

DRAFT Compatibility Determination

Use: Commercial Guiding for Wildlife Observation and Photography

Refuge Name: Shiawassee National Wildlife Refuge

Establishing and Acquisition Authority(ies): Established October 21, 1953

Shiawassee National Wildlife Refuge (NWR, the refuge) was established as part of a dedicated wildlife area in the floodplain area of central Saginaw County. The area consisted of two units, the Shiawassee NWR administered by the U.S. Fish and Wildlife Service (Service) and the Shiawassee River State Game Area administered by the Michigan Department of Natural Resources (DNR). Establishment of the Shiawassee Project was authorized by the Migratory Bird Conservation Commission in May of 1953. Federal acquisition authorities used to acquire the Federal portion of the dedicated wildlife area were the:

Migratory Bird Conservation Act (16 U.S.C. 714-714r)
Refuge Recreation Act (16 U.S.C. 460k-460k-4).

Funds for acquiring the Federal lands were primarily derived from Federal duck stamp sales.

Refuge Purpose(s):

Shiawassee NWR was established under the dual authorities listed above with the following purposes:

“... for use as an inviolate sanctuary, or any other management purpose, for migratory birds.

... for (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, [and] (3) the conservation of endangered and threatened species...”

National Wildlife Refuge System Mission:

“The mission of the National Wildlife 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:

What is the use? This Compatibility Determination is for commercially-guided public wildlife viewing and photography within the Shiawassee NWR boundaries. Commercial guides would charge a fee to lead visitors on wildlife tours of the refuge by motorboat, kayak, or canoe, or on land such as biking, hiking, cross-country skiing or snowshoeing.

Where is the use conducted? Land-based commercial guiding would occur along existing open roads and trails, including all trails at the Green Point Environmental Learning Center (2.5 miles of hiking, snowshoeing and cross-country skiing), Woodland Trail (4.5 miles of biking, hiking, snowshoeing and cross-country skiing), Ferguson-Bayou Trail (4.5 miles of biking, hiking, snowshoeing and cross-country skiing) and the Wildlife Drive, a 6.5 mile one-way loop. Water-based commercial guiding would occur in all accessible areas of the rivers running through the refuge, including the Shiawassee, Flint, Cass and Tittabawassee Rivers, and accessible drains and ditches such as the Spaulding Drain. The launch ramp on the Cass River would likely be used to launch and retrieve water craft and is open year-round. The launch site offers public parking, but no other facilities. Water-based guiding would not occur in any managed wetlands, moist soil units or pools. No portage of watercraft would occur over dikes or other structures to access managed areas.

When is the use conducted? Commercially-guided use may occur year-round depending on the activity. Boating, canoeing and kayaking would largely occur during the spring, summer and fall, whereas hiking and biking could occur year-round and snowshoeing and cross-country skiing would occur during the winter. All activities would occur between sunrise and sunset. Commercial activities may need to be temporarily curtailed due to refuge management actions that close a specific area, road or trail; during times of flooded or muddy roads and trails; or during active hunts or other sensitive times of the year for wildlife. Specifically, the Wildlife Drive is closed October 1 through May 31 each year. All other trails are open year-round, except for during active hunts in the fall. Commercial guides and other visitors will be notified of any closures via signage, press releases, the refuge website, and/or the refuge Facebook page. All navigable rivers and ditches are open year-round except during goose hunts for safety reasons. The Special Use Permit for each commercial guiding activity would specify all appropriate closures. In addition, Special Use Permit stipulations would restrict commercially-guided watercraft landings on refuge lands to reduce harassment of wildlife and the trampling of vegetation.

How is the use conducted? All commercial guides would independently advertise their guided services. All commercial guides would have to apply for a separate Special Use Permit. If approved, the Special Use Permit would contain stipulations to ensure the activities are conducted consistent with refuge purposes, public safety and in a manner that minimizes disturbance to wildlife, other wildlife observers, and sensitive habitats.

Why is the use being proposed? Wildlife observation and photography are priority public uses on National Wildlife Refuge System (Refuge System) Lands as identified in the National Wildlife Refuge System Improvement Act of 1997. Access to the refuge for wildlife observation and photography will meet one of the goals of the refuge and Refuge System. This use meets Goal 3 of the refuge's Comprehensive Conservation Plan (CCP) of enhancing visitor experiences and environmental education through wildlife-dependent recreational uses and encouraging an appreciation of the refuge and its fish and wildlife resources. Commercially guided tours may appeal to a sector of society that is less prone to venture out on their own, do not have the resources to venture out alone (i.e., don't own a boat), are unable to explore on their own due to a disability, or who desire their adventures to include environmental education/interpretation as a component of their visit.

