

# Step 4 Determine Approach

*\*Will be changed to “Select approach” or “Decide process for determining surrogate species” to more clearly explain the step’s purpose.*



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# Learning Objectives

- *Discuss how the surrogate species approach differs from a priority species approach and what the benefits and ramifications of this approach are*
- *Discuss how different surrogate species approaches are appropriate for different conservation “objectives”*
- *Given the Service’s mission, describe the surrogate species approach that would be most appropriate to achieve it*



# Priority Species vs. Surrogate Species Approach

## Priority Species

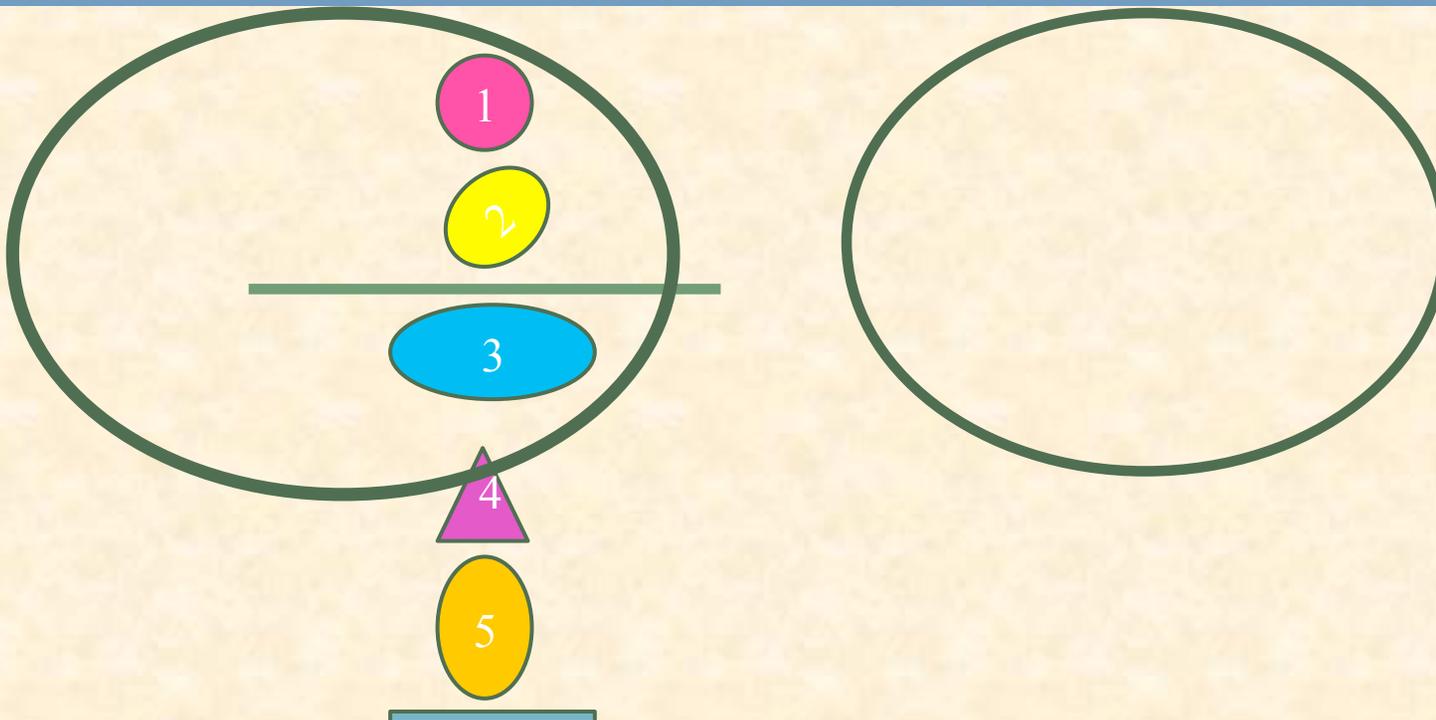
- Species in most need of management action
- Ranked
- Management focused on top species



## Surrogate Species

- Considers species that are priority
- Assumption is that management for one species benefits other species





