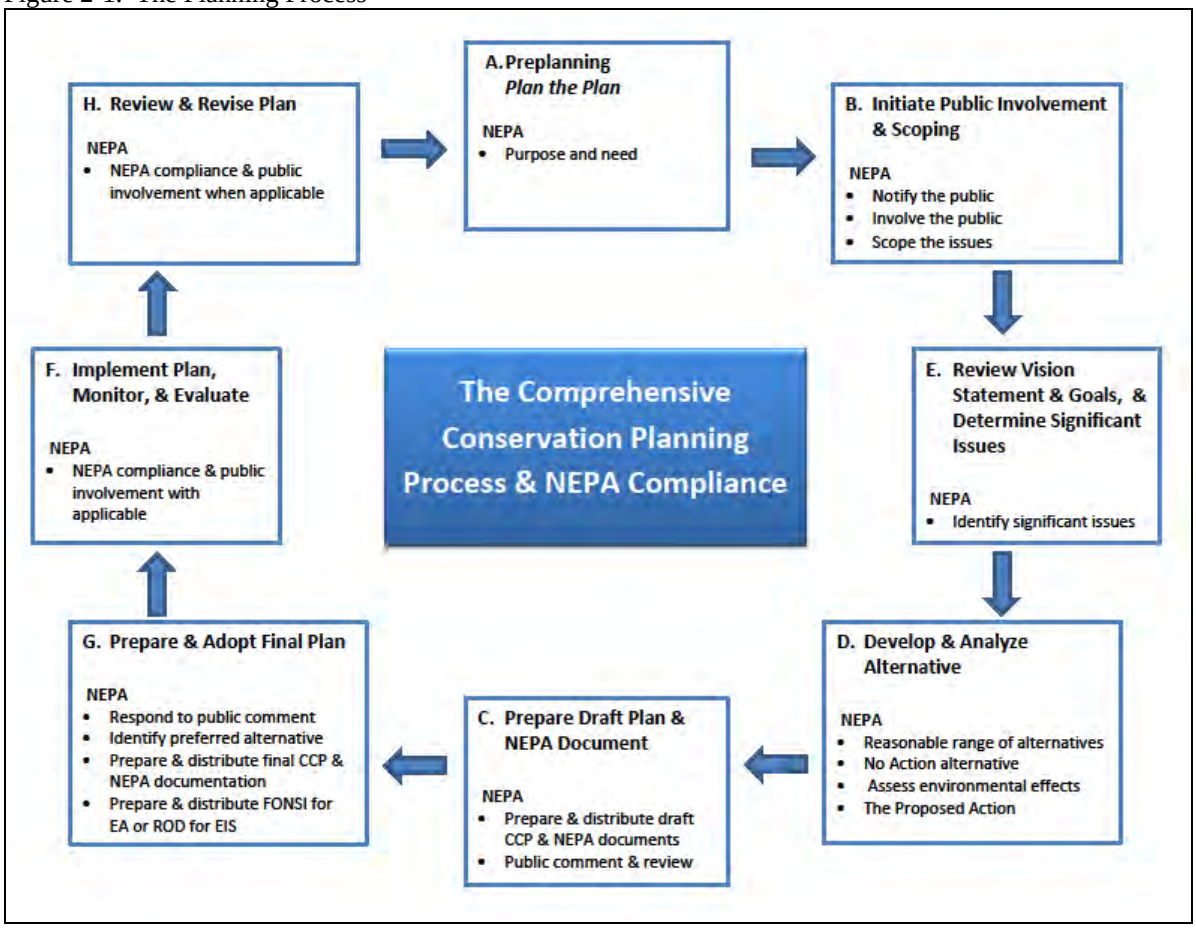
2.0 The Planning Process

This CCP complies with the requirements of the Improvement Act and NEPA. Refuge planning policy also guided the process and development of the CCP, as outlined in Part 602, Chapters 1, 3, and 4 of the Service Manual. Service policy, the Improvement Act, and NEPA provide specific guidance for the planning process, such as seeking public involvement in the preparation of the EA. The development and analysis of "reasonable" management alternatives within the EA include a "no action" alternative that reflects current conditions and management strategies on the Complex. Figure 2-1 shows the steps in the CCP planning process in a linear cycle. The following sections (2.1-2.8) provide additional detail on individual steps in the planning process.