Availability of Resources:

Maintaining public use facilities is part of routine refuge management duties, and staff and funding are currently available for our existing infrastructure. No new facilities are currently planned, although some facilities may need upgrading and maintenance. The Wildlife Drive was designed and is maintained to accommodate extensive use. There is a small amount of road and trail maintenance, mowing, and other upkeep performed that is funded as part of regular refuge management activities. Due to the emerald ash borer, most of the ash trees on the refuge are dead and are starting to fall to the forest floor on a regular basis increasing our need to maintain clear and safe trails. This activity will decrease over time as the number of dead standing ash trees decline over time. Trail signage is adequate, but could be improved with minor expenses or grants. Due to topography and accessibility there is only one boat launch in the refuge. No new infrastructure would be built to accommodate commercially-guided activities.

Law enforcement and administrative monitoring are the primary tools necessary to ensure proper and safe administration of these commercial uses. The refuge will have a full time Refuge Officer beginning in the fall of 2017 and additional law enforcement services are available through the Regional Law Enforcement Program and Refuge Officers stationed at other refuges nearby. Additionally, the local State DNR Conservation Officers, County Sheriff's Office, and township police provide additional assistance when needed.

At the anticipated level of commercial guiding use (which is considered low) there are adequate refuge resources to implement this program. Administrative costs for administering Special Use Permits for commercial guiding will be minimal due to a small number of permits that will be allowed.

Anticipated Impacts of Use:

Commercial guiding for wildlife observation and photography has shown no documented environmental impact to the refuge, its habitats or wildlife species. Given stipulations in Special Use Permits for commercial guiding, limited to no impacts to vegetation, water, or soils are anticipated. However, these activities do pose the threat of disturbing wildlife which is difficult to measure or document. However, with restrictions limiting access to specific locations during sensitive times of the year, disturbance to wildlife will be minimized.

The primary impact from commercially-guided wildlife observation and photography, including use of the Wildlife Drive, is disturbance to wildlife. This use must be managed to minimize disturbance to wildlife or wildlife habitats. Cline et al. (2007) view human-wildlife disturbances as direct or indirect and present a classification of potential impacts. Direct impacts are activities that affect animal physiology, behavior, or cause death. Indirect impacts are typically from activities that degrade habitats. There can be short-term or long-term effects and the vulnerability of wildlife varies greatly. Impacts from commercially-guided wildlife observation and photography at Shiawassee NWR could fall into the classes of mortality, stress, reduced use of preferred habitat, or reduced use of the refuge. Cline et al. (2007) suggest evaluating the amount of use, type and behavior of use,

timing of use, resistance and resilience of the environment, and spatial distribution of use in determining impacts from commercially-guided wildlife observation and photography and other recreational uses. These factors were considered in the below assessment and stipulations contained in Special Use Permits are designed with these factors in mind.

Short-term impacts:

Low impact activities such as walking, biking, canoeing, kayaking, cross-country skiing and snowshoeing are expected to cause minimal and short-term disturbance to wildlife, even if conducted in small guided groups. Guides would be expected to keep clients on designated trails and use low impact observation skills (being still and quiet) to observe or photograph wildlife. These types of activities have been occurring on the refuge for years and are controlled by directing most users to facilities (trails, observation decks, etc.) such that disturbance of wildlife is temporary and localized. By directing use to these facilities the majority of the refuge is left undisturbed. Based on anecdotal information from refuge staff, these uses have not resulted in excessive wildlife disturbance. The refuge currently receives relatively low numbers of users for these activities and they are not expected to increase substantially; however, organized groups may draw larger numbers of people (usually no more than 15 people). Guided tour groups are controlled through Special Use Permit stipulations that limit the number of visitors, and the time and area accessible to the tour to minimize wildlife disturbance.

Motorboats however due to their speed and noise may be more disturbing to wildlife, especially airboats, than other means of transportation. All navigable waterways within the refuge boundary are open to all watercraft by State law. Although motorized boats may operate at high rates of speed along the mainstem of the Shiawassee River, we anticipate that commercial guides and the public will slow down as they approach refuge lands because of shallow water, ever changing hazards (trees, sand hills, altered stream courses, etc.) and to be able to observe, but not disturb wildlife. Use of airboats for commercial guiding will not be allowed. Motorboat guide trips can accommodate up to 10 people per trip and usually include up to 100 clients per year between March 28 and December 31. Because guided boat trips are generally between 4 and 8 hours long, clients may need a respite from being in the boat and occasionally need to exit the boat. The refuge will address this potential need through stipulations in the Special Use Permit to avoid trampling vegetation and disturbing wildlife. Experience by refuge staff indicates these stipulations would have minimal impacts on refuge lands and wildlife. The refuge and portions of the Shiawassee River are closed to all boat entry during the fall goose hunt; therefore, commercial guiding at this time will not be allowed. Motorboat use is not expected to appreciably increase, but kayak and canoe use may increase slightly if the Shiawassee River is designated as a National Water Trail in the future. However, given a lack of amenities and navigational buoys, the portion of the Shiawassee River within the refuge is considered advanced water for kayakers and canoeists thus limiting future growth of this use.

