

II. ALTERNATIVES

Formulation of Alternatives

Alternatives are different approaches or combinations of management objectives and strategies designed to achieve the refuge purpose, vision, and goals identified in the comprehensive conservation plan; the priorities and goals of the Central Gulf Ecosystem Team; the goals of the National Wildlife Refuge System; and the mission of the Fish and Wildlife Service. Alternatives are formulated to

address the significant issues, concerns, and problems identified by the Service and the public during the scoping process.

The three alternatives identified and evaluated represent different approaches to provide permanent protection, restoration, and management of fish, wildlife, plants, habitats, and other resources. A major consideration in the formulation of alternatives is the Service's ability to obtain sufficient proprietary interests to manage forests and forested wetlands necessary to serve as stop-over and breeding habitat for important wildlife species. Private landowners and wildlife managers recognize the multiple ecological, social, and economic values of functional forest ecosystems.



Controlled burn
USFWS Photo

The staff assessed biological conditions and analyzed external relationships affecting the refuge. This information contributed to the development of goals and objectives and, in turn, alternative formulation. As a result, each alternative presents different sets of objectives and strategies for reaching long-term goals. Each alternative was evaluated based on how much progress it could make and how it could address core habitat issues, problems, and wildlife threats.

Problems and threats provide important perspective and guidance in developing alternatives. Trends in habitat and wildlife uses were evaluated, as was the capability of refuge habitat to support these uses. The vegetative change of forest structure from previous logging activities and various water development projects before the refuge was established contributed to the loss of wildlife habitat. Overall, the greatest risks to fish, wildlife, plants, and wildlife habitats in the Central Gulf Ecosystem are characterized by changes in forest structural composition and connectivity, and in the natural processes of the rivers and streams. As a result, the Service has identified restoration of forest structure and water management as important to address these risks.

Description of Alternatives

Serving as a basis for each alternative, goals and sets of objectives and strategies were developed that lead to the fulfillment of the refuge purpose and the National Wildlife Refuge System mission. Objectives are desired conditions or outcomes that are grouped into sets, and for this planning effort, consolidated into three alternatives. These alternatives, overall, represent a range of different approaches for managing the refuge. Plans are revised every 15 years, or earlier if monitoring and evaluating indicate that changes are needed. A list of goals follows the summary descriptions which is the same for each alternative, with varying objectives and strategies formulated for each alternative. The three management alternatives are described in the following paragraphs:

Alternative 1: (No Action) Manage wildlife and habitat with emphasis on old growth forest communities, maintaining education and recreation programs at current levels.

This alternative represents the status quo; e.g., no change from current management of the refuge. The refuge would continue with its existing forest management plan that emphasizes older-aged classes of trees and late successional wildlife communities (Fig. 13). This alternative would maintain 26,470 acres of pine and pine/hardwood forest habitats. Of this, approximately one percent would be regenerated every year to ensure an adequate distribution of age classes. This is equivalent to a rotation age of 100 to 120 years for all pine and pine/hardwood stands. This management provides more than adequate habitat for red-cockaded woodpeckers and other species dependent on mature pine habitat. Stands would continue to be thinned as necessary to guard against catastrophic southern pine beetle attacks and to provide optimum habitat for red-cockaded woodpeckers. Understory hardwoods would be controlled primarily by prescribed burning on a 1- to 4-year cycle.

Management under this alternative would maintain 15,308 acres of hardwood forest habitat. This forest type would be regenerated at approximately 0.5 percent per year, which is equivalent to a rotation age of 200 to 300 years. This management emphasizes providing habitat for forest nesting birds dependent on mature hardwood forests and adequate habitat for resident and migratory waterfowl. Stands would be thinned when necessary to remove less desirable hardwood species in favor of hard- and soft-mast producing species. Hydrology in bottomland hardwoods would be maintained primarily by controlling beaver populations and removing their dams when needed.

Waters and wetlands would be managed under current policies. This includes manipulating water levels in both Bluff and Loakfoma lakes (total of 1,900 acres) to provide waterfowl food plants. Moist-soil areas (total of 300 acres) would be disced, planted, and flooded as necessary to provide waterfowl foods and habitat conditions. Water levels in the four greentree reservoirs (total of 1,150 acres) would be managed to provide habitat for wintering waterfowl. The current water quality monitoring program would continue with stations at Hollis and Browning creeks. Exotic and invasive species such as water lotus would be controlled as needed to maintain habitat diversity.

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Field and grassland habitats would be maintained in current conditions. Morgan Hill Prairie Restoration Area would be maintained in a partially restored state that includes many native grasses and light-seeded broadleaf plants, but lacks heavy-seeded tuberous species. Other field areas would be maintained by mowing and burning, and by the current cooperative farming program. Force account farming would continue as a means of providing additional wildlife foods, such as millet, sorghum, winter rye, and wheat.

Management of the two established research natural areas would continue at the current level. The Old Robinson Road Research Natural Area was designated in 1959, and contains 46 acres of bald cypress forest. The Morgan Hill Research Natural Area was established in 1973, and contains 67 acres of red-cedar, pine, and hardwood forest. Both areas are currently excluded from active management (i.e., no timber management or prescribed fire is allowed) to preserve their natural character.

Figure 13. Alternative 1, Current Conditions



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The proposed wilderness would continue to be maintained as it has since 1974, when the proposal was transmitted to Congress for "Wilderness" designation. Final legislation to designate the area has not been forthcoming. In 2000, a wilderness inventory was conducted to review lands for potential wilderness characteristics. At that time, the proposed wilderness was mapped using Geographic Information System equipment. The decision was made to remove a portion along the eastern end that had been previously impacted by timber harvesting and construction of a levee, and that was situated very close to a private in-holding. The revised mapping indicated a total of 1,090 acres instead of the previous 1,200 indicated in a 1974 Environmental Impact Statement submitted to the Council on Environmental Quality and the public.

Fish and wildlife populations would continue to be managed at the current level. Management would continue to focus on trust species such as the endangered red-cockaded woodpecker and migratory birds such as waterfowl and late successional neotropical migrants. Current efforts to enhance the red-cockaded woodpecker population would continue, such as nest monitoring, cavity augmentation, and predator control—all directed towards reaching or exceeding a goal of 88 groups. Wood duck banding and nest box programs would continue in support of Service-wide efforts to monitor and enhance habitat for this waterfowl species. Neotropical migratory birds would be monitored as funds and staffing allow. Monitoring programs that track wading birds nesting in the rookeries in Bluff Lake as well as cormorants that roost there would continue.

White-tailed deer are the most prominent resident game species and their population would continue to be monitored through health checks and collection of harvest data. Population control is achieved through public hunting. This alternative includes forest management practices which are expected to maintain a deer population that can sustain an annual harvest of 400-600 per year. Wild turkey populations also are monitored by collecting harvest data, and current management provides for an annual harvest of approximately 50 turkeys per year. Harvest data are not collected for other types of game animals. The hunting program would continue to be coordinated with the Mississippi Department of Wildlife, Fisheries, and Parks to ensure that it is biologically sound and compatible with state regulations.

Other resident wildlife species such as amphibians, reptiles, and invertebrates would be monitored as funds and staff permit. No comprehensive surveys for these groups are included in this alternative.

Invasive, exotic, and nuisance plant and animal species would be controlled as needed to ensure they do not affect trust species. Currently, this includes controlling beaver and nutria populations through trapping, and controlling lotus, kudzu, and cogon grass with herbicides. Control programs are coordinated with state and federal agencies to ensure that the most effective methods are used.

Land acquisition would continue within the existing acquisition boundary to acquire the remaining 4,263 acres of private in-holdings. Landowners would continue to be contacted on a regular basis to determine interest and willing-seller status. No formal prioritization would be done for remaining acquisitions, rather they would continue as opportunities present themselves. Acquisitions through timber-for-land exchanges would continue as the refuge finds opportunities to work with loggers and timber companies.

Current partnerships that assist the refuge in accomplishing conservation objectives would continue. Partnerships have been established with several state and federal agencies, non-profit organizations, academic institutions, and private land managers. Existing partnerships include: Georgia Pacific; Barge Lumber Company; U.S. Forest Service including Tombigbee National Forest; Mississippi Forestry Commission; Natchez Trace Parkway; Natural Resources Conservation Service; Farm Service Agency; Starkville City School District; Mississippi State University; Ducks Unlimited; Quails Unlimited; and the Sierra Club.