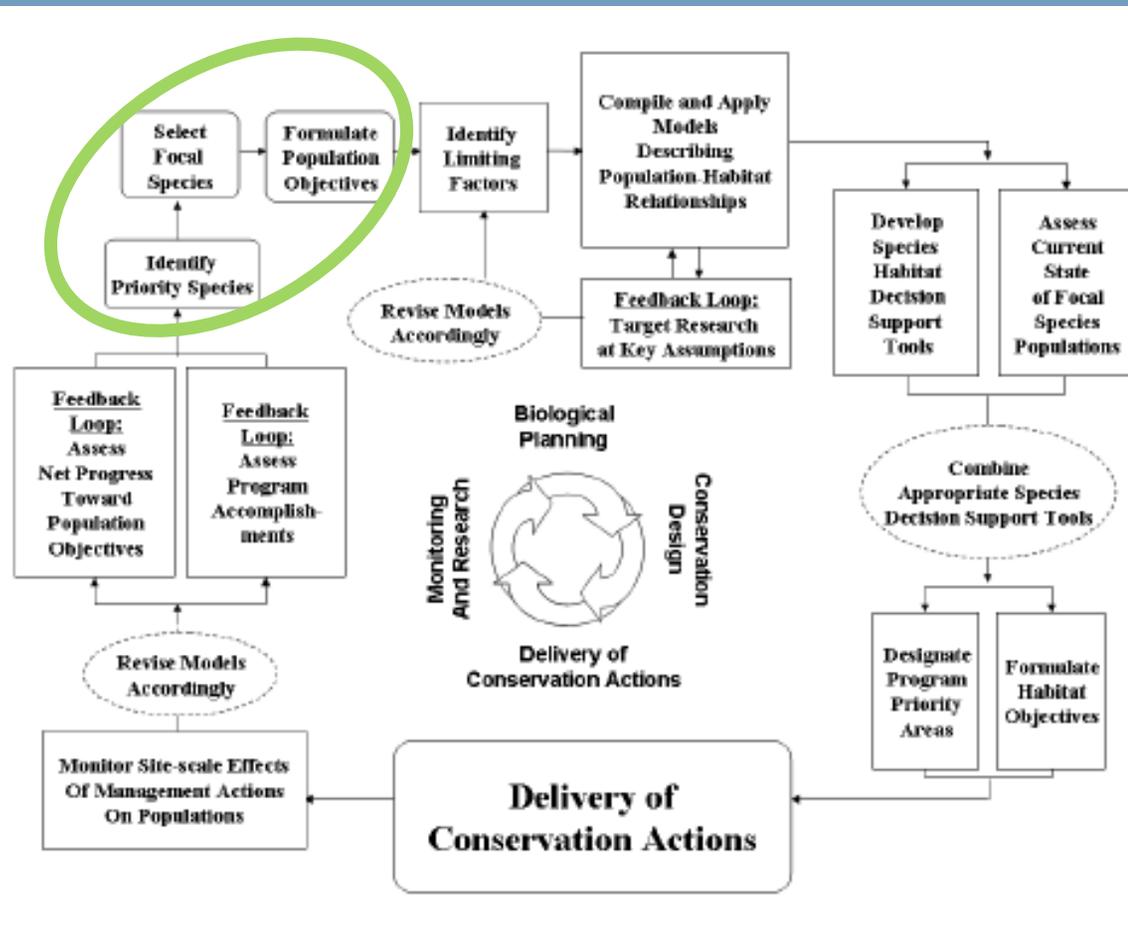
**Surrogate Species:** Species used to represent other species or aspects of the environment.



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# Surrogate Species and SHC



# Types of Surrogate Species

- **Focal species** in NEAT report
  - species that represent larger guilds of species that use habitats similarly
- **Focal species**
  - It is important to be clear on concepts behind terminology
  - Species that is being studied



# Types of Surrogate Species

- Umbrella species and suites of umbrella species
- Landscape species and suites of landscape species
- Indicator species
- Management indicator species



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# Types of Surrogate Species

## Umbrella Species

- A species, generally with a large area requirements



The cheetah can be considered an umbrella species in its sub-Saharan range. Photo C. Michael Hogan

## Conservation “Objective”

- Reserve design
- Conserve all species in a geography



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# Types of Surrogate Species

## Landscape Species

- A species, generally with a large area requirements
- Use large, ecologically diverse areas and often have significant impacts on the structure and function of natural ecosystems
- Often cultural icons

## Conservation “Objective”

- Use wildlife to define and conserve functional landscapes (Wildlife Conservation Society 2008)



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# Types of Surrogate Species

## Indicator Species

- Assess concentration of pollutants
- Assess environmental quality
- Assess management effectiveness
- ...

## Conservation “Objective”

- Various
- Some definitions

**It is important to be clear on concepts behind terminology**



# Conservation “Objective”

- Characterize and maintain functional landscapes capable of supporting self-sustaining fish, wildlife, and plant populations.



