OUTLINE AND GUIDANCE FOR DEVELOPING HABITAT MANAGEMENT PLANS

I. Introduction

A. Scope and rationale. Provide a brief discussion of the scope and rationale for developing an HMP.

B. Legal mandates. List the refuge purpose(s), the System mission, and any other legal mandate or responsibility that you must meet when managing specific resources on the refuge.

C. Relationship to other plans. Explicitly describe how the HMP is consistent with other plans (e.g., threatened and endangered species recovery plans, Service ecosystem plans, State fish and wildlife conservation plans, North American Waterfowl Management Plan, Partners in Flight plans, flyway management plans, national/regional shorebird plans, and fisheries resource plans) relevant to the refuge, and how the refuge actions will achieve refuge purpose(s), the System mission, and contribute to goals and objectives of those plans. Identify conflicts between these various sources and document resolution of conflicts. You must resolve conflicts in favor of and in priority order of refuge purpose(s), System mission, and other plans.

II. Background. Provide a detailed description of refuge habitats, including the historic and current condition, and changes over time. This section establishes the frame of reference, in accordance with maintaining or restoring the biological integrity, diversity, and environmental health of the refuge (see 601 FW 3), for developing habitat goals and objectives and development and implementation of specific habitat management strategies.

A. Inventory and description of habitat.

(1) Location -- List the distance to major cities, list county(ies) where the refuge is located, and include State(s) vicinity map.

(2) Management units -- Describe the location, size, and purpose(s) of specific management units on the refuge.

(3) Physical or geographic setting -- Describe the geologic and ecoregional setting of the refuge, the physiographic province, broad vegetation zones, hydrology, flyway, and proximity of refuge to other protected areas.

(a) Historic condition -- Identify natural plant communities and species and ecological processes that may have existed on the refuge and surrounding landscape/seascape prior to significant disturbances by humans. Use historical records, oral history, old photographs, professional judgment, or any other useful source to determine the historic condition (see 601 FW 3).

(b) Current condition -- Describe current habitat(s). Identify individual plant or community types, vegetative composition, soil types, water quality, invasive species, erosion problems, hydrological and fire regimes, contaminant problems, and any

other conditions affecting habitat management. Identify existing rare, declining, or unique natural communities, species, and ecological processes inside and outside refuge boundaries. These species, along with the species identified in section IIIA are important to the management of biological integrity, diversity, and environmental health on the refuge.

(c) Habitat changes from historic condition to current condition -- Summarize management practices from the historic condition to the present. Consider disturbances such as agriculture, catastrophic events, urban development, fire, hydrologic changes, contaminants, erosion, and other practices. Identify changes and provide possible or known explanations for these changes from the historic condition, including increases or decreases of various habitat types. Include natural phenomena, such as changes to a river course, as appropriate.

(4) Maps - Include map(s) of the refuge, refuge subunit, or management area for a physical frame of reference. Include cover types, physical features, and unique resources. Use standard classification systems such as the National Wetlands Inventory and National Vegetation Classification System, and geographic information systems, where possible, to analyze potential habitat contribution of the refuge to the resources of concern (see 701 FW 2).

III. Resources of Concern. Resources of concern are the primary focus of the HMP. The following four steps provide guidance to identify refuge priority species, species groups, and communities; identify habitat requirements; analyze the refuge's potential contribution to the habitat need of these species, species groups, or communities; and potential solutions for conflicts among species or community groups.

A. Identification of refuge resources of concern. Identify priority refuge plant and animal species, species groups, and communities such as those identified in refuge purpose(s). Also consider international, national, Regional, or ecosystem goals; State fish and wildlife conservation plans; threatened and endangered species; regional fisheries management plans; and biological integrity, diversity, and environmental health of these priority groups. Consider the refuge's rare, declining, or unique natural communities, species, and ecological processes (section IIA(3)(c)).

B. Identification of habitat requirements. Identify habitat requirements, including the quality and quantity, vegetative characteristics, timing of availability, and distribution of specific habitats and associated ecological processes necessary to support the species, species groups, and communities. Compile additional habitat information for the resources of concern from available sources, such as GAP analysis; geographic information system(s) analysis; published literature; refuge reports; and local area, species, or communities experts. Describe important information gaps for the resources of concern. Identify studies and acknowledge limitations of the available habitat information. The type of information available varies depending on the specific resource identified but may include the following:

(1) Size, configuration, and juxtaposition of different habitats or seral stages;

(2) Presence or absence of edge habitats;

(3) Temporal distribution of required habitat elements or conditions based on cyclic life history needs of a species or species group;

(4) Necessity for connectivity to other habitats in the landscape/seascape for dispersal of young, seasonal migration, and genetic flow;

(5) Need for buffers from adjacent land uses or land cover negatively impacting refuge habitat;

(6) Existence of appropriate hydrologic, edaphic, climatic, and topographic conditions to support the resources of concern; and

(7) Conservation of the remnant habitats supporting, or having the potential to support, native biological communities or processes.

C. Potential refuge contribution to the habitat needs of the resources of concern. Assess and identify the refuge's potential contribution to the habitat needs of the resources of concern. Consider life cycle requirements and habitats afforded by other refuges, private lands, marine protected areas, and conservation areas within the surrounding ecosystem. Consider abiotic components such as topography, geology, hydrology, water quality, and soils that support, or could potentially support, resources of concern.