Figure 2-1. The Planning Process



2.1 Preplanning

The Service completed the following preplanning tasks prior to formally initiating the development of this CCP in order to support planning activities:

- Established an interdisciplinary interagency planning team;
- Identified refuge purposes, history, and establishing authorities;

- Identified all relevant laws, regulations, and policies that would have to be considered during the development of the CCP;
- Identified purpose and need for the CCP to make sure all issues are adequately addressed; and
- Identified planning area and resource data needs.

2.2 Initiate Public Involvement and Scoping

The formal planning process begins with the scoping period, which involves soliciting public involvement and results in a thorough assessment of issues, concerns, opinions, thoughts, ideas, concepts, and visions for the Complex. Formal scoping began with publication of a Notice of Intent to prepare a Comprehensive Conservation Plan and Environmental Assessment, published in the *Federal Register* on June 23, 2009 (Volume 74, Number 119, pp. 29714-29715).

The planning team distributed a Planning Update Newsletter requesting public feedback and informing community members of upcoming public scoping meetings upon publication of the Notice of Intent. The planning team solicited public comments on Complex issues to aid in the CCP development through three open house meetings held the week of September 14, 2009 as shown in Table 2-1. The local newspaper announced meeting dates, times and locations, with the first held at the Lake Jackson Library in Lake Jackson, Texas, the second at the Demi-John Fire Hall in Freeport, Texas, and the third at the Complex Headquarters in Brazoria, Texas.

Table 2-1. Location, Attendance, and Dates of Public Meetings

Community	Attendance	Meeting Date
Lake Jackson, Texas	18	09/15/2009
Freeport, Texas	9	09/16/2009
Brazoria, Texas	14	09/17/2009

The planning team held an ecoregion-wide coordination meeting with partner agencies and organizations at the Complex's Discovery Center on December 2, 2009, to gain a better understanding of what issues are occurring within the Gulf Coast Prairies and Marshes Ecoregion, and to determine the Complex's role in addressing issues that impact fish, wildlife, and their habitats within this larger landscape. Seventeen people attended this meeting, representing the following agencies and organizations:

- Attwater Prairie Chicken NWR
- Bosque del Apache NWR
- USFWS Ecological Services
- The Nature Conservancy
- Texas Parks and Wildlife Department
- Texas Chenier Plains NWR Complex
- Trinity River NWR

One additional stakeholder meeting, with representatives from TPWD, was held on February 9, 2010. The meeting enabled the Complex staff to discuss their concerns regarding past management, future management and issues common to both agencies. The feedback received at the conclusion of the public involvement period identified numerous concerns from a variety of stakeholders. Table 2-2 lists the concerns identified by each stakeholder.

Table 2-2. Concerns Grouped by Category and Listed by Stakeholder

Issues/Opportunities	General Public	State of Texas	USFWS
General / Ecoregion			
Climate Change	X		X
Erosion/Salt Water Intrusion	X	X	X
Invasive Flora/Fauna Control	X	X	X
Fire Suppression	X	X	X
Urbanization and Development	X	X	X
Petroleum Development	X	X	X
Habitat Management			
Bottomland Forest Habitat			
Land Acquisition	X		X
Wildfire	X		X
Wetland Restoration	X	X	X
Gulf Goast Prairies and Marshes			
Habitat Management	X	X	X
Fire and Smoke Management	X	X	X
Erosion / Salt Water Intrusion	X	X	X
Water Management	X	X	X
Public Use			
Waterfowl and Other Hunting Opportunities	X	X	X
Fishing Opportunities	X		X
Historical Preservation and Interpretation	X		X
Canoe and Kayak Access	X		X
Education and Outreach	X		X
Entrance Fee for Public	X		X
Wildlife			
Disturbance to Wildlife	X	X	X
T & E Species and Species of Concern	X	X	X
Reitroduction of Species	X	X	X

Issues/Opportunities	General Public	State of Texas	USFWS
Facilities			
Volunteer Facilities	X		X
Administrative Facilities			X
Visitor Center / Orientation Center	X		X
Roads and Trails	X		X