Existing recreation and education program activities and facilities would continue under this "no action" alternative. For example, the refuge would continue to provide a range of hunting and sport fishing opportunities. Similarly, wildlife observation and photography would occur at current levels. Recreational use would likely remain stable, and because of the on-going partnership with Starkville School District, environmental educational would likely increase.

Cultural resources would be managed at current levels. Cultural resource surveys would be conducted on an as-needed basis, as there has been no comprehensive survey or mapping of cultural resource sites.

Staff numbers and activities would be managed at current levels (Fig. 14). New construction to enhance environmental education, major maintenance projects, and equipment replacements would continue as funding is allocated.

The "no action" alternative provides a baseline against which the two action alternatives can be compared. This alternative reflects a continuation of existing programs and activities until such time the plan is revised.

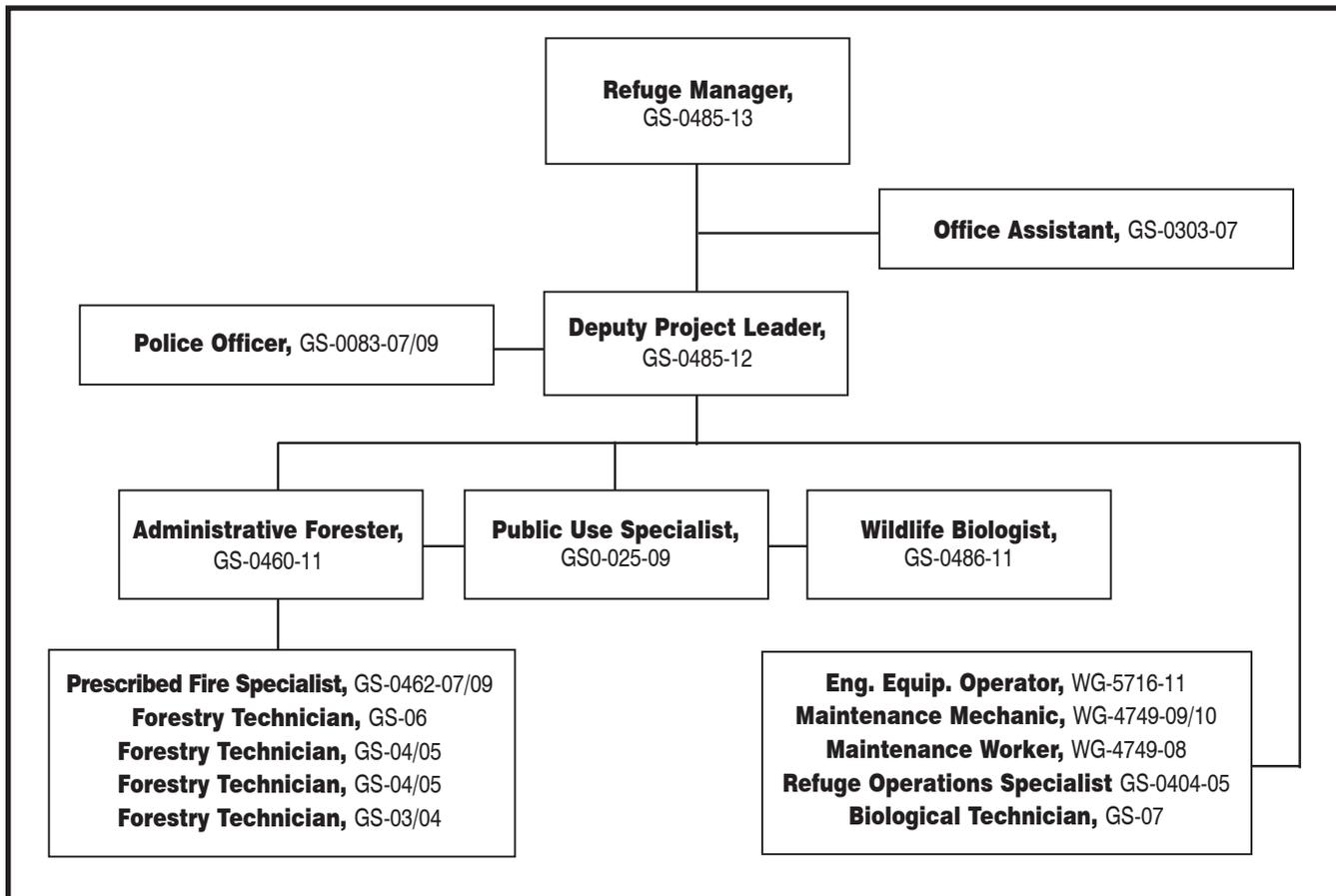
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Alternative 2: (Proposed Action) Manage wildlife and habitat with emphasis on old growth forest communities, increasing education and recreation programs.

This alternative represents the Service's proposed management action. Under this alternative, all current management activities would continue, and some programs would be substantially expanded. The refuge would continue with its existing forest management plan that emphasizes older-aged classes of trees and late-successional wildlife communities (Fig.15).

This alternative would maintain 26,470 acres of pine and pine/hardwood forest habitats. Of this, approximately 1 percent would be regenerated every year to ensure an adequate distribution of age classes. This is equivalent to a rotation age of 100 to 120 years for all pine and pine/hardwood stands. This management provides more than adequate habitat for red-cockaded woodpeckers, as well as other species dependent on mature pine habitat. Stands would continue to be thinned as necessary to guard against catastrophic southern pine beetle attacks and to provide optimum habitat for red-cockaded woodpeckers. Understory hardwoods would be controlled primarily by prescribed burning on a 1- to 4-year cycle.

