

## **Appendix C. Compatibility Determinations**

Compatibility determinations are included in this appendix. The following uses were found to be appropriate and evaluated to determine their compatibility with the mission of the Refuge System and the purposes of refuges within the Complex:

- Hunting
- Fishing
- Wildlife Observation
- Wildlife Photograph
- Environmental Education
- Interpretation
- Boating
- Bicycling
- Hiking
- Cooperative Farming
- Cooperative Grazing
- Pesticide Application to Control Mosquito Populations

(This page intentionally left blank.)

## DRAFT COMPATIBILITY DETERMINATION

**Use:** Hunting

**Refuge Name:** Texas Mid-coast National Wildlife Refuge Complex

**Establishing and Acquisition Authority(ies):**

Texas Mid-coast National Wildlife Refuge Complex (Complex) is comprised of Brazoria, San Bernard, and Big Boggy National Wildlife Refuges (NWRs). Brazoria NWR was established on October 20, 1966, San Bernard NWR was established next on November 7, 1968, and Big Boggy NWR was established on July 8, 1983. All three refuges were created and managed under provisions of the Migratory Bird Conservation Act (16 U.S.C. 712d) and the Refuge Recreation Act (16 U.S.C. 460k-1 and 16 U.S.C. 460k-2). Brazoria and San Bernard NWRs were also established under the Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4) and 16 U.S.C. 742(b)(1)).

**Refuge Purpose(s):**

1. "...for use as an inviolate sanctuary,... for any other management purposes,... for migratory birds." (Migratory Bird Conservation Act [16 U.S.C. 712d])
2. "...for the development, advancement, management, conservation, and protection of fish and wildlife resources..." [16 U.S.C. 742f(a)(4)] and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." [16 U.S.C. 742f(b)(1)] (Fish and Wildlife Act of 1956)
3. "...suitable for-(1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species..." [16 U.S.C. 460k-1]; "...the Secretary... may accept and use... real... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donor..." [16 U.S.C. 460k-2] (Refuge Recreation Act, as amended [16 U.S.C. 460k – 460k-4]).

**National Wildlife Refuge System Mission:**

The mission of the National Wildlife Refuge System (Refuge System) is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

**Description of Use:**

**(a) What is the use?**

Currently, waterfowl hunting is allowed on all three refuges in the Complex. In addition to waterfowl hunting opportunities, the Service cooperates with Texas Parks and Wildlife Department (TPWD) and the Nannie M. Stringfellow Wildlife Management Area (WMA) to provide white-tailed deer/feral hog youth hunts on San Bernard NWR. For these youth hunts, TPWD issues youth hunting permits through a

lottery system, and assigns hunt blinds on the day of the hunt. Permitted hunters and standby hunters are given the opportunity to utilize up to 9 blinds (one youth hunter per blind with one adult) on the refuge, adjacent to the WMA, so that all standby hunters are accommodated and a youth has the opportunity to hunt. TPWD administers the hunt almost completely, with the exception of the Service providing the land base and providing a higher level of regulations regarding hunting methods (e.g., baiting is not allowed). The Service also partners with Texas Youth Hunting Program (TYHP) to provide feral hog hunting opportunities at San Bernard and Brazoria NWRs. Feral Hog hunts normally provide opportunities for 10 youth hunters a weekend, on 4 weekend hunts (2 weekends at each refuge).

**(b) Where is the use conducted?**

Brazoria NWR has two public waterfowl hunting areas: Christmas Point and Middle Bayou Public Waterfowl Hunt Areas - see Brazoria NWR Hunt Area Map 3-30 of the Comprehensive Conservation Plan (CCP). The Christmas Point Public Waterfowl Hunt Area lies southeast of the Gulf Intracoastal Waterway and encompasses approximately 4,000 acres. Access is by boat only. The Middle Bayou Public Waterfowl Hunt Area encompasses approximately 1,500 acres and access to this site is also by boat or by walk-in from CR227. On these units, hunting of ducks, geese and coots is permitted. Pits and permanent blinds are prohibited.

During the youth feral hog hunts, in partnership with TYHP, youth hunt from temporary blinds located off FM2004, in the Otter Slough Area.

San Bernard NWR has three designated public hunting areas (Cedar Lakes, Smith Marsh, and Salt Bayou Public Waterfowl Hunt Areas) and one permit hunting area (Sargent Permit Waterfowl Hunt Area), illustrated on the San Bernard NWR Hunt Area Map 3-32 of the CCP. All of these public hunting areas are accessible by boat only, and are open for the pursuit of ducks, geese and coots. The Cedar Lakes Public Waterfowl Hunt Area (2,400 acres) lies south of the Gulf Intracoastal Waterway, and the Smith Marsh Public Waterfowl Hunt Area (1,400 acres) is on the west side of Cedar Lakes Creek. Salt Bayou Public Waterfowl Hunt Area encompasses 3,600 acres accessible from Cedar Lakes Creek, the Gulf Intracoastal Waterway, or through the shallow Cowtrap Lakes system. The Sargent Permit Waterfowl Hunt offers a limited hunting opportunity on 4,000 acres with walk-in or boat access.

For the TPWD youth deer/feral hog hunts and the TYHP feral hog hunts, all hunting opportunities are limited to stationary blinds. There are a total of nine stationary blinds in the McNiel/Ducroz/Stringfellow Unit. This bottomland unit is contiguous with the Nannie M. Stringfellow WMA.

Big Boggy NWR has two public hunting areas: the Pelton Lake Public Waterfowl Hunt Area and Matthes Field Public Waterfowl Hunt Area. Pelton Lake encompasses 1,100 acres on the east end of the refuge, whereas the Matthes Field Public Waterfowl Hunt Area is located at the north end of the refuge along Chinquapin Road (see Big

Boggy NWR Hunt Area Map 3-33 of the CCP). This 200-acre area is primarily maintained for goose hunting, but both areas are open for the hunting of ducks, geese, and coots.

**(c) When is the use conducted?**

On the Complex, the Public Waterfowl Hunt Areas are open during the State Waterfowl seasons. Teal Season is generally scheduled for 9 to 16 days beginning mid September. Regular season generally begins late October through mid-January with one two-week mid-season closure. In addition the Public Waterfowl Hunt Areas across the Complex are open during the Conservation Order Light Goose Season, following regular waterfowl season. Youth hunts on the McNiel/Ducroz/Stringfellow Unit of San Bernard NWR are held three weekends per year; two in October and one in December. Youth hunts led by the TYHP occur at San Bernard and Brazoria NWRs two weekends per year (February/March) at each location.

**(d) How is the use conducted?**

Hunting on these Public Waterfowl Hunt Areas is managed in accordance with regulation set forth by the State of Texas. Hunters are required to use non-toxic shot. As stated in Goal 4, Strategy 5 under Objective 5 of the CCP, the refuge will promote hunter compliance with Federal and State regulations and encourage good sportsmanship, ethical hunting behavior, and understanding of the refuge and its purposes through law enforcement visibility and effective wording within informational brochures with high-quality maps, signs, and website updates. The refuge will continue to encourage hunting participation of under-represented segments of the public such as disadvantaged youth, persons with disabilities, and women, through various organizations.

In addition, San Bernard NWR permits TPWD to utilize the McNiel/Ducroz/Stringfellow Unit during their youth deer/feral hog hunts three weekends per year. The refuge provides this opportunity to youth hunters enabling standby hunters an additional area to hunt if needed due to standby hunters in excess of permits available on the Stringfellow WMA. No baiting is allowed in association with the hunt on refuge lands. The Service maintains nine hunt blinds on Service property for this cooperative hunt.

As stated above, the Service also partners with TYHP to provide feral hog hunting opportunities at San Bernard and Brazoria NWRs. At San Bernard NWR, TYHP utilizes the same blinds as utilized by TPWD during their youth hunts. A special use permit is issued to TYHP to enable them access to the blinds and for baiting prior to the hunt and during the hunt. At Brazoria NWR, TYHP erects portable blinds within Otter Slough and along ditches on the north side of the refuge. The hunt has been successful over the past three years in removing an average of 35 feral hogs per year from the refuges.

**(e) Why is this use being proposed?**

Hunting is an existing wildlife-dependent public use occurring on all three refuges within the Complex. Hunting, one of the six priority public uses of national wildlife refuges, is an important wildlife management tool used to control populations of some species that might otherwise exceed the carrying capacity of their habitat and threaten the well-being of other wildlife species or, in some instances, human health and safety. The objective for hunting is to provide safe and high quality hunting opportunities on the Complex. Waterfowl hunting is a traditional use and still very popular outdoor recreational pursuit in the region. Refuges and other public lands along the Texas Gulf Coast play a key role in providing hunting opportunities to the public.

Big game hunting is one management tool used to enhance healthier populations of deer, and decrease feral hog populations, however, throughout the Complex; impacts to the overall populations of these species are minimal.

The guiding principles that the Refuge System uses to manage quality hunting on refuges are: 1) to manage wildlife populations consistent with approved management plans; 2) to promote visitor understanding of and increase visitor appreciation for America's natural resources; 3) to provide opportunities for quality recreational and education experiences; and, 4) to minimize conflicts with visitors participating in other compatible wildlife-dependent recreational activities.

**Availability of Resources:**

With the exception of the Sargent Permit Hunt, waterfowl hunting is open in accordance with state seasons. The Complex has two full-time Refuge Officers and one dual function officer, who monitor the use for adherence to regulations. Permits for the Sargent Permit Hunt are issued out of the Complex office in October each year. These permits require about 40 hours to process. Although blinds have been maintained in the past, the refuge changed the permit hunt to allow hunters to set up temporary blinds within the hunt zone. The estimated cost for managing waterfowl hunts is \$22,000.

In preparation for the TPWD deer/feral hog hunts, the refuge maintains the access to the nine blinds. During the TPWD deer/feral hog hunts and the TYHP feral hog hunts, the Service provides one individual during orientation to provide information on the refuge and Refuge System. One staff will also be available during the hunt for any issues that arise. Both of these hunts are managed by the partner agency/organization. In addition to the hunting opportunity, youth receive a variety of other opportunities tied to hunting such as learning how to follow a blood trail, making hog sausage, and learning about the refuge and its purpose. The San Bernard NWR provides nine hunt blinds for both of these hunts. Temporary blinds and feeders are provided by the TYHP. The estimated cost for partnering with these organizations and providing youth hunting opportunities is \$3,800.

**Anticipated Impacts of the Use:**

Short-term impacts: Providing carefully planned and managed hunting opportunities with restrictions that limit access to specific refuge locations will generally minimize disturbance to wildlife populations, the environment, and non-consumptive users. Direct mortality to hunted species (deer, feral hogs,) would, of course, occur. Some wounding of animals may occur as well. The presence and activity of hunters may cause temporary disturbance to other wildlife in the area, but there are no foreseeable detrimental impacts to these species.

Concerns are primarily centered on the possibility of impacting non-target species that are sensitive to disturbance. Visitor and hunter safety and law enforcement issues are the priority when designing and planning all hunting activities on refuges. Vehicle traffic will increase slightly during the hunting events, and the sound of gun shots will temporarily reduce the serenity for the non-hunting public. Loss of plants from foot traffic is minor, or temporary. Soil and plant disturbance may occur in ingress and egress routes, but will be minor and temporary because of the limited and controlled use associated with the managed hunts.

*Long-term impacts:* No detrimental long-term impacts from hunting are anticipated as long as wildlife populations are monitored through the refuge biological program or by state officials. When deer populations become over-abundant they can have profound negative impacts on their environment through herbivory thereby directly and indirectly affecting other native plants and wildlife species.

**Cumulative Impacts:**

There are no anticipated cumulative impacts. Harvest on the refuge would be limited and would fall within the state's population management goals, which are based on the best available science.

All hunts would follow all applicable laws, regulations and policies; including title 50 of the Code of Federal Regulations, the Refuge System Manual, the mission and goals of the Refuge System, and the purposes, goals, and objectives of the Complex. Operating this activity does not hinder the refuge's ability to meet habitat goals, provides for the safety of the area's citizens, and supports several of the primary objectives of the refuge. The EA for the Draft CCP contains a more detailed discussion of the anticipated impacts of hunting on the Complex.

**Public Review and Comment:**

During public scoping for the preparation of the Texas Mid-Coast Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA), verbal and written comments were solicited from members of the general public on all aspects of current refuge management through public meetings, special mailings, and local newspapers. This draft compatibility determination is being made available for public review and comment in conjunction with the Draft CCP/EA. Public comments on the proposed use are invited and due by the deadline stated on the cover of the Draft CCP/EA.

**Determination (check one below):**

**Use is Not Compatible**

**Use is Compatible with Following Stipulations**

**Stipulations Necessary to Ensure Compatibility:**

In order to ensure that hunting remains a compatible use on the Complex, the following stipulations are necessary:

1. Big Boggy NWR, Sargent Permit Public Waterfowl Hunt Area on San Bernard NWR, and Middle Bayou Public Waterfowl Hunting Area on Brazoria NWR prohibit the shooting or hunting of all animals except ducks, geese, and coots.
2. Hunters are prohibited from the use of or possession of lead shot, target shooting, target practice, dog training (with or without the use of firearms), and hunting within 500 feet of houses.
3. Hunters utilizing temporary blinds are required to remove decoys and portable blinds daily upon cessation of hunting.
4. Shotguns must be unloaded and cased or broken down when transported in vehicles.
5. Hunters must use nontoxic shot and maintain a safe and courteous distance from other parties.
6. Hunters must carry out their empty shells and trash.
7. The Complex prohibits the use or possession of alcoholic beverages while on refuge lands or waters.
8. In order to protect fragile habitats and wildlife, the Complex prohibits off-road vehicle travel and ATV use on refuge lands.

**Justification:**

As defined by the National Wildlife Refuge System Improvement Act of 1997, wildlife-dependent recreational uses may be authorized on a refuge when they are compatible and not inconsistent with public safety. Hunting is included as one of these six wildlife-dependent recreational opportunities, which are to receive enhanced and priority consideration in refuge planning and management. Continued hunting opportunities on the Complex will not conflict with any of the other priority public uses, adversely impact biological resources, or detract from refuge goals, objectives, and management activities described in the CCP. Through the compatibility determination process, the Complex has determined that hunting, in accordance with the stipulations provided above, will not materially interfere with or detract from the fulfillment of the Refuge System mission or the purposes of each refuge.

**Signature: Refuge Manager** \_\_\_\_\_  
(Signature and Date)

**Concurrence: Regional Chief** \_\_\_\_\_  
(Signature and Date)

**Mandatory 15-year Re-Evaluation Date:** \_\_\_\_\_

**DRAFT COMPATIBILITY DETERMINATION**

**Use:** Fishing

**Refuge Name:** Texas Mid-coast National Wildlife Refuge Complex

**Establishing and Acquisition Authority(ies):**

Texas Mid-coast National Wildlife Refuge Complex (Complex) is comprised of Brazoria, San Bernard, and Big Boggy National Wildlife Refuges (NWRs). Brazoria NWR was established on October 20, 1966, San Bernard NWR was established next on November 7, 1968, and Big Boggy NWR was established on July 8, 1983. All three refuges were created and managed under provisions of the Migratory Bird Conservation Act (16 U.S.C. 712d) and the Refuge Recreation Act (16 U.S.C. 460k-1 and 16 U.S.C. 460k-2). Brazoria and San Bernard NWRs were also established under the Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4) and 16 U.S.C. 742(b)(1)).

**Refuge Purpose(s):**

1. "...for use as an inviolate sanctuary,... for any other management purposes,... for migratory birds." (Migratory Bird Conservation Act [16 U.S.C. 712d])
2. "...for the development, advancement, management, conservation, and protection of fish and wildlife resources..." [16 U.S.C. 742f(a)(4)] and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." [16 U.S.C. 742f(b)(1)] (Fish and Wildlife Act of 1956)
3. "...suitable for- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species..." [16 U.S.C. 460k-1]; "...the Secretary... may accept and use... real... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donor..." [16 U.S.C. 460k-2] (Refuge Recreation Act, as amended [16 U.S.C. 460k – 460k-4]).

**National Wildlife Refuge System Mission:**

The mission of the National Wildlife Refuge System (Refuge System) is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

**Description of Use:****(a) What is the use?**

Fishing is an existing wildlife-dependent public use occurring on all three refuges within the Complex. Fishing is one of the six priority public uses of national wildlife refuges, as specified in the National Wildlife Refuge Improvement Act of 1997. Approximately 35,000 of the 78,000 annual visitors come to the Complex to fish allowing the Complex to provide traditional outdoor activities for families to

participate in wildlife recreational opportunities. Anglers are treated to some of the best fishing for redfish, spotted sea trout, black drum, sheepshead, and flounder in the state of Texas. No commercial fishing or crabbing is allowed on the Complex.

