Project Title: Lower Keys marsh rabbit adaptive management in the Florida Keys National Wildlife Refuge Complex

Headline Title (2-5 words): Lower Keys marsh rabbit adaptive management

Brief Summary (Abstract): A collaborative project to model the Lower Keys marsh rabbit metapopulation, quantify impacts of sea-level rise and storm surges on the rabbit and its environment, test assumptions about vulnerability to sea-level rise and storm surges, and implement adaptive management including actions to enhance resiliency.

Project Location: Florida Keys National Wildlife Refuge Complex, Florida Keys Wildlife and Environmental Area

Partners: U.S. Geological Survey (Patuxent Wildlife Research Center), Southeast Climate Science Center, Florida International University, University of Louisiana – Lafayette, Institute for Regional Conservation

Background: Sea-level rise and storm surges pose management challenges for ecosystem sustainability in the Florida Keys and Florida Coasts. Coastal wetland habitats and their inhabitants serve as sentinels in regard to sea-level rise. Freshwater wetlands near coasts have distinct but related stressors, responses, limitations, and challenges. The marsh rabbit inhabits two distinct but interrelated wetland systems, coastal and freshwater. Achieving a greater understanding of limiting factors on upslope migration of coastal communities is required to inform management decisions of this important ecosystem. The Keys are a microcosm of more far-reaching influences and impacts. The Lower Keys marsh rabbit metapopulation and environment serves as a model system in which to develop predictive capabilities regarding these relationships and challenges. Additional, prominent management concerns regarding the rabbit and environment include fire relationships, rabbit genetic diversity, and whether to move rabbits.

Project Goals: The goals of this project are to provide climate-related information for adaptive management of the marsh rabbit, including quantifying impacts of sea-level rise and storm surges on the rabbit and the wetland systems it inhabits, developing predictive capabilities regarding upslope migration of coastal communities, and implementing actions to enhance resiliency in an adaptive management framework.

Strategy Goals Implemented: Goal 1 - Action 1.3.1: develop and implement restoration protocols and techniques that promote ecosystem resilience and facilitate adaptation under a

range of possible future conditions. 1.4.2: Assess and prioritize critical connectivity gaps and needs across current conservation areas, including areas likely to serve as refugia in a changing climate. 1.4.3: Conserve corridors and transitional habitats between ecosystem types through both traditional and non-traditional (e.g., land exchanges, rolling easements) approaches. Goal 2 – Action 2.1.1: Incorporate climate change considerations into new and future revisions of species and area management plans using the best available science regarding projected climate changes and trends, vulnerability and risk assessments, scenario planning, and other appropriate tools as necessary; 2.1.2: Develop and implement best management practices to support habitat resilience in a changing climate; 2.1.9: Develop strategic protection, retreat, and abandonment plans for areas currently experiencing rapid climate change impacts (e.g., coastline of Alaska and low-lying islands). Action 2.2.1: Use vulnerability and risk assessments to design and implement management actions at species to ecosystem scales. 2.2.2: develop criteria and guidelines that foster the appropriate use, and discourage inappropriate use of translocation, assisted relocation, and captive breeding as climate adaptation strategies. Action 2.3.1- Develop and implement approaches for assessing and maximizing the potential for maintaining genetic diversity of plant and animal species.

Climate Impacts Addressed: Impacts on species and habitats, including closely adjacent coastal (saltwater) and interior (freshwater) marsh systems.

Status of Project Implementation: Project is ongoing. Milestones include the development of an adaptive management framework and development of models that describe the system and provide a basis for testing assumptions and hypotheses. Next Steps: more detailed modeling to advance understanding of habitat dynamics and sea-level influences; reiteration of adaptive management model; and generate estimates of optimal management actions from models.

Project Outcomes: The Lower Keys marsh rabbit adaptive management project models well described rabbit metapopulation dynamics, including important factors pertaining to dispersal, and illustrated that extinctions are more frequent in coastal than nearby freshwater systems.

Funding Sources: USFWS, USGS

Photos/Attachments:

>   LKMR [Craig Faulhaber]/ Credit Craig Faulhaber (permission? yes):

>   Suggested Photo Caption: Lower Keys marsh rabbit