Figure 14. Alternative 1, Staffing Chart

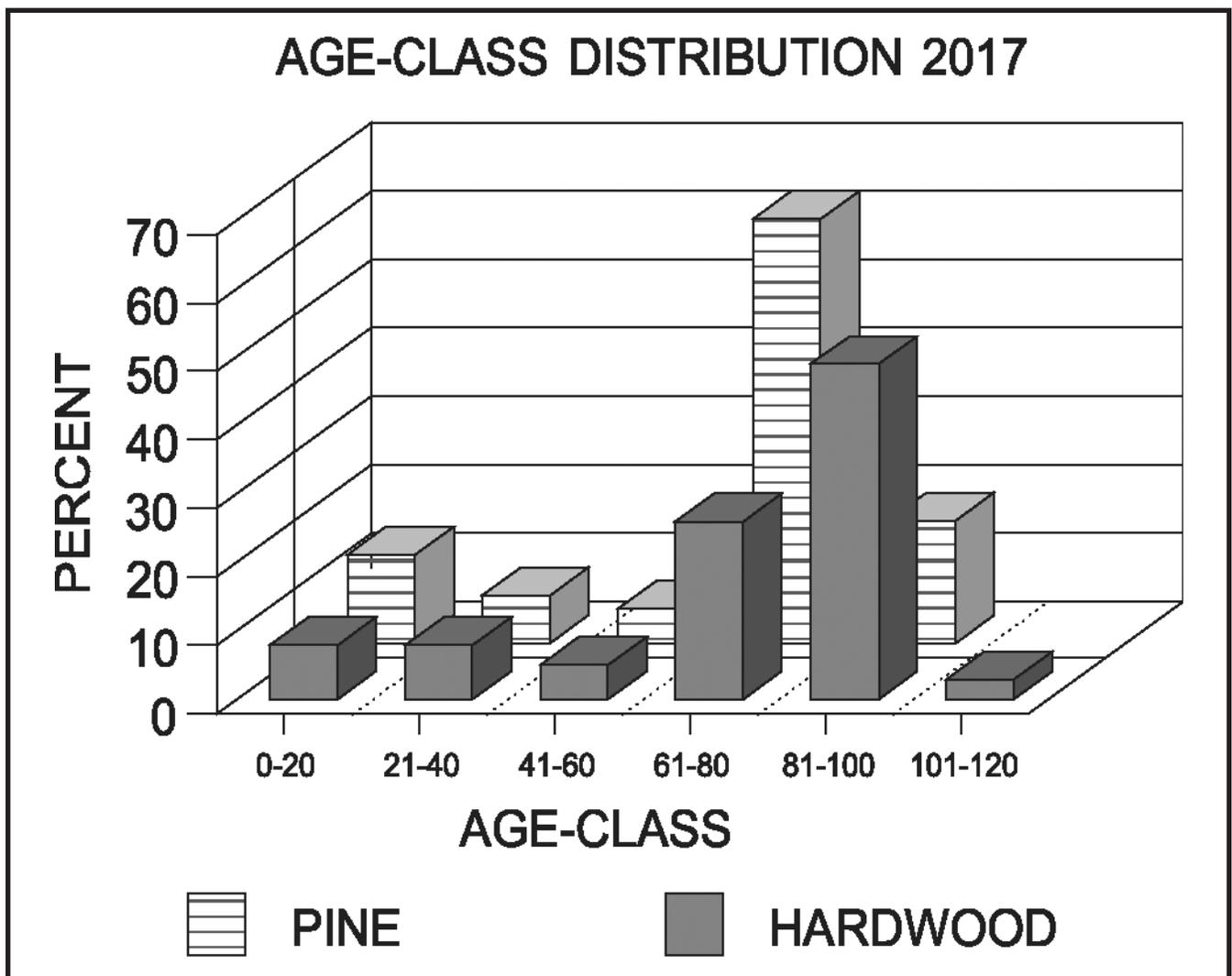


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This alternative would maintain 15,308 acres of hardwood forest habitat. This forest type would be regenerated at approximately 0.5 percent per year, which is equivalent to a rotation age of 200 to 300 years. This management emphasizes providing habitat for forest nesting birds dependent on mature hardwood forests and adequate habitat for resident and migratory waterfowl. Stands would be thinned when necessary to remove less desirable hardwood species in favor of hard- and soft-mast producing species. Hydrology in bottomland hardwoods would be maintained primarily by controlling beaver populations and removing their dams when needed.

Waters and wetlands would be managed under current policies. In addition to the activities described under Alternative 1, two new projects would be implemented. The North Levee extension at Bluff Lake would be constructed to improve water management capabilities and restore historical water flows to Oktoc Creek. The water quality monitoring program would be expanded beyond Hollis and Browning creeks to include all major waterways on the refuge.

Figure 15. Alternative 2, Proposed Conditions



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American lotus
USFWS Photo

Field and grassland habitats would be maintained essentially the same as in Alternative 1. However, there would be new projects designed to fully restore the Morgan Hill Prairie Restoration Area by reintroducing some of the heavier seeded tuberous plant species.

Management of the two established research natural areas would continue as in Alternative 1. However, this alternative would also include the evaluation of two additional areas, Pete's Slough and Douglas Bluff, as possible research natural areas. Also, formal research objectives and management strategies would be developed for all research natural areas.

Management of the proposed wilderness would be identical to Alternative 1.

Fish and wildlife populations would be managed as proposed in Alternative 1, except there would be additional surveys and monitoring for other resident wildlife species such as amphibians, reptiles, and invertebrates.

Current efforts to control invasive, exotic, and nuisance plant and animal species would continue under this alternative, and there would be additional efforts directed towards controlling Chinese privet and bicolor lespedeza, two species which are becoming increasingly abundant on the refuge.

This alternative would involve substantial changes in the land protection program. Not only would the refuge continue efforts to acquire the remaining 4,263 acres of private in-holdings remaining within the existing acquisition boundary, it would expand the boundary to include an additional 5,169 acres. The proposed expansion area on the north side of the refuge includes species associated with upland pine forests such as the pine warbler. The endangered red-cockaded woodpecker is found near the northern refuge boundary. The proposed expansion area on the east side of the refuge includes species associated with bottomland and riverine habitats.

Current partnerships that assist the refuge in accomplishing its conservation objectives would continue under this alternative, as would coordination with the Service's private lands' biologist to implement the Partners for Fish and Wildlife Program and other conservation programs. Communication with local landowners and community groups to promote wildlife conservation also would continue.

The existing recreation and education programs would continue under this alternative; however, some programs would be substantially expanded. New projects would include constructing additional hunting blinds and a fishing pier for people with disabilities, renovating the boat ramps at both Bluff and Loakfoma lakes, and developing additional vehicle pull-offs and parking areas to facilitate safe access for hunters, anglers, and other visitors. Wildlife observation and photography opportunities would be enhanced under this alternative by the addition of an auto tour trail.

Interpretive and educational programs would expand under this alternative. The refuge would increase the number of on-site interpretive events annually from 5-10 to approximately 15. There would also be an increase in programs delivered off-site. Additional interpretive kiosks would be constructed along Highway 25 and at Morgan Hill. The ongoing partnership with the Starkville School District to provide environmental education would expand as staff from both the refuge and school district would seek funding for additional construction phases (dormitory and cafeteria). Under this alternative, emphasis would also be placed on developing a Refuge Friends Group and increasing the number of refuge volunteers, both to assist with environmental education programs and other management programs.

This alternative includes numerous changes to the cultural resource management program. For instance, rather than conducting individual cultural resource surveys for specific projects, a comprehensive refuge-wide survey would be accomplished by the year 2005. In addition, a bibliography of scientific reports and articles pertaining to the area's cultural resources would be assembled. Law enforcement and managerial staff would receive additional training in cultural resource law. An archaeologist would be added to the staff to implement a comprehensive cultural resource management program including a greatly expanded educational component. Partnerships would be developed with other agencies and ethnic groups (e.g., Choctaw Nation, African American groups, etc.), to improve management of cultural resources.

Substantial increases in equipment and facilities would be required to implement this alternative. A total of 12 additional staff positions are identified.

Alternative 3: (Proposed Action) Manage wildlife and habitat with emphasis on early successional forest communities, increasing education and recreation programs.

This alternative emphasizes providing early successional forest habitat and increases in certain education and recreation programs. Under this alternative, forest management on 22,000 acres of pine and pine/hardwood forests would be directed towards providing old-growth pine habitat adequate to support the refuge's goal of 88 red-cockaded woodpecker groups. However, management on the remaining 4,470 acres of pine and pine/hardwood forests would be directed towards providing early successional habitat for neotropical migrant birds and certain game species. Similarly, management of the 15,308 acres of hardwood forests would also be directed towards providing early successional habitat. In both cases, this increase would be accomplished by decreasing the rotation age of these forest stands to approximately half the current age, thereby regenerating approximately twice as much acreage per year (Fig. 16).

Waters and wetlands management is identical to the description found in Alternative 2.