**(b) Where is the use conducted?**

The Complex provides four public fishing areas, offering a variety of saltwater fishing and crabbing opportunities. All shoreline areas open to fishing are designated by “Public Fishing Area” signs and are shown on public use maps of the Comprehensive Conservation Plan (CCP). Navigable waters open to fishing are by boat access only and users must remain within the tidal margins.

<b>Fishing Opportunities on Brazoria NWR</b>	<b>Fishing Opportunities on San Bernard NWR</b>	<b>Fishing Opportunities on Big Boggy NWR</b>
Bastrop Bayou Public Fishing Area and Pier	Cedar Lake Creek Public Fishing Area and Pier	Navigable waters within refuge boundaries
Clay Banks Public Fishing Area	Navigable waters within refuge boundaries	
Salt Lake Public Fishing Area		
Navigable waters within Refuge Boundaries		

Brazoria NWR has three public fishing areas that allow land access to salt water fishing: Bastrop Bayou, Clay Banks, and Salt Lake Public Fishing Areas. Bastrop Bayou Public Fishing Area is universally accessible and offers a 200-foot pier with fish attracting lights, five paved bank fishing pull-offs, a universally accessible toilet, paved parking, and night-lights. The Clay Banks Public Fishing Area offers bank fishing along a one-mile segment of Bastrop Bayou. The Salt Lake Fishing Area offers 1.4 mile of bank fishing and a non-motorized boat ramp.

Navigable waters within the boundaries of the refuge open to fishing are Salt Lake, Nicks Lake, and Lost Lake. State waters including Cox Lake, Alligator Lake, Bastrop Bayou, and bays, adjacent to the Brazoria NWR are open to fishing as well.

San Bernard NWR has one public fishing area that allows land access to Cedar Lake Creek. The Cedar Lake Public Fishing Area offers an accessible 20 foot by 10 foot fishing pier, a fishing trail that offers .4 miles of bank fishing, and a small public boat ramp that gives visitors access to Cedar Lake Creek. Fishing is permitted in navigable waters including Cedar Lake Creek, Cedar Lakes and Cow Trap Lakes within and adjacent to the boundary of the refuge.

On Big Boggy NWR, public fishing is allowed on the navigable waters of Boggy Creek and adjacent State waters.

**(c) When is the use conducted?**

Fishing is allowed year-round in the designated areas in accordance with applicable State and federal regulations. All public fishing areas are available for use during daylight hours only, with the exception of Bastrop Bayou Public Fishing Area. This particular area is open 24 hours a day, but no overnight camping is permitted.

**(d) How is the use conducted?**

All fishing must occur in accordance with state fishing regulations, and fishermen are required to have appropriate State fishing licenses. Refuge law enforcement officers patrol Public Fishing Areas to prevent littering and illegal take of fish, while educational efforts have been increased to encourage anglers to collect and discard excess and old fishing line, hooks, and sinkers, since wildlife are known to die after ingesting this debris. The refuge allows the use of cast nets for collecting bait for personal use at public fishing areas. The Brazoria NWR also has picnic tables at the Bastrop Bayou Fishing Area and Salt Lake Fishing Area. Refuge visitors are welcome to use these tables for picnicking, which typically occurs in conjunction with the primary use of fishing.

**(e) Why is this use being proposed?**

The objective for the fishing program is to provide safe and high-quality fishing opportunities on the Complex, which offers exceptional recreational fishing and crabbing opportunities in a saltwater environment.

Fishing programs promote understanding and appreciation of natural resources and their management on all lands and waters in the Refuge System.

**Availability of Resources:**

The public fishing areas require routine maintenance in terms of mowing, maintenance or repairs to piers, and replacement of lights at Bastrop Bayou. At Brazoria NWR, trash is collected from trash receptacles on a weekly basis. Port-a can service is required at the Bastrop Bayou Fishing Pier and Salt Lake Public Fishing Area. The majority of routine maintenance is performed by volunteers and youth program hires in the summer. The estimated cost of maintaining these areas is \$5,000. Two full-time and one dual function law enforcement officers patrol the public fishing areas and assist TPWD Game Wardens patrolling navigable waters, ensuring that regulations are being followed and resources protected. Checking fishing areas and users is the single greatest LE activity occurring on the refuges. Approximately, \$55,000 is needed for law enforcement associated with this use. The Complex can sustain the current fishing program at current funding levels.

**Anticipated Impacts of the Use:****Short and Long-term Impacts:**

Fishing is consistent with the refuge purpose and mission by providing traditional outdoor pastime that is deeply rooted in America's natural heritage. Fishing on the refuge will have a beneficial effect on goals and objectives identified in the Complex's CCP by providing opportunities for families to participate in a wildlife dependent recreational use.

The affects of fishing and associated boating activities on migratory and shore birds include noise, harassment and displacement. Compaction of vegetation may occur along the shores and along creeks from fisherman accessing fishing points. With the existing mitigation measures disturbances caused by fishing, including associated boating activities is not having an adverse impact on wildlife resources. Shorelines are monitored for erosion. Trash is the single greatest impact on the refuges associated with this use.

**Cumulative Impacts:**

Fishing on the Complex is not anticipated to have any cumulative negative impacts that will affect life history requirements of any wildlife species. Fish and crab harvest on the refuges would be limited and would fall within the state's population management goals which are based on the best available science. Shoreline fishing is permitted at only four locations (identified above) which limits conflict with other users, habitat degradation and wildlife disturbance.

All fishing is within all applicable laws, regulations and policies; including title 50 of the Code of Federal Regulations, the Refuge System Manual, the mission and goals of the Refuge System, and the purposes, goals, and objectives of the Complex. Operating this activity does not hinder the refuge's ability to meet habitat goals, provides for the safety of the area's citizens, and supports several of the primary objectives of the refuges.

**Public Review and Comment:**

During public scoping for the preparation of the Texas Mid-Coast Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA), verbal and written comments were solicited from members of the general public on all aspects of current refuge management through public meetings, special mailings, and local newspapers. This draft compatibility determination is being made available for public review and comment in conjunction with the Draft CCP/EA. Public comments on the proposed use are invited and due by the deadline stated on the cover of the Draft CCP/EA.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

The following stipulations are required to ensure that fishing remains a compatible use on the Complex:

1. Vehicles may be parked only in designated areas.
2. Access to the three designated Public Fishing Areas where bank fishing is allowed is by foot only.
3. The Complex prohibits off-road vehicle travel and parking.
4. Mud boats use on refuge waters is prohibited to protect fragile habitats and wildlife.
5. The Complex prohibits commercial crab traps on refuge waters.
6. Campfires and camping is prohibited.
7. Boat launching is allowed in designated areas only.

8. The use of trot lines, sail lines, set lines, jugs, gigs, spears, bush hooks, snatch hooks, crossbows, or bows and arrows of any type is not allowed on the Complex.

**Justification:**

As defined by the National Wildlife Refuge System Improvement Act of 1997, wildlife-dependent recreational uses may be authorized on a refuge when they are compatible and not inconsistent with public safety. Fishing is included as one of these six wildlife-dependent recreational opportunities, which are to receive enhanced and priority consideration in refuge planning and management. The continued fishing program on the Complex will not conflict with any of the other priority public uses, adversely impact biological resources, or detract from refuge goals, objectives, and management activities described in the National Wildlife Refuge System Improvement Act of 1997.

Through the compatibility determination process, The Complex has determined that fishing, in accordance with the stipulations provided above, will not materially interfere with or detract from the fulfillment of the Refuge System mission or the purposes of the refuges.

**Signature: Refuge Manager** \_\_\_\_\_  
(Signature and Date)

**Concurrence: Regional Chief** \_\_\_\_\_  
(Signature and Date)

**Mandatory 15-year Re-Evaluation Date:** \_\_\_\_\_

## DRAFT COMPATIBILITY DETERMINATION

**Use:** Wildlife Observation

**Refuge Name:** Brazoria National Wildlife Refuge

**Establishing and Acquisition Authority(ies):**

Brazoria NWR was established next on October 20, 1966, under provisions of the Migratory Bird Conservation Act (16 U.S.C. 712d), the R Recreation Act (16 U.S.C. 460k-1 and 16 U.S.C. 460k-2), and the Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4) and 16 U.S.C. 742(b)(1)).

**Refuge Purpose(s):**

1. "...for use as an inviolate sanctuary,... for any other management purposes,... for migratory birds." (Migratory Bird Conservation Act [16 U.S.C. 712d])
2. "...for the development, advancement, management, conservation, and protection of fish and wildlife resources..." [16 U.S.C. 742f(a)(4)] and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." [16 U.S.C. 742f(b)(1)] (Fish and Wildlife Act of 1956)
3. "...suitable for- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species..." [16 U.S.C. 460k-1]; "...the Secretary... may accept and use... real... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donor..." [16 U.S.C. 460k-2] (Refuge Recreation Act, as amended [16 U.S.C. 460k – 460k-4]).

**National Wildlife Refuge System Mission:**

The mission of the National Wildlife Refuge System (Refuge System) is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

**Description of Use:**

**(a) What is the use?**

Wildlife observation is an existing wildlife-dependent recreational use available on Brazoria NWR. The refuge estimates annual visitation at 35,000 with approximately 16,000 visitors coming to the refuge for wildlife observation opportunities. General public access to observe wildlife and refuge habitats including the means of access such as automobile, hiking, bicycling, boating, canoeing and kayaking. Bird watching continues to be the most popular form of wildlife observation on the refuge, where visitors can see large concentrations of waterfowl, wading birds and neo-tropical songbirds. Other wildlife observation opportunities allow the public to view

alligators, raccoons, armadillos, coyotes, bobcats, butterflies, and dragonflies, as well as wildflowers.

**(b) Where is the use conducted?**

The refuge will continue to emphasize wildlife observation and highlight these opportunities in a variety of strategic locations including: the Big Slough Public Use Area, Otter Slough, Bastrop Bayou and Middle Bayou Trail. On Brazoria NWR, the 7.5-mile gravel auto tour route meanders through the Big Slough Public Use Area, wrapping around Olney and Teal Ponds and accessing Big Slough and Rogers Pond. The tour loop, accessible by foot, bicycle, or automobile, includes boardwalks, observation platforms, vehicle pull-offs, trails, and butterfly gardens, each of which is associated with offering opportunities for wildlife observation. In addition, a remote bird viewing camera is set up at Gator Nest Pond to broadcast video of wildlife to the Discovery Center. The 3-mile paved entrance road from County Road 227 also provides wildlife observation opportunities.

Brazoria NWR also has viewing areas outside the Big Slough Public Use Area. Mottled Duck Marsh, off County Road 208 on the refuge's northern edge, rewards visitors on the lookout for views of waterfowl, wading birds, and shorebirds. The farm fields along County Road 227 and FM 2004 also offer wildlife viewing opportunities from the public roadway. The refuge is proposing to work with Brazoria County and develop pull-offs along the County Roads for visitors to safely view wildlife safely without hampering traffic flow.

**(c) When is the use conducted?**

Visitors can observe wildlife on Brazoria NWR year-round during daylight hours. As bird watching is the most popular form of wildlife observation across the refuge, most people prefer to visit during the cooler months of November through March when large concentrations of migratory waterfowl are present. The spring and fall bird migrations are also popular for viewing neo-tropical songbirds and shorebirds. The refuge is also known for its easily observed population of alligators, which brings visitors to the refuge throughout the year.

**(d) How is the use conducted?**

Wildlife observation is conducted with the Service's mission and the refuge's purposes, goals, and objectives as the guiding principles. Visitors are allowed to utilize any of the public use areas for wildlife observation purposes. Occasionally, refuge visitors observing wildlife utilize picnic tables scattered across the refuge. Picnicking, therefore, is an incidental use that supports wildlife observation. Wildlife observation may occur through a variety of modes, including from vehicles and bicycles on refuge public access roads as well as on foot along designated trails and boardwalks.

**(e) Why is this use being proposed?**

Wildlife observation is an existing priority public use of the Refuge System as identified in the Refuge System Improvement Act of 1997, and receives enhanced

consideration over non-priority uses. Wildlife observation activities on Brazoria NWR are designed to promote the purpose of the refuge and support the mission, promote understanding and appreciation of natural and cultural resources, and their management on all lands and waters in the Refuge System.

The objective for wildlife observation is to provide safe, enjoyable, high quality, and accessible opportunities to view wildlife on the refuge. In addition, the program aims to promote visitor understanding for America's natural resources while minimizing conflicts with visitors participating in other compatible wildlife-dependent activities. Almost half of all visitors to the refuges hike a trail, drive the auto tour, or spend a few moments at a wildlife overlook. The refuge provides local, regional, national and international visitors with a wide range of wildlife observation opportunities, supporting a rapidly growing nature tourism industry in coastal Texas.

**Availability of Resources:**

The refuge only has one full-time public-use staff (Outdoor Recreation Planner). The majority of maintenance in public use areas is completed by volunteers, youth program hires and maintenance staff. Roadways, trails and the yard around the Discovery Center require mowing and weed-eating throughout the growing season. Gravel roads require grading and all observation decks, platforms and shelters require annual maintenance and repairs. Much of the public use area is below 8 feet in elevation and even tropical storms may wash debris up on to the roads, scour gravel, damage piers and platforms and blow down signs. The estimated cost for providing facilities for wildlife observation at Brazoria NWR is \$22,000 annually. To date, annual requirements in time, materials, and supplies needed to manage and ensure the success of this area have been within existing refuge resources.

Public use areas are patrolled regularly by law enforcement staff (2 –FTEs) ensuring protection of refuge resources and public safety.

**Anticipated Impacts of the Use:**

Short and Long-term Impacts:

Wildlife observation of one of several wildlife oriented public use opportunities being provided primarily within the Big Slough Public Use Area. Although there is some temporary disturbance to wildlife due to human activity on the land, these short-term impacts are minimal. The most likely impacts will be during migration when wildlife may be easily disturbed because they have not become accustomed to recurring traffic. Visitor access is typically by individuals or small groups for short durations. Destruction or negative impacts to habitat and associated vegetation are minimal because public use is confined to trails, and to state, county, and refuge roads.

These short-term, temporary effects are countered by the opportunity to connect with nature while observing wildlife, which results in stronger environmental stewardship. This is a long-term benefit that impacts the landscape as a whole. The long-term impacts of the public use facilities are minimal, because the facilities are confined to county roads and the Public Use Areas which are utilized for biological monitoring and habitat management as well.

The activities follow all applicable laws, regulations and policies, including: Migratory Bird Conservation Act, Title 50 Code of Federal Regulations, Refuge System Manual, Refuge System goals and objectives, and refuge goals and objectives.

These activities are compliant with the purpose of the refuge and the Refuge System mission. Wildlife observation has a beneficial effect on refuge goals and objectives by striving to enhance opportunities and quality of visitor experiences on the refuge while instilling an appreciation for the value of and the need for fish and wildlife habitat conservation. Crucial

**Cumulative Impacts:**

Providing an opportunity for people to observe wildlife and nature is a beneficial long-term environmental impact. Because of the limited opportunity beyond the refuges that provide wildlife observation in a natural setting, cumulative impacts are considered beneficial. Because facilities are utilized by visitors conducting multiple priority recreation uses, the cumulative impacts are minimal. Since impacts are anticipated to be minimal, there will be no negative impacts to the extent that will affect life history requirements of any wildlife species. Wildlife impacts will be carefully monitored in an attempt to identify changes in wildlife behavior and habitat response near observation areas. If impacts are detected, adaptive strategies will be developed to reduce or eliminate impacts to wildlife.

**Public Review and Comment:**

During public scoping for the preparation of the Texas Mid-Coast Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA), verbal and written comments were solicited from members of the general public on all aspects of current refuge management through public meetings, special mailings, and local newspapers. This draft compatibility determination is being made available for public review and comment in conjunction with the Draft CCP/EA. Public comments on the proposed use are invited and due by the deadline stated on the cover of the Draft CCP/EA.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

To ensure compatibility with Refuge System and Brazoria NWR goals and objectives the activity can only occur under the following stipulations:

1. Use is confined to daylight hours.
2. Camping and campfires are prohibited.
3. To protect fragile habitat and wildlife, the refuge prohibits off-road vehicle travel and parking is not permitted. Wandering off-trail is also prohibited.
4. Harassment of wildlife or excessive damage to vegetation is prohibited.