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# Documentation

- Description of surrogate species approach used
- Rationale
- Assumptions



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# Step 5

## Establish Surrogate Species



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# Establish Surrogate Species

- This step is the heart of the surrogate species process
- Critical to document process and assumptions
- Most opportunity for advancing the science behind the surrogate species approach



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# Learning Objectives

- *Discuss methods for grouping species and selecting surrogate species*
- *Describe key things to consider when selecting surrogate species*
- *Describe species information needed to group and select surrogate species*
- *List potential questions to test logic of surrogate species selection*



# Criteria for Determining Surrogate Species

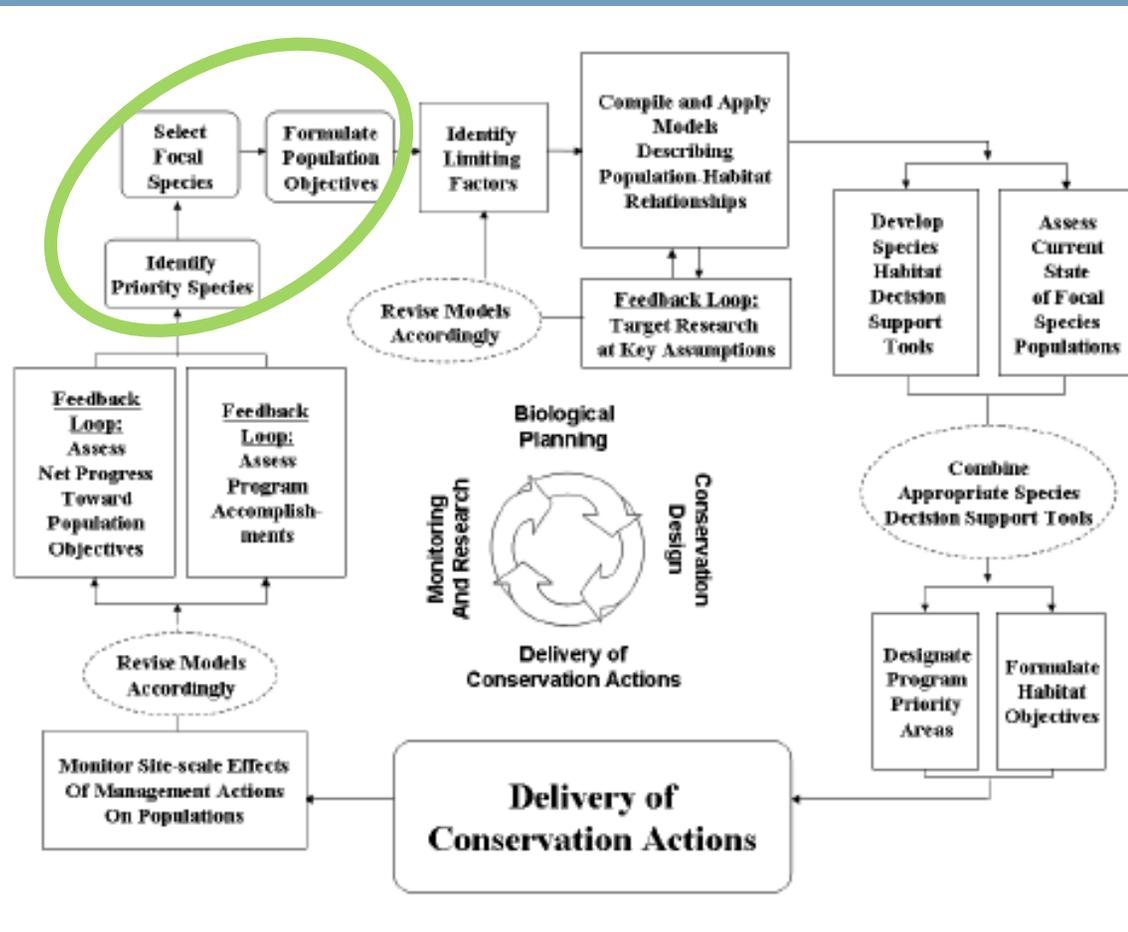
- Depends on the conservation “objective” and the surrogate species approach
- Identify surrogate species that best represent the full range of biological outcomes sought by conservation partners while maintaining the Service’s commitment to its mission and trust responsibilities