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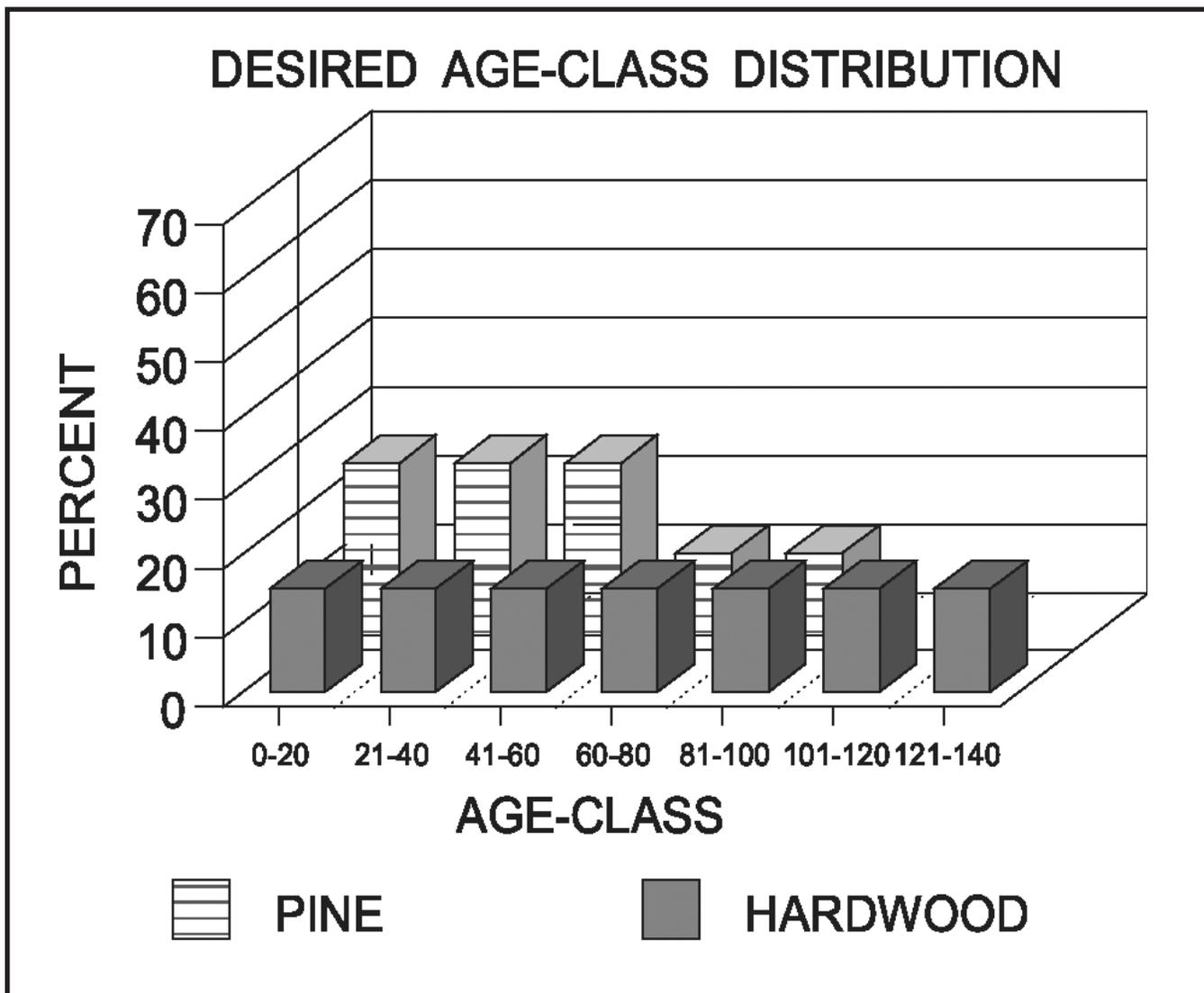
Grassland and field management is identical to the description found in Alternative 2; however, an attempt would be made to increase the cooperative farming program, thus reducing the amount of staff farming.

Management of the proposed wilderness would be identical to Alternatives 1 and 2.

Management of the research natural areas would differ from Alternative 1, in that specific research objectives and strategies would be established for them. Unlike Alternative 2, this alternative includes no provisions for evaluating additional areas for research natural area status.

Population levels of some trust species would differ from levels under the other two alternatives. As described in the habitat management objectives A.1 and A.2, management of 22,000 acres of pine and pine/hardwood forests would be directed towards providing

Figure 16. Alternative 3, Proposed Conditions



adequate habitat for the refuge goal of 88 groups of red-cockaded woodpeckers, but would preclude any chance of exceeding this goal. Management of remaining acreage would be directed at creating early successional habitat for neotropical migratory birds such as prairie warblers, Kentucky warblers, yellow-billed cuckoos, gray catbirds, hermit thrush, etc. Population levels of other trust species, such as waterfowl, would be the same as Alternative 2. Monitoring efforts for all species and species groups would be the same as Alternative 2.

As mentioned before, some resident species such as deer would probably benefit from the forest management described in this alternative. The increase in early successional vegetation would probably elevate the deer population to a level that would require an increased harvest of 500-700 per year. The wild turkey population would likely remain the same, capable of sustaining a harvest of approximately 50 per year. The quail and rabbit population also would likely increase, but there would probably be a decrease in the squirrel population. Monitoring efforts for all resident species would be the same as Alternative 2.

Control of invasive, exotic, and nuisance plants and animals would be the same as Alternative 2.

Land protection and conservation efforts would be the same as Alternative 2.

Conservation partnerships would be managed the same as Alternative 2.

The hunting program would be managed identical to Alternative 2, except there would be increased hunting opportunities for deer, quail, and rabbit, and less opportunity for squirrel.

The fishing program would be managed similar to Alternative 2, except there would be an increase in stocking to maintain sufficient game fish populations capable of sustaining increased fishing pressure.

Opportunities for wildlife observation, wildlife photography, and environmental education and interpretation would remain the same as Alternative 2.

Cultural resources would be managed the same as Alternative 2.

Administrative needs, such as equipment, facilities, and staff would be identical to Alternative 2.

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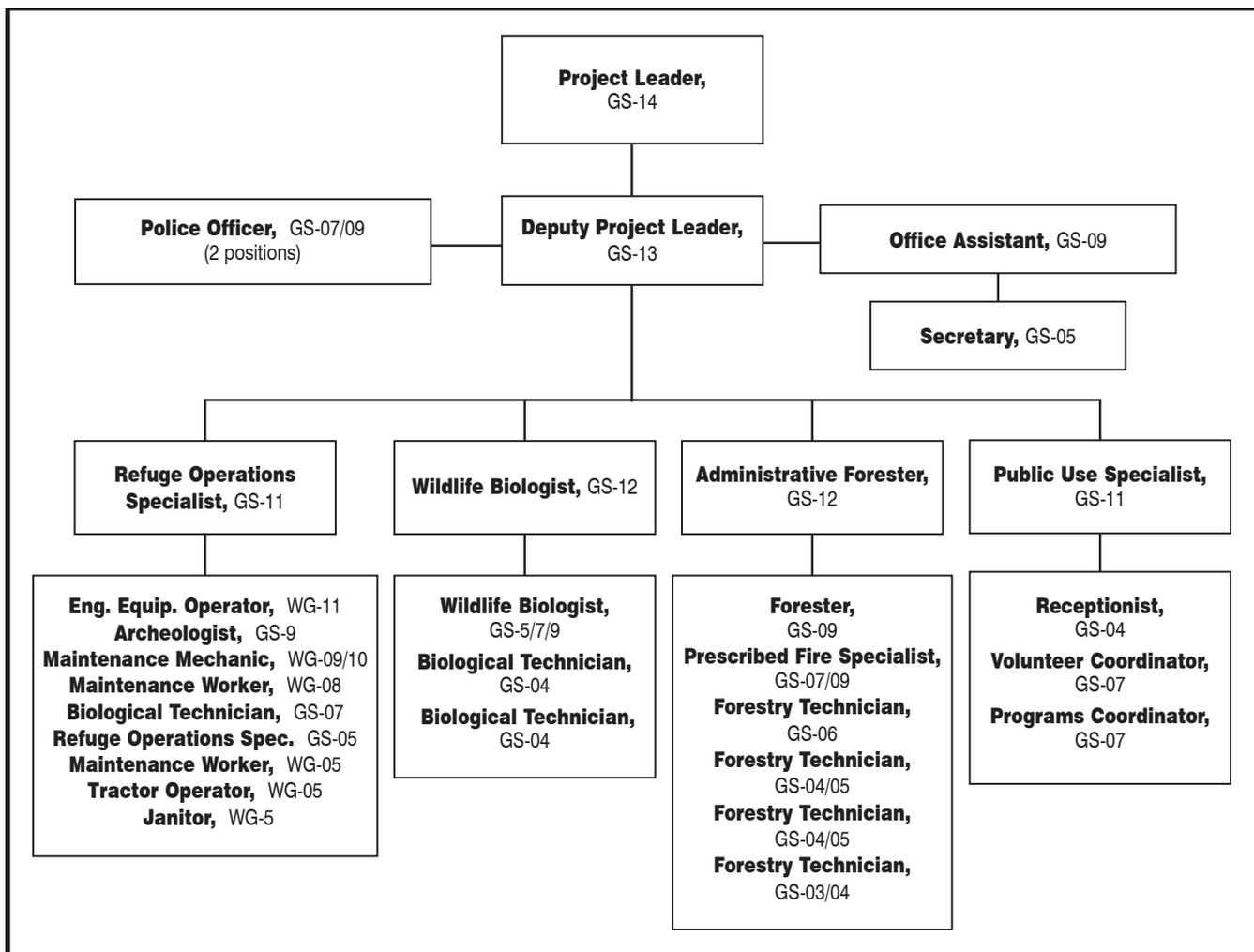
Features Common to All Alternatives

All three alternatives, including the "no action" alternative, incorporate several concepts and management techniques intended to achieve the species, habitat, education, and recreation goals of the refuge.