**Justification:**

As defined by the National Wildlife Refuge System Improvement Act of 1997, wildlife-dependent recreational uses may be authorized on a refuge when they are compatible and not inconsistent with public safety. Wildlife observation is included as one of these six wildlife-dependent recreational opportunities, which are to receive enhanced and priority consideration in refuge planning and management. Continued wildlife observation on the refuge will not conflict with any of the other priority public uses, adversely impact biological resources, or detract from refuge goals, objectives, and management activities described in the CCP. Through the compatibility determination process, Brazoria NWR has determined that wildlife observation, in accordance with the stipulations provided above, will not materially interfere with or detract from the fulfillment of the Refuge System mission or the purposes of the refuge.

**Signature: Refuge Manager** \_\_\_\_\_  
(Signature and Date)

**Concurrence: Regional Chief** \_\_\_\_\_  
(Signature and Date)

**Mandatory 15-year Re-Evaluation Date:** \_\_\_\_\_

## DRAFT COMPATIBILITY DETERMINATION

**Use:** Wildlife Observation

**Refuge Name:** San Bernard National Wildlife Refuge

**Establishing and Acquisition Authority(ies):**

San Bernard NWR was established next on November 7, 1968, under provisions of the Migratory Bird Conservation Act (16 U.S.C. 712d), the Refuge Recreation Act (16 U.S.C. 460k-1 and 16 U.S.C. 460k-2), and the Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4) and 16 U.S.C. 742(b)(1)).

**Refuge Purpose(s):**

1. "...for use as an inviolate sanctuary,... for any other management purposes,... for migratory birds." (Migratory Bird Conservation Act [16 U.S.C. 712d])
2. "...for the development, advancement, management, conservation, and protection of fish and wildlife resources..." [16 U.S.C. 742f(a)(4)] and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." [16 U.S.C. 742f(b)(1)] (Fish and Wildlife Act of 1956)
3. "...suitable for- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species..." [16 U.S.C. 460k-1]; "...the Secretary... may accept and use... real... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donor..." [16 U.S.C. 460k-2] (Refuge Recreation Act, as amended [16 U.S.C. 460k – 460k-4]).

**National Wildlife Refuge System Mission:**

The mission of the National Wildlife Refuge System (Refuge System) is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

**Description of Use:**

**(a) What is the use?**

Wildlife observation is an existing wildlife-dependent recreational use available on San Bernard NWR. The refuge estimates annual visitation at 35,000 with approximately 16,000 visitors coming to the refuge for wildlife observation opportunities. General public access to observe wildlife and refuge habitats including the means of access such as automobile, hiking, bicycling, boating, canoeing and kayaking. Bird watching continues to be the most popular form of wildlife observation on the refuge, where visitors can see large concentrations of waterfowl and neo-tropical songbirds. Other wildlife observation opportunities allow the public

to view alligators, raccoons, armadillos, coyotes, bobcats, butterflies, and dragonflies, as well as wildflowers.

**(b) Where is the use conducted?**

San Bernard NWR offers wildlife observation and hiking at several locations. The San Bernard auto tour and Moccasin Pond loop provide 9.4 miles of gravel roads with observation platforms, vehicle pullouts, trails, boardwalks, and a butterfly garden. The Cacklebur Slough Road provides opportunities to see wading birds, raptors and passerines as well as resident wildlife in light forest and grassland habitats. Moccasin Pond loop is at the edge where the salty prairie meets the high marsh. From the loop road a variety of fresh and saltwater, open water, marsh and grassland habitats support an array of migratory and resident wildlife. Bicyclists are welcome on all refuge roads that are open to public vehicles. The San Bernard Oak trail which is located .5 mile north of the refuge entrance, along CR 306, provides a .6 mile trail through a mature bottomland forest to the largest live oak in Texas. The trail crosses a slough before reaching the tree which provides excellent opportunity for viewing bottomland wildlife including wood ducks, reptiles and songbirds.

Hudson Woods, located 5 miles west of Angleton, Texas on SH 521 provides 5.9 miles of walking trails through early and mid-succession stage bottomland forest. Walking the trails provides excellent opportunities for viewing winter and migratory songbirds. Two oxbow lakes provide opportunities for viewing waterbirds including anhinga, waterfowl and wading birds. An observation deck at Scoby Lake, the deck on the front of the Discovery Outpost and the photo blind provide excellent opportunities to view wetland wildlife.

Dow Woods is the most recent bottomland forest unit opened to provide wildlife observation opportunities. The unit is located on the north side of the City of Lake Jackson. Currently 2.7 miles of trail are available for wildlife observation through a restoring forest and along the shore of Bastrop Bayou. Native wildlife including deer, armadillo's and raccoons are commonly seen along with migratory songbirds, woodpeckers and owls.

Betty Brown, the smallest unit on San Bernard NWR, has a 3/8 mile loop trail which takes visitors to the shore of the San Bernard River. This mature growth forest provides excellent opportunities to see migratory songbirds as they move inland from the Gulf of Mexico.

**(c) When is the use conducted?**

Visitors can observe wildlife on San Bernard NWR year-round during daylight hours. As bird watching is the most popular form of wildlife observation across the Complex, most people prefer to visit during the cooler months of November through March when large concentrations of waterfowl are present. The spring and fall bird migrations are also popular for viewing neo-tropical songbirds. The refuge is also known for their easily observed population of alligators.

**(d) How is the use conducted?**

Wildlife observation is conducted with the Service's mission and the refuges' purposes, goals, and objectives as the guiding principles. Visitors are allowed to utilize any of the public use areas for wildlife observation purposes. Occasionally, refuge visitors observing wildlife utilize picnic tables at the headquarters, Bobcat Woods or at Hudson Woods. Picnicking, therefore, is an incidental use that supports wildlife observation. Wildlife observation may occur through a variety of modes, including vehicles and bicycles on refuge public access roads as well as on foot at designated trails and boardwalks.

**(e) Why is this use being proposed?**

Wildlife observation is an existing priority public use of the Refuge System as identified in the Refuge System Improvement Act of 1997, and receives enhanced consideration over non-priority uses. Wildlife observation activities on San Bernard NWR are designed to promote the purpose of the refuge and support the mission, promote understanding and appreciation of natural and cultural resources, and their management on all lands and waters in the Refuge System.

The objective for wildlife observation is to provide safe, enjoyable, high quality, and accessible opportunities on the refuge. In addition, the program aims to promote visitor understanding for America's natural resources while minimizing conflicts with visitors participating in other compatible wildlife-dependent activities. Almost half of all visitors to the refuges hike a trail, drive the auto tour, or spend a few moments at a wildlife overlook. The refuge provides local, regional, national and international visitors with a wide range of wildlife observation opportunities, supporting a rapidly growing nature tourism industry in Texas.

**Availability of Resources:**

The Complex only has one full-time public-use staff (Outdoor Recreation Planner). The majority of the maintenance of the public use areas is completed by volunteers, youth program hires and maintenance staff. Facilities at Hudson Woods are maintained via a contract. Roadways, trails and the yard around the Discovery Outpost at Hudson Woods all require mowing and weed-eating throughout the growing season. Gravel roads require grading and all observation decks, platforms and shelters require annual maintenance and repairs. Current staff is stretched with trying to maintain all trails and parking areas. For this reason, a contract is issued for work at Hudson Woods, which is 23 miles away from the field headquarters. A contract may be added for maintaining Dow Woods in the future. The estimated cost for providing facilities for wildlife observation at San Bernard NWR is \$35,000 annually. To date, annual requirements in time, materials, and supplies needed to manage and ensure the success of this area have been within existing refuge resources. Trail counters are being installed on trails to better evaluate the use of trails. A sign-in record is being maintained at Hudson Woods.

Public use areas are patrolled regularly by law enforcement staff (2 –FTEs) ensuring protection of refuge resources and public safety.

**Anticipated Impacts of the Use:**

Short and Long-term Impacts:

Wildlife observation of one of several wildlife oriented public use opportunities being provided at several public use locations on San Bernard NWR. Although there is some temporary disturbance to wildlife due to human activity on the land, these short-term impacts are minimal. The most likely impacts will be during migration when wildlife may be easily disturbed because they have not become accustomed to repetitive traffic. Visitor access is typically by individuals or small groups for short durations. Destruction or negative impacts to habitat and associated vegetation are minimal because public use is confined to trails, and to state, county, and refuge roads.

These short-term, temporary effects are countered by the opportunity to connect with nature while observing wildlife, which results in stronger environmental stewardship. This is a long-term benefit that impacts the landscape as a whole. The long-term impacts of the public use facilities are minimal, because the facilities are confined to county roads and the Public Use Area which are utilized for biological monitoring and habitat management as well.

The activities follow all applicable laws, regulations and policies, including: Migratory Bird Conservation Act, Title 50 Code of Federal Regulations, Refuge System Manual, Refuge System goals and objectives, and refuge goals and objectives.

These activities are compliant with the purpose of the refuge and the National Wildlife Refuge System Mission. Wildlife observation has a beneficial effect on refuge goals and objectives by striving to enhance opportunities and quality of visitor experiences on the refuge while instilling an appreciation for the value of and the need for fish and wildlife habitat conservation.

Cumulative Impacts:

Providing an opportunity for people to observe wildlife and nature is a beneficial long-term environmental impact. Because of the limited opportunity beyond the refuges that provide wildlife observation in a natural setting, cumulative impacts are considered beneficial. Because facilities are utilized by visitors conducting multiple priority recreation uses, the cumulative impacts are minimal. Since impacts are anticipated to be minimal, there will be no negative impacts to the extent that will affect life history requirements of any wildlife species. Wildlife impacts will be carefully monitored in an attempt to identify changes in wildlife behavior and habitat response near observation areas. If impacts are detected, adaptive strategies will be developed to reduce or eliminate impacts to wildlife.

**Public Review and Comment:**

During public scoping for the preparation of the Texas Mid-Coast Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA), verbal and written comments were solicited from members of the general public on all aspects of current refuge management through public meetings, special mailings, and local newspapers. This draft compatibility determination is being made available for public review and comment in conjunction with the Draft CCP/EA. Public comments on the proposed use are invited and due by the deadline stated on the cover of the Draft CCP/EA.

**Determination (check one below):** Use is Not Compatible Use is Compatible with Following Stipulations**Stipulations Necessary to Ensure Compatibility:**

To ensure compatibility with National Wildlife Refuge System and San Bernard NWR goals and objectives the activity can only occur under the following stipulations:

1. Use is confined to daylight hours.
2. Camping and campfires are prohibited.
3. To protect fragile habitat and wildlife, the refuge prohibits off-road vehicle travel and parking is not permitted. Wandering off-trail is also prohibited.
4. Harassment of wildlife or excessive damage to vegetation is prohibited.

**Justification:**

As defined by the National Wildlife Refuge System Improvement Act of 1997, wildlife-dependent recreational uses may be authorized on a refuge when they are compatible and not inconsistent with public safety. Wildlife observation is included as one of these six wildlife-dependent recreational opportunities, which are to receive enhanced and priority consideration in refuge planning and management. Continued wildlife observation on the refuge will not conflict with any of the other priority public uses, adversely impact biological resources, or detract from refuge goals, objectives, and management activities described in the CCP. Through the compatibility determination process, San Bernard NWR has determined that wildlife observation, in accordance with the stipulations provided above, will not materially interfere with or detract from the fulfillment of the Refuge System mission or the purposes of the refuge.

**Signature: Refuge Manager** \_\_\_\_\_  
(Signature and Date)

**Concurrence: Regional Chief** \_\_\_\_\_  
(Signature and Date)

**Mandatory 15-year Re-Evaluation Date:** \_\_\_\_\_

## DRAFT COMPATIBILITY DETERMINATION

**Use:** Wildlife Photography

**Refuge Name:** Texas Mid-coast National Wildlife Refuge Complex

### **Establishing and Acquisition Authority(ies):**

Texas Mid-coast National Wildlife Refuge Complex (Complex) is comprised of Brazoria, San Bernard, and Big Boggy National Wildlife Refuges (NWRs). Brazoria NWR was established on October 20, 1966, San Bernard NWR was established next on November 7, 1968, and Big Boggy NWR was established on July 8, 1983. All three refuges were created and managed under provisions of the Migratory Bird Conservation Act (16 U.S.C. 712d) and the Refuge Recreation Act (16 U.S.C. 460k-1 and 16 U.S.C. 460k-2). Brazoria and San Bernard NWRs were also established under the Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4) and 16 U.S.C. 742(b)(1)).

### **Refuge Purpose(s):**

1. "...for use as an inviolate sanctuary,... for any other management purposes,... for migratory birds." (Migratory Bird Conservation Act [16 U.S.C. 712d])
2. "...for the development, advancement, management, conservation, and protection of fish and wildlife resources..." [16 U.S.C. 742f(a)(4)] and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." [16 U.S.C. 742f(b)(1)] (Fish and Wildlife Act of 1956)
3. "...suitable for- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species..." [16 U.S.C. 460k-1]; "...the Secretary... may accept and use... real... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donor..." [16 U.S.C. 460k-2] (Refuge Recreation Act, as amended [16 U.S.C. 460k – 460k-4]).

### **National Wildlife Refuge System Mission:**

The mission of the National Wildlife Refuge System (Refuge System) is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

### **Description of Use:**

#### **(a) What is the use?**

Wildlife photography is one of the six existing wildlife-dependent recreational uses occurring on Brazoria and San Bernard NWR. Many visitors come to the Complex to observe a variety of wildlife and landscapes that they would not be able to observe without the Complex's presence. Photography is closely linked to wildlife observation as the refuge offers visitors a chance to photograph wildlife in their

native habitat. The Complex estimates annual visitation at 78,000 with approximately 30,000 visitors coming to the Complex for wildlife observation and photography opportunities.

**(b) Where is the use conducted?**

All Complex public roads will be open to the public for wildlife photography unless specifically closed by the refuge manager. Wildlife photography is primarily facilitated by wildlife observation points across the general public use areas throughout the Complex. These include auto-tour routes, boardwalks, observation platforms, vehicle pullouts, trails, butterfly gardens, access roads, and farm fields. In addition, San Bernard NWR has constructed a photo blind at the Hudson Woods Unit that has enhanced the visitor’s opportunity for a quality wildlife experience while limiting wildlife disturbance with a protected walkway and blind. An additional photo blind is planned for Dow Woods and at Brazoria NWR.

The Complex will continue to emphasize wildlife photography and highlight these opportunities in a variety of locations including:

<b>Brazoria NWR</b>	
Brazoria Auto Tour	Middle Bayou Trail
Field Headquarters Entrance Road /Otter Slough	Bastrop Bayou Fishing Areas
Farm Fields	Mottled Duck Marsh
<b>San Bernard NWR</b>	
San Bernard Auto Tour and Moccasin Pond	
San Bernard Oak Trail	Hudson Woods Unit
Little Slough Trail (across from Complex Office)	Dow Woods Unit
Betty Brown Unit	

**(c) When is the use conducted?**

Visitors are welcome to participate in photography opportunities during daylight hours year-round.

**(d) How is the use conducted?**

The Complex provides local, regional, national, and international visitors with a wide range of photography opportunities, supporting a rapidly growing nature-tourism industry in Texas. Photography of birds, wildlife, wildflowers, and scenery are each very popular. Most of the photography takes place from the window of the visitor’s vehicle, trails, and observation platforms at the Brazoria and San Bernard NWR. A photo contest in conjunction with the Migration Celebration has attracted many new photographers to the refuge Complex.

In addition, Brazoria NWR has added a nature photography activity to the Discovery Environmental Education Program (DEEP). The Friends group funded eleven

cameras to be used for structured and unstructured exploration of nature occurring there. These cameras will also be used for interpretive programs at Migration Celebration.

Through the strategies listed under Objective 3 of the Comprehensive Conservation Plan, the refuge has established a bird feeding station at Discovery Center and manage this station as dynamic exhibits that promote photography among other public uses. In addition, the Complex plans to host children refuge photography contests and display the winning photos in the Complex office or Brazos Mall. Lastly, the Complex will continue to facilitate photography by making cameras and portable photo blinds available for loan to the visiting public.

**(e) Why is this use being proposed?**

The objective for this use is to provide safe and high quality opportunities for photography on the Complex. Visitors of all ages and abilities have an opportunity to photograph wildlife and habitat resources on the refuges. Photographing wildlife in natural or managed environments fosters a connection between visitors and natural resources. Wildlife photography on the Complex provides opportunities for wildlife enjoyment not commonly available on adjacent private land.