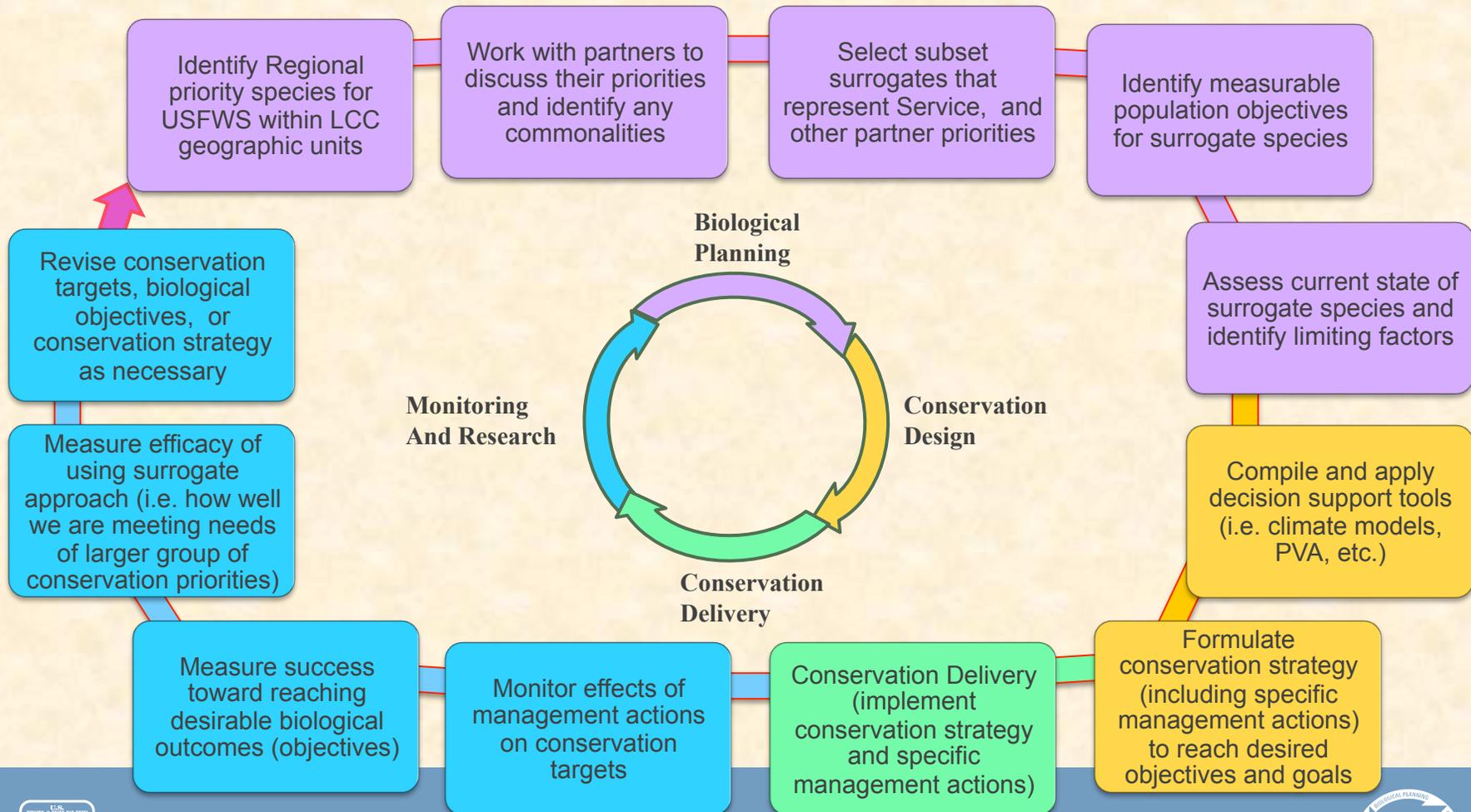


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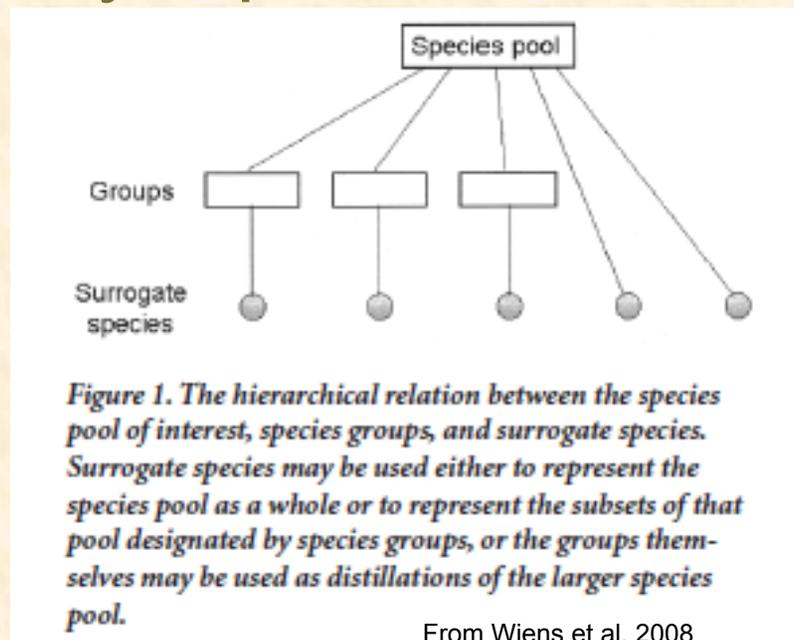
# Surrogate Species and SHC





# Establish Surrogate Species

- What are the surrogate species?
- What do they represent?