Additional public scoping for the LPP planning process was conducted in January, 2012, with a comment period open from January 15, 2012 until February 5, 2012. Three public (open house) meetings were held to provide information on the proposed expansion and respond to questions and concerns; January 20, 2012, at the Discovery Center on Brazoria NWR near Freeport, Texas; January 24, 2012, at the Complex Office near Brazoria, Texas; and February 2, 2012 at the Hudson Woods Unit of San Bernard near Angleton, Texas. A total of 30 people attended the public meeting, with attendance of 15, 7, and 8 respectively, at each public meeting. A response card indicating support or non-support of the proposal was handed out at each meeting, enabling participants to provide a quick response. In addition, The Facts newspaper printed articles twice during the open comment period which generated 8 email responses. Of the 27 total responses, 22 supported the project expansion and five did not.

2.3 Determine Issues

To determine the planning issues the CCP addresses, the planning team reviewed the concerns identified by the public along with management concerns identified by Service staff, the State of Texas and other governmental agencies.

Refuge planning policy defines an issue as any unsettled matter that requires a management decision: an initiative, opportunity, resource management problem, threat to the Complex's resources, conflict in uses, public concern, or presence of an undesirable resource condition (602 FW 1.6I). Public responses, obtained through newsletters and three public open house meetings, in addition to management concerns identified by the Complex's staff and other stakeholders, were used to identify issues addressed in the CCP and EA.

Public responses identified a broad range of concerns, which the planning team grouped and categorized by how they would be address them in the CCP (see Table 2-3). This process helped the planning team identify issues that are addressed in the CCP.

Table 2-3. Addressing the Issues Raised during Scoping –

Category	Concern
Issues that are outside the scope of this Plan.	Landscape Level • Urbanization and Development • Stream Channelization Wildlife Management • Reintroduction of Species
Issues to be addressed in this Plan where no alternatives are presented.	Landscape Level • Petroleum Development • Wildfire Suppression Habitat Management (Bottomland Forests) • Forest Restoration • Wildfire • Wetland Restoration Habitat Management (Gulf Coast Prairies and Marshes) • Fire and Smoke Management Public Use Opportunities • Fishing Opportunities
Issues to be addressed in the Plan where alternative actions are presented.	Landscape Level • Land Conservation • Erosion/Salt Water Intrusion • Flora and Fauna Invasive Species Control • Climate Change Habitat Management (Bottomland Forests) • Habitat Management Habitat Management (Gulf Coast Prairies and Marshes) • Habitat Management (farming, grazing, haying, etc.) • Water Management • Invasive Species (flora) Control • Prairie Restoration Wildlife Management • T & E species and Species of Concern • Waterfowl Management • Species of Management Concern • Invasive Species (fauna) Control Public Use Opportunities • Waterfowl and other hunting opportunities • Historical Preservation and Interpretation • Environmental Education and Outreach • Wildlife Observation • Canoe and Kayak Access • Entrance Fee for public Facilities • Roads and Trails • Volunteer Facilities • Visitor Center/ Orientation Center • Administrative Facilities

Based on issues, concerns and opportunities identified during scoping, the Complex identified five issue categories (ecoregion, habitat, wildlife, public use and facilities) for consideration during planning and development of this Draft CCP. These issues reflect problems, opportunities, or points of discussion that the Draft CCP addresses in a variety of ways. The EA (Appendix B) further discusses how the issues were addressed and displays the potential environmental consequences of the proposed action and its alternatives.

Strong public support or opposition is an important consideration, and the Service considers all comments, when deciding what management actions best meet the purposes of each refuge and the mission of the Refuge System. These comments demonstrate the broad range of approaches and opinions people bring to the issues. The complete set of written and verbal responses received is available from the Service's Regional Office in Albuquerque, New Mexico.

2.2.1 Ecoregion Issues

Documents including TNC's Gulf Coast Prairies and Marshes Ecoregional Assessment, Texas Comprehensive Wildlife Conservation Strategy, and Gulf Coast Joint Venture's Migratory Bird Management Plans and others identify threats and issues for the Gulf Coast Prairies and Marshes Ecoregion. We used the information derived from these documents during the meeting to gain a greater understanding of what other land management agencies and organizations are doing to address identified issues. The Complex used a "larger picture" when considering development of management direction for its CCP.