**Availability of Resources:**

Because photography utilizes the same facilities as wildlife observation, there is no identified additional cost of maintaining these facilities for photography beyond that described under the wildlife observation compatibility determination. Photography was added to the mini-course schedule for DEEP in 2010. Although the majority of the costs of starting the program were handled by the Friends Group, an estimated \$1,000 is required annually for maintaining the program; replacing cameras, flash drives and portable blinds. Costs generally come out of the Public Use Operational budget for the Complex. Expansion of photography opportunities through providing cameras and blinds on loan through special interpretation programs will require additional staff or volunteers to manage this use. The estimated cost for this expansion is \$2500.00 annually. The photography contest, held in association with Migration Celebration, is managed by a Friends Group Member and self sustaining through the entry fees required for the contest. Costs associated with matting and the display of the photographs in the Complex office is paid by the refuge. An estimated \$500.00 is required annually to mount and display quality photographs. To date, the photography mini-course has been well received by students and teachers. The Complex will continue to monitor the success of this and other DEEP courses through teacher feedback. No formal monitoring of photography users is planned.

**Anticipated Impacts of the Use:**

Short and Long-term Impacts:

The measurable environmental impacts for photography are expected to be short-term. There is some temporary disturbance to wildlife due to human activity on the land. The most likely impacts will be during spring and early summer when many animals are nesting and brood rearing, and during spring and fall migration. Visitor access is typically by individuals or

small groups for short durations. Destruction or negative impacts to habitat and associated vegetation are minimal because public use is confined to trails, and to state, county, and refuge roads. Reducing the size of the impacted area, combined with sporadic, limited use by the public should prevent unacceptable impacts. Winter activities pose little to no impact on vegetation, and winter disturbance to resident wildlife is temporary and minor.

These short-term, temporary effects are countered by the opportunity photography allows, which results in stronger environmental stewardship long-term which benefits the landscape as a whole.

The activities follow all applicable laws, regulations and policies, including: Migratory Bird Conservation Act, Title 50 Code of Federal Regulations, Refuge System Manual, Refuge System goals and objectives, and refuge goals and objectives.

These activities are compliant with the purposes of the refuges and the Refuge System Mission. Operating this activity does not alter the refuges' ability to meet habitat goals and it helps support several of the primary objectives of the refuges.

Cumulative Impacts:

Wildlife photography opportunities are not anticipated to have any cumulative negative impacts to the extent that will affect life history requirements of any wildlife species. Other public uses such as wildlife observation occur at the same sites used for wildlife photography. Wildlife photography opportunities may increase over time, but it is not anticipated to be significant enough to cause any cumulative impacts. Wildlife impacts will be carefully monitored in an attempt to identify changes in wildlife behavior and habitat response near photography areas. If impacts are detected, adaptive strategies will be developed to reduce or eliminate the impacts on wildlife.

Providing an opportunity for people to photograph wildlife and nature is a beneficial long-term environmental impact. Because of the limited opportunity beyond the refuges that provide photography in a natural setting, cumulative impacts are considered beneficial. Because photographers also participate in other approved recreation uses, the cumulative impacts will be minimal.

**Public Review and Comment:**

During public scoping for the preparation of the Texas Mid-Coast Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA), verbal and written comments were solicited from members of the general public on all aspects of current refuge management through public meetings, special mailings, and local newspapers. This draft compatibility determination is being made available for public review and comment in conjunction with the Draft CCP/EA. Public comments on the proposed use are invited and due by the deadline stated on the cover of the Draft CCP/EA.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

To ensure compatibility with the Refuge System and Complex goals and objectives, photography can only occur under the following stipulations:

1. Use is confined to daylight hours only.
2. Camping and fires are prohibited.
3. No temporary photo blinds may be left on the overnight.
4. Harassment of wildlife or excessive damage to vegetation is prohibited.
5. Photography is restricted to designated public access points and established blinds. To protect fragile habitats and wildlife, off-road vehicle travel and parking is not permitted.
6. Wildlife impacts will be carefully monitored. If impacts are detected, adaptive strategies will be developed, such as temporary closures and limit number o photographers in a given area to reduce wildlife disturbance.

**Justification:**

As defined by the National Wildlife Refuge System Improvement Act of 1997, wildlife-dependent recreational uses may be authorized on a refuge when they are compatible and not inconsistent with public safety. Photography is included as one of these six wildlife-dependent recreational opportunities, which are to receive enhanced and priority consideration in refuge planning and management. Continued photography opportunities on the Complex will not conflict with any of the other priority public uses, adversely impact biological resources, or detract from refuge goals, objectives, and management activities described in the National Wildlife Refuge System Improvement Act of 1997. Through the compatibility determination process, the Complex has determined that photography, in accordance with the stipulations provided above, will not materially interfere with or detract from the fulfillment of the Refuge System mission or the purposes of the refuges.

**Signature: Refuge Manager** \_\_\_\_\_  
(Signature and Date)

**Concurrence: Regional Chief** \_\_\_\_\_  
(Signature and Date)

**Mandatory 15-year Re-Evaluation Date:** \_\_\_\_\_

## DRAFT COMPATIBILITY DETERMINATION

**Use:** Environmental Education

**Refuge Name:** Texas Mid-coast National Wildlife Refuge Complex

**Establishing and Acquisition Authority(ies):**

Texas Mid-coast National Wildlife Refuge Complex (Complex) is comprised of Brazoria, San Bernard, and Big Boggy National Wildlife Refuges (NWRs). Brazoria NWR was established on October 20, 1966, San Bernard NWR was established next on November 7, 1968, and Big Boggy NWR was established on July 8, 1983. All three refuges were created and managed under provisions of the Migratory Bird Conservation Act (16 U.S.C. 712d) and the Refuge Recreation Act (16 U.S.C. 460k-1 and 16 U.S.C. 460k-2). Brazoria and San Bernard NWRs were also established under the Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4) and 16 U.S.C. 742(b)(1)).

**Refuge Purpose(s):**

1. "...for use as an inviolate sanctuary,... for any other management purposes,... for migratory birds." (Migratory Bird Conservation Act [16 U.S.C. 712d])
2. "...for the development, advancement, management, conservation, and protection of fish and wildlife resources..." [16 U.S.C. 742f(a)(4)] and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." [16 U.S.C. 742f(b)(1)] (Fish and Wildlife Act of 1956)
3. "...suitable for- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species..." [16 U.S.C. 460k-1]; "...the Secretary... may accept and use... real... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donor..." [16 U.S.C. 460k-2] (Refuge Recreation Act, as amended [16 U.S.C. 460k – 460k-4]).

**National Wildlife Refuge System Mission:**

The mission of the National Wildlife Refuge System (Refuge System) is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

**Description of Use:**

**(a) What is the use?**

Environmental education is an existing wildlife-dependent recreational use occurring on Brazoria and San Bernard NWRs. The environmental education (EE) program provides safe, accessible, and high quality opportunities for children and adults to learn about the refuge and habitats of the Texas Gulf Coast.

Environmental education at the Complex incorporates on-site, hands-on activities and programs that address the audience's course of study, refuge purpose(s), physical attributes, ecosystem dynamics, conservation strategies, and the Refuge System mission. These programs are conducted on refuge lands by Service staff, volunteers and partner organizations.

The Complex currently provides on-site environmental education programs for local schools ranging from elementary to high school in the surrounding areas and activities for approximately 41 groups per year with a total yearly visitation of approximately 3,200 students to these programs.

On Brazoria NWR, the refuge has been conducting the Discovery Environmental Education Program (DEEP) since 1994. The program there currently serves approximately 3,000 students but the refuge would like to increase the program's capabilities in other school districts.

DEEP has also been functioning at the San Bernard NWR since 2003, serving approximately 500 students with expectations to expand service to 1,000 students.

**(b) Where is the use conducted?**

On Brazoria NWR, the Discovery Center has been the center of the Complex's active environmental education program since 2005, serving also as a meeting site for refuge staff and the Friends of the Brazoria NWR and a visitor contact station. The building has received high praise from visitors and the classroom/lab, outfitted with stereomicroscopes and a video microscope projector, has become a highlight for visiting students and adults. In addition to the Discovery Center Environmental education programs are conducted at the following refuge trails and facilities:

- Big Slough Trail
- Big Slough Auto Tour
- Crosstrails Kiosk

The San Bernard NWR activities occur primarily at the Hudson Woods Unit, making use of a small cabin (Discovery Outpost), the entrance road, and various trails including:

- Scoby Lake
- Live Oak Trail

At Hudson Woods environmental education focuses primarily on freshwater wetlands and bottomland forest ecosystems and wildlife. On average, a single field trip is hosted at the San Bernard Wolfweed Wetland Complex annually. This trip focuses on freshwater marsh, riparian habitat and blue crab ecology. The Comprehensive Conservation Plan includes opportunities to expand the program at San Bernard NWR's Wolfweed Wetlands area and at Dow Woods.

**(c) When is the use conducted?**

The use is conducted during the school year with on-site activities occurring primarily throughout the spring and fall. The refuge provides winter and summer programs as needed.

**(d) How is the use conducted?**

Structured, curriculum-based environmental education activities comply with Service policy (605 FW 6), which are aligned with State and national environmental education criteria. Environmental education programs typically involve groups of students of varying ages participating in on-site activities led by staff or docents about the geological, biological, or ecological topics regarding the site. A variety of mini-courses are available that are generally taught outside of the classroom. Standard mini-courses include:

- Bug sweeping in a freshwater wetland
- Microscope lab in the classroom
- Fishing basics
- Reptiles and amphibians
- Wildlife track casting
- Trail Walks
- Refuge tours
- Water and it's characteristics
- Seining in brackish wetlands
- Bats: facts and superstitions
- Wings: how birds fly
- Terrestrial insect sweeping and ID
- blue crab ecology
- nature photography and
- tree identification and growth.

At some sites, students have even been involved with habitat restoration activities.

A partnership exists between the Friends of Brazoria NWR and area school districts to help with the financial impacts of the program expansion. The Complex has a Memorandum of Understanding (MOU) with the Brazosport Independent School District for this program and additional MOUs are expected with other school districts. To help accommodate increases in demand for the program, workshops will be available to train teachers to lead their students through a high quality outdoor experience.

Both refuges also participate in the Wilderness Passport program, and each child receives a passport sticker for two of the eight area ecosystems, included in the passport, they visit on the Complex. This program was developed by Houston Wilderness, a community conservation and outdoor education organization.

Picnicking may occur as an incidental use supportive of the environmental education program. Picnic tables are located outside of the Discovery Center and may be utilized in conjunction with environmental education activities.

**(e) Why is this use being proposed?**

Environmental education provides a way for people to connect with nature through a hands-on approach and provides educational experiences that are not easily gained in a classroom setting. Texas mandates that a significant percentage of science education be in the form of lab and field investigations, and the refuge program is a perfect fit for these types of field-based experiences. The program meets local and State of Texas education standards, allows professional development for teachers, provides community-based service organization programs, meets youth group merit badge requirements, and instills a sense of stewardship and understanding of conservation issues. The EE program also improves the quality of the visitor's experience and provides them with a better understanding of the benefits, issues, and challenges of natural resource conservation in the coastal ecosystem. The program expansion is proposed to serve additional students, though the expansion is limited by the number of available docents as well as the carrying capacity of the environment. The experiences provided at the Discovery Complex influence the lives of the children and help them to fully appreciate the gift of living on the Texas Coast.

**Availability of Resources:**

The Complex currently has one part-time employee (1/2 FTE) to manage the environmental education program. The program relies heavily on volunteers, many of which are trained Texas Master Naturalists, for docents and to conduct the actual classes. Other Complex staff assists throughout the year during various field trips when volunteers are not available or providing specialty topics such as fire management. Operation of DEEP requires replacement of EE supplies, including; petri dishes, sweep nets, cameras, flash drives, food for live reptiles, etc. and operation of the Discovery Center. Being off the electrical grid, operations costs are generally associated with replacement of batteries, propane fuel for the back-up generator and facility cleaning and maintenance (including staff salary). Annual expenditures to maintain the current DEEP are estimated at \$65,000. Based on a review of the refuge budget allocated for these activities, there is currently sufficient funding to ensure compatibility and to administer and manage the existing use. Strategies to expand DEEP have been identified and would require hiring a full-time FTE to replace the current part-time position. Expansion of DEEP to additional School Districts including the use of additional venues and full-time FTE will increase the annual costs to \$110,000.

The Complex has an MOU with the Brazosport Independent School District for this program and additional MOUs are expected with other school districts.

The activities follow all applicable laws, regulations and policies, including: Migratory Bird Conservation Act, Title 50 Code of Federal Regulations, Refuge System Manual, Refuge System goals and objectives, and refuge goals and objectives.

These activities are compliant with the purpose of the refuge and the Refuge System Mission. Operating this activity does not alter the refuge's ability to meet habitat goals and it helps support several of the primary objectives of the refuge.

### **Anticipated Impacts of the Use:**

#### Short and Long-term Impacts:

Environmental education has a beneficial effect on refuge purposes as well as the mission of the NWRs by developing a refuge based curriculum to meet national and/or State educational standards for 4<sup>th</sup> and 7<sup>th</sup> grades. The Complex serves as an information resource and outdoor classroom for post secondary schools throughout the area.

Environmental education has a beneficial effect on refuge goals and objectives by striving to enhance opportunities and the quality of the visitor's experience, allowing program participants to demonstrate learning through refuge-specific stewardship tasks and projects. Environmental education activities strive to promote understanding and appreciation of natural and cultural resource management throughout the Complex.

Most interpretation activities will occur at, or be directed to, existing and future facilities in strategic locations, providing quality opportunities while limiting wildlife and habitat disturbance. These activities are usually predictable in timing (such as daylight hours) and in a given geographical location (such as on a trail). School buses and personal vehicles would utilize developed roads and parking areas to access trails which are already in place. Self-guided interpretation would be sporadic, by small groups of people, and at established trails and kiosks. This may cause short term disturbance as well, but would have minimal impact. In addition, the refuge teaches students the prohibitions on picking wildflowers and removing bird feathers. Students are taught the importance of good wildlife observation techniques, including moving slowly and quietly to produce the least possible disruption to the environment

Potential impacts to wildlife and the environment include short-term disturbance, minor soil compaction on existing trails and vegetative impacts in the immediate vicinity of the activity. During on-site activities, a small number of organisms, like aquatic insects, may be temporarily removed from their habitat for observation, but these organisms are returned and the students are taught the ethic of leaving the refuge in an undisturbed state. Disturbance is typically short-term and will only temporarily displace wildlife. Adequate habitat is usually available for wildlife nearby. Anticipated long-term impacts are beneficial to the refuge, as these activities promote a conservation ethic in the local community. This use would increase in the future the DEEP program expanded to additional school districts with a full-time position with visitor services responsibilities added as proposed in the CCP.

#### Cumulative Impacts:

Environmental education on the Complex is not anticipated to have any cumulative negative impacts to the extent that will affect life history requirements of any wildlife species. Other public uses such as wildlife observation and photography at the same sites used for environmental education and interpretation may increase over time, but it is not anticipated to be significant enough to cause cumulative impacts. The cumulative impacts of educating the public about conservation issues would be beneficial to meeting the Service mission and

refuges purposes. Wildlife impacts will be carefully monitored in an attempt to identify changes in behavior and habit response near congregation areas. If impacts are detected, adaptive strategies will be developed to reduce or eliminate the impacts to wildlife.

**Public Review and Comment:**

During public scoping for the preparation of the Texas Mid-Coast Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA), verbal and written comments were solicited from members of the general public on all aspects of current refuge management through public meetings, special mailings, and local newspapers. This draft compatibility determination is being made available for public review and comment in conjunction with the Draft CCP/EA. Public comments on the proposed use are invited and due by the deadline stated on the cover of the Draft CCP/EA.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

The refuges are always involved in facilitating environmental education programs on the Complex in order to ensure compatibility. Special requests for environmental education use of the Complex after-hours must be reviewed by the Refuge Manager.

1. Other than Service programs, any other environmental education activity or program conducted on Service lands will be required to obtain a Special Use Permit. These permits will contain conditions to ensure that impacts are minimized to ensure compatibility. As part of the special use permit application and renewal process, annual evaluations will be conducted to assess if objectives are being met and that the natural resources are not being adversely affected. The refuge will modify or eliminate any use that results in unacceptable impacts to wildlife or any other resources.
2. Environmental education programs will avoid sensitive sites and vulnerable wildlife populations and will be held at or near established facilities so that impacts may be minimized.
3. Evaluations of sites and programs will be conducted periodically to assess if objectives are being met and that natural resources are not being adversely impacted.
4. Wildlife impacts will be carefully monitored. If impacts are detected, adaptive strategies will be developed, such as the creation of approach-zones, or moving program locations and times to reduce wildlife disturbance.