# Criteria for Grouping Species

- Cover type associations
- Shared threats
- Similar life-history characteristics
- Categories of home range size
- Others



**Based on their relationship to the conservation “objective”**



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# Criteria for Selecting Surrogate Species

- Species' population dynamics track changes in the larger landscape or ecosystem
- Species and habitat parameters can be accurately and precisely estimated and are linked to changes in the landscape
- Likelihood of detecting a change in the species' status is high, given a change in the status of the ecosystem
- Species/habitat dynamics have low natural variability, or additive variation, and changes in their values can be distinguished from background variation
- Cost of monitoring the species is not prohibitive
- Species are particularly adaptive to climate change and can be used to monitor species expanding their ranges

From SHC Handbook (FWS 2008)



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# Documentation

- The universe of species considered
- Surrogate approach used
- Criteria uses to determine groupings and surrogate species
- How the selection criteria were applied
- What species were selected and what they represent
- Assumptions



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# Step 6 Identify Species Requiring Special Attention

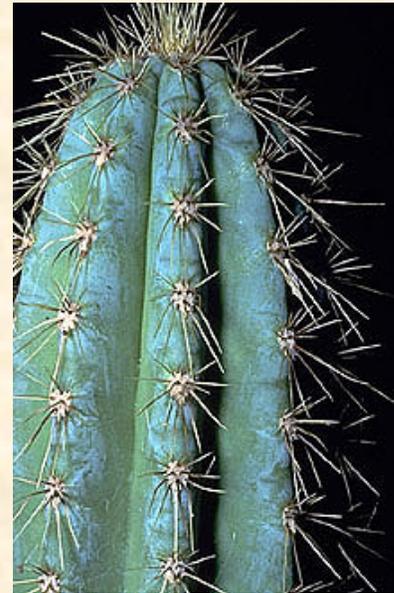


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# Learning Objectives

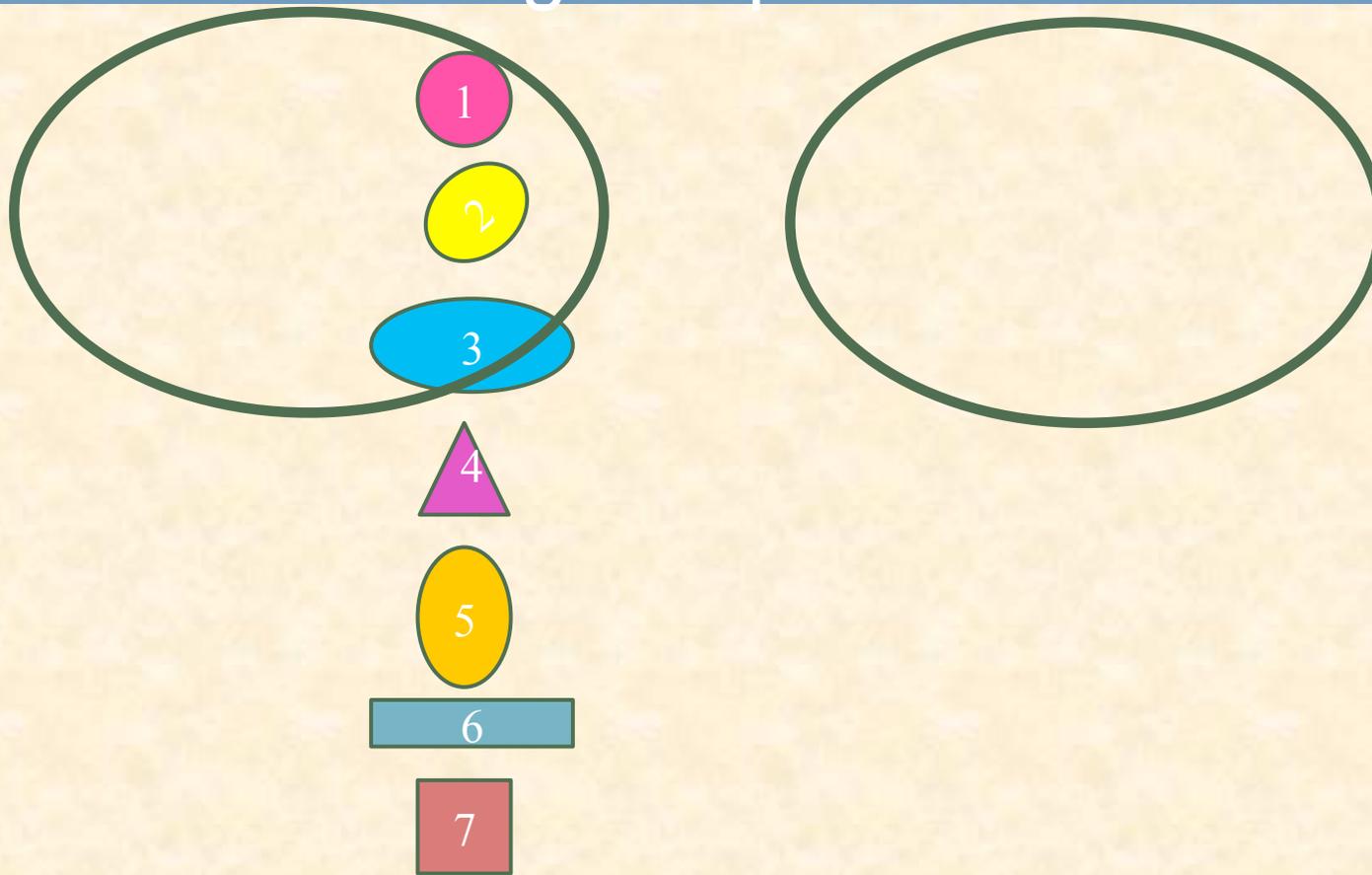
- *Discuss handling of USFWS priority species not represented by surrogate species*



