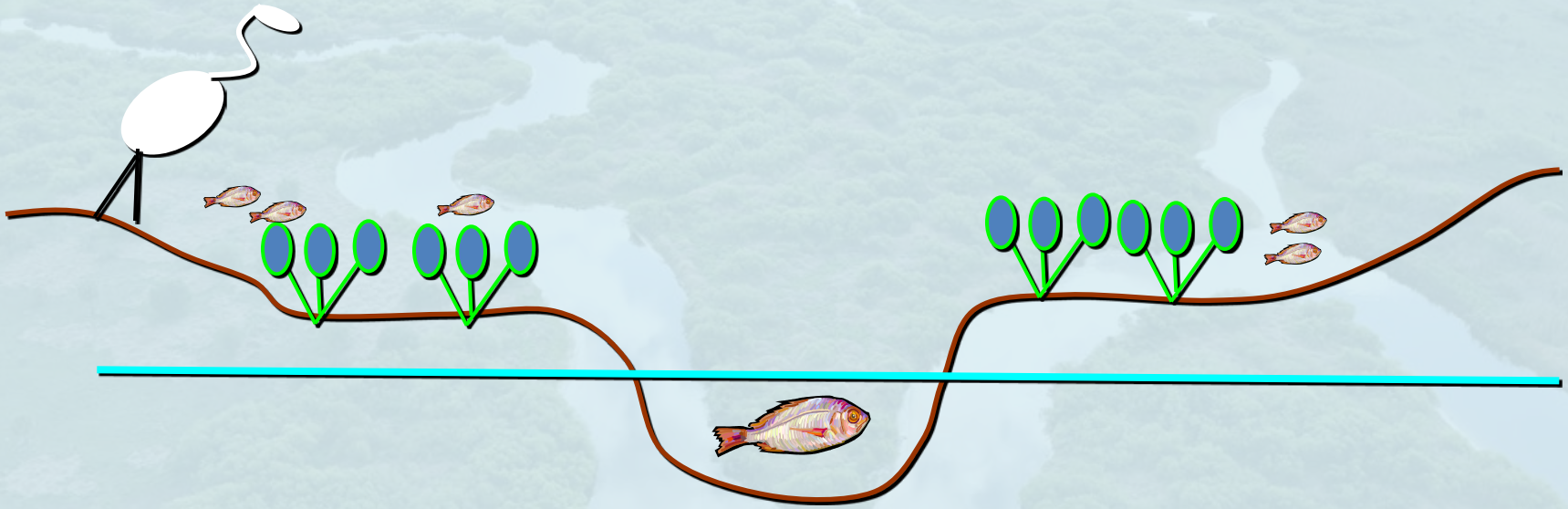
Linkages Between Hydrology and Wildlife



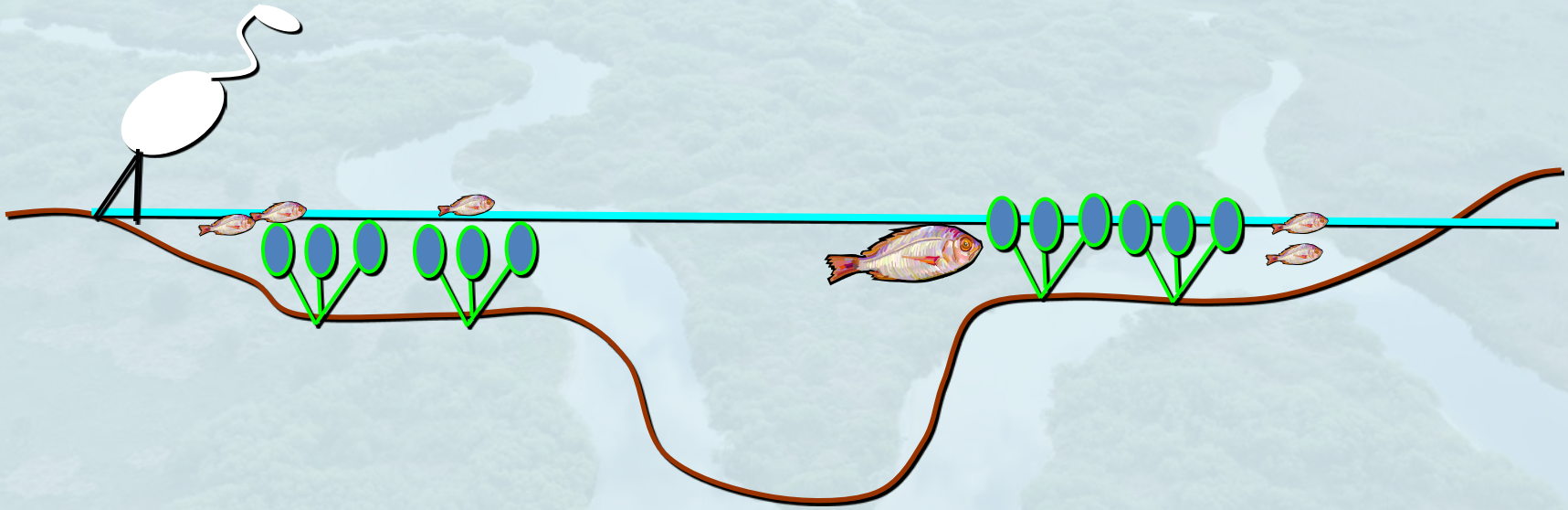
Fish and Wildlife Hydrologic Requirements



Fish and Wildlife



Fish and Wildlife



What is a Performance Measure?