**Justification:**

Environmental education is an existing priority public use of the Refuge System as identified in the Refuge System Improvement Act of 1997, and receives enhanced consideration over non-priority uses. Environmental education activities on the Complex are designed to promote the purpose of the Refuge and support its mission, promoting understanding and appreciation of natural and cultural resources and their management on all lands and water in

the Refuge System. Environmental education programs conducted on the Complex are in accordance with the stipulations above, will not “materially detract from or interfere with” the purposes for which the refuges were established or conflict with any of the other priority public uses. The program also will not adversely impact other biological resources or detract from refuge goals, objectives, and management activities.

**Signature: Refuge Manager** \_\_\_\_\_  
(Signature and Date)

**Concurrence: Regional Chief** \_\_\_\_\_  
(Signature and Date)

**Mandatory 15-year Re-Evaluation Date:** \_\_\_\_\_

## DRAFT COMPATIBILITY DETERMINATION

**Use:** Interpretation

**Refuge Name:** Texas Mid-coast National Wildlife Refuge Complex

### **Establishing and Acquisition Authority(ies):**

Texas Mid-coast National Wildlife Refuge Complex (Complex) is comprised of Brazoria, San Bernard, and Big Boggy National Wildlife Refuges (NWRs). Brazoria NWR was established on October 20, 1966, San Bernard NWR was established next on November 7, 1968, and Big Boggy NWR was established on July 8, 1983. All three refuges were created and managed under provisions of the Migratory Bird Conservation Act (16 U.S.C. 712d) and the Refuge Recreation Act (16 U.S.C. 460k-1 and 16 U.S.C. 460k-2). Brazoria and San Bernard NWRs were also established under the Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4) and 16 U.S.C. 742(b)(1)).

### **Refuge Purpose(s):**

1. "...for use as an inviolate sanctuary,... for any other management purposes,... for migratory birds." (Migratory Bird Conservation Act [16 U.S.C. 712d])
2. "...for the development, advancement, management, conservation, and protection of fish and wildlife resources..." [16 U.S.C. 742f(a)(4)] and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." [16 U.S.C. 742f(b)(1)] (Fish and Wildlife Act of 1956)
3. "...suitable for- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species..." [16 U.S.C. 460k-1]; "...the Secretary... may accept and use... real... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donor..." [16 U.S.C. 460k-2] (Refuge Recreation Act, as amended [16 U.S.C. 460k – 460k-4]).

### **National Wildlife Refuge System Mission:**

The mission of the National Wildlife Refuge System (Refuge System) is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

### **Description of Use:**

#### **(a) What is the use?**

Interpretation is an existing wildlife-dependent recreational opportunity occurring on Brazoria and San Bernard NWRs. The refuge communicates the most important fish, wildlife, habitat, and resource issues to visitors of all ages and abilities through effective interpretation. In accordance with Objective 4 of the Comprehensive Conservation Plan, the Complex is proposing to increase the overall effectiveness of

the interpretive program above current levels to ensure that all visitors gain a better understanding of three primary concepts:

1. The value of protecting natural landscapes and the unique purposes of the Complex;
2. The Complex as a component of a national network of refuges, protecting wildlife and habitat resources; and
3. The significance and mission of the Refuge System.

**(b) Where is the use conducted?**

Opportunities for interpretation occur throughout the Complex. People may encounter interpretive opportunities within any public use areas provided on the Complex including but not limited to the following areas:

On Brazoria NWR, interpretation is conducted at the following locations: the self-guided auto tour route, Discovery Center and associated information pavilion, Bastrop Bayou Fishing Area, Big Slough Trail, and the Teal Pond observation platform. Personal interpretive services include the Discovery Center programs, group presentations, guided talks and tours, and special events. The refuge utilizes open houses to provide unique interpretative opportunities to groups, families, and individuals, through live reptile displays, animal track casting, seining for aquatic insects, and viewing the microscopic world. Hunting and fishing information kiosks are located at the Bastrop Bayou Fishing Area. The Big Slough Trail has a corresponding interpretive trail guide. Teal Pond observation platform has three interpretive panels providing information on migratory waterfowl. The Discovery Center has static and interactive interpretive displays and dioramas. The information pavilion near the Discovery Center has four interpretive panels on recreational opportunities and wildlife specific information and identification. The Brazoria Field Office, located off FM 2004 near Otter Slough, provides a brief welcome and introduction to the refuge via interpretive panels in the lobby.

**San Bernard NWR** has five interpretive kiosks located at Bobcat Woods, Auto Loop entrance, San Bernard Oak Trail, Hudson Woods, and Dow Woods. Hunting and fishing information kiosks are located at Cedar Lake Creek, Sargent, and Big Boggy NWR. San Bernard NWR Oak Trail and the Tveten Trail at Dow Woods has a corresponding interpretive guide and trail brochure. Bobcat Woods, Hudson Woods, and Dow Woods have interpretive panels along each trail. Cedar lake Creek Paddling Trail also has an interpretive trail guide. San Bernard NWR Office and Screened Shelter both contain interpretive panels to welcome and orient visitors and introduce them to refuge resources.

**(c) When is the use conducted?**

Visitors are welcome to participate in interpretive programs during daylight hours throughout the year. Interpretive opportunities are available in the form of self-guided tours and interpretive signs along historical structures and trails. Interpretive

guided programs are also available throughout the year or as requested by organized groups such as school groups, Boy Scouts, Girl Scouts, etc.

**(d) How is the use conducted?**

The Complex contains multiple means for refuge visitors to experience the interpretative program through publications, including: brochures, fact sheets, and species lists; signs, interpretive panels, exhibits, guided walks and presentations. Exhibits are accessible and easy to read and understand. They contain audio and tactile elements that can benefit everyone through appealing to multiple paths of learning. The Complex plans to enhance the interpretation program through partnerships with the Texas Master Naturalists and the Friends Group providing additional lectures and guided walks at both Brazoria and San Bernard NWRs.

**(e) Why is this use being proposed?**

Interpretation enhances opportunities for a high quality visitor experience on each of the three refuges. It also promotes visitor understanding for America's natural resources by providing safe, enjoyable, and accessible interpretive opportunities, products, and facilities. Many visitors do not realize the distinction between national wildlife refuges and a park or Federal or State agency lands that are managed for different purposes. Increased efforts are needed to help people better understand the role of national wildlife refuges, the Service mission, and to have a heightened awareness of conservation and stewardship concepts. Interpretation at the Complex provides opportunities for visitors to make their own connection with refuge resources through talks, publications, brochures, fact sheets, species lists, signs, interpretive panels, and exhibits.

**Availability of Resources:**

Currently, the primary interpretation is primarily through panels and publications. Over the past three years, many of the brochures and panels were updated and replaced through the efforts of a seasonal intern (.25 FTE) and the outdoor recreation specialist. Approximately 0.5 FTE is required to administer and manage these activities adequately. In addition, maintenance and improvement of refuge interpretive signs, trails, and visitor center displays will periodically be required. The total estimated cost per year is estimated at \$65,000. Based on a review of the refuge budget allocated for these activities, there is currently sufficient funding to ensure compatibility and to administer and manage the existing use. Strategies to expand the interpretive program with additional interpretive activities will require hiring another FTE to capture the potential for this area.

The CCP recommends additional staffing and facilities to expand interpretation. Greater numbers of people would learn about, and benefit from, the refuge with additional staff and interpretative materials. Additional staff would be able to provide additional interpretation programs and develop new or replace existing panels and literature.

**Anticipated Impacts of the Use:**Short and Long-term Impacts:

The overall impacts to the refuges and their associated wildlife populations from interpretation would be minimal. Most interpretive activities will occur at, or be directed to, existing and future facilities in strategic locations, providing quality opportunities while limiting wildlife and habit disturbance. These activities are usually predictable in timing (such as daylight hours) and in a given geographical location (such as on a trail). Potential impacts to wildlife and the environment include short-term disturbance, minor soil compaction on existing trails and vegetative impacts in the immediate vicinity of the activity. Disturbance is typically short-term and should only temporarily displace wildlife. Adequate habitat is usually available for wildlife nearby. Personal vehicles would utilize developed roads and parking areas to access trails that are already in place. Self-guided interpretation would be sporadic, by small groups of people, and at established trails and kiosks. This may cause short-term disturbance as well, but would have minimal impact.

Cumulative Impacts: No cumulative or indirect effects are anticipated to occur as a result of the refuge interpretation program. Evaluations of sites and programs will be conducted periodically to assess if objectives are being met and that natural resources are not being adversely impacted.

Interpretation occurs in conjunction with other wildlife-dependent activities including; wildlife observation, environmental education and photography. Providing an opportunity for people to learn among natural habitats and view native wildlife provides wide-scale beneficial environmental impacts. Although interpretation and associated wildlife-dependent uses may increase over time, it is not anticipated to be significant enough to cause cumulative impacts. The cumulative impacts of educating the public about conservation issues would be beneficial to meeting the Service mission and the refuges purposes.

As the demand for interpretation changes, refuge management will adjust the frequency, time and locations of the programs to minimize impact on wildlife and other resources affected by these programs. Interpretive programs will avoid sensitive sites and vulnerable wildlife populations and will be held at or near established facilities so that impacts may be minimized. Potential wildlife impacts will be carefully monitored. If impacts are detected, adaptive strategies will be developed, such as the creation of approach-zones, or moving program locations and times to reduce wildlife disturbance.

**Public Review and Comment:**

During public scoping for the preparation of the Texas Mid-Coast Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA), verbal and written comments were solicited from members of the general public on all aspects of current refuge management through public meetings, special mailings, and local newspapers. This draft compatibility determination is being made available for public review and comment in conjunction with the Draft CCP/EA. Public comments on the proposed use are invited and due by the deadline stated on the cover of the Draft CCP/EA.

**Determination (check one below):**

**Use is Not Compatible**

**Use is Compatible with Following Stipulations**

**Stipulations Necessary to Ensure Compatibility:**

To ensure compatibility with the Refuge System and Complex goals and objectives, photography can only occur under the following stipulations:

1. Use is confined to daylight hours only.
2. Camping and campfires are prohibited.
3. To protect fragile habitat and wildlife, the refuge prohibits off-road vehicle travel and parking is not permitted.
4. Harassment of wildlife or excessive damage to vegetation is prohibited.

**Justification:**

As defined by the National Wildlife Refuge System Improvement Act of 1997, wildlife-dependent recreational uses may be authorized on a refuge when they are compatible and not inconsistent with public safety. Interpretation is included as one of these six wildlife-dependent recreational opportunities, which are to receive enhanced and priority consideration in refuge planning and management. The continued interpretation program on the Complex will not conflict with any of the other priority public uses, adversely impact biological resources, or detract from goals, objectives, and management activities described in the National Wildlife Refuge System Improvement Act of 1997. In fact, this wildlife-dependent recreational use will serve to enhance visitors' understanding of refuge resources and the role the refuges serve within the Refuge System. Through the compatibility determination process, the Complex has determined that interpretation, in accordance with the stipulations provided above, will not materially interfere with or detract from the fulfillment of the Refuge System mission or the purposes of the refuges.

**Signature: Refuge Manager** \_\_\_\_\_  
(Signature and Date)

**Concurrence: Regional Chief** \_\_\_\_\_  
(Signature and Date)

**Mandatory 15-year Re-Evaluation Date:** \_\_\_\_\_

## DRAFT COMPATIBILITY DETERMINATION

**Use:** Boating (Use of small motor boats, canoes, kayaks, and air boats)

**Refuge Name:** Texas Mid-coast National Wildlife Refuge Complex

**Establishing and Acquisition Authority(ies):**

Texas Mid-coast National Wildlife Refuge Complex (Complex) is comprised of Brazoria, San Bernard, and Big Boggy National Wildlife Refuges (NWRs). Brazoria NWR was established on October 20, 1966, San Bernard NWR was established next on November 7, 1968, and Big Boggy NWR was established on July 8, 1983. All three refuges were created and managed under provisions of the Migratory Bird Conservation Act (16 U.S.C. 712d) and the Refuge Recreation Act (16 U.S.C. 460k-1 and 16 U.S.C. 460k-2). Brazoria and San Bernard NWRs were also established under the Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4) and 16 U.S.C. 742(b)(1)).

**Refuge Purpose(s):**

1. "...for use as an inviolate sanctuary,... for any other management purposes,... for migratory birds." (Migratory Bird Conservation Act [16 U.S.C. 712d])
2. "...for the development, advancement, management, conservation, and protection of fish and wildlife resources..." [16 U.S.C. 742f(a)(4)] and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." [16 U.S.C. 742f(b)(1)] (Fish and Wildlife Act of 1956)
3. "...suitable for- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species..." [16 U.S.C. 460k-1]; "...the Secretary... may accept and use... real... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donor..." [16 U.S.C. 460k-2] (Refuge Recreation Act, as amended [16 U.S.C. 460k – 460k-4]).

**National Wildlife Refuge System Mission:**

The mission of the National Wildlife Refuge System (Refuge System) is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

**Description of Use:**

**(a) What is the use?**

Boating is an existing recreational use occurring on Brazoria, San Bernard, and Big Boggy NWRs. Boating opportunities on the Complex include use of canoes, kayaks, small motor boats, and airboats. Although boating is not identified as one of the six wildlife-dependent recreational uses in the National Wildlife Refuge System Improvement Act of 1997, this activity is directly tied to fishing and hunting and

supports wildlife observation, photography, and interpretation. The Complex is proposing to continue to provide boating opportunities specifically in support of fishing, hunting and wildlife observation. The Complex estimates annual visitation at 78,000 with approximately 32,000 visitors accessing the Complex through boats for wildlife observation, hunting and fishing.

**(b) Where is the use conducted?**

On Brazoria NWR, boats are permitted on Nicks, Salt, and Lost Lakes by way of the Gulf Intracoastal Waterway (GIWW) or Bastrop Bayou. Brazoria NWR has one non-motorized boat launch for canoes and kayaks at Salt Lake and one at Clay Banks for access into Bastrop Bayou. Other boat launches are located off-refuge, and individuals may access refuge waters through the adjacent bayous, bays, and the Intracoastal Waterway.

At San Bernard NWR, a boat ramp is located on Cedar Lake Creek to provide access for canoes, kayaks, and small motor boats. A second non-motorized boat launch is available further up Cedar Lake Creek, just off CR 318 to encourage wildlife observation from non-motorized boats on Cedar Lake Creek. Navigable waters of Cedar Lakes, Cow Traps, and Salt Bayou are open to boat access. Again, boats may gain access to refuge waters from adjacent bayous, bays, and the GIWW. Boats are allowed on all navigable waters across the Complex.

Navigable waters of Boggy Creek are open for boating on Big Boggy NWR. Access is gained via the Intracoastal Waterway.

**(c) When is the use conducted?**

Boat launches on Brazoria and San Bernard NWRs are open to the public each day from dawn to dusk. Boating may occur year-round within that time range. As the majority of this use occurs in association with fishing and hunting, boating use is heaviest in the spring and fall during prime fishing seasons.

**(d) How is the use conducted?**

Refuge visitors are allowed to access waters via refuge boat ramps and by access from adjacent bays, bayous, and the GIWW. The refuges boating opportunities is designed as a means of enabling additional opportunities for wildlife dependent priority public uses such as hunting and fishing (in accordance with state regulations) and wildlife observation and photography. These opportunities enable visitors to fish and observe wildlife, which can instill an appreciation for the value of and need for fish and wildlife habitat conservation.

**(e) Why is this use being proposed?**

Boating on Brazoria and San Bernard NWRs facilitates fishing, hunting, wildlife observation, photography, and interpretation, each of which is one of the six wildlife-dependent recreational uses described in the National Wildlife Refuge System Improvement Act of 1997. This supportive recreational opportunity will help to

establish an enhanced appreciation of the outdoor experience and encourage families and future generations to continue to pursue outdoor recreation

**Availability of Resources:**

Boating serves primarily as a mode of transportation for Complex visitors to experience hunting, fishing and wildlife observation opportunities. Existing refuge visitor services and law enforcement staff and budget are adequate to administer this use. The Service will not have to provide special equipment or require a significant increase in staff expenditure to continue this use but will need to maintain the current staffing levels. The needed staff, time, and equipment is already largely committed. Approximately \$10,000 is required annually to maintain this use.

**Anticipated Impacts of the Use:****Short and Long-term Impacts:**

Boating supports the fishing, hunting and wildlife observation which are all consistent with the refuges' purposes and the mission of the Service, by providing traditional outdoor pastime that is deeply rooted in America's natural heritage. Boating on the refuge will have a beneficial effect on Refuge goals and objectives identified in the Complex's Comprehensive Conservation Plan by providing opportunities for families to participate in the wildlife dependent recreational uses.