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There may be priority species with management needs that will not be met by conservation of the selected surrogate species



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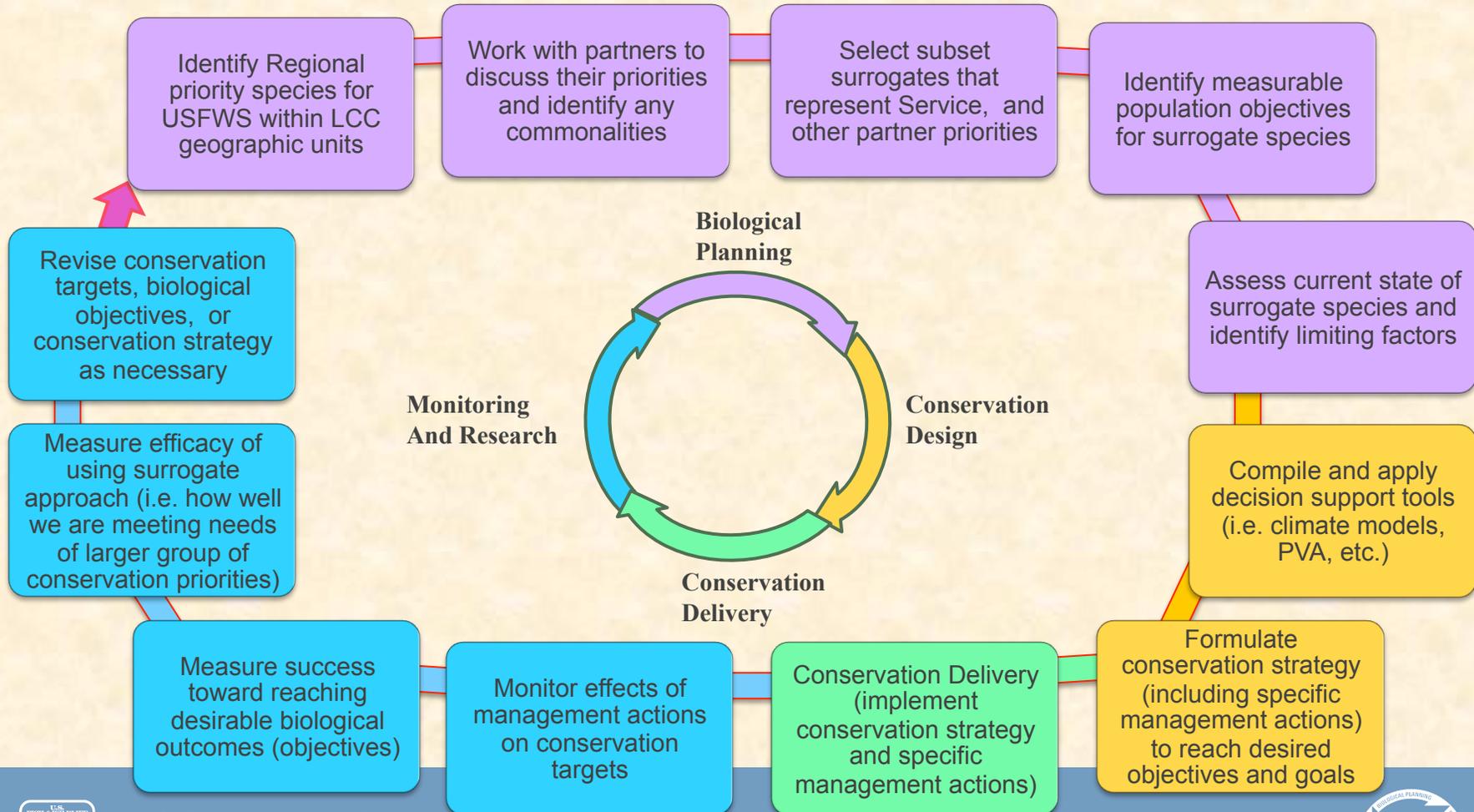
# Identify Species Requiring Special Attention

- Those that have unique habitat needs
- Experience unique threats
  - Collection for pet trade
  - Over harvest
  - Disease
- Legal action