These include the following:

- Restoring native habitats;
- Establishing, maintaining, and improving partnerships with landowners and local, state, and federal agencies and organizations;
- Coordinating management actions with local and state land and resource management agencies;
- Monitoring breeding red-cockaded woodpecker populations in partnership with others;
- Removing non-native invasive plants;
- Encouraging scientific research on the refuge; and,
- Exploring expansion of the refuge boundary.

Figure 17. Alternatives 2 and 3, Staffing Chart



Under the National Wildlife Refuge System Improvement Act of 1997, specific management direction is expressed in terms of objectives and strategies. Refuge goals are broad, open-ended statements of refuge emphasis and direction. In contrast, refuge objectives are concise statements of what will be achieved to help meet a particular refuge goal. When possible, refuge objectives should be measurable, clear, specific, and feasible within the 15-year time frame of the comprehensive conservation plan. Refuge strategies describe specific actions or combinations of actions that can be used to meet an objective. In some cases, strategies describe specific projects in enough detail to assess funding and staffing needs. In other cases, further site-specific detail is required to implement a strategy, usually in the form of a step-down management plan.

Refuge goals are common among all alternatives. The summary of alternatives on the following pages represents different combinations of objectives and strategies. The proposed objectives and strategies in the summary apply to each common goal.

Serving as a basis for each alternative, goals and sets of objectives and strategies were developed to fulfill the refuge purpose and the National Wildlife Refuge System mission. Objectives are desired conditions or outcomes that are grouped into sets for this planning effort, and consolidated into three alternatives. These alternatives, overall, represent a range of different management treatments or approaches for managing the refuge over a long-term period with plan review occurring every 5 years, and revised as needed.

Comparison of Alternatives

The following table provides a detailed comparison of Alternative 2, the proposed action, and the alternatives to the proposed action.

Figure 18. Comparison of Alternatives

<p>Habitats</p> <p><i>Goal A.</i> Perpetuate a diversity of high quality, more natural-like communities as habitats for trust and resident species</p>
<p><i>Objective A.1</i> Pine and Pine/Hardwood Forest Stands</p>

Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3 (Proposed Action)
<p>Maintain 26,470 acres of pine and pine/hardwood forests with emphasis on providing habitat for the red-cockaded woodpecker and other wildlife dependent on late successional pine habitat.</p> <p>Strategies:</p> <p>Evaluate pine and pine/hardwood compartments every 10 years; Ensure regeneration of approximately 1 percent of pine and pine/hardwood acreage every year; Monitor active and artificial cluster areas and regulate basal areas to 50-80; Monitor remaining area, and when basal area exceeds 100, thin to 75-85, primarily to guard against devastating attacks by southern pine beetles; Reduce and prevent mid-story development primarily through prescribed burning on a 1- 4-year cycle and using mechanical control when necessary. Continue to research effects of prescribed burning on individual plant and animal species and on natural communities.</p>	<p>Same as Alternative 1</p> <p>Strategies:</p> <p>Same as Alternative 1</p>	<p>Maintain 22,000 acres of older age class pine and pine/hardwood forests to support red-cockaded woodpecker populations, and emphasize early successional age classes on remaining 4,470 acres in support of migratory birds and resident wildlife.</p> <p>Strategies:</p> <p>Evaluate pine and pine/hardwood compartments every 10 years; Ensure regeneration of approximately 2 percent of pine/hardwood acreage each year; Monitor active and artificial cluster areas and regulate basal areas to 50-80; Monitor remaining area, and when basal area exceeds 100, thin to 75-85, primarily to guard against devastating attacks by southern pine beetles; Reduce and prevent mid-story development through mechanical means and prescribed burning on a 1- to 6-year cycle; Continue to research effects of prescribed burning on individual plant and animal species, as well as effects on natural communities.</p>

Objective A.2 Hardwood Forests

Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3 (Proposed Action)
<p>Maintain species diversity within 15,308 acres of hardwood forest stands and increase overall mast production and regeneration of mast producing species. This would follow the current Forest Management Plan designed to emphasize older age classes that support late successional migratory birds and resident wildlife.</p> <p>Strategies:</p> <p>Evaluate bottomland hardwood compartments every 15 years; Ensure regeneration of approximately 0.5 percent of hardwood acreage per year; Regulate stand composition to favor hard- and soft-mast producing trees; Restore hydrology where needed (through beaver control and dam removal) to minimize water retention during the growing season.</p>	<p>Same as Alternative 1</p> <p>Strategies:</p> <p>Same as Alternative 1</p>	<p>Maintain species diversity within 15,308 acres of hardwood forest stands and increase overall mast and browse production. This would include revising the current Forest Management Plan so as to emphasize younger-aged classes that support early successional migratory birds and resident wildlife.</p> <p>Strategies:</p> <p>Evaluate bottomland hardwood compartments every 15 years; Ensure regeneration of approximately 1 percent of hardwood acreage per year; Regulate stand composition to favor hard- and soft-mast producing trees; Restore hydrology where needed (through beaver control and dam removal) to minimize water retention during the growing season</p>

Objective A.3 Waters and Wetlands

Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
<p>Maintain existing species diversity of 300 acres of moist-soil impoundments, 1,900 acres of lakes, and 1,150 acres of greentree reservoirs with emphasis on supporting habitat for migratory birds (e.g., wood ducks and mallards), colonial nesting birds and native aquatic fauna; continue quality monitoring of Hollis and Browning creeks.</p> <p>Strategies:</p> <p>Manipulate water levels to favor moist-soil plant production; Disc, plow, plant units; Control exotic, invasive, and nuisance plant species where appropriate; Control beaver populations and remove dams where appropriate; Continue monitoring of herptifauna and mussel populations; Continue monitoring water quality at Hollis and Browning creeks.</p>	<p>Maintain existing species diversity of 300 acres of moist-soil impoundments, 1,900 acres of lakes, and 1,150 acres of greentree reservoirs with emphasis on supporting habitat for migratory birds (e.g., wood ducks and mallards), colonial nesting birds, and native aquatic fauna; restore historical water flow to Oktoc Creek below Bluff Lake spillway to enhance paddlefish populations; and develop a comprehensive water quality monitoring program refuge-wide.</p> <p>Strategies:</p> <p>Manipulate water levels to favor moist-soil plant production; Disc, plow, plant units; Control exotic, invasive, and nuisance plant species where appropriate; Control beaver populations and remove dams where appropriate; Continue monitoring of herptifauna and mussel populations; Develop water quality monitoring program assessing the impact of environmental contaminants affecting the refuge; Work with USGS to install water gauge on Noxubee River.</p>	<p>Same as Alternative 2.</p> <p>Strategies:</p> <p>Same as Alternative 2.</p>

Objective A.4 Fields/Grasslands

Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
<p>Maintain fields and grasslands, including 958 acres of partially restored prairie habitat (grasses and light-seeded broadleaf) at Morgan Hill.</p> <p>Strategies:</p> <p>Maintain open nature of fields and grasslands using prescribed fire, mowing, and farming; Supplement natural food production using traditional farming operations, the current cooperative farming program, and integrated management practices.</p>	<p>Maintain fields and grasslands and continue restoration of 958 acres of grassland/prairie habitat (grasses and light- and heavy-seeded broadleaf and tuberous perennials) at Morgan Hill.</p> <p>Strategies:</p> <p>Maintain open nature of fields and grasslands using prescribed fire, mowing, and farming; Supplement natural food production using traditional farming operations, the current cooperative farming program, and integrated pest management practices; Re-establish heavy-seeded and tuberous perennials to complete restoration at Morgan Hill.</p>	<p>Same as Alternative 2.</p> <p>Strategies:</p> <p>Maintain open nature of fields and grasslands using prescribed fire, mowing, and farming; Supplement natural food production using traditional farming operations, an increased cooperative farming program, and integrated pest management practices; Re-establish heavy-seeded and tuberous perennials to complete restoration at Morgan Hill.</p>