Members of the public, TPWD, and the planning team expressed concern about what role the Complex plays within the larger landscape. The Complex would like to take a landscape-scale approach to managing the Complex over the life of the CCP. Comments and concerns from our partners and the general public on ecoregion conservation-related issues were addressed according to, but not limited to, major issues such as climate change, fragmentation, commercialization, prairie conversion/habitat conservation, fire suppression, urbanization, and disturbance and are described in detail below.

Climate Change - As habitats change, the wildlife species that utilize those habitats will also change. Although the Complex can do little to resolve this issue, it can realize that such change is occurring, document these changes through data collection, and adapt management to reflect/address changes in hydrology and plant communities. Sea-level rise will have a direct impact on all three of the coastal refuges. Various models are being used to evaluate the loss of coastal marshes. Estimates from some models are showing that nearly 90 percent of the marshes on the Complex today may be converted to open water by 2100. Water, or lack of water, is expected to become a major environmental crisis throughout the state in the near future if conservation measures are not taken seriously. Combined with climate change, this issue has the potential to impact many refuge management activities such as wetland management, farming, habitat restoration, grazing, and fire management. Although climate change and other factors have the potential to alter the distribution of habitat types in this area, the effects of this change on resources across the landscape, including wildlife species, are still unknown.

Fragmentation - Remaining tracts of wetland, marsh, and prairie habitats are being broken up, divided, and impacted from development of roads for commerce, development for housing and businesses, and for agricultural purposes. Fragmentation has a highly detrimental impact on species that are less mobile.

Commercialization - Commercialization activities have negative impacts on both wildlife and habitat within the ecoregion. One of the commercialization activities of concern involves loss of habitat from communities spreading out from the Houston Metropolitan, which is approximately 45 miles north of the Complex. Commercial resale of sand deposits from wetland and riparian areas impacts water quality downstream and in the bays.

Petroleum development, timber cutting, commercial crabbing and oyster harvest, grazing and haying, turf farms, and illegal dumping are major impacts of commercialization affecting the entire ecoregion.

Petroleum Development - The public had concerns of petroleum development and the potential impacts it can have on both Complex habitats and wildlife species. Many members of the public would like to see no petroleum development on refuges and many would like to see special mitigations incorporated to minimize negative impacts to wildlife.

Prairie Conversion, Habitat Conversion - Monocultures and urban environments change habitats through development and draining of wetlands. These projects are directly contributing to a net loss of prairie habitat affecting both flora and fauna prairie-dependent species. This direct loss of habitat is a major concern for the ecoregion.

Wildland Fire Use - The suppression of wildfire has changed local prairie communities and this suppression supports the growth of invasive and exotic species, which compound the need for prairie restoration efforts.

Salt Water Intrusion - Navigation traffic introduces saltwater into freshwater marshes, causes drastic changes in native local plant communities and loss of habitat for many other species. Natural processes such as storms, hurricanes, and ea-level rise all contribute to salt-water intrusion that impacts prairie habitat.

Urbanization - Changing from vegetative environments to those of asphalt and concrete are reducing wildlife species, producing monocultures of grass that do not benefit wildlife and create barriers for many less mobile species. Urbanization is fragmenting native plant communities and resulting in a direct loss of plant diversity. Increasing pesticide and herbicide use around managed lands and an increase in fertilizer use are some of the many contributing factors of urbanization with negative impacts on prairie habitat. Urbanization is also adding additional stressors on a limited amount of public lands in Texas with an increased amount of natural resource users such as boaters, anglers, hunters, and outdoor enthusiasts. Urbanization is a serious issue, since the Complex is approximately 45 miles outside of the 5 million people living in Houston.

Disturbance - The effects of disturbance in some coastal habitats to a number of coastal wildlife species, particularly certain groups of birds (waterfowl, colonial waterbirds, shorebirds), is largely unquantified and merits investigation. Ecoregional partners have identified increased boat use and increased air traffic, as well as oil and gas exploration, as disturbances that affect wildlife in the ecoregion.