- **For the Kissimmee River water reservation, a performance measure describes a hydrologic condition (water level or flow) needed to protect fish and wildlife**
- **Characterized by magnitude, duration, timing, rate of change, or frequency of occurrence**
- **Used to develop target time series for protection of fish and wildlife**

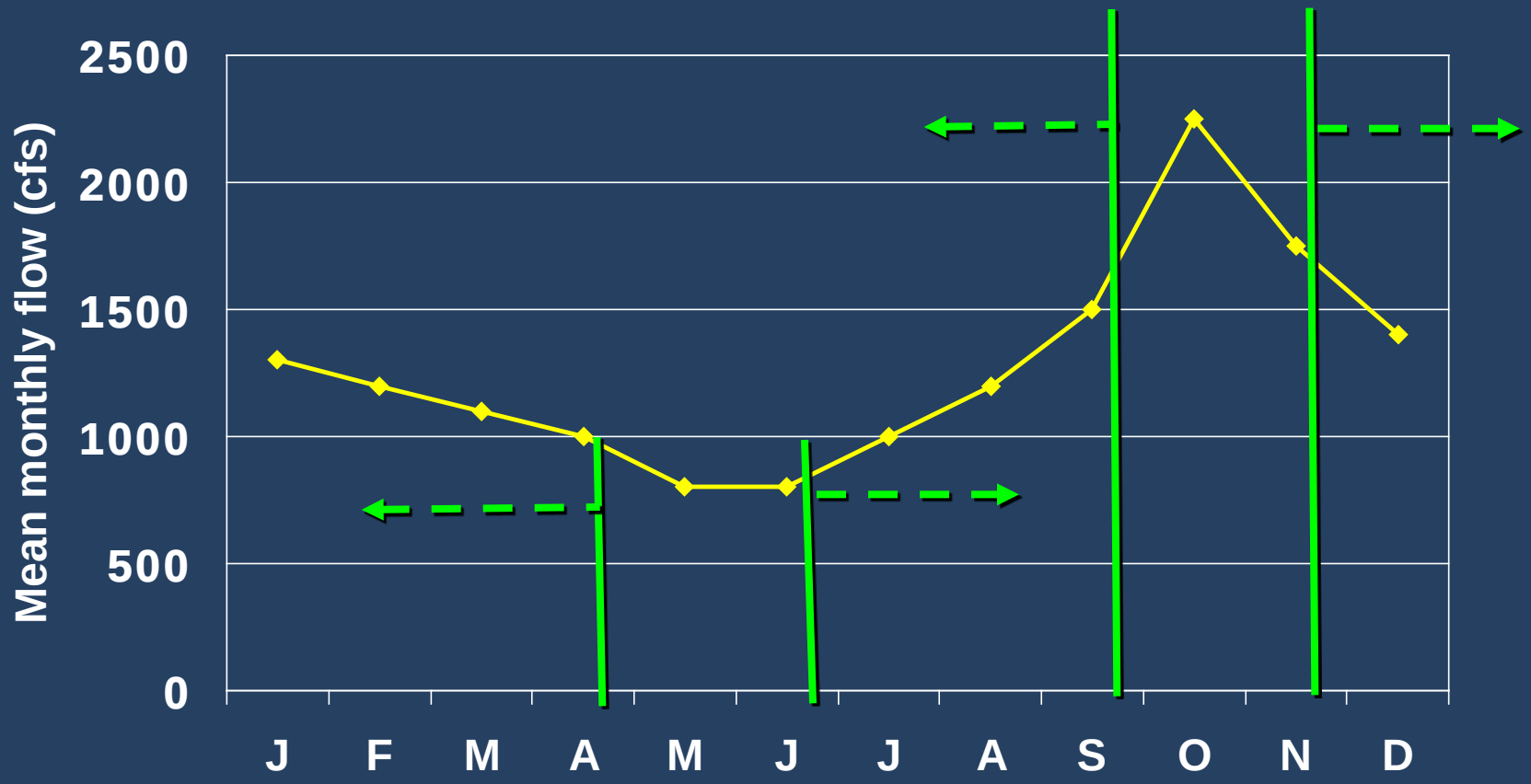
Performance Measure History

- **Kissimmee River Demonstration Project provided a basis for five hydrologic criteria**