Objective A.5 Research Natural Areas and Wilderness

Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
<p>Continue current management of two research natural areas (46-acre bald cypress swamp and 67-acre red cedar/pine/hardwood) and one wilderness study area (1,090 acres) within the guidelines of the Fish and Wildlife Service Manual and complete a wilderness review and study for the wilderness study area</p> <p>Strategies:</p> <p>Coordinate research efforts with scientists and the research community; Prohibit forest management in research natural areas and wilderness study area; Maintain foot trail access to wilderness study area; Coordinate wilderness review with the public.</p>	<p>Same as Alternative 1</p> <p>Strategies:</p> <p>Coordinate research efforts with scientists and the research community; Prohibit forest management in research natural areas and wilderness study area; Maintain foot trail access to wilderness study area; Coordinate wilderness review with the public; Develop research objectives and management strategies for research natural areas; Evaluate Pete's Slough and Douglas Bluff as candidates for research natural area designations.</p>	<p>Same as Alternative 1</p> <p>Strategies:</p> <p>Coordinate research efforts with scientists and the research community; Prohibit forest management in research natural areas and wilderness study area; Maintain foot trail access to wilderness study area; Coordinate wilderness review with the public; Develop research objectives and management strategies for research natural areas.</p>

Fish and Wildlife Populations

Goal B. Continue to protect, maintain, and enhance populations of trust and native plant and animal species within the guidelines of the Central Gulf Ecosystem Five-Year Action Plan, the Red-Cockaded Woodpecker Recovery Plan, the North American Waterfowl Plan, Partners-In-Flight Plan, and the Noxubee National Wildlife Refuge Forest Management Plan.

Objective B.1 Trust Species

Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
<p>Monitor and maintain healthy populations of red-cockaded woodpeckers, waterfowl, and other migratory birds (with emphasis on late-succession neotropical migratory birds) and conduct refuge inventory and monitoring to evaluate and improve management practices for trust species on refuge lands.</p> <p>Strategies:</p> <p>Continue monitoring, cavity augmentation, and predator control for red-cockaded woodpeckers to reach or exceed population target of 88 groups; Monitor waterfowl populations as part of the Service's efforts to track continental populations and to determine responses to management actions, to include regular waterfowl surveys as well as monitoring wood duck boxes; Monitor populations of other migratory birds through breeding bird point counts as part of the Service's Partners-in-Flight program and to determine species responses to management actions (emphasis on late-succession neotropical migrant birds); Monitor wading birds as appropriate; Maintain approximately 150 wood duck nest boxes; Annually band 200 pre-season wood ducks in support of Service monitoring efforts; Continue monitoring populations of cormorant roosts in cooperation with USDA, Division of Wildlife Services.</p>	<p>Same as Alternative 1</p> <p>Strategies:</p> <p>Same as Alternative 1</p>	<p>Monitor and maintain healthy populations of red-cockaded woodpeckers, waterfowl, and other migratory birds (with emphasis on early-successional neotropical migratory birds), and conduct refuge inventory and monitoring to evaluate and improve management practices for trust species on refuge lands.</p> <p>Strategies:</p> <p>Continue monitoring, cavity augmentation, and predator control for red-cockaded woodpeckers to reach population target of 88 groups; Monitor waterfowl populations as part of the Service's efforts to track continental populations and to determine responses to management actions, to include regular waterfowl surveys as well as monitoring wood duck boxes; Monitor populations of other migratory birds through breeding bird point counts as part of the Service's Partners-in-Flight program and to determine species responses to management actions (emphasis on early-successional neotropical migrant birds); Monitor wading birds as appropriate; Maintain approximately 150 wood duck nest boxes; Annually band 200 pre-season wood ducks in support of Service monitoring efforts; Continue monitoring populations of cormorant roosts in cooperation with Animal Damage Control.</p>

Objective B.2 Resident and Other Species

Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
<p>Manage to maintain healthy, resident wildlife populations including white-tailed deer (average harvest range 400-600 deer) and turkey.</p> <p>Strategies:</p> <p>Coordinate hunting regulations for resident wildlife with state agencies to maintain population health and stability; Monitor and manage the population of white-tailed deer and waterfowl at current levels; Identify and implement management activities to benefit bob-white quail and other early-successional wildlife species; Identify thresholds of disturbance and develop associated standards and techniques that can be applied, where appropriate, to reduce conflicts and achieve balance between the public and wildlife; Coordinate management and safety issues with Service public use specialists and game enforcement officials.</p>	<p>Same as Alternative 1.</p> <p>Strategies:</p> <p>Same as Alternative 1.</p>	<p>Manage to maintain healthy resident wildlife populations, and enhance white-tailed deer (average harvest range 500-700 deer) and turkey.</p> <p>Strategies:</p> <p>Coordinate hunting regulations for resident wildlife with state agencies to maintain population health and stability; Monitor and manage the population of white-tailed deer and waterfowl at higher levels, primarily as a result of increased early successional habitat; Identify thresholds of disturbance and develop associated standards and techniques that can be applied, where appropriate, to reduce conflicts and achieve balance between the public and wildlife; Coordinate management and safety issues with Service public use specialists and game enforcement officials.</p>

Objective B.3 Exotic, Invasive, and Nuisance Plants and Animals

Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
<p>Control exotic, invasive, and nuisance species (e.g., beaver) to levels that do not negatively affect trust species.</p>	<p>Same as Alternative 1.</p>	<p>Same as Alternative 2.</p>
<p>Strategies:</p> <p>Maintain monitoring and control programs for exotic plant species that compromise habitat quality; Use integrated pest management techniques to reduce lotus, kudzu, and cogon grass infestations to levels that do not negatively affect trust resources or impede recreational uses of water bodies; Coordinate with the State to implement control programs; Coordinate results of information concerning success/failure of control treatments within and outside the agency, especially in regard to lotus and kudzu.</p>	<p>Strategies:</p> <p>Maintain monitoring and control programs for exotic plant species that invade/compromise habitat quality; Use integrated pest management techniques to reduce lotus, kudzu, and cogon grass infestations to levels that do not negatively affect trust resources; Develop an Integrated Pest Management Plan consistent with Beaver Control Plan; Coordinate results of information concerning success/failure of control treatments within and outside the agency, especially in regard to lotus and kudzu; Investigate control methods for Chinese privet and bicolor lespedeza.</p>	<p>Strategies:</p> <p>Same as Alternative 2.</p>

Land Protection and Conservation

Goal C. Protect and improve conditions for fish, wildlife, habitats, special management areas, and wilderness through the use of current land protection programs, laws, policies, and partnerships.

Objective C.1 Land Acquisition and Conservation Easements

Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
<p>Seek to acquire 4,263 acres of private land in-holdings within the existing approved acquisition boundary and continue managing nine Farmers Home Administration Conservation Easements.</p> <p>Strategies:</p> <p>Continue to utilize and seek partnerships with conservation organizations and others to complete acquisitions; Work with loggers and timber companies to conduct timber for land exchanges; Continue contact with all landowners within the refuge acquisition boundary to determine landowner interest and willing-seller status.</p>	<p>Seek to acquire 4,263 acres of private land in-holdings within the existing approved acquisition boundary and work to expand acquisition boundary to allow purchase of an additional 5,169 acres outside the current boundary. Also continue managing nine Farmers Home Administration Conservation Easements.</p> <p>Strategies:</p> <p>Establish a new acquisition boundary that would encompass an additional 5,169 acres; Establish acquisition priorities based upon habitat values and/or possible threats to existing resources; Initiate and continue contact with all landowners within the refuge acquisition boundary to determine landowner interest and willing-seller status; Continue to utilize and seek partnerships with conservation organizations and others to complete acquisitions; Work with loggers and timber companies to conduct timber-for-land exchanges.</p>	<p>Same as Alternative 2.</p> <p>Strategies:</p> <p>Same as Alternative 2.</p>

Objective C.2 Conservation Partnerships

Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
<p>Maintain conservation and research partnerships with state, nonprofit organizations, academia, and private land managers on the refuge and within the region.</p> <p>Strategies:</p> <p>Continue coordination with the Service's private lands biologist located in Jackson, Mississippi, to implement, locally, the Partners for Wildlife Program and other conservation programs available that offer incentives and technical assistance to landowners; Continue communication to promote wildlife conservation with landowners and community groups; Continue outreach techniques using Internet web page, newsletters, and local events; Participate in refuge system centennial outreach events and activities.</p>	<p>Maintain and develop new partnerships with states, tribes, nonprofit organizations, academia, private land managers, and businesses to broaden support for the refuge.</p> <p>Strategies:</p> <p>Increase participation and coordination with the Service's private lands biologist located in Jackson, Mississippi, to implement, locally, the Partners for Fish and Wildlife Program and other conservation programs available that offer incentives and technical assistance to landowners; Increase communication to promote wildlife conservation with landowners and community groups; Continue outreach techniques using Internet web page, newsletters, and local events; Participate in refuge system centennial outreach events and activities.</p>	<p>Same as Alternative 2.</p> <p>Strategies:</p> <p>Same as Alternative 2.</p>

Recreation and Education

Goal D. Maintain, develop, and support recreation and education opportunities that promote fish and wildlife conservation consistent with the Service mission, refuge purpose, and Service policy.