Land Conservation - The San Bernard NWR is approaching the 28,000-acre cap originally set by the Service in 1997 in decision documents with the Austin's Woods Conservation Plan Land Protection and Compliance Document. The Plan outlines the need to counter the rapid development and expansion of urban areas within the Columbia Bottomlands and protect a unique ecosystem essential for maintaining populations of migratory birds and resident species. The concerns identified in 1997 are still relevant and to date less than 5 percent of the historic habitat has been conserved. Recent research has continued to support the importance of these habitats for migratory songbirds, while nation-wide populations of songbirds continue to decline. Millions of Nearctic-Neotropical migrants make landfall in the bottomlands during spring and fall migration to rest and feed after and before crossing the Gulf of Mexico, respectively.

Acquisition efforts are a watershed-scale ecosystem type approach; focusing on the conservation of ecosystem integrity, function, heterogeneity, and biologic diversity addressed as a "bioreserve" network. The bottomlands are home to rare plants and several species that are at the edge of their range as well as newly defined species. Where the landscape is flat and unencumbered, the native forests are unique and add to the natural beauty of the area. An updated Land Protection Plan (LPP) (Appendix I) includes a proposal to allow the Service to continue conservation efforts within the Columbia Bottomlands, including raising the 28,000-acre cap to 70,000 acres. During the separate scoping meetings held for the LPP, concerns from the public regarding this expansion included feral hogs, the "thicket" appearance, removing lands from the tax base, acquisition funding, and additional public use opportunities. These issues are addressed in this document, the EA and the LPP.

2.2.2 Habitat Management Issues

Gulf Coast Prairies and Marshes

The Gulf Coast prairies and marshes were once part of an immense ecosystem covering nine million acres, in the states of Texas and Louisiana. Many of the tall grasses typically found in the Midwest prairie region occur on the coastal prairie as well, where bluestems are intermixed with species native to the coastal wetlands. The coastal prairie underwent intensive man-made development starting in the mid-20th century (Allain et al. 1999) and now totals less than 250,000 acres in Texas. Many native plant and animal components have already been lost, but the Service along with partners recognize the need to maintain existing remnants and restore native coastal prairie habitats.

Members of the public, TPWD, other federal agencies, and the planning team expressed concern on how the Complex will manage to ensure the conservation, diversity, and enhancement of the Gulf Coast prairies and marshes. Comments and concerns from our

partners and the general public on issues related to the conservation, diversity, and enhancement of Gulf Coast prairies and marshes were addressed consistent with, but not limited to, major issues such as development, erosion, fragmentation, invasive species, land management and other land use practices, natural occurrence, and pollution and are described in detail below.

Development - The effects of development include construction activity (i.e. building roads, structures, hardscape, oil and gas exploration), urbanization, urban sprawl, utility lines, and right of ways, as well as creation and modification of reservoirs. Direct effects of development in the Gulf Coast prairies and marshes are loss and habitat, and direct mortality of wildlife. Associated affects to development include impacts on water quality due to fertilizers, pesticides, herbicides and sanitary waste systems.

Erosion – Erosion may occur on beaches, along rivers, streams, creeks, shipping channels, jetties, ditches and other locations. Sea level rise, siltation, beach erosion, and subsidence are also major contributors to erosion.

Fragmentation – Habitat fragmentation results from changes in land use for purposes such as agriculture, land transportation (roads and highways), water transportation (shipping channels), housing, and commercial and industrial development. Ecoregional partners have linked fragmentation to inhibited wildlife dispersal, lack of available habitat and reduced gene flow. Fencing and saltwater intrusion have been linked to fragmentation as well.

Invasive Species (Flora) – Invasive species are a sub-set of non-native species that can aggressively alter an ecosystem. Several invasive species, including Chinese tallow, Macartney rose, deep-rooted sedge, and salt cedar are common on the Complex and are reducing the quality and potential of native prairie and marsh habitats. Invasive species out-compete native vegetation, reduce plant diversity, alter hydrology, change soil characteristics and nutrient cycling and can impact the effectiveness of prescribed fire. Fire is the predominant management tool in the coastal prairies and salt marsh to control brush and invasive species encroachment. The use of herbicides may be employed during habitat restoration to remove invasive species and improve overall habitat conditions to support native wildlife.

Land Management and Other Land Use Practices - Land management practices including, prescribed fire, farming, moist soil management, grazing and haying have avariety of impacts on the Gulf Coast prairies and marshes. Effects of management practices vary but the intent is to provide quality habitat for native wildlife, including non-natural management areas. Water management is the one tool that the refuges do not have control over. Although the refuges do have some water rights, they are not sufficient for even current management needs. In addition, the ability to purchase water in support of farming programs and wildlife wetlands is solely determined by the Water Development Boards.