- **Hydrologic criteria used for planning the Kissimmee River Restoration Project (U.S. Army Corps of Engineers 1991, 1996)**
- **Translated into expectations for assessing responses to the Kissimmee River Restoration Project**
  - **External peer review in 2001; District publication in 2005**
- **Subset used for water reservation; peer reviewed in 2009**

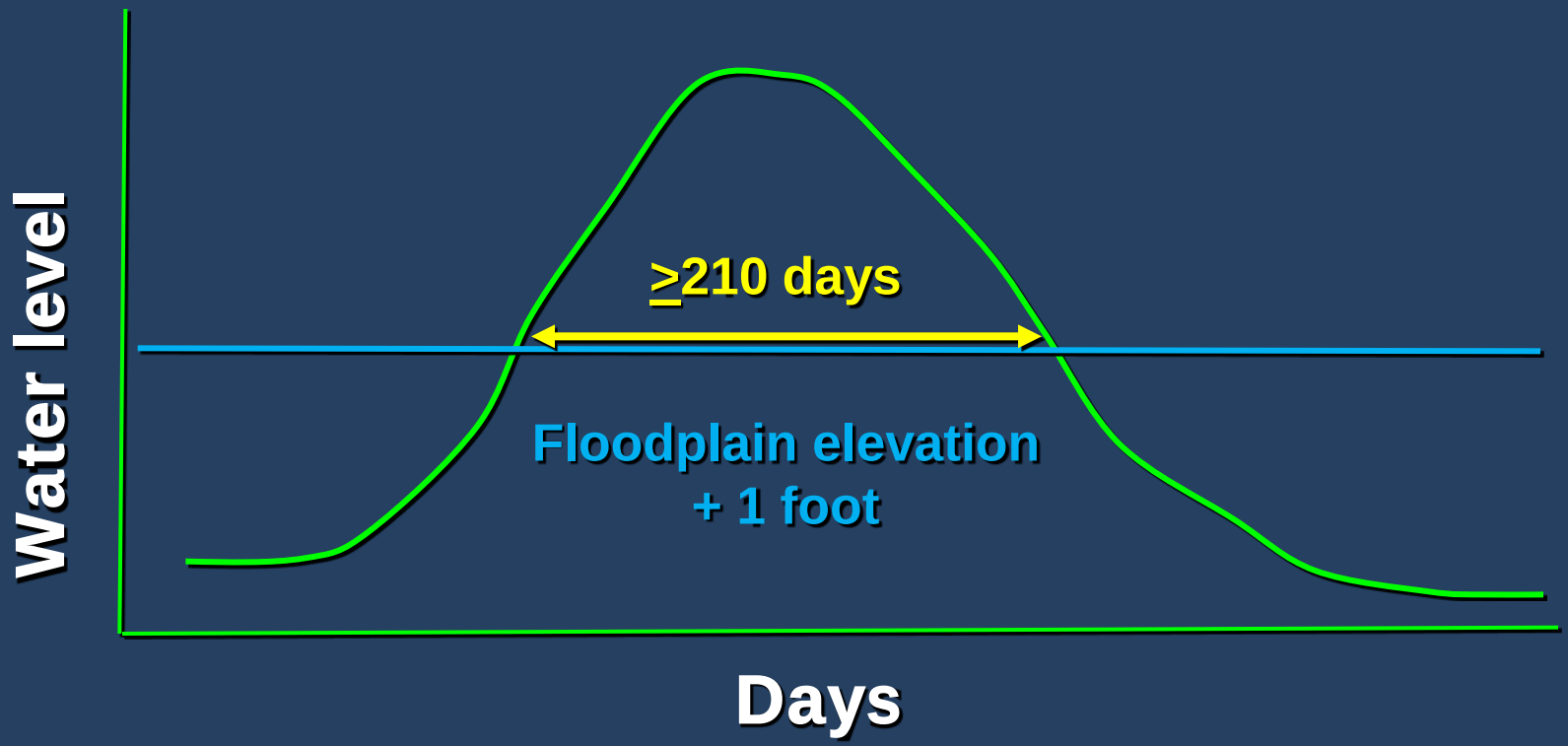
Three Performance Measures Describe Fish and Wildlife Hydrologic Requirements

