**Refining Species Endpoints & Developing Biological Objectives**

**For the Gulf Coastal Plains & Ozarks Landscape Conservation Cooperative**

**Need**

The Integrated Science Agenda (ISA) serves as the foundation of conservation planning & science in the Gulf Coastal Plains & Ozarks Landscape Conservation Cooperative (GCPO LCC). Currently in version 4, the ISA identifies 9 focal habitat systems for the GCPO region, as well as identifying metrics associated with ecological integrity (i.e. Landscape Endpoints) and species limited by those metrics (i.e. Species Endpoints). In the 3 years since version 4 of the ISA was produced, significant effort has been expended to develop a baseline assessment of the Landscape Endpoints. These assessments have become the basis for developing a Conservation Blueprint (a.k.a. Landscape Conservation Design) to guide conservation delivery in the GCPO LCC. In contrast, little work has been done on the Species Endpoints, despite the need recognized by the ISA. “**Clearly documented species-habitat models that quantify relationships between indicator species and limiting factors reflecting desired states for each habitat type are needed**”(Science Need #2).

Additional work on Species Endpoints will advance work on the Conservation Blueprint, not only by refining our ability to identify quality habitat, but also in addressing the basic planning question of “how much is enough?” To more fully answer this question, we need to complete work on the Species Endpoints by developing population objectives for each species to inform setting of habitat objectives (where & how much) to inform conservation delivery. Together, population objectives and habitat objectives constitute “Biological Objectives,” which provide a quantitative goal to meet the LCC’s vision of sustaining these important natural & cultural resources.

Combining clearly documented species-habitat models with biological objectives provides a strong foundation for a Strategic Framework for Conservation Delivery. The models can be used to assess the likely outcomes of conservation action or other landscape change driver. When results are compared to the biological objectives, actions can be identified as a help or hindrance to reaching the LCCs vision. Using this framework, actions can be planned proactively and alternative plans can be assessed for efficiency & effectiveness.

The goal of this project will be to refine the Species Endpoints in the ISA and develop an initial Strategic Framework to Conservation Delivery.

**Objectives**

1. Revise the list of species for each habitat in the Integrated Science Agenda to:
   1. Reflect sub-regional differences in species composition, and
   2. Reflect different uses of species data.
2. Compile existing biological objectives for the revised list of species & identify gaps.
3. Develop species-habitat models capable of estimating changes in population status resulting from changes in habitat quantity & condition.
4. Develop biological objectives for the GCPO, including refining existing biological objectives where appropriate.

**Approach**

This important work will be accomplished by hiring 2 postdoctoral researchers. One postdoc will focus on terrestrial species and the other postdoc will focus on aquatic species. The postdocs will work closely with LCC staff, members of the Adaptation Science Management Team (ASMT) and members of the Partnership Advisory Council (e.g. SARP) in all phases of the project.

Objective 1 will be accomplished through meetings of the ASMT to identify uses of species information in the blueprint (e.g. prioritizing actions, revising landscape endpoints, scenario modeling) and the criteria that make a species suitable for each use. State Wildlife Action Plans will provide the primary source for the pool of species to be considered, but other priority lists will be consulted as well (e.g. USFWS At-Risk Species). Literature reviews and results of LCC-funded projects will be used to determine if species meet the proposed criteria for a particular use. It is anticipated that species meeting the criteria more data-intensive uses (e.g. scenario modeling) will be a small subset of species meeting less data-intensive uses (e.g. ranking sites on “biodiversity”).

Objective 2 will be accomplished by building on work done in the “Biological Objectives for the Gulf” project, in which the GCPO LCC is a partner. In that project, Biological Objectives have been compiled from Recovery Plans and other planning documents, and allocated among planning units along the Gulf when needed. Similar methodologies would be applied here for the revised list of species for the ISA.

Objective 3 will be accomplished by compiling existing monitoring data for species identified as suitable for modeling. Literature reviews will be used to identify any known species response thresholds to Landscape Endpoints identified in the ISA. Ideally, sufficient data will be available to build population viability models. In the absence of sufficient data, modeling approaches will selected based on available data. The number of species modeled for each habitat system and the order in which species models are developed will be determined through consultation with the ASMT.

Objective 4 will be accomplished by running the species models across a range of landscape change scenarios (e.g. no change, urbanization, climate change, conservation adaptation strategies) to determine thresholds below which population levels and trends are not acceptable and sustainable. Results will be used to propose Biological Objectives for species in the ISA that currently lack objectives, as well as objectives for each habitat system in each sub-geography based on the combined response across all species modeled (e.g. the species that needs the most habitat area to sustain populations at acceptable levels sets the habitat objective for the sub-geography).

**Benefits/Uses**

The primary products produced by this project will include refined Species Endpoints in the ISA, Biological Objectives for species that currently lack such objectives, and species-habitat models that inform conservation delivery by allowing proactive assessment of landscape change. Secondary products produced by this project will include compiled and QA/QC’ed species data sets, compiled Biological Objectives for the GCPO LCC region, and species response information to inform refinements to the Landscape Endpoints in the ISA.

**Timeline**

Two years, based on available funding. Additional years could be added to allow more species models to be developed.

**Estimated Costs**

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| --- | --- | --- | --- |
|  | Year 1 | Year 2 | Total |
| Terrestrial Postdoc | $ 75,000 | $ 75,000 | $150,000 |
| Aquatic Postdoc | $ 75,000 | $ 75,000 | $150,000 |
| Travel and Supplies | $ 5,000 | $ 5,000 | $ 10,000 |
| Totals | $155,000 | $155,000 | $310,000 |