Natural Occurrences - Natural occurrences such as drought, floods, and stochastic events such as hurricanes and wildfire have both positive and negative impacts on Gulf Coast

prairies and marshes. Although unpredictable, these events are regularly occurring and impact management decisions.

Pollution - Pollution outside the Complex, but within the Gulf Coast prairies and marshes—such as petroleum/chemical spills, non-point and point source pollutants, contaminated water discharge, airborne sulfates, nitrates, heavy metals, and pesticide use—have lasting negative impacts on both wildlife and habitat.

Bottomland Hardwood Forests

Bottomland hardwood forests are the most diverse Texas ecosystems; they also rank as one of the most endangered ecosystems in the United States (U.S. Department of the Interior 2006). The Columia bottomlands of east Texas in the Sabine, Trinity, Neches, and Sulfur River flood plains are the predominant Texas bottomlands, which make up about 75 percent of Texas' interior wetlands. Columbia bottomland wetlands are plant communities created because of the actions of creeks, rivers, and floodplains. Trees found in the bottomland hardwood forests include bald cypress, pecan, oaks, elm, cottonwood, and hackberry. These hardwoods, particularly old-growth hardwoods (50 to 100 years old), contribute to the biodiversity of the wetland system and provide food and shelter for wildlife. There has been a steady decline in bottomland forest since the early 19th century. Estimated loss of bottomland forest in Texas is 12% per decade.

The southern most bottomland forest, located south of Houston, is commonly referred to at the Columbia Bottomlands. The Columbia Bottomlands extends from the Gulf Coast in Brazoria and Matagorda County inland approximately 93 miles. Today, less than one quarter of the 700,000 acre historic forest remains intact. The Service along with partner agencies and organizations have conserved approximately 20 percent or 31,000 acres of those remaining forests.

Members of the public, representatives at the ecoregional meeting (TPWD and other agencies) and the planning team are concerned about the conservation of the Columbia Bottomlands. Restoration of wetlands (including flooded forests) are essential to preserving diversity, and controlling flooding down-stream flooding. There is concern that recently restored areas are vulnerable to wildfire ignitions in areas where the tree canopy has not yet shaded out grasses. Concerns were also expressed about how the Complex will manage to ensure the conservation, diversity and enhancement of the bottomland hardwood forests. Comments and concerns from our ecoregional meeting, as well as concerns from partners and the general public, were addressed according to, but not limited to, major issues such as incompatible forestry and livestock production practices, stream channelization, and invasive flora and fauna and are described in detail below.

Incompatible Forestry and Livestock Production Practices - Forestry and livestock production affects the productivity and function of bottomland hardwood forests through efforts such as clear cutting of trees to convert forests to grasslands as well as an increased number of "hobby ranchers." These types of incompatible practices can eliminate or alter a system drastically enough to change the entire production of flora and provide ideal

conditions for exotic flora establish, decrease soil stability, and change the hydrology of the entire system.

Stream Channelization - As residential areas continue to expand, the natural hydrology of a system becomes difficult to maintain and manage, especially in the constantly flooded hardwood forest. Large developers, as well as municipalities, typically alter hydrological activities on a large-scale in an attempt to minimize damage to newly developed areas.

Invasive Native and Exotic Flora and Fauna - Invasive plants have the potential to take over sites and out-compete less aggressive native vegetation in areas disturbed through livestock production practices, clear-cutting, and development including rights-of-way. Animal pests, such as feral hogs and free roaming cats, have negative impacts on native wildlife in bottomland hardwood forests.

2.2.3 Wildlife Management Issues

The Complex is home to a vast variety of wildlife species that reside year round and others that migrate to, from, and through the Complex. The expanse of marshes, sloughs, ponds, prairies, and forests represent feasting and lodging for more than 400 species of wildlife, including 320 species of birds. The Complex also provides wildlife an opportunity to nest, rest, feed, and winter within the boundaries of the Complex. The Complex is well known for its large variety of migratory birds including waterfowl and other water, grassland and forest dependant species. The Complex supports more than 100,000 shorebirds annually, as well as white-tail deer, bobcat, river otter and alligator populations. The refuges include several rookeries for a large variety of wading birds, terns, gulls, and black skimmers.