Vehicle use on the Wildlife Drive has the potential to cause the most short-term disturbance to wildlife as compared to the other forms of human disturbance. Regular vehicle use by the public would be from June 1 until September 30; this would coincide

with the commercially-guided auto tours. The Wildlife Drive is closed in the spring and fall to protect waterfowl during the spring and fall migration as well as nesting bald eagles and to provide quality hunt experiences and public safety during the goose and deer hunts. Vehicle use, both from the general public and commercially-guided tours, would be greatest immediately after the Wildlife Drive opens (June 1st) and before the Wildlife Drive closes (September 30th), as these are the times of greatest wildlife abundance to be seen from the Wildlife Drive; whereas sporadic use would occur throughout the summer. There are specific areas along the Wildlife Drive designed for people to park and get out of their vehicles to view wildlife. Vehicles on the Wildlife Drive and people observing wildlife at designated locations during the times the Wildlife Drive is open to the public have shown little to no disturbance to wildlife. Guided trips would likely use minivans or buses to reduce the number of vehicles on the Wildlife Drive to minimize the disturbance of wildlife. Guided tours would occur at the same time as general public use of the Wildlife Drive.

Wading birds and large numbers of shorebirds can be present on mudflats during the summer months when they are beginning to migrate, but these birds are generally farther from the Wildlife Drive due to low water levels and are not generally disturbed by passing vehicles. Some resident wildlife such as deer, turkeys, and coyotes may be periodically disturbed by passing vehicles, but they would generally move short distances away from the vehicles. Turtles, frogs and snakes are often on the Wildlife Drive during spring and early summer and could be run over by vehicles or disturbed causing them to expend energy to move off of the roadway. Signage alerts drivers to watch for and avoid reptiles and amphibians on the road and to obey the posted 15 mph speed limit to reduce the potential of injuring or killing these wildlife.

The primary concern for short-term impacts to wildlife from commercially-guided activities would be to spring and fall migrating waterfowl and nesting bald eagles close to the Wildlife Drive. Peak bird numbers vary, but can be up to 50,000 ducks and geese, or more, in the moist soil units in the fall. Bird numbers begin to increase in September and usually peak in late November. Birds will stay until freeze-up, usually in early December. Spring numbers can also be high, but birds typically stay for a limited duration of only 2 to 3 weeks in early March. Migrating waterfowl are trying to conserve energy and maximize time spent feeding; therefore, the purpose of the Wildlife Drive closure is to provide foraging and resting habitat for migrating waterfowl and nesting habitat for bald eagles with minimal human disturbance.

Waterfowl are naturally wary and susceptible to human disturbance. Korschgen and Dahlgren (1992) outline some of the results of human disturbance on waterfowl including changing their feeding habits or habitat use patterns which can ultimately lead to a loss of weight. Dahlgren and Korschgen (1992) conducted a literature review of human disturbance impacts to waterfowl primarily from boat and foot traffic, with limited information on effects from vehicle traffic. Researchers found that disturbance to waterfowl from various causes modified waterfowl behavior and caused significant energetic consequences. DeLong (2002) cited studies that documented northern pintails

and other waterbirds moved farther from auto tours as traffic volume increased, and that migrant wildlife were more sensitive to traffic than resident wildlife. However, sensitivity of species to disturbances varies; some studies show that geese, and some duck species, can become accustomed to vehicle traffic. In general, diving ducks may be more susceptible than dabbling ducks, and large flocks of waterfowl are more susceptible than small flocks of waterfowl to disturbances (Korschgen and Dahlgren 1992). Repeated disturbances (such as multiple vehicles) appear to disrupt feeding behaviors, whereas prolonged disturbances can cause birds to migrate elsewhere. Korschgen and Dahlgren (1992) ranked various types of disturbances and found that activities along shorelines, including traffic, were the least disturbing to wildlife as compared to approaching wildlife on foot (Cline et al. 2007).

Fredrickson and Reid (1988) suggest that disturbance from researchers, management activities, and bird watchers can be as detrimental as boating and hunting disturbances. Disturbance is more severe if the birds have to fly a long distance to find food elsewhere, if food resources are