The affects of boating activities on migratory and shore birds include noise, harassment and displacement. Within current regulations including the restrictions to navigable waters and closed marsh, boating activities are not anticipated to have an adverse impact on wildlife resources.

**Cumulative Impacts:**

There are no anticipated cumulative impacts anticipated from the use of boats for fishing, hunting and wildlife observation to the extent that will affect life history requirements of any wildlife species. Any potential wildlife impacts will be carefully monitored in an attempt to reduce or eliminate these impacts on all wildlife.

All wildlife-dependant uses and boating are within all applicable laws, regulations and policies; including title 50 of the Code of Federal Regulations, the Refuge System Manual, the mission and goals of the Refuge System, and the purposes, goals, and objectives of the Complex. Operating this activity does not hinder the refuges' ability to meet habitat goals, provides for the safety of the area's citizens, and supports several of the primary objectives of the refuges.

**Public Review and Comment:**

During public scoping for the preparation of the Texas Mid-Coast Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA), verbal and written comments were solicited from members of the general public on all aspects of current refuge management through public meetings, special mailings, and local newspapers. This draft compatibility determination is being made available for public review and comment in

conjunction with the Draft CCP/EA. Public comments on the proposed use are invited and due by the deadline stated on the cover of the Draft CCP/EA.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

To ensure that boating remains a compatible use, the Complex has developed the following stipulations:

1. Use is confined to daylight hours only.
2. Camping and campfires are prohibited.
3. Boat launching is permitted at designated areas only.
4. The use of mud boats outside of navigable waters is prohibited to protect fragile habitat and wildlife.

**Justification:**

As defined by the National Wildlife Refuge System Improvement Act of 1997, wildlife-dependent recreational uses are to receive enhanced and priority consideration in refuge planning and management. Boating is consistent with the refuges purposes and the mission of the Refuge System by providing alternative means of transportation to allow the public to enjoy wildlife dependent recreational opportunities such as hunting, fishing, wildlife observation, wildlife photography and interpretation.

Boating will not conflict with any of the other priority public uses, adversely impact biological resources, or detract from refuge goals, objectives, and management activities described in the CCP. Boating in accordance with the above stipulations will enhance the Complex's ability to attract refuge visitors and teach them about the purposes of the refuges and their role in the Refuge System. Through the compatibility determination process, the Complex has determined that boating, as described above, will not materially interfere with or detract from the fulfillment of the Refuge System mission or the purposes of the refuges.

**Signature: Refuge Manager** \_\_\_\_\_

(Signature and Date)

**Concurrence: Regional Chief** \_\_\_\_\_

(Signature and Date)

**Mandatory 10-year Re-Evaluation Date:** \_\_\_\_\_

## DRAFT COMPATIBILITY DETERMINATION

**Use:** Bicycling

**Refuge Name:** Texas Mid-coast National Wildlife Refuge Complex

**Establishing and Acquisition Authority(ies):**

Texas Mid-coast National Wildlife Refuge Complex (Complex) is comprised of Brazoria, San Bernard, and Big Boggy National Wildlife Refuges (NWRs). Brazoria NWR was established on October 20, 1966, San Bernard NWR was established next on November 7, 1968, and Big Boggy NWR was established on July 8, 1983. All three refuges were created and managed under provisions of the Migratory Bird Conservation Act (16 U.S.C. 712d) and the Refuge Recreation Act (16 U.S.C. 460k-1 and 16 U.S.C. 460k-2). Brazoria and San Bernard NWRs were also established under the Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4) and 16 U.S.C. 742(b)(1)).

**Refuge Purpose(s):**

1. "...for use as an inviolate sanctuary,... for any other management purposes,... for migratory birds." (Migratory Bird Conservation Act [16 U.S.C. 712d])
2. "...for the development, advancement, management, conservation, and protection of fish and wildlife resources..." [16 U.S.C. 742f(a)(4)] and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." [16 U.S.C. 742f(b)(1)] (Fish and Wildlife Act of 1956)
3. "...suitable for- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species..." [16 U.S.C. 460k-1]; "...the Secretary... may accept and use... real... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donor..." [16 U.S.C. 460k-2] (Refuge Recreation Act, as amended [16 U.S.C. 460k – 460k-4]).

**National Wildlife Refuge System Mission:**

The mission of the National Wildlife Refuge System (Refuge System) is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

**Description of Use:**

**(a) What is the use?**

Bicycling is an existing recreational use occurring on all established gravel tour roads, Middle Bayou Trail on Brazoria NWR and trails at the Dow Woods Unit of San Bernard NWR. Although bicycling is not identified as one of the six wildlife-dependent recreational uses in the National Wildlife Refuge System Improvement Act

of 1997, this activity serves as a supplemental recreational opportunity that enhances the Complex's offerings for wildlife observation, photography, and interpretation.

**(b) Where is the use conducted?**

On San Bernard NWR, bicyclists are welcome on the Auto Tour Loop, along with vehicles, within the Public Use Area.

On Dow Woods, a unit of San Bernard NWR, bicycling is permitted on both the Tveten Trail and the Bayou Loop.

On Brazoria NWR, bicycling is permitted on gravel roads, open to vehicles, within the Big Slough Auto Tour. In addition, bicycling is allowed on the Middle Bayou Trail, located near the Fishing Pier on Bastrop Bayou.

**(c) When is the use conducted?**

Both Brazoria and San Bernard NWRs are open to the public each day from sunrise to sunset. Bicycling may occur during those daytime hours.

**(d) How is the use conducted?**

Bicyclists are allowed to ride solely along designated refuge trails and public access roads. This use primarily facilitates other wildlife-dependent recreational uses such as wildlife observation, photography and interpretation.

**(e) Why is this use being proposed?**

Bicycling on Brazoria and San Bernard NWRs facilitates/or generates additional opportunities for wildlife observation, photography, and interpretation, each of which is one of the six wildlife-dependent recreational uses described in the National Wildlife Refuge System Improvement Act of 1997. This supportive recreational opportunity helps to establish an enhanced appreciation of the outdoor experience and encourage families and future generations to continue to pursue outdoor recreation and appreciate the value of wildlife and habitat conservation.

**Availability of Resources:**

For the management and maintenance of this use in association with the public use roads at San Bernard and Brazoria NWRs, there is no additional cost. Roads are graded and roadways are mowed for all traffic. No additional mowing or maintenance is required for the Middle Bayou Trail at Brazoria NWR. The trail is mowed two to three times annually for all users. The costs associated with bicycling on the Dow Woods Trails, has not been determined. This is a new use on a new type of trail base (recycled granite over crushed concrete laid between garden edging). Additional maintenance may be required on the Bayou Loop, for the first couple of years as the concrete and granite compact. The estimated cost of maintaining the Dow Woods Trails is \$1,200 annually for the first several years and less than \$500 after that.

Additional law enforcement is required at Dow Woods to monitor all public uses, including bicycling to ensure that use is in accordance to published regulations and habitat and wildlife

disturbance is minimized. Based on a review of the refuge budget allocated for these activities, there is currently sufficient funding to ensure compatibility and to administer and manage the existing use.

**Anticipated Impacts of the Use:**

Short and Long-term Impacts:

Short-term negative impacts from bicycling are similar to those associated with vehicular traffic on roads and hiking along trails, namely associated with disturbance of wildlife. Wildlife disturbances may include flushing, as well as altering wildlife behavior to avoid human presence. The most likely impacts will be during spring and early summer when public use is greatest. Visitor access is typically by individuals or small groups for short durations. The use of the trails and roadways are generally irregular; minimizing impacts to temporarily displaced wildlife.

The long-term negative impacts are the modification of natural habitat to provide public use opportunities. This loss of natural habitat may be minimal, for dirt paths or mowed vegetation paths to moderate; for boardwalks or concrete trails and gravel roads.

Bicycling also has a beneficial effect on refuge goals and objectives by striving to enhance and diversify opportunities and quality of visitor experiences on the refuge. Bicycling can also promote visitor understanding of, and increase appreciation for, America's natural and cultural resources and conservation history. Bicycling provides an opportunity for people to bicycle among natural habitats and view native wildlife which is a beneficial long-term environmental impact as people are able to connect with nature. This connection fosters environmental stewardship.

The activity follows all applicable laws, regulations and policies, including: Migratory Bird Conservation Act, Title 50 Code of Federal Regulations, National Wildlife Refuge System Manual, National Wildlife Refuge System goals and objectives, and Refuge goals and objectives.

This activity is compliant with the purposes of the refuges and the Refuge System mission. Operating this activity does not alter the refuges' ability to meet habitat goals and it helps support several of the primary objectives of the refuges.

Cumulative Impacts: Bicycling on the Complex is not anticipated to have any cumulative negative impacts to the extent that will affect life history requirements of any wildlife species. Bicycling is a mode for visitors to obtain access to the refuges while participating in other wildlife-dependent activities including; wildlife observation, interpretation, environmental education and photography. Providing an opportunity for people to bicycle among natural habitats and view native wildlife provides wide-scale beneficial environmental impacts as well. Although bicycling and associated wildlife-dependent uses may increase over time, it is not anticipated to be significant enough to cause cumulative impacts. The Complex will regularly evaluate bicycling to assess if objectives are being met and that natural resources are not being adversely impacted by these opportunities. If negative

impacts are determined, mitigation measures may include seasonal or short term closures to protect both wildlife and trails.

**Public Review and Comment:**

During public scoping for the preparation of the Texas Mid-Coast Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA), verbal and written comments were solicited from members of the general public on all aspects of current refuge management through public meetings, special mailings, and local newspapers. This draft compatibility determination is being made available for public review and comment in conjunction with the Draft CCP/EA. Public comments on the proposed use are invited and due by the deadline stated on the cover of the Draft CCP/EA.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

To protect fragile habitats and wildlife, off-road vehicle travel and parking is not permitted. For the same reason, bicycles are allowed only on public access roads and designated trails.

**Justification:**

As defined by the National Wildlife Refuge System Improvement Act of 1997, wildlife-dependent recreational uses are to receive enhanced and priority consideration in refuge planning and management. The continuation of bicycling at the Complex supports these priority public uses offered on the refuges as this activity supports wildlife observation, photography, and interpretation. This use will not conflict with any of the other priority public uses, adversely impact biological resources, or detract from refuge goals, objectives, and management activities described in the CCP. In fact, bicycling in accordance with the above stipulations will enhance the Complex's ability to attract refuge visitors and teach them about the purpose of the Complex and its role in the National Wildlife Refuge System. Through the compatibility determination process, the Complex has determined that bicycling, as described above, will not materially interfere with or detract from the fulfillment of the Refuge System mission or the purposes of the refuges.

**Signature: Refuge Manager** \_\_\_\_\_  
(Signature and Date)

**Concurrence: Regional Chief** \_\_\_\_\_  
(Signature and Date)

**Mandatory 10-year Re-Evaluation Date:** \_\_\_\_\_

## DRAFT COMPATIBILITY DETERMINATION

**Use:** Hiking

**Refuge Name:** Texas Mid-coast National Wildlife Refuge Complex

**Establishing and Acquisition Authority(ies):**

Texas Mid-coast National Wildlife Refuge Complex (Complex) is comprised of Brazoria, San Bernard, and Big Boggy National Wildlife Refuges (NWRs). Brazoria NWR was established on October 20, 1966, San Bernard NWR was established next on November 7, 1968, and Big Boggy NWR was established on July 8, 1983. All three refuges were created and managed under provisions of the Migratory Bird Conservation Act (16 U.S.C. 712d) and the Refuge Recreation Act (16 U.S.C. 460k-1 and 16 U.S.C. 460k-2). Brazoria and San Bernard NWRs were also established under the Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4) and 16 U.S.C. 742(b)(1)).

**Refuge Purpose(s):**

1. "...for use as an inviolate sanctuary,... for any other management purposes,... for migratory birds." (Migratory Bird Conservation Act [16 U.S.C. 712d])
2. "...for the development, advancement, management, conservation, and protection of fish and wildlife resources..." [16 U.S.C. 742f(a)(4)] and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." [16 U.S.C. 742f(b)(1)] (Fish and Wildlife Act of 1956)
3. "...suitable for- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species..." [16 U.S.C. 460k-1]; "...the Secretary... may accept and use... real... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donor..." [16 U.S.C. 460k-2] (Refuge Recreation Act, as amended [16 U.S.C. 460k – 460k-4]).

**National Wildlife Refuge System Mission:**

The mission of the National Wildlife Refuge System (Refuge System) is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

**Description of Use:**

**(a) What is the use?**

Hiking is an existing recreational use occurring at Brazoria and San Bernard NWRs. Hiking serves as a supportive recreational use that enhances the Complex's wildlife-dependent recreation offerings, especially wildlife observation, photography, and interpretation. The refuge estimates annual visitation at 78,000 with approximately 30,000 visitors coming to the refuge for wildlife observation and photography

opportunities with an additional 3,500 attending interpretational and environmental educational opportunities; with many of these activities accessed through hiking.

**(b) Where is the use conducted?**

Brazoria NWR provides three trails for hikers to use in a variety of settings, leading to a wide variety of habitat experiences. The Big Slough Boardwalk and Trail (0.6 miles) over the slough that provides a close encounter with a marsh crowned with spiky cattail and bulrush. The Big Slough Trail winds through low forests of yaupon and small clearings to an observation platform. The Cox Lake Trail is a short (.5 miles) is located within the Big Slough Public Use Area and takes visitors to the Maddox homesite and the shore of Cox Lake. The Middle Bayou Trail (2 miles) is located along the old abandoned Union Pacific Railroad. The trail traverses salty and coastal prairie habitats.

San Bernard NWR has a total of twelve hiking trails. Cow Trap Marsh Trail (1.2 miles) is a levee trail that traverses high, intermediate, and low marsh zones. Bobcat Woods Trails (1.5 miles) provides an accessible boardwalk and trail that provides exciting wildlife observation opportunities. At the trailhead are restrooms, interpretive displays, tables, and demonstration native garden for hummingbirds and butterflies. The San Bernard Oak Trail (0.7 miles) allows refuge visitors to wander through an old growth stand of live oak, pecan, hackberry, and ash. The Scissortail Trail (0.8 miles) is a loop following forested and brushy habitat along Cocklebur Slough. Cedar Lake Creek Trail is a .20 mile trail following the creek for fishing or hiking opportunities. Little Slough Trail (1.2 miles) located across from the Complex Office offers an opportunity for visitors to walk along a seasonally flooded slough.

Three bottomland units provide hiking opportunities away from the core refuges. Betty Brown Unit, located just north of FM 2611 offers a 3/8<sup>th</sup> mile loop trail that takes visitors to the shore of the San Bernard River. Hudson Woods Unit, located 5 miles west of Angleton, Texas, on State Highway 521, has three additional hiking trails in early and mid-succession stage bottomland forest. These include the Scoby Lake Trail (1.4 mile loop along Scoby Lake), the Live Oak Trail (1.8 miles that circles the north end of the property), and the Oyster Creek Trail (2.7 mile trail following the Oyster Creek). Dow Woods Unit, located just north of Lake Jackson, Texas, includes the accessible Tveten Trail (0.9 concrete loop) and Bayou Loop (2.3 mile gravel trail).

**(c) When is the use conducted?**

Public use areas, including the trails on Brazoria and San Bernard NWRs, are open each day from dawn to dusk. Hiking may occur during daytime hours with no seasonal closures, though this use occurs primarily in the spring with some use in the fall and winter.

**(d) How is the use conducted?**

All manner of pathways are available, from a concrete trail to boardwalks to woodland and bayou mowed trails. None of the trails are especially long, and all are on relatively flat terrain. Wandering off-trail is prohibited, due to habitat disturbance and dangerous wildlife such as alligators and venomous snakes reside in thicker vegetation.

**(e) Why is this use being proposed?**

Hiking on Brazoria and San Bernard NWRs facilitates fishing, wildlife observation, photography, and interpretation, each of which is one of the six wildlife-dependent recreational uses described in the National Wildlife Refuge System Improvement Act of 1997. The trails provide excellent opportunities for visitors to view waterfowl, wading birds, migratory songbirds, deer, alligators, and other resident and migratory wildlife, while also experiencing the unique coastal ecosystems across the Complex. This supportive recreational opportunity will help to establish an enhanced appreciation of the outdoor experience and encourage families and future generations to continue to pursue outdoor recreation. Additional self-guided brochures or interpretive trails will be developed to expand hiking opportunities as they support wildlife dependent recreational activities. Hiking is usually the preferred method of wildlife observation and increases the potential of observing more elusive bird species not commonly observed on roads.