- **Kissimmee River Flow**
  - Seasonality
- **Stage Hydrograph/Floodplain Hydroperiod**
  - Hydroperiod for Broadleaf Marsh
  - Intra- and Inter-annual variability of water levels
- **Water Level Recession**
  - Rate of water level decreases
  - Frequency of large water level reversals

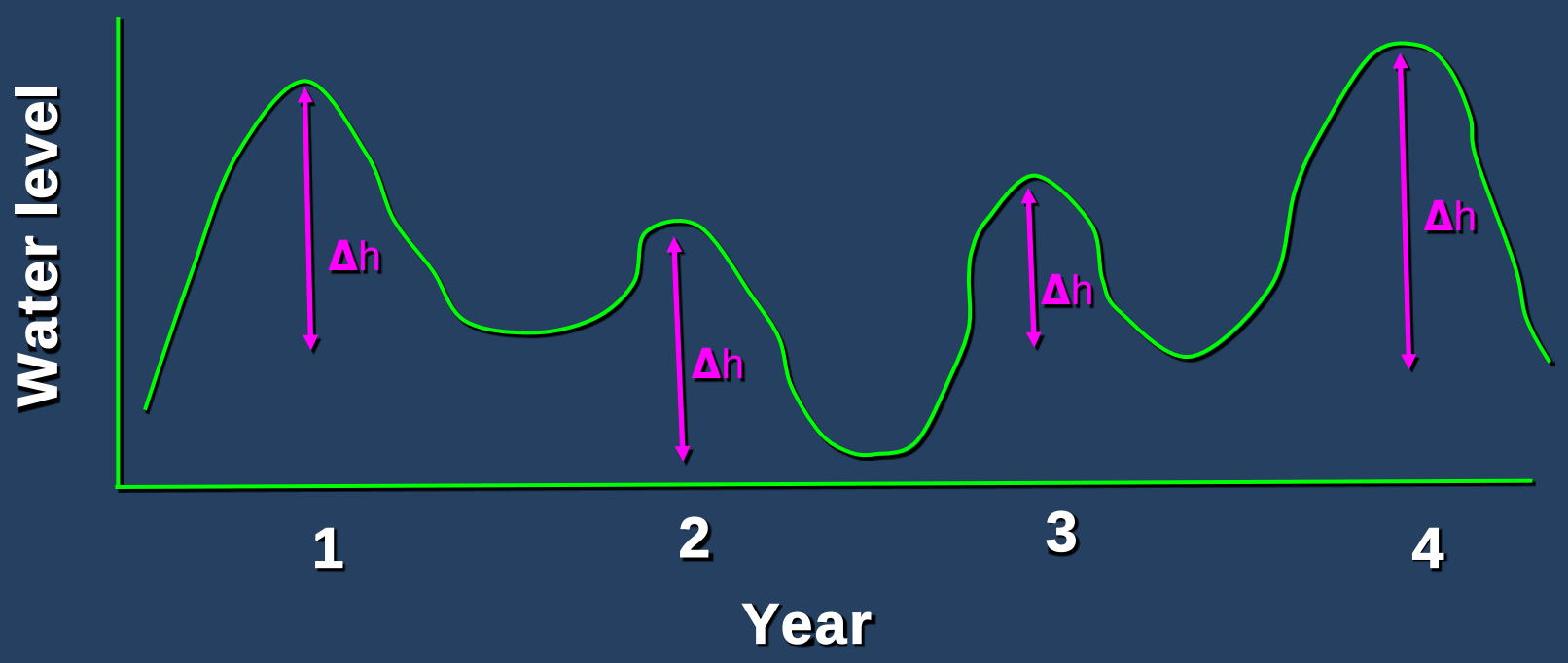
Seasonality of Flow



Hydroperiod & Water Level Variability

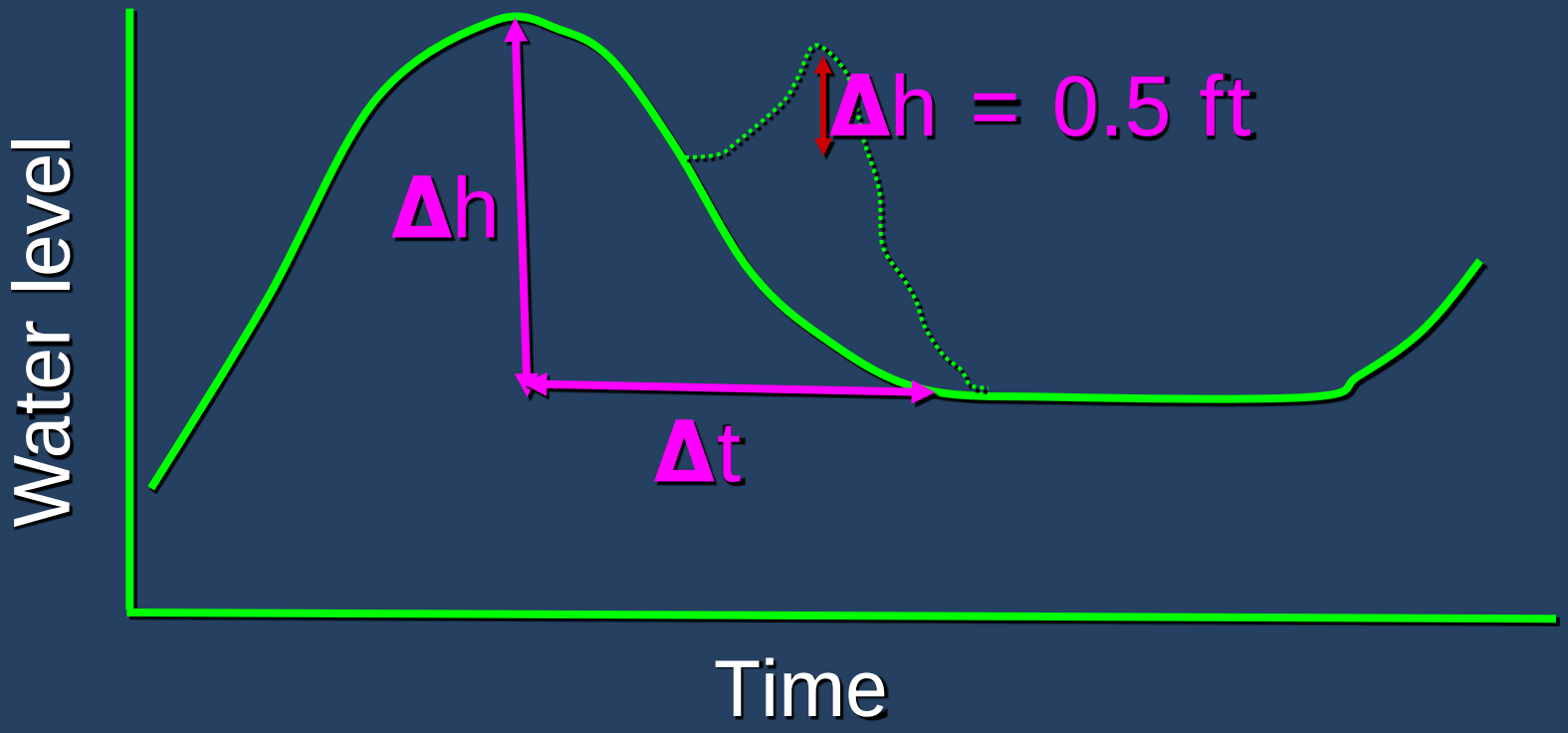


Hydroperiod & Water Level Variability



Δh = maximum h – minimum h for a calendar year
Intra-annual variability = average of Δh
Inter-annual variability = standard deviation of Δh