D. Reconciling conflicting habitat needs for resources of concern. Consider the relative priority for each resource of concern using refuge purpose(s) or any other legal or biological mandate, and discuss management activities that result in the optimal management strategy for those resources. Provide discussion and rationale to resolve conflicting habitat needs. Base resolution of the conflicts should be based on the relative importance of the resources of concern considering refuge purpose(s), the System mission, and applicable laws, regulations, or plans.

IV. Habitat Goals and Objectives. (See Writing Refuge Management Goals and Objectives: A Handbook for more information on the qualities of good goals and objectives.)

A. Restate habitat goals and objectives from CCPs that apply to the refuge, refuge unit, or management area for which you are developing the HMP. These habitat objectives provide the fundamental foundation for specific habitat management plans.

B. If you have completed a CCP, but habitat goals and objectives do not provide the level of specificity necessary to manage habitat on refuge lands, then restate the goals and objectives described in the CCP and add detail to those habitat objectives, as necessary, utilizing criteria outlined in section II.

C. If you have not completed a CCP, develop habitat goals and objectives based on a comprehensive habitat analysis conducted for the resources of concern. These habitat objectives concisely state the habitat conditions desired for the resources of concern.

(1) Use scientific information, expert opinion, and professional judgment to clearly

support each habitat goal and objective for the resources of concern. Habitat objectives contain the SMART criteria: Specific (who, what, where, when, and why); Measurable; Achievable; Results-oriented; and Time-fixed as recommended in "Writing Refuge Management Goals and Objectives: A Handbook," as referenced in 602 FW 1, 3 & 4.

(2) Use habitat models, as appropriate, to help develop habitat objectives. A model may be simple or complex, but generally contains explicit descriptions of the relationship among the management activity, the habitat, and the resources of concern. Models provide a clear and explicit expression of the logic and assumptions used to guide management strategies, allowing improved communication and the formulation of testable management strategies for an adaptive process.

V. Habitat Management Strategies. Use the following steps to select specific habitat management strategies and develop prescriptions to meet habitat management objectives:

A. Potential management strategies. Identify potential management strategies for specific habitat objectives utilizing information compiled in sections II - IV (e.g., burning, water control, moist-soil management, forest management, haying, mowing, grazing, cropland management, predator or pest control). Conduct a literature review, examine limiting factors, and consult with experts to identify the most effective strategy(ies) to accomplish habitat objectives.

B. Management strategy constraints. Discuss how the potential management strategy(ies) may affect the refuge's ability to successfully implement each strategy.

C. Impacts to the resources of concern associated with the implementation of the proposed habitat management strategies. Provide an analysis of the potential positive and negative impacts of each proposed strategy on resources of concern as well as nontarget resources. Determine the management strategies necessary to meet habitat objectives with the most positive effects on refuge resources.

D. Management strategy selection. Using sound professional judgment, select the specific management strategy(ies) identified above necessary to accomplish habitat objectives. Provide clear rationale for the decision.

E. Management strategy prescriptions. Discuss the prescription for each selected strategy, by habitat objective. Include the following, as appropriate:

(1) Location -- Identify on a map, refuge management units where each strategy may be used.

(2) Timing -- Identify the appropriate timing associated with each strategy to achieve desired habitat conditions. Consider vegetative response of the habitat and potential conflicts with other habitat and wildlife objectives. For example, time the fall burning of grasslands in order to provide early spring green-up of native grasslands for foraging sandhill cranes and geese. Prescribed burning would occur in October when staging cranes have left the refuge and grasses are sufficiently dry to provide the appropriate fire intensity. Other variables to consider include time of day and duration of the activity. Use biological criteria to define the timing when possible. Once you have considered and selected biological criteria, consider incorporating

visitor services programs to maximize recreational or educational opportunities provided by the habitat management activities or to reduce habitat management activity conflicts with public use activities.

(3) Frequency -- Indicate the required frequency to achieve desired habitat conditions. Use biological criteria in determining the frequency when possible.

(4) Intensity -- Describe the intensity of the strategy required to achieve the desired habitat objective. Examples include the depth and length of inundation, residual cover, fire intensity, etc. Use biological criteria in determining the intensity when possible.

F. Management strategy documents.

(1) Necessary resources -- Identify the fiscal resources necessary to successfully implement the HMP. Include staff needs for planning, administration, implementation, and monitoring; funding needs (e.g., water, fuel, seed, contract labor, materials, physical improvements); and equipment. Include additional resources necessary to successfully implement the HMP in future budget requests (i.e., Refuge Operating Needs System) to help address staff and funding shortages precluding full, but practical, implementation of the HMP.

(2) Documentation of special uses -- Identify and document special uses (e.g., grazing, haying, cropland management, timber sales) with special use permits (603 FW 3). Include compatibility determinations for refuge management economic activities, where applicable.

(3) Documentation of compliance -- Identify and include documentation of compliance of applicable laws including permits, as necessary, to implement selected habitat management strategies (e.g., section 404, air quality permits, ESA compliance, or cultural resource clearance).

VI. Appendices. Include a bibliography of references related to information essential to the development of the HMP.