Members of the public and planning team commented on the management of both migratory and resident wildlife on the Complex. They identified the need for critical habitat for mottled ducks year round. The Complex provides important habitat for migratory waterfowl, songbirds, and shorebirds during portions of the year, including critical beach habitat for piping plovers.

The public, other state and federal agencies, and the planning team also expressed concern on how the Complex will manage wildlife to ensure the conservation, diversity, and enhancement of trust resources. Wildlife are vulnerable to disturbance and habitat loss as a result of agriculture, development, erosion, fragmentation, human disturbance, invasive species, natural events such as hurricanes, flood events, brood parasitism, direct competition, stochastic events, wildfire, pollution, lack of protection, naturally limited range, and vehicular impacts such as beach compaction and nest disturbance.

Threatened and Endangered Species – Three listed bird species (piping plover, northern aplomado falcon, and interior least tern) have been documented on the Complex. The piping plover is listed as endangered in Brazoria and Matagorda Counties and can be found on refuge beaches and mud flats from late July to May annually. The northern aplomado falcon is listed as endangered in Matagorda County. Irregular sitings of a transient bird have occurred on the San Bernard NWR. The interior least tern is listed as endangered in Wharton

and Fort Bend Counties. These birds are migratory through the area and are usually associated with mudflats along river banks. In addition, the Sprague's pipit, which is a candidate species, has been documented in all four counties, but its current status on the Complex is unknown. It is a migrant species found during migration and winter, generally tied to upland native grasslands and can be found in large numbers in coastal grasslands. The red know is also a candidate species utilizing beach and tidal flats at San Bernard NWR. All five listed sea-turtles are found in the Gulf or Bays near the refuges. The Kemp's ridley sea turtle will nest on the San Bernard NWR beach. The refuge supports the Kemp's ridley Sea Turtle Recovery Plan by patrolling and responding to turtle stranding and nesting reports.

Two additional species, the Attwater's prairie chicken and the whooping crane, which do not currently occur on the Complex, may have potential recovery habitat on the Complex. In the future, the Service may consider reintroducing the Attwater's prairie-chicken onto refuge prairies and the expansion of whooping crane populations up the coast.

Migratory Bird Species and Species of Special Management Concern – The Texas Gulf Coast is the primary wintering area for most of the Central Flyway. More than 250 bird species us Complex habitats during all or part of the year. The Complex is one of the few areas on the Texas coast where snow geese still feed on native salt marsh grasses rather than on agricultural crops. The mottled duck is a species of management concern which requires an integration of habitats including prairie for nesting and freshwater wetlands for brood rearing and molting.

Species of special management concern and focal species are monitored with the intent that habitat features affecting these species can expect to have similar affects on other species with similar habitat requirements. Species are selected to monitor the affects of landscape scale characteristics that if properly managed will have beneficial effects on species sharing similar conservation needs. Loss of prairie habitat has affected many grassland dependent bird species which are experiencing an alarming rate of decline. Managed wetlands are essential for providing habitats for migratory waterfowl where drought and loss of wetlands have altered the landscape. Preserving old growth forest habitats along the Gulf Coast are essential for maintaining Nearctic-Neotropical migratory bird populations and resident mammal, bird and herptile populations in this rapidly developing area.

2.2.4 Public Use Issues

Approximately 34,000 visitors visit Brazoria NWR and 34,000 visitors come to San Bernard NWR annually. About a quarter of the visitors, come during the spring season (March–April) to view birds and enjoy the coastal prairie habitat when a variety of flowering plants are blooming. Approximately 5,000 visitors come to Big Boggy NWR for hunting and fishing opportunities. The Brazoria NWR Discovery Center is approximately 1,500 square feet in size and includes a visitor contact center, lab, and office, and can host up to 50 students at a time. It also contains a large screen television and projection screen for interpretive programs and contains a pavilion overlooking Big Slough in the back of the Discovery Center. The Discovery Environmental Education Program (DEEP) has been functioning at the refuge since 1994. DEEP currently serves approximately 3,000 students

and in future years, could expand to 6,000 students as the population of the area increases. The Complex continues to serve as an outdoor education center where graduate students conduct research projects involving waterfowl and other migratory birds, agriculture, moist soil unit production, fish and wildlife, and forestry studies. The Complex is open to the public throughout the year with the exception of Big Boggy NWR, which stays closed to all public uses except for limited hunting and fishing activities.