Water Level Recession

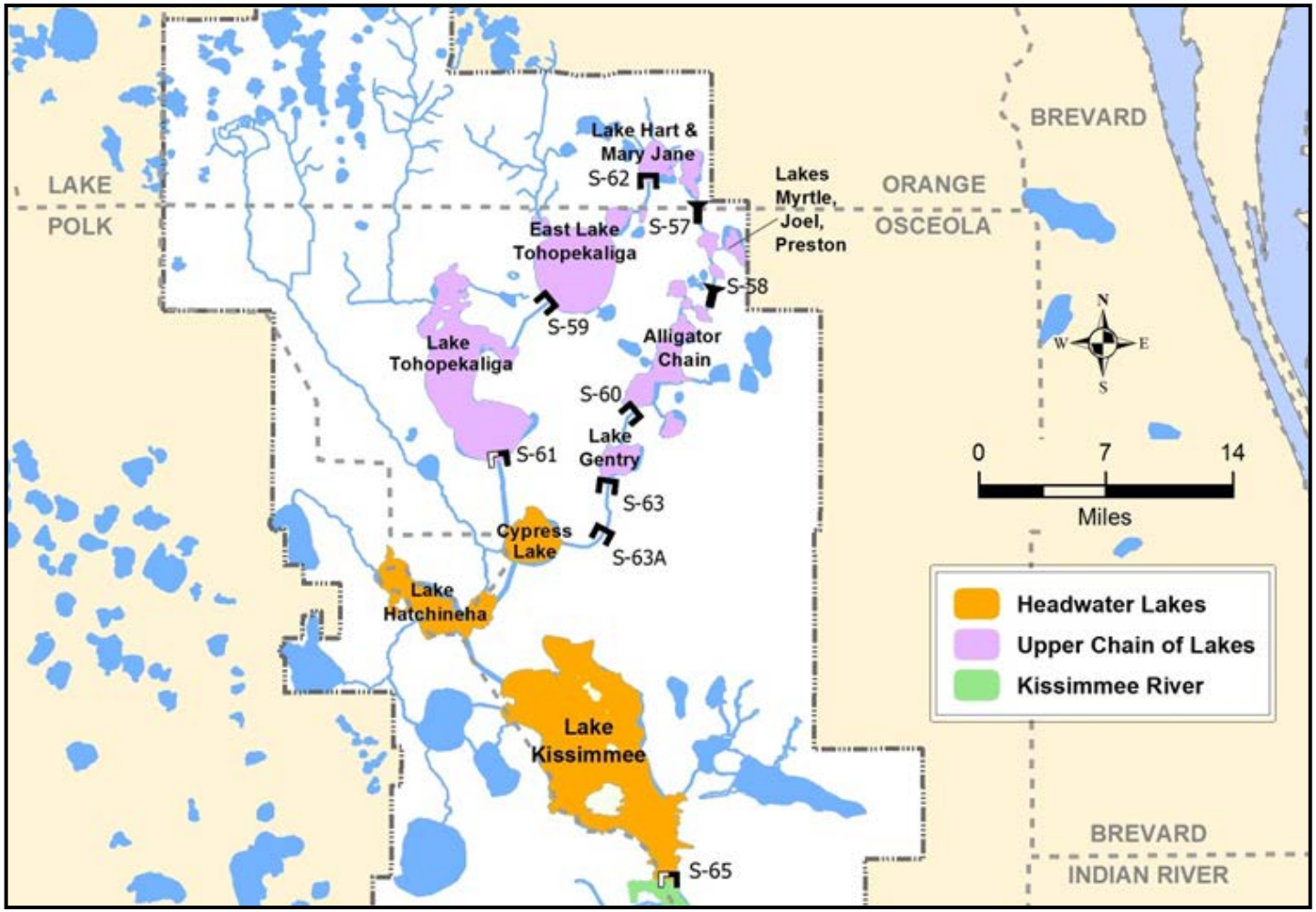


Recession rate = Δh/Δt * 30 d

Kissimmee River Summary

- **Considerable fish & wildlife in the Kissimmee River and floodplain**
- **The hydrologic requirements of fish & wildlife in the Kissimmee River are being represented by three performance measures that focus on:**
  - **Seasonality of Flow**
  - **Hydroperiod and Water Level Variability**
  - **Water Level Recession**
- **These performance measures used to define water reservation**

Kissimmee Chain of Lakes (KCOL)



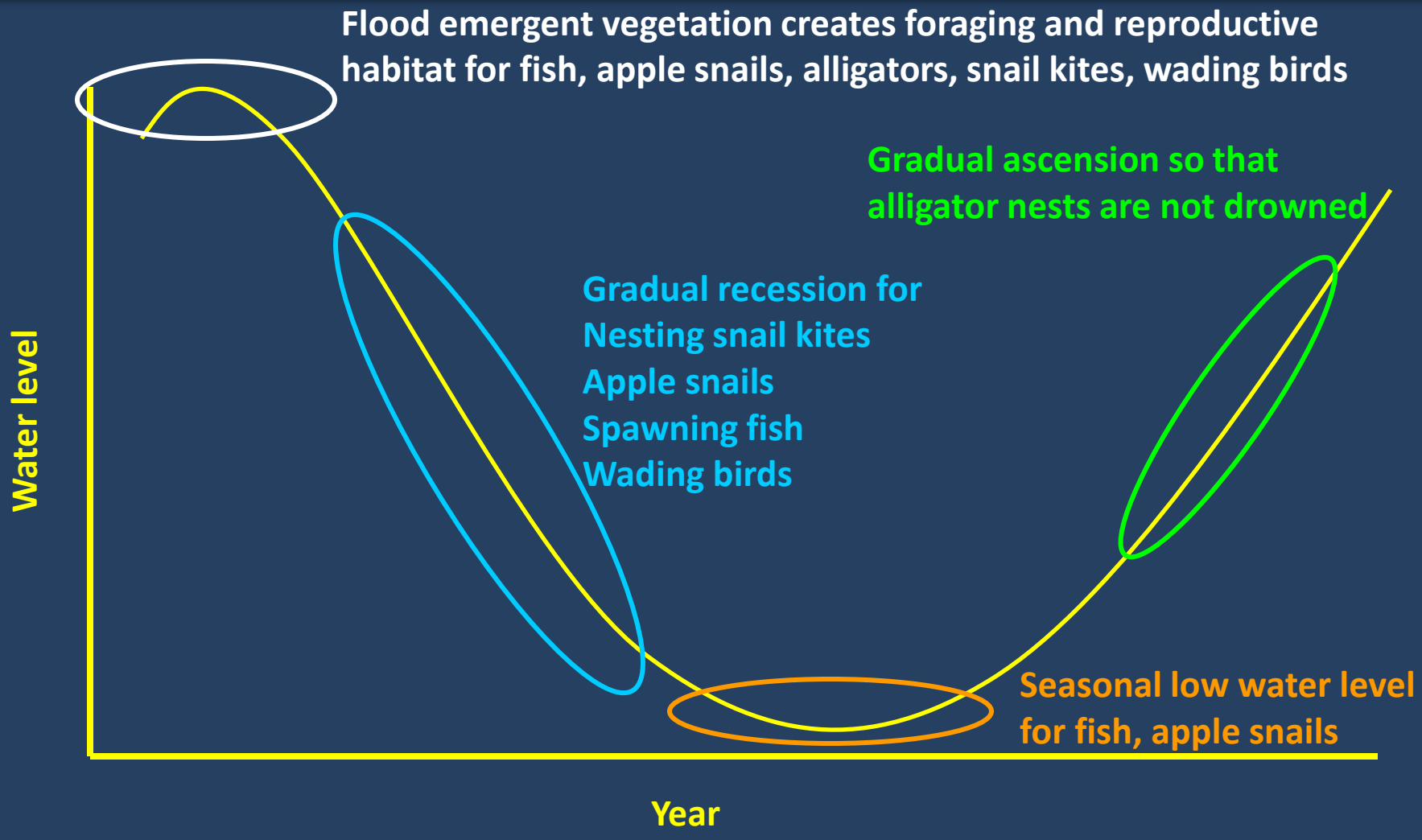
KCOL Objectives

- **Identify specific fish & wildlife associated with the KCOL reservation water bodies**
- **Identify their hydrologic requirements**
- **Express these as performance measures and targets**