Objective D.1 Hunting

Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
<p>Where appropriate, provide hunting opportunities to manage deer populations (average annual harvest range 400-600 deer) and provide small game and waterfowl hunting opportunities.</p> <p>Strategies:</p> <p>Monitor deer populations via harvest data and periodic health checks to maintain a healthy population and sustainable harvest; Maintain well-defined boundaries around areas closed to hunting to ensure the safety of other refuge visitors and provide a high quality experience for the hunter; Annually review hunt regulations in coordination with Mississippi Department of Wildlife, Fisheries, and Parks' biologists to assist in achieving balanced and healthy game populations; Evaluate potential impacts of hunting on other refuge activities and programs;</p>	<p>Same as Alternative 1.</p> <p>Strategies:</p> <p>Monitor deer populations via harvest data and periodic health checks to maintain a healthy population and sustainable harvest; Maintain well-defined boundaries around areas closed to hunting to ensure the safety of refuge visitors and provide a high quality experience for the hunter; Annually review hunt regulations in coordination with Mississippi Department of Wildlife, Fisheries, and Parks' biologists to assist in achieving balanced and healthy game populations; Evaluate potential impacts of hunting on other refuge activities and programs; Develop additional hunting blinds for disabled hunters; Develop vehicle pull-offs and parking areas to facilitate safe access to hunting areas. Provide opportunities for youth to hunt waterfowl.</p>	<p>Where appropriate, provide hunting opportunities to manage deer populations (average annual harvest range 500-700 deer) and provide small game and waterfowl hunting opportunities.</p> <p>Strategies:</p> <p>Same as Alternative 2.</p>

Objective D.2 Fishing

Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
<p>Maintain sufficient game fish populations at Bluff and Loakfoama lakes to support an annual average of 13,000 angler-use days through natural reproduction, habitat management, regulated harvest, and stocking when appropriate.</p>	<p>Same as Alternative 1.</p>	<p>Same as Alternative 2.</p>
<p>Strategies:</p> <p>Evaluate fishery resource annually using staff from Mississippi State University; Coordinate stocking needs with Private John Allen National Fish Hatchery.</p>	<p>Strategies:</p> <p>Evaluate fishery resource annually using staff from Mississippi State University; Coordinate stocking needs with Private John Allen National Fish Hatchery; Develop fishing piers for wheelchair access; Renovate docks and boat ramps and provide access for the disabled persons at Bluff and Loakfoama lakes and Ross Branch Reservoir.</p>	<p>Strategies:</p> <p>Same as Alternative 2.</p>

Objective D.3 Wildlife Observation and Photography

Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
<p>Maintain overlooks, boardwalks, and trails, and provide special guided education tours each season.</p> <p>Strategies:</p> <p>Maintain hiking trails; Support Audubon Christmas Bird Count and other birding events; Support Xerces Fourth of July Butterfly Count; Advertise and maintain guided interpretive tours.</p>	<p>Restore and improve overlooks, boardwalks, and trails; provide special guided and education program tours each season; and seek funding to develop an auto tour route with interpretive panels to provide observation opportunities and develop key resource awareness.</p> <p>Strategies:</p> <p>Maintain hiking trails; Conduct Audubon Christmas Bird Count and other birding events; Advertise and maintain guided interpretive tours; Seek funding for auto tour route.</p>	<p>Same as Alternative 2.</p> <p>Strategies:</p> <p>Same as Alternative 2.</p>

Objective D.4 Interpretation

Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
<p>Continue managing interpretation opportunities including 5 to 10 events annually.</p> <p>Strategies:</p> <p>Conduct guided tours; Maintain restrooms and potable water faucets for visitors; Maintain interpretive and directional signs, Internet web site, brochures, newsletters, and public updates of upcoming events and conservation awareness and activities.</p>	<p>Increase interpretation activities by up to 15 events annually.</p> <p>Strategies:</p> <p>Conduct guided tours; Maintain restrooms and potable water faucets for visitors; Maintain interpretive and directional signs, Internet web site, brochures, newsletters, public updates of events, and conservation awareness and activities; Construct a vehicle pull-off and information kiosk on Highway 25; Construct information kiosk at Morgan Hill Overlook.</p>	<p>Same as Alternative 2.</p> <p>Strategies:</p> <p>Same as Alternative 2.</p>

Objective D.5 Environmental Education

Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
<p>Coordinate with Starkville School District, Mississippi State University, and civic groups to teach required curriculum, share expertise, and host meetings at the Environmental Education Center, refuge outdoor classroom, and off-site locations to support 10,000 students annually.</p> <p>Strategies:</p> <p>Maintain facilities and manage programs to support education activities; Continue providing off-site demonstrations and loaning portable exhibits to local garden clubs, school groups, retired citizens, and local nursing home and other groups.</p>	<p>Coordinate with Starkville School District, Mississippi State University, and civic groups to teach required curriculum, share expertise, and host meetings at the Environmental Education Center, refuge outdoor classroom, and off-site locations to support 15,000 students annually; initiate and support a Refuge Friends Group.</p> <p>Strategies:</p> <p>Seek funding to construct and operate the additional phases of the Environmental Education Center; Maintain facilities and manage programs to support education activities; Increase number of off-site programs and demonstrations to school groups, garden clubs, conservation clubs, retired citizens, etc.; Develop teaching materials and host teacher workshops to promote environmental education and basic curriculum in local schools; Encourage the development of a Refuge Friends Group and solicit volunteers to support environmental education programs.</p>	<p>Same as Alternative 2.</p> <p>Strategies:</p> <p>Same as Alternative 2.</p>

Cultural Resources

Goal E. Identify and protect cultural resources in accordance with state and federal historic preservation legislation and regulations.

Objective E.1 Surveys and Investigations

Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
<p>Maintain inventory of cultural resource sites located on the refuge.</p> <p>Strategies:</p> <p>Continue to collect and catalog information about cultural resource sites located on the refuge. Refuge staff will continue to gather such information, incidental to carrying out their primary duties.</p>	<p>Conduct a refuge-wide archaeological survey by the year 2005.</p> <p>Strategies:</p> <p>Conduct a comprehensive archaeological survey of the refuge and develop a GIS layer for the cultural resource sites; Produce an annotated bibliography of scientific reports and articles.</p>	<p>Same as Alternative 2.</p> <p>Strategies:</p> <p>Same as Alternative 2.</p>

Objective E.2 Protection

Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
<p>Minimize impacts to cultural resources resulting from management activities and protect cultural resources from looting and vandalism.</p> <p>Strategy:</p> <p>Maintain current levels of law enforcement to protect the refuge's cultural resources from looting and vandalism.</p>	<p>Develop and implement planning and law enforcement procedures to protect the refuge's cultural resources and diminish site destruction due to looting and vandalism.</p> <p>Strategies:</p> <p>Ensure that full-time refuge law enforcement officer completes Archaeological Resources Protection Act training course; Ensure that pertinent refuge staff complete the Section 106/Cultural Resources for Managers' training course.</p>	<p>Same as Alternative 2.</p> <p>Strategies:</p> <p>Same as Alternative 2.</p>