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# Documentation

- Why the species can not be represented by a surrogate species
- Assumptions
- Biological Models
- Scientific information used



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# Step 7

## Identify Population Objectives



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# Learning objectives

- *Describe what is meant by population objectives.*
- *Describe characteristics of population objectives.*
- *Identify existing resources of population objectives.*



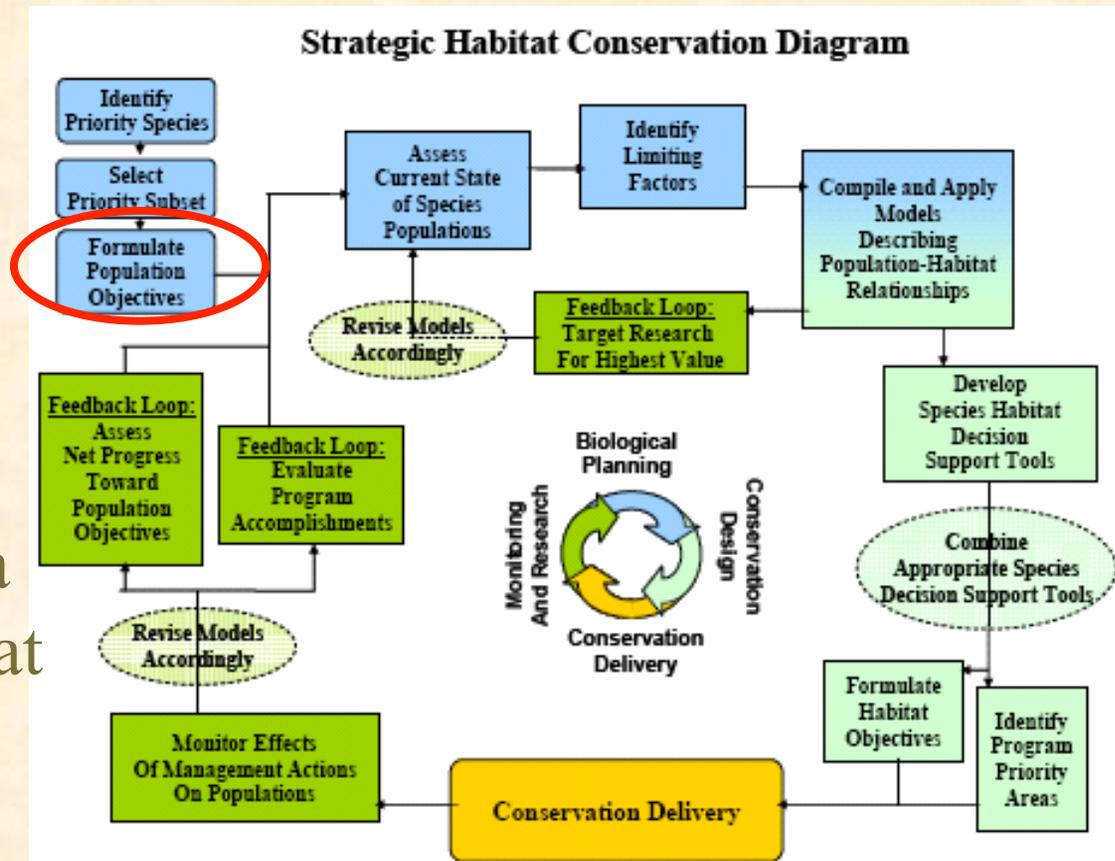
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# Identify Population Objectives

“A population objective represents a measurable expression of a desired outcome.”

“Defining measurable population objectives is a key component of SHC, at any scale”  
(USFWS and USGS 2006)



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# Population Objectives

The Purpose of Population Objectives Is To Link Measurable Biological Outcomes To Landscape Change. Change Resulting From Conservation Actions, Conversion to Other Lands Uses, and Effects of System Change (e.g., Climate). This information will inform resource management decisions across scales (DC, RO, field stations).



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# Population Objectives

A population objective represents a measurable expression of a desired biological outcome such as:



Swallow-tailed Kite

- Abundance  
Ex: 7,400 kites
- Trend  
Ex: 10% annual increase
- Vital Rates  
Ex: 2 fledglings/pair/year
- Population index  
Ex: 62 active territories



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# Population Objectives

Population objectives describe the desired state of a population and are:

- Expressed as abundance, trend, vital rates, demographic variable, or other measurable indices of population status, based on the best biological information;
- used to compare the current state of the population against future conditions;
- metrics to assess and improve the performance of our management actions;
- indices that can relate back to an estimate of current population compared to habitat base (i.e., carrying capacity) and estimates of habitat deficits indicating how much is needed to support desired future populations; and
- scale-dependent.