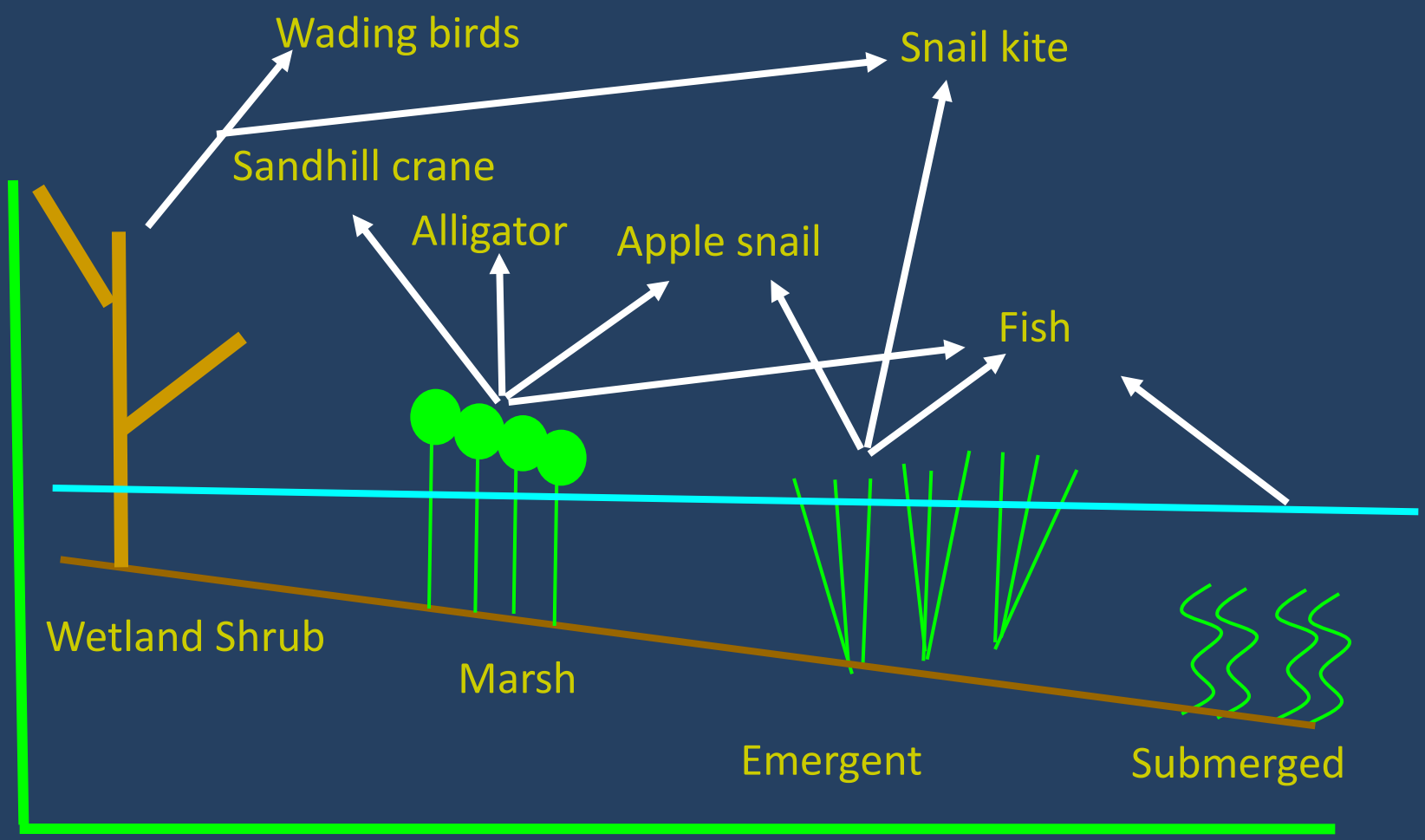
Major Groups of Fish and Wildlife that depend on the Kissimmee Chain of Lakes

- **Fish - 45 species total, 26 species common, includes gamefish**
- **Wading and other Water Birds - 10 species of wading birds, 3 important rookeries, waterfowl**
- **Threatened and Endangered Species – Snail Kites, Wood Storks, Sandhill Cranes, Bald Eagles**
- **Amphibians and Reptiles -14 species of amphibians, 19 species of reptiles including the American Alligator**
- **Mammals – 4 species River Otter, Marsh Rabbit, Marsh Rice Rat, and Round-Tailed Muskrat**

Fish and Wildlife Hydrologic Requirements



Fish and Wildlife that are Focus of the Water Reservation



Performance Measures for the Chain of Lakes

- **Unique performance measure for each reservation water body**
- **The performance measure is represented as an annual hydrograph**
- **Hydrograph represents the threshold for lake water levels below which is needed to protect fish & wildlife**

Assumptions

1. **Fish and Wildlife Resources Reflect Current Water Level Regime**
2. **Loss of Wetland Habitat Will Result in Loss of Fish & Wildlife**
3. **Hydrologic Needs Can Be Expressed with an Annual Stage Hydrograph**
4. **Fish and Wildlife Benefit from Water Levels as High as the Maximum Elevation of the Regulation Schedule**
5. **Hydrographs May Be Modified For Specific Biological Needs**

Basis for Seasonal High and Low

- **Seasonal High**
  - Based on the highest stage allowed in the regulation schedule and the date on which it occurs
  - Protecting water levels that go this high, maintains the existing area of wetlands at the lake margin
  - The number of species and abundance of individual organisms are related to the amount of habitat
- **Seasonal Low**
  - Based on water levels on May 31 for the regulated time period
  - Variable low water levels are needed to maintain habitat for fish & wildlife

Performance Measure Hydrographs were Created from Two Points

Refinements to Protect Fish and Wildlife

1. **Performance measure hydrographs did not protect**
   - The Bird Island Rookery on Hart-Mary Jane
   - Snail Kite nesting on Tohopekaliga
2. **Kissimmee-Cypress-Hatchineha**
   - Proposed performance measure hydrograph is based on implementation of Headwaters Revitalization schedule
   - Balances fish and wildlife needs between the Kissimmee-Cypress-Hatchineha lakes and the Kissimmee River/floodplain
   - Adjusted for snail kites and apple snails

KCOL Summary

1. **Considerable fish and wildlife resources are associated with each KCOL water body**
2. **Performance measure were developed for each of the seven reservation water bodies to protect:**
   - The full extent of aquatic vegetative habitats that support fish and wildlife
   - The interannual variation in water levels that is required to maintain healthy plant and animal communities
   - Wildlife resources that are found on specific reservation water bodies

Rule Development Workshop For Kissimmee Basin Water Reservations
July, 2014

Next Steps

Don Medellin, Principal Scientist
Coastal Ecosystems Section
Applied Sciences Bureau