**Availability of Resources:**

Trails, including the bottomland trails, require monthly mowing during the growing season. In addition, trimming limbs and picking up fallen limbs is required twice a year. The trails are maintained through a variety of means; contract, volunteers, summer youth programs and maintenance staff. Approximately \$6,000 for San Bernard NWR and \$1,200 for Brazoria NWR are required for annual maintenance of trails and associated parking areas. An estimated 1400 hours, by staff, contractor and volunteers, are spent on trail maintenance across the Complex.

**Anticipated Impacts of the Use:****Short and Long-term Impacts:**

Potential impacts to hiking activities include short-term disturbance to wildlife, minor soil compaction on existing trails and vegetative impacts in the immediate vicinity of the activity. Most hiking activities will occur at, or be directed to, existing and future trails and roads in strategic locations, providing quality opportunities while limiting wildlife and habit disturbance. Disturbance is typically short-term and should only temporarily displace wildlife. Adequate habitat and escape cover is usually available for wildlife nearby.

Impacts will be greatest during spring and early summer when use of the trails is greatest. Visitor access is typically by individuals or small groups for short durations. The use of the trails is generally irregular; minimizing impacts to temporarily displaced wildlife.

The long-term negative impacts are the modification of natural habitat to provide public use opportunities. This loss of natural habitat may be minimal, for dirt paths or mowed vegetation paths to moderate; for boardwalks or concrete trails. Hiking has a beneficial effect on refuge goals and objectives by striving to enhance and diversify opportunities and quality of visitor experiences on the refuge, promoting visitor understanding of, and increase appreciation for, America's natural and cultural resources and conservation history by providing safe, informative, enjoyable, and accessible areas of the refuge that would not otherwise be observed or appreciated. Providing an opportunity for people to hike among natural habitats and view native wildlife connects people with nature and fosters environmental stewardship.

The activities follow all applicable laws, regulations and policies, including: Migratory Bird Conservation Act, Title 50 Code of Federal Regulations, Refuge System Manual, National Wildlife Refuge System goals and objectives, and Refuge goals and objectives.

These activities are compliant with the purposes of the refuges and the National Wildlife Refuge System mission. Operating this activity does not alter the refuge's ability to meet habitat goals and it helps support several of the primary objectives of the refuges.

Cumulative Impacts: There are no anticipated cumulative impacts. Hiking is a mode for visitors to obtain access to the refuges while participating in other wildlife-dependent activities including; wildlife observation, interpretation, environmental education and photography. Providing an opportunity for people to hike among natural habitats and view native wildlife provides wide-scale beneficial environmental impacts as well. Because of the limited opportunity beyond the refuges that provide hiking in a natural setting, the cumulative impacts of the hiking program are beneficial. Although hiking and associated wildlife-dependent uses may increase over time, it is not anticipated to be significant enough to cause cumulative impacts. Evaluations of sites and programs will be conducted periodically to assess if objectives are being met and that natural resources are not being adversely impacted by hiking. The cumulative impacts of educating the public about conservation issues would be beneficial to meeting the Service mission and the refuges purposes.

**Public Review and Comment:**

During public scoping for the preparation of the Texas Mid-Coast Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA), verbal and written comments were solicited from members of the general public on all aspects of current refuge management through public meetings, special mailings, and local newspapers. This draft compatibility determination is being made available for public review and comment in conjunction with the Draft CCP/EA. Public comments on the proposed use are invited and due by the deadline stated on the cover of the Draft CCP/EA.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

To ensure that hiking remains a compatible use, the Complex has developed the following stipulations:

1. Camping is prohibited.
2. To protect fragile habitats and wildlife, off-road vehicle travel and parking is not permitted. No motorized vehicles are allowed on trails.
3. Wandering off trails is prohibited.
4. Littering is prohibited; hiking is allowed on a “pack it in, pack it out” basis.

**Justification:**

As defined by the National Wildlife Refuge System Improvement Act of 1997, wildlife-dependent recreational uses are to receive enhanced and priority consideration in refuge planning and management. The continuation of hiking at the Complex supports these priority public uses offered on the refuges as this activity supports wildlife observation, photography, fishing, and interpretation. This use will not conflict with any of the other priority public uses, adversely impact biological resources, or detract from refuge goals, objectives, and management activities described in the Refuge System Improvement Act of 1997. In fact, hiking in accordance with the above stipulations will enhance the Complex’s ability to attract refuge visitors and teach them about the purpose of the Complex and its role in the Refuge System. Through the compatibility determination process, the Complex has determined that hiking, as described above, will not materially interfere with or detract from the fulfillment of the Refuge System mission or the purposes of the refuges.

**Signature: Refuge Manager** \_\_\_\_\_  
(Signature and Date)

**Concurrence: Regional Chief** \_\_\_\_\_  
(Signature and Date)

**Mandatory 10-year Re-Evaluation Date:** \_\_\_\_\_

## DRAFT COMPATIBILITY DETERMINATION

**Use:** Cooperative Farming

**Refuge Name:** Brazoria National Wildlife Refuge

**Establishing and Acquisition Authority(ies):**

Brazoria NWR was established next on October 20, 1966, under provisions of the Migratory Bird Conservation Act (16 U.S.C. 712d), the Refuge Recreation Act (16 U.S.C. 460k-1 and 16 U.S.C. 460k-2), and the Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4) and 16 U.S.C. 742(b)(1)).

**Refuge Purpose(s):**

1. "...for use as an inviolate sanctuary,... for any other management purposes,... for migratory birds." (Migratory Bird Conservation Act [16 U.S.C. 712d])
2. "...for the development, advancement, management, conservation, and protection of fish and wildlife resources..." [16 U.S.C. 742f(a)(4)] and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." [16 U.S.C. 742f(b)(1)] (Fish and Wildlife Act of 1956)
3. "...suitable for- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species..." [16 U.S.C. 460k-1]; "...the Secretary... may accept and use... real... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donor..." [16 U.S.C. 460k-2] (Refuge Recreation Act, as amended [16 U.S.C. 460k – 460k-4]).

**National Wildlife Refuge System Mission:**

The mission of the National Wildlife Refuge System (Refuge System) is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

**Description of Use:**

**(a) What is the use?**

Cooperative farming is an economic use on the Brazoria NWR which is utilized as a management tool to provide habitat for resident and migratory wildlife. The cooperative farming, primarily rice farming occurs on a 3-year rotational basis across up to 1200 acres. Only approximately 1/3 of the total acreage is in production each year, enabling the other acreage to be flooded for moist soil management purposes. Payments by the cooperator may be in the form of water purchase for moist soil units, in-kind services such as mowing or disking fields, or direct payment in addition to a portion of the crop is left in the field for wildlife use.

**(b) Where is the use conducted?**

The farming acreage is located on the north side of the refuge between Ditch 6 and CR 208, just south of FM2004. The acreage is former coastal prairie that has been in crop production for many years prior to becoming part of the refuge. The area is traversed by several drainage ditches managed by the Brazoria County Drainage District #8. These ditches, along with FM2004, have altered the hydrology throughout this area. Where historically there was sheet surface flow, excess rainfall has been channelized. Although the ditches have altered the natural habitat, the refuge can take advantage of the same ditches by flooding croplands and moist-soil units. Surrounding acreage is managed as coastal prairie where prescribed fire is utilized. Water holding capability has been enhanced where ditch run-off water and excess water from farming is captured creating wet prairies.

**(c) When is the use conducted?**

Initial entry into the farm units occurs late winter to begin draining flooded units, followed by disking and ground preparation, with planting in March. The units are flooded throughout the growing season (April – June) and drained for harvest in July. Following harvest, the units are re-flooded for a second crop which is harvested in late September/early October. The Service's portion of the crop, generally comes from this second harvest which can be flooded for a third time, allowing winter waterfowl and waterbirds to utilize the field for food and cover.

**(d) How is the use conducted?**

A cooperative farming agreement is prepared annually. The agreement identifies which units are to be planted in a given year. Total acreage planted annually is 350 – 400 acres, with fields rotated every three years. In addition, payment including in-lieu services is identified and scheduled.

**(e) Why is this use being proposed?**

As it has been implemented, cooperative farming is a management tool utilized to provide high energy food for wildlife during the late fall and early winter months. In addition through rotation, fallow units are flooded, providing freshwater wetland habitats during the winter or during periods of severe drought when freshwater resources are critical. One additional benefit of the farming program is the capture of excess water onto the prairies below the farm fields.

**Availability of Resources:**

Adequate funding and staff are available to manage the cooperative farming program. The cooperative farming program is overseen by the assistant refuge manager. Following preparation of the annual agreement, the assistant manager must stay in contact with the farmer throughout the year ensuring that the agreement is adhered to. On average, less than 2 percent of their time is required to manage the cooperative farming program. Estimated cost for managing the program is \$3500 annually.

**Anticipated Impacts of the Use:**

Short and Long-term Impacts:

Farming and associate moist-soil management activities on the refuge are directly related to and support the purposes for which the refuge was established. Cooperative farming results in short-term disturbances and long-term benefits to both resident and migratory wildlife using the refuge. Short-term impacts will include disturbance and displacement of wildlife that is typical of any heavy equipment operation. Positive long-term benefits result in providing food/habitat for migratory and resident wildlife. In 2010, the crops grown on the refuge provide food for a peak population of 800+ mottled ducks, 3,000 snow geese, 10,000+ winter waterfowl, 3000 sandhill cranes, 4000+ shorebirds and 1,000 wading birds.

The activities follow all applicable laws, regulations and policies, including: Migratory Bird Conservation Act, Title 50 Code of Federal Regulations, National Wildlife Refuge System Manual, National Wildlife Refuge System goals and objectives, and Refuge goals and objectives.

These activities are compliant with the purpose of the refuge and the Refuge System mission. Operating this activity does not alter the refuge’s ability to meet habitat goals and it helps support several of the primary objectives of the refuge.

Cumulative Impacts:

Farming only occurs on lands that have been previously farmed. The impacts described above are minimal and short-term. The proposed action is not expected to incrementally add to any other state, private, or federal actions that are proposed or currently occurring in the area. The proposal benefits numerous wildlife species and supports hunting, wildlife observation, wildlife photography, environmental education, and interpretation. This activity does not significantly impact other refuge activities or wildlife populations locally or nationwide.

**Public Review and Comment:**

During public scoping for the preparation of the Texas Mid-Coast Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA), verbal and written comments were solicited from members of the general public on all aspects of current refuge management through public meetings, special mailings, and local newspapers. This draft compatibility determination is being made available for public review and comment in conjunction with the Draft CCP/EA. Public comments on the proposed use are invited and due by the deadline stated on the cover of the Draft CCP/EA.

**Determination (check one below):**

- Use is Not Compatible**
- Use is Compatible with Following Stipulations**

**Stipulations Necessary to Ensure Compatibility:**

Brazoria NWR management will continue periodic monitoring of the vegetative conditions and wildlife populations within the farm field/moist soil units and be aware of changing

climatic (e.g. drought, flood) or other conditions which might necessitate changes to the number of farmed acres. If changes should occur, the permittee will be contacted and adjustments to the permit will be made, pursuant to the terms and conditions of the Special Use Permit.

**Justification:**

The farming program supports the refuge purposes by providing forage and cover for wildlife and by contributing to a diversity of habitat types. The acreage farmed by cooperators greatly reduces the budgetary and manpower requirements that would be needed if the refuge staff farmed all of the cropland independently. Farming, as a management tool to achieve certain vegetative and water level conditions, is recognized in the Service Manual as approved management practices so long as the refuge has control over season and area of use, and the location and extent of farming operations. Cooperative farming on the refuge is consistent with local practices and is accomplished only on land suitable for such management. Refuge croplands supplement natural food sources on the refuge and provide undisturbed areas where wintering waterfowl can forage. The refuge farming program minimizes crop depredation on area lands, thus preventing economic loss to private landowners. Additionally, wildlife viewing opportunities are enhanced through concentrating birds.

**Signature: Refuge Manager** \_\_\_\_\_  
(Signature and Date)

**Concurrence: Regional Chief** \_\_\_\_\_  
(Signature and Date)

**Mandatory 15-year Re-Evaluation Date:** \_\_\_\_\_

## DRAFT COMPATIBILITY DETERMINATION

**Use:** Cooperative Grazing Program

**Refuge Name:** Texas Mid-coast National Wildlife Refuge Complex

### **Establishing and Acquisition Authority(ies):**

Texas Mid-coast National Wildlife Refuge Complex (Complex) is comprised of Brazoria, San Bernard, and Big Boggy National Wildlife Refuges (NWRs). Brazoria NWR was established on October 20, 1966, San Bernard NWR was established next on November 7, 1968, and Big Boggy NWR was established on July 8, 1983. All three refuges were created and managed under provisions of the Migratory Bird Conservation Act (16 U.S.C. 712d) and the Refuge Recreation Act (16 U.S.C. 460k-1 and 16 U.S.C. 460k-2). Brazoria and San Bernard NWRs were also established under the Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4) and 16 U.S.C. 742(b)(1)).

### **Refuge Purpose(s):**

1. "...for use as an inviolate sanctuary,... for any other management purposes,... for migratory birds." (Migratory Bird Conservation Act [16 U.S.C. 712d])
2. "...for the development, advancement, management, conservation, and protection of fish and wildlife resources..." [16 U.S.C. 742f(a)(4)] and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." [16 U.S.C. 742f(b)(1)] (Fish and Wildlife Act of 1956)
3. "...suitable for- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species..." [16 U.S.C. 460k-1]; "...the Secretary... may accept and use... real... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donor..." [16 U.S.C. 460k-2] (Refuge Recreation Act, as amended [16 U.S.C. 460k – 460k-4]).

### **National Wildlife Refuge System Mission:**

The mission of the National Wildlife Refuge System (Refuge System) is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

### **Description of Use:**

#### **(a) What is the use?**

This Compatibility Determination evaluates the use of domestic livestock grazing on selected units of Brazoria and San Bernard NWR as a management tool in order to maintain vital components of waterfowl, endangered species, and other wildlife habitat. Livestock grazing is proposed by the Service under Alternative B (proposed action) of the Draft Comprehensive Conservation Plan (CCP) as an additional

management tool which in conjunction with fire, herbicide and mechanical manipulation would be utilized to achieve desired coastal prairie and freshwater management unit conditions to benefit grassland-dependant wildlife.

**(b) Where is the use conducted?**

A comprehensive livestock management plan will be developed to determine strategic locations to graze livestock, however, grazing may be employed as a management tool in coastal prairie habitats and fresh-water impoundments which would benefit native wildlife including: 1) maintaining of mottled duck nesting habitat; 2) control of invasive species; and 3) manage prairie habitats for Attwater's prairie chicken. Potential locations for implementation include; on Brazoria NWR moist-soil units, farm fields and restored prairie units between Austin Bayou and Ditch 6 and north of Walker Ditch and Haskins Mound, on San Bernard NWR restored prairie units associated with the historic Damon Prairie (Buffalo Creek and Eagle Nest Lake Units).

**(c) When is the use conducted?**

Timing of grazing will be determined on the development of the livestock management plan that will address season, timing, intensity and duration of each grazing season to meet the management needs of grassland dependent wildlife species throughout the Complex.

**(d) How is the use conducted?**

Livestock grazing will be conducted based seasonal rotation systems that best meet the habitat management considerations for endangered species, grassland dependent wildlife species, and waterfowl. Stocking rates, season, timing, intensity and duration of all livestock grazing occurring on the Complex will be designed to meet the needs of wildlife. The refuge would administer livestock grazing through issuance of a Special Use Permit (SUP) to a cooperative livestock permittee(s). The SUP would specify the details of the use, including any restrictions.

**(e) Why is this use being proposed?**

The objective of the livestock grazing program is to provide a management tool to help meet the desirable habitat characteristics (reduce vegetative cover, encourage forbs) that benefit grassland dependent wildlife species that prefer early seral stages. This type of management could make certain areas more attractive to waterfowl, shorebirds, other migratory birds and resident species, including the Attwater's prairie chicken, for which the Complex has been identified as a potential re-introduction site. Grazing on the Complex will be strictly incorporated as a wildlife management tool and no consideration will be given on the basis of economic significance to the Complex or surrounding communities.

Light to moderate grazing, often in combination with prescribed fire, is a generally accepted tool in prairie chicken management for preventing creation of an overly-dense, matted grassland cover situation (Lehmann 1941; Hamerstrom et al. 1957;

Chamrad and Dodd 1972; Cogar et al. 1977; Kessler 1978a,b; Jurries 1979; U.S. Fish and Wildlife Service 2010).