Objective E.3 Management and Education

Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
<p>Manage known cultural resources in a manner that preserves their historical integrity.</p>	<p>Manage known cultural resources in a manner that preserves their historical integrity and implement an educational program that will provide an understanding and appreciation of the human influence on the region's ecosystems.</p>	<p>Same as Alternative 2.</p>
<p>Strategy:</p> <p>Continue coordinating management activities with Service's Regional Archaeologist and State Historic Preservation Office.</p>	<p>Strategies:</p> <p>Establish an archaeologist position at the refuge to implement a comprehensive cultural resources management program. This position would compliment the existing Regional Archaeologist position and be shared with other stations on the west side of the refuge; Plan management activities so they prevent or minimize disturbance to known cultural resources, such as the Old Robinson Road National Historic Landmark, graveyards, encampments, church sites, home sites, etc.;</p> <p>Design environmental education and basic interpretive programs that explain refuge history and resources in the context of human influences;</p> <p>Work with local Native- and African-American communities to develop an education program regarding their cultural heritages.</p>	<p>Strategies:</p> <p>Same as Alternative 2.</p>

Objective E.4 Cultural Resource Partnerships

Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
<p>Continue coordinating with Native- and African-American groups through the State Historic Preservation Office when planning management activities.</p>	<p>Facilitate partnerships to manage cultural resources with the pertinent state and federal agencies, the State Historic Preservation Office, professional archaeologists, Native American and African American communities, and the general public.</p>	<p>Same as Alternative 2.</p>
<p>Strategy:</p> <p>Seek and evaluate the sentiments of Native American, African American, and other ethnic groups prior to implementing any management activity that may impact a site or landscape important to that group.</p>	<p>Strategies:</p> <p>Seek a Memorandum of Understanding with the U.S. Forest Service and Mississippi Department of Wildlife, Fisheries, and Parks to enhance law enforcement of the Archaeological Resources Protection Act, the Native American Grave Protection and Repatriation Act, and Section 50 of the Code of Federal Regulations, as well as facilitate investigations of Archaeological Resources Protection Act violations and unpermitted artifact collecting; Approach the Choctaw Nation and other pertinent Native American groups for information on and input into the management of cultural sites on the refuge; Identify potential avenues of archaeological and historic investigations and promote interdisciplinary research, such as the Jenkins' and Krause's investigations in the Tennessee-Tombigbee River Watershed; Expand existing partnership with Mississippi State University's Department of Anthropology to include more extensive surveys and research, and potentially the sponsorship of a graduate intern on the refuge. Negotiate an agreement with appropriate facilities for the permanent curation of archaeological collections and associated documentation derived from investigations on the refuge.</p>	<p>Strategies:</p> <p>Same as Alternative 2.</p>

Refuge Administration

Goal F. Develop, rehabilitate, implement, and maintain a comprehensive refuge facility, operations, and maintenance program responsive to supporting the management of fish and wildlife resources and the safety and experience of visitors

Objective F.1 Equipment and Facilities

Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
<p>Maintain and replace equipment, fleet, computer and communication systems, and upgrade refuge entrance roads and bridges, buildings, structures, trails, and signs as appropriations allow, and by utilizing existing partnerships to assist with funding.</p> <p>Strategies:</p> <p>Improve and maintain facilities to comply with safety standards and support biological, education, and visitor service program objectives; Continue cooperating with local and state highway officials to maintain and improve roadways; Educate local officials and Regional Office about refuge needs;</p>	<p>Improve and maintain equipment, fleet, computer and communication systems, refuge entrance roads, buildings, structures, trails, and signs as appropriations allow, and by utilizing existing partnerships and seeking additional ones to assist with funding.</p> <p>Strategies:</p> <p>Improve and maintain facilities to comply with safety standards and support biological, education, and visitor service program objectives; Continue cooperating with local and state highway officials to maintain and improve roadways; Update local officials and Regional Office as to refuge needs; Conduct Congressional briefings and tours as needed to communicate refuge needs.</p>	<p>Same as Alternative 2.</p> <p>Strategies:</p> <p>Same as Alternative 2.</p>

Objective F.2 Operations and Maintenance

Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3
<p>Utilize current funding and staff to support biological programs as appropriations allow and continue using adaptive management and research to evaluate effectiveness of wildlife conservation programs.</p> <p>Strategies:</p> <p>Utilize current staff to implement the best management programs at current levels; Manage volunteer and student intern programs in such a manner that they compliment existing staff efforts as well as provide meaningful and educational opportunities of volunteers and interns; Provide employee training as necessary to meet mandatory requirements.</p>	<p>Increase staff and seek funding to improve expertise, address inadequacies, orient research to articulate funding shortfalls, and ensure adequate funding support for management of trust species.</p> <p>Strategies:</p> <p>Add 12 staff positions necessary to fully implement management programs; Manage a comprehensive employee training program to ensure adequate expertise in all program areas; Manage volunteer and student intern programs in such a manner that they complement existing staff efforts, as well as provide meaningful and educational opportunities; Seek increases in refuge funding to support additional operations and maintenance activities as identified for each program area; Encourage the development of a Refuge Friends Group to support environmental education and other programs.</p>	<p>Same as Alternative 2.</p> <p>Strategies:</p> <p>Same as Alternative 2.</p>

Proposed Action

Once several feasible management alternatives have been developed, the planning policy that guides implementation requires the Service to select a preferred alternative that becomes its proposed action under the National Environmental Policy Act. The written description of this proposed action is effectively the comprehensive conservation plan. Alternative 2 has been chosen as the proposed management action for the refuge because the Service believes it best meets the following criteria:

- Achieves the mission of the National Wildlife Refuge System;
- Is consistent with the Service's Central Gulf Ecosystem goals;
- Achieves the purposes of the Noxubee National Wildlife Refuge;

- Will be able to achieve the vision and goals outlined for the refuge;
- Restores and maintains the ecological integrity of the habitats and populations on the refuge;
- Addresses the important issues identified during the scoping process;
- Addresses the legal mandates of the Service and the refuge; and
- Is consistent with the scientific principles of sound fish and wildlife management and endangered species recovery.

The management action ultimately selected and described in the comprehensive conservation plan will be determined, in part, by the comments received on the draft version of the plan. The action may or may not be the proposed action contained in the draft plan, but could be a modification of one of the alternatives presented in this environmental assessment.

Alternatives Considered but Eliminated from Detailed Analysis

The alternative's development process under the National Environmental Policy Act and the National Wildlife Refuge System Improvement Act is designed to allow the planning team to consider the widest possible range of issues and feasible management solutions. These management solutions are then incorporated into one or more alternatives evaluated in the environmental assessment process and considered for inclusion in the comprehensive conservation plan.

Actions and alternatives that are infeasible or that may cause substantial harm to the environment are usually not considered in an environmental assessment. Similarly, an action or an alternative containing the action should generally not receive further consideration if it is illegal; it does not fulfill the mission of the National Wildlife Refuge System; it does not relate to or achieve one of the goals of the refuge unit; or its environmental impacts have already been evaluated in a previously approved National Environmental Policy Act document.

During the process of developing alternatives, the planning team considered a wide variety of potential actions on the refuge. The following actions were ultimately rejected and excluded from the alternatives proposed because they did not achieve refuge purposes or were incompatible with one or more goals:

- Substantially increasing wilderness areas and research natural areas;
- Introducing new types of public use such as camping;
- Increasing timber harvesting for economic development; and
- Substantially increasing non-consumptive public uses without increasing management of natural resources.

Compatible Secondary Uses

The National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, states that national wildlife refuges must be protected from incompatible or harmful human activities to ensure that Americans

can enjoy refuge system lands and waters. Before activities or uses are allowed on a national wildlife refuge, the uses must be found to be compatible. A compatible use "... will not materially interfere with or detract from the fulfillment of the mission of the refuge system or the purposes of the refuge." "Wildlife-dependent recreational uses may be authorized on a refuge when they are compatible and not inconsistent with public safety."

Other Management

All management activities that could affect natural resources, including subsurface mineral reservations, utility lines and easements, soil, water and air, and cultural resources will be managed to comply with all laws and regulations. The Service has a legal responsibility to comply with all laws and regulations and to consider the effects its actions have on cultural resources. Under all alternatives, the Service would manage these resources in accordance with public law and agency policy. Individual projects would require additional consultation with the Advisory Council on Historic Preservation and the State of Mississippi Historic Preservation Office. Additional consultation, surveys, and clearance would be required where project development would be conducted on the refuge or when activities would affect properties eligible for the National Register of Historic Places.

III. AFFECTED ENVIRONMENT

Background information, as well as a description of the environment affected by the proposed management action and activities, can be found in Section A, of the Comprehensive Conservation Plan for Noxubee National Wildlife Refuge.