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# Challenges

Population objectives need to consider:

- The ability of current and alternative landscapes to support species.
- Past, present and future conditions that will be able to support fish and wildlife populations.
- Processes to link population objectives across spatial scales (e.g., across LCCs, FWS Regions, range-wide objectives).



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# Potential Sources of Existing Population Objectives

Conservation Target/Species Groups	Existing Guidance with Goals and Objectives
Migratory birds	Goals and objectives from continental plans for waterfowl, land birds, water birds and shorebirds; Joint Venture or Bird Conservation Region implementation plans
Species of Greatest Conservation Need	State Wildlife Action Plans
Marine mammals	Individual species conservation plans or recovery plans (e.g. Pacific walrus, sea otters, Florida manatee)
Fish and aquatic resources	Management plans by stocks or sites; National Fish Habitat Action Plan partnerships
Threatened and endangered species	Recovery plans, Spotlight Species Action Plans, 5-Year Reviews
Game species	State management plans
Ecological services and other more traditional conservation targets (species, habitat types)	Other partner strategic planning documents and implementation plans.



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# What if No Population Objectives Exist?

- Regions and programs will work collaboratively with key partners willing to develop population objectives.
- **Critical Point!** State fish and wildlife agencies have a primary role in fish and wildlife conservation and this includes determining population levels of fish and wildlife within their jurisdictions.



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# What if No Population Objectives Exist?

- Species-habitat models can be developed to predict potential carrying capacity of the landscape to support populations; thereby informing the development of population objectives.
- These types of assessments should consider past, present, and future conditions as well as population levels desired by the public.



# Documentation

- Sources of population objectives
- Rationale
- Assumptions



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# Example of Steps 4 to 7

**Time to discuss!**



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# Step 5

## Establish surrogate species

- To establish surrogate species
  - with partners
    - small subset of species including terrestrial and aquatic
- Examples
  - terrestrial birds (i.e., falcons)
  - migratory birds (i.e., warblers and terns)
  - amphibians (i.e., *Eleutherodactylus spp.*)
  - pollinators (i.e., bees)

*Accipiter striatus venator*



*Dendroica discolor*



Bee



Bee



*Eleutherodactylus portoricensis* / RC



Bridled Tern / RC



## Step 6

# Identify species requiring special attention

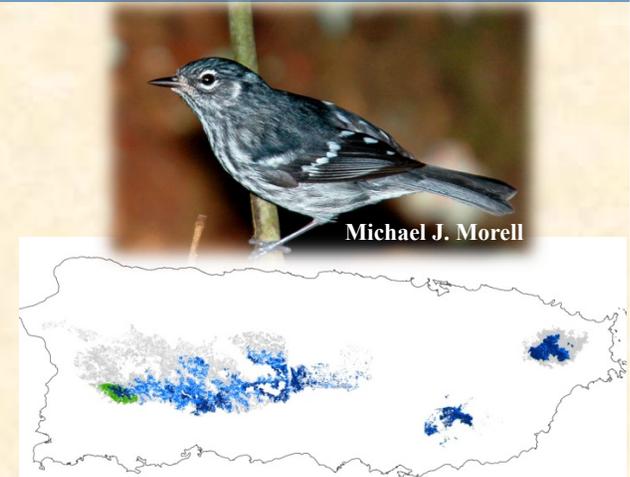
- Species requiring special attention
  - Species with limited range and very special requirements
    - VI boa
    - “Coquí llanero”
    - Puerto Rican parrot
    - Harlequin butterfly



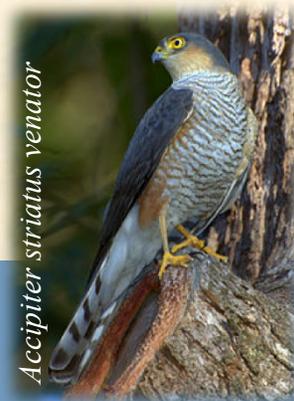
# Step 7

## Identify Population objectives

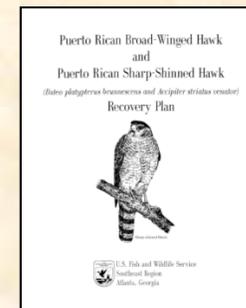
- Population objectives
  - abundance, trends, number and population status
- Conservation actions: measurable
- Modeling (Elfin-wood warbler)
- Example of population objectives:
  - Sharp shinned hawk: minimum 250 breeding pair
    - island wide (5 forests)
    - maintained for at least 7 years
    - breeding densities should be restored to the levels known in 80's
      - Carite - 0.42/km<sup>2</sup>
      - Guilarte - 0.821/km<sup>2</sup>
      - Luquillo - 1.03/km<sup>2</sup>
      - Maricao - 1.15/km<sup>2</sup>
      - Toro Negro - 1.45/km<sup>2</sup>



Elfin-wood warbler habitat suitability model



*Accipiter striatus venator*



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