Individuals expressed multiple concerns regarding public use opportunities on the Complex such as increased opportunities for public use facilities, administrative facilities and increased access. Some individuals would like to see more opportunities for photography and viewing areas with information about refuge habitats. Individuals expressed a desire to expand DEEP into additional school districts. Some individuals would also like to have additional canoe and kayak launch sites available for accessing water bodies adjacent to and within the Complex.

2.2.5 Facilities Issues

The Complex is comprised of three wildlife refuges and a headquarters office Stringfellow Unit of San Bernard NWR outside Brazoria, TX. A Complex manager oversees a number of employees with duties toward all refuges and the individual refuge managers.

Brazoria NWR - The Otter Slough headquarters consists of the refuge's field office, maintenance and equipment storage facilities which is located off FM 2004, Angleton, TX. The office has eight individual offices and supports field operations including management, maintenance, fire, and law enforcement.

San Bernard NWR - The field headquarters of San Bernard NWR is located on CR 306, near Brazoria, TX. The field headquarters include the refuge's office and fire office, maintenance and epuipment storage facilites and storage sheds, one quarters, two volunteer recreational vehicle pads, and a communications tower (repeater).

Big Boggy NWR - The primary facility resources on Big Boggy NWR are habitat management and resource protection related. No developed infrastructure occurs on this refuge.

Members of the public and the planning team have concerns about the Complex's facilities. There is a need to repair and update some roads and trails and build greening infrastructures to help mitigate climate change impacts. The Complex desires to upgrade and construct additional facilities to support volunteer program and public use opportunities. The additions of administrative facilities to support various refuge programs would be beneficial.

2.4 Develop and Analyze Alternatives

The practice of developing management alternatives as a part of the planning process is derived from NEPA. This act requires federal agencies to consider the impacts of proposed actions and to develop a reasonable range of alternatives to those actions. Alternatives are

"different sets of objectives and strategies or means of achieving refuge purposes and goals, helping to fulfill the Refuge System mission, and resolving issues" (602 FW 1 of the Service Manual). The planning team developed a range of alternatives that respond to the planning issues and eliminated alternatives that did not meet each refuge's purposes or that were outside the Service's ability to implement. The effects of the alternatives were analyzed and presented in Chapter 4 of the EA found in Appendix B.

2.5 Prepare Draft CCP and EA

The Draft CCP and EA were prepared concurrently. The Draft CCP and EA were then submitted for internal review, submitted to TPWD for review, then released to the public for a 30-day review period. The public was informed of the release through a notice in the Federal Register as well as through local media outlets.

2.6 Prepare and Adopt Final CCP

Comments received on this Draft CCP and EA will be incorporated where appropriate, and perhaps result in modifications to the proposed action or selection of one of the other alternatives. The alternative ultimately selected will be the basis for the Final CCP. The Final CCP will provide an appendix with responses to comments received during public review and will replace current management direction after the decision document is signed (see section 1.6, Decision to be Made, of Appendix B, Environmental Assessment).

2.7 Implement Plan, Monitor, and Evaluate

The Final CCP will guide management of the Complex over the coming 15-year period. It will guide the development of more detailed step-down management plans for specific resource areas and will be the basis for the annual budgeting process for operations and maintenance (Chapter 5). Most importantly, it lays out the general approach to managing habitat, wildlife, and people at the Complex that will direct day-to-day decision-making and actions.

A critical component of management is monitoring and measuring resources and social conditions to make sure that the Complex makes progress towards meeting its goals. Monitoring also detects new problems, issues, or opportunities to address. The Complex is using an adaptive management approach, which means that information gained from monitoring is used to evaluate and, as needed, to modify Complex objectives.

2.8 Review and Revise Plan

Agency policy directs that the Complex review the CCP annually to assess the need for changes. The Complex will revise the CCP when significant new information becomes available, ecological conditions change, or upon identification of the need to do so during the annual review. If major changes are proposed, the Complexe may hold public meetings, or new environmental assessments and environmental impact statements may be necessary. Consultation with appropriate state agencies would occur at least every 15 years.