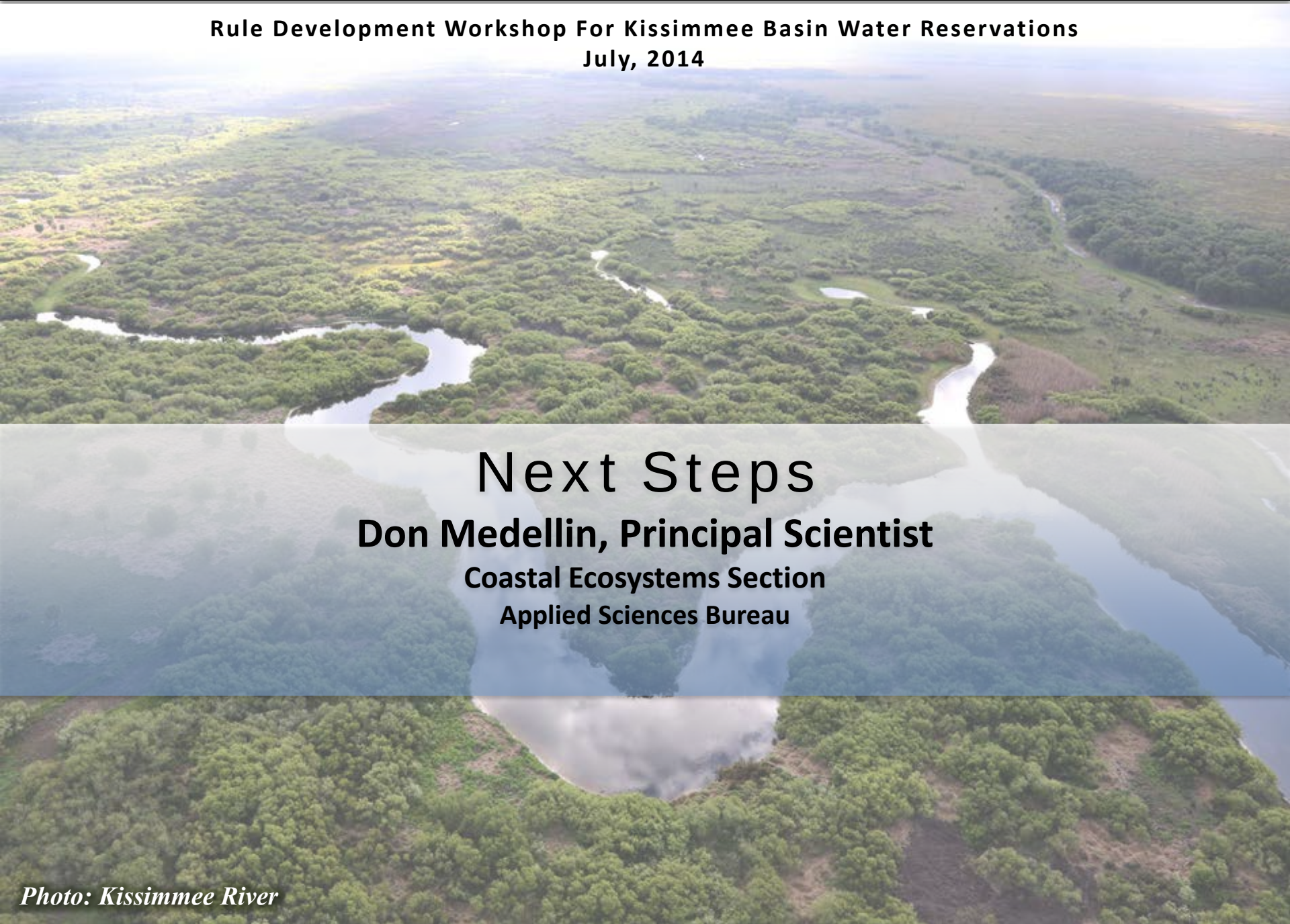


Photo: Kissimmee River

Next Steps

- Workshop presentations will be posted to the Kissimmee Reservations web page
- Revise draft technical document
- Provide Peer Review document

Next Workshop:

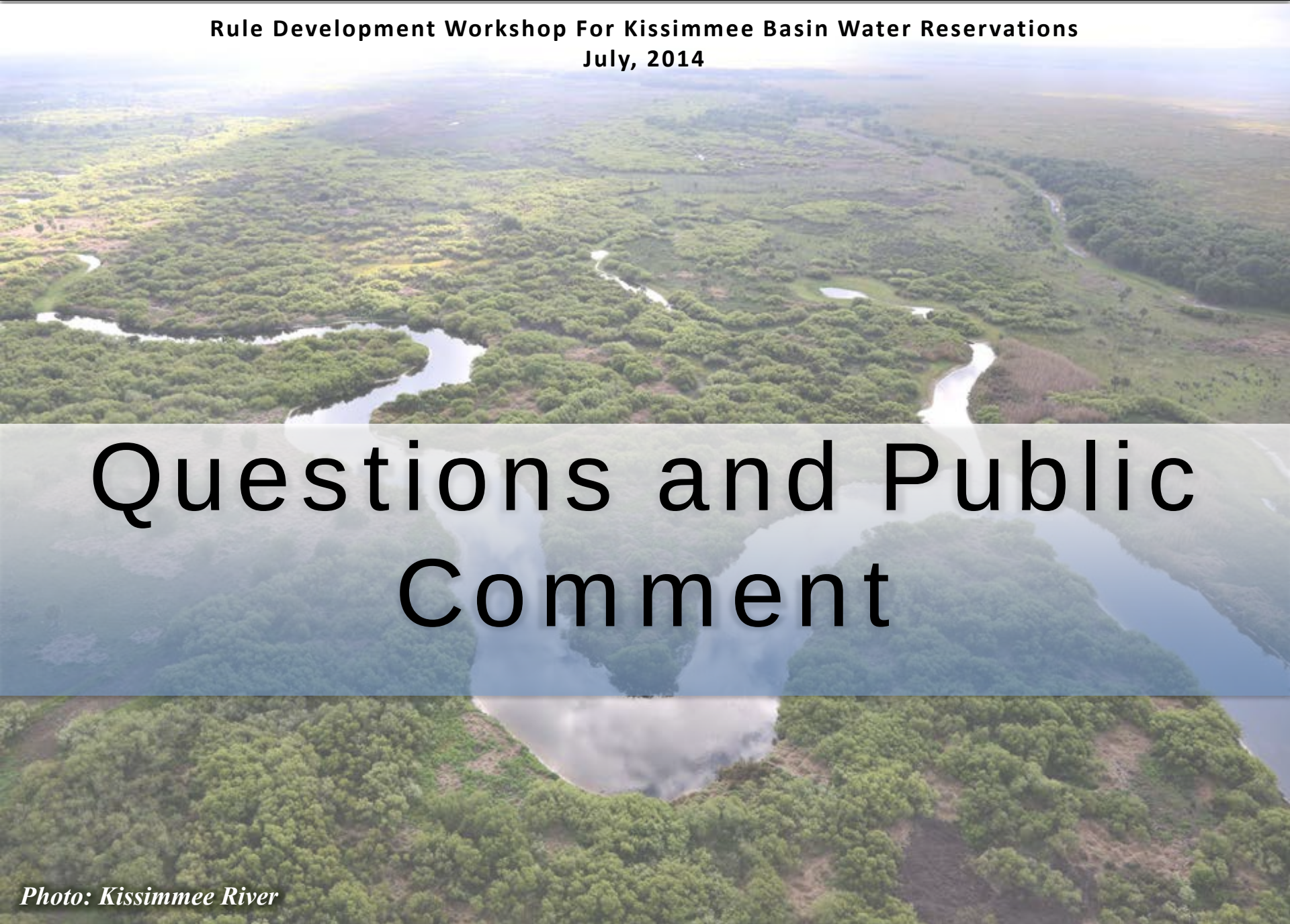
- Proposed Draft Rule Language

Next Steps

Web Pages with Helpful Information

- **Kissimmee Reservations Main Web Page:**
  www.sfwmd.gov/reservations
- **Kissimmee Web Board:**
  http://sfwmd.websitetoolbox.com/
  (under SFWMD Rule Development)
- **SFWMD Rules Web Page**
  www.sfwmd.gov/rules

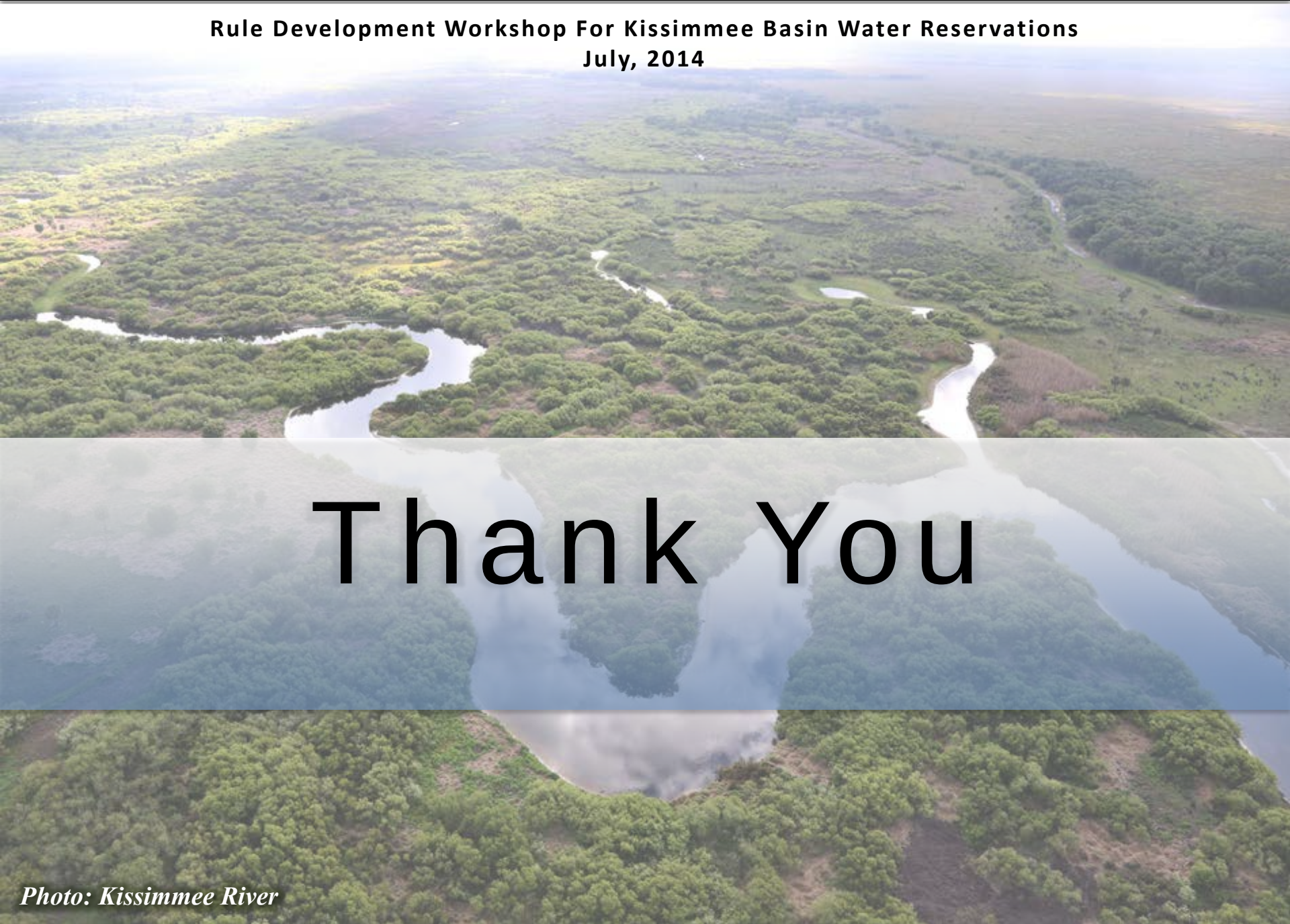
Rule Development Workshop For Kissimmee Basin Water Reservations
July, 2014



Questions and Public Comment

Photo: Kissimmee River

Rule Development Workshop For Kissimmee Basin Water Reservations
July, 2014



Thank You

Photo: Kissimmee River