**Availability of Resources:**

Through the issuance of refuge SUPs, this use is a cooperative, commercial program whereby the permittee is leased the grazing rights and the refuge dictates the number of cattle to meet objectives. Direct annual costs to administer this program and facilities are primarily in the form of staff time. It is anticipated that refuge staff will collectively spend approximately 0.25 FTE's (divided between botanist, biologist and manager) and \$25,000 in salary, materials and supplies annually to administer a grazing program. Regular communication with the permittees, rotation and rest planning, boundary and interior fence inspection, vegetation monitoring and wildlife use monitoring are all necessary to gather information and make informed decisions to use this tool.

**Anticipated Impacts of the Use:**

Short and Long-Term Impacts:

The refuge does not anticipate short-term or long-term adverse impacts to wildlife species or other resources from the grazing operations as this activity is a management tool which will specifically benefit early succession dependent species. In general, light to moderate grazing results in an increased species richness of both plants and animals (Kantrud and Kologiski 1982, Archer and Smeins 1991). It must be noted however, that while grazing is a viable tool for managing wildlife habitat (Lehmann 1941; Kessler 1978a,b; Ryder 1980; Bryant et al. 1982; Kantrud and Kologiski 1982), not all wildlife species have the same habitat requirements. Therefore, not all species respond similarly to grazing (Phillips 1936, Ryder 1980, Kantrud and Kologiski 1982, Hanley and Page 1982, Clark et al. 1989). Grazing will be implemented in accordance with an approved management plan which will strive to balance the needs of wildlife dependent on more mature prairie grasslands with the needs of early successional grasslands. Grazing, along with fire, will be utilized to proportionally manage for the latter.

Grazing has the potential of producing negative impacts on watershed hydrologic parameters including infiltration, run-off, temperature increase and sedimentation. With light stocking rates and short-term grazing cycles, these potential negative impacts will be minimized through appropriate planning and monitoring.

No adverse socioeconomic impacts are anticipated.

Cumulative Impacts:

There are no anticipated cumulative impacts. Grazing, when implemented would occur in conjunction with other prairie management and restoration techniques. Managing prairie grasslands to provide a diversity species and prairie conditions will benefit a wider array of wildlife and plants. Should grazing be implemented on the Complex as a management tool, the cumulative impacts will be beneficial based on improving habitat characteristics for selective species of wildlife.

**Public Review and Comment:**

During public scoping for the preparation of the Texas Mid-Coast Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA), verbal and written comments were solicited from members of the general public on all aspects of current refuge management through public meetings, special mailings, and local newspapers. This draft compatibility determination is being made available for public review and comment in conjunction with the Draft CCP/EA. Public comments on the proposed use are invited and due by the deadline stated on the cover of the Draft CCP/EA.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

The following stipulations are required to ensure that grazing remains a compatible use on the Complex:

1. A step down Livestock Management Plan will be developed to determine how grazing will accomplish management objectives on the Complex
2. Grazing activities are strictly used as a management tool to benefit grassland dependent wildlife species, threatened and endangered species and grassland dependent species.
3. The refuges will conduct annual utilization and monitoring techniques to determine if wildlife objectives are being met by the livestock management plan.
4. The Refuge Manager reserves the right to modify all aspects of the livestock management plan to insure wildlife objectives are being met by grazing livestock on the refuge.

**Justification:**

With the potential of reintroduction of Attwater's prairie chickens to the mid-coast prairies, grazing should be considered at a viable management tool. Numerous research studies have documented the beneficial impacts of carefully managed grazing on prairie chicken habitat. The approved Attwater's Prairie Chicken Recovery Plan also reflects the importance of grazing as a tool for management of Attwater's prairie chicken habitat. Properly managed, grazing provides an alternative prairie management tool that can be beneficial to early seral grassland dependent wildlife species, including mottled ducks, bobwhite quail and some grassland songbirds by prolonging early seral conditions either after habitat manipulating activities or just through active grazing.

The Complex has determined that grazing, in accordance with the stipulations provided above, will not materially interfere with or detract from the fulfillment of the Refuge System mission or the purposes of the refuge. The refuge will continue to monitor this use and adjust the program as necessary to protect and enhance refuge resources. The benefits of the grazing program are expected to outweigh associated impacts.

**Appendix C: Compatibility Determinations**

**Signature: Refuge Manager** \_\_\_\_\_  
(Signature and Date)

**Concurrence: Regional Chief** \_\_\_\_\_  
(Signature and Date)

**Mandatory 15-year Re-Evaluation Date:** \_\_\_\_\_

## DRAFT COMPATIBILITY DETERMINATION

**Use:** Pesticide application to control mosquito populations

**Refuge Name:** Texas Mid-coast National Wildlife Refuge Complex

**Establishing and Acquisition Authority(ies):**

Texas Mid-coast National Wildlife Refuge Complex (Complex) is comprised of Brazoria, San Bernard, and Big Boggy National Wildlife Refuges (NWRs). Brazoria NWR was established on October 20, 1966, San Bernard NWR was established next on November 7, 1968, and Big Boggy NWR was established on July 8, 1983. All three refuges were created and managed under provisions of the Migratory Bird Conservation Act (16 U.S.C. 712d) and the Refuge Recreation Act (16 U.S.C. 460k-1 and 16 U.S.C. 460k-2). Brazoria and San Bernard NWRs were also established under the Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4) and 16 U.S.C. 742(b)(1)).

**Refuge Purpose(s):**

1. "...for use as an inviolate sanctuary,... for any other management purposes,... for migratory birds." (Migratory Bird Conservation Act [16 U.S.C. 712d])
2. "...for the development, advancement, management, conservation, and protection of fish and wildlife resources..." [16 U.S.C. 742f(a)(4)] and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." [16 U.S.C. 742f(b)(1)] (Fish and Wildlife Act of 1956)
3. "...suitable for- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species..." [16 U.S.C. 460k-1]; "...the Secretary... may accept and use... real... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donor..." [16 U.S.C. 460k-2] (Refuge Recreation Act, as amended [16 U.S.C. 460k – 460k-4]).

**National Wildlife Refuge System Mission:**

The mission of the National Wildlife Refuge System (Refuge System) is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

**Description of Use:**

**(a) What is the use?**

In accordance with Service policy, enable Mosquito Control District(s) to apply pesticides for the control of adult mosquitoes over specified areas of the refuges that are adjacent to human populations. Mosquitoes breed in the high salt marsh and migrate inland to brush or forest cover. Spraying is in the public interest, mostly to

alleviate severe nuisance to the citizens of Brazoria County but these have the potential of carrying diseases which can infect both human and wildlife populations.

The following mosquito species can be found breeding in the saltmarsh environment on the refuges; the first two of which are the main pests:

*Aedes sollicitans* – a vector of eastern equine encephalitis and the primary pest, receiving more than half of the control effort. (Note: western equine encephalitis occurs in Texas in western portions)

*A. taeniorhynchus* – primarily a pest to people.

*A. albopictus* – a vector of dengue fever (relatively new in the United States)

*Psorophora columbiae* – primarily a pest to people

West Nile Virus was confirmed in Texas in July 2002. That year, Harris County had several hundred confirmed cases of West Nile in humans. In 2010, although Brazoria County did not have any documented cases of West Nile Virus, Houston and surrounding counties documented 28 cases among the human population and 269 infected mosquitoes (diseasemaps.USGS.gov/wnv). The primary carrier of West Nile has been identified as *Culex spp.* These species breed in fresh water ponds and potholes which can be found on in the wet prairie during periods of high rainfall. These mosquitos are single egg layers, found in generally low numbers and should not be a driving force in implementing a mosquito control program on the refuges.

In Texas, cases of Saint Louis encephalitis (SLE) have averaged about 17 per year, and statewide, SLE caused 27 deaths in 1964, two in 1980 and six in 1986. The local history in State Health Department records indicated four past human cases of SLE from Brazoria County: in 1980, one case each in Freeport and Brazoria; in 1982 one in Freeport. No cases were reported in 2010.

In 2010, six out of 19 documented cases of imported dengue fever in Texas occurred in the Greater Houston area.

Species *A. sollicitans* and *A. taeniorhynchus* are the primary nuisance mosquitos. They lay their eggs in large groups and their eggs may lay in the salt marsh for months without hatching until conditions are right.

**(b) Where is the use conducted?**

Specific locations would be identified in the Mosquito Control Plan. Locations would generally be areas of the refuge in proximity of human populations including the DemiJohn area, lower San Bernard River (River's End). In the past, the spray areas totaled 996 acres, which comprises only a relatively small portion of the refuges – about two percent. About four percent of the uplands are sprayed: on Brazoria NWR 593 acres are sprayed out of 14,051 acres of upland and on San Bernard NWR 403 acres are sprayed out of 2,220 acres of upland. Malathion nor Dibrom may not be sprayed over water.

The Complex will coordinate with the Mosquito Control district to ensure they are aware of Service lands (bottomlands) near inland communities and restrain from spraying these area unless a serious health concern is identified.

**(c) When is the use conducted?**

The need for daily spraying is determined through the use of “Landing Rate Counts” by the District; an observer counts the number of mosquitoes landing per minute on the observer’s thigh and on those sites which had a “threshold” count of 5 or more spraying is then completed. Although spraying could occur at any time during the year, it is most likely to occur during late spring and fall when high tides have brought water up and into the upper salt marshes. Spraying is generally conducting during morning hours when the winds are light.

**(d) How is the use conducted?**

Spraying would be conducted the Mosquito Control District through aerial application. This compatibility review is on ultra-low volume (ULV) aerially-applied Malathion or Dibrom for use on selected small upland portions of the refuges for control of adult mosquitoes.

**(e) Why is this use being proposed?**

The Service allows pesticide treatments for mosquito population control on Refuge System lands when local, current mosquito population monitoring data have been collected and indicate that refuge-based mosquito populations are contributing to a human or wildlife health threat. The data from New Jersey Traps at locations near DemiJohn and the San Bernard NWR headquarters show periods of time where within 24 hours, collections in excess of 500 occurred regularly throughout the year.

**Availability of Resources:**

Adequate staff and funding are available to manage this program, which involves issuance of a Special Use Permit (SUP) to the Mosquito District for mosquito control. The cost is minimal. Primary cost associated with this permit will be annual review of permitted and conditions which warrant control, preparation and reporting on Pesticide Use Proposal and field monitoring. Direct annual costs to administer this program, including staff time is less than \$5,000 annually.

**Anticipated Impacts of the Use:**

Short and Long-Term Impacts:

An Environmental Assessment completed in 1994 on this proposed activity discusses the effects of spraying Malathion on refuge lands. In addition the Services’ Report, Environmental Effects of Mosquito Control, discusses the ecological role of mosquitoes and the effects of various control agents of mosquitoes and non-target species.

Malathion and Dibrom are organophosphate adulticides. Several pyrethroids including, permethrin, resmethrin and sumithrin. The pyrethroids are usually combined with the synergist piperonyl butoxide, which interferes with an insect’s detoxifying mechanisms.

None of these pesticides is persistent in the environment. Currently, Dibrom is being used to spray over communities and lands surrounding the refuges by the Mosquito Control District.

All adulticides are very highly toxic to aquatic invertebrates in concentration  $< 1$  ppb (Milam al. 2000). However unlike other adulticides, Malathion and Dibrom application over water is restricted by the label and is not proposed by the refuges.

Like other aquatic insects with terrestrial adult stages, mosquitoes provide a link between aquatic and terrestrial ecosystems as they convert detritus and aquatic microbial biomass into flying insect biomass. Most adult mosquitoes are relatively short-lived. The probability of daily survival for adult mosquitoes, an important factor in disease transmission varies among species and habitats. Daily survival probabilities usually range from 0.6-0.9, with much of the mortality coming from predation (USFWS 1993). Mosquitoes are fed upon by a variety of invertebrates predators, including spiders (Strickman et al. 1997; Fox 1998) and odonates (Sukhacheva 1996), although there are no known specialist predators that prey exclusively on mosquitoes. Vertebrate predators include insectivorous birds and bats (Zinn and Humphrey 1981), although mosquitoes often account for only a small percentage of the total biomass consumed. Consumption of mosquitoes by the Indiana bat (*Myotis sodalist*), for example, accounted for up to 6.6 percent of the total diet (Kurta and Whitaker 1998). The apparent absence of any specialized predator-prey relationships among adult mosquitoes and predators however, does not necessarily discount the contribution of mosquitoes to the diet of a wide variety of generalized predators.

The impact of reducing the density of mosquitoes in aquatic and terrestrial systems has not been studied. General predators probably switch to alternate prey, which in turn may be impacted by the increased predation. The few specialist predators of mosquito larvae may be impacted the greatest due to the lack of alternate prey and/or the inability of such predators to uncouple from a closely evolved predator-prey relationship.

None of the adulticides identified above are known to directly impact birds. Nesting birds are not expected to be impacted. The black-shouldered and swallow-tailed kites, white-tailed hawk and northern harrier infrequently nest on the refuges. The American kestrel occurs in migration. Although some insect prey of some bird species will be affected, only a small percentage of the habitat will be impacted and alternate feeding sites are available. No significant impacts are expected.

Threatened and endangered species that occur on the refuge (piping plover) and Category 2 species including black rail, Henslow's sparrow, and southeastern snowy plover), and State-listed species (wood stork, swallow-tailed kite, reddish egret and white-tailed hawk) that occur, are not expected to be within spray areas. A Section 7 consultation, dated 1994, has been completed.

Most passerine birds such as warblers are insectivorous. Nesting occurs from March to August. Found nesting in the salty prairie grassland community are eastern meadowlarks, red-winged blackbirds, boat-tailed grackles and sea-side sparrows. The coastal prairie is used during the winter by migrant mourning doves, painted buntings, dickcissels, eastern

meadowlarks eastern kingbirds and scissor-tailed flycatchers. Bobwhite quail and great-tailed grackles are nesters. No significant impacts are expected on these species because alternate sites to the small portions of sprayed habitat are available.

The Service places special emphasis on protection of neo-tropical migratory bird species such as the orioles, tanagers, hummingbirds, wood warblers, vireos, flycatchers, etc., several of which are insectivorous. These birds “fall out” of northward migration during passage of cold fronts along the Gulf coast in May, using coastal woodlands. These sites are not sprayed.

The principle purpose for the refuges is waterfowl maintenance. Common waterfowl species on the refuges include the snow goose, American wigeon, green-winged and blue-winged teal, gadwall, northern pintail and northern shoveler. The mottled duck is a year round resident and a nesting species. With their increased nutritional requirements, breeding female ducks and mottled duck broods are extremely dependent on invertebrate foods. Since wetlands should not receive spray, the waterfowl invertebrate foods, broods and breeding pairs should not be impacted.

Impacts on fish are not expected since spraying over water is not permitted. Maintaining buffer zones should help avoid water. Strict control will be needed on the part of the pilot to avoid drift over tidal water. Impacts on amphibians and reptiles have been poorly studied. One study found no observable response. No significant impacts should occur.

Mammalian toxicity is relatively low for all aduaticides.

Cumulative Impacts:

No adverse cumulative impacts are anticipated by the proposed mosquito control techniques. This use will be closely monitored for any adverse impacts throughout the year.

**Public Review and Comment:**

During public scoping for the preparation of the Texas Mid-Coast Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA), verbal and written comments were solicited from members of the general public on all aspects of current refuge management through public meetings, special mailings, and local newspapers. This draft compatibility determination is being made available for public review and comment in conjunction with the Draft CCP/EA. Public comments on the proposed use are invited and due by the deadline stated on the cover of the Draft CCP/EA.

**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

The following stipulations are required to ensure that fishing remains a compatible use on the Complex:

1. A step-down Mosquito Management Plan will be developed to determine how pesticide applications will accomplish management and human health objectives on the Complex.

**Justification:**

The Complex has a large number of communities near refuge lands. Arthropods such as mosquitoes pose an annoyance to humans and worldwide can have consequences such as mosquito-borne infections. Service Policy allows mosquito control on refuge lands when it is necessary to protect the health and safety of the public or a wildlife or domestic animal population. We will allow management of mosquito populations on refuge lands using effective means that pose the lowest risk to wildlife and habitats.

**Signature: Refuge Manager** \_\_\_\_\_  
(Signature and Date)

**Concurrence: Regional Chief** \_\_\_\_\_  
(Signature and Date)

**Mandatory 10-year Re-Evaluation Date:** \_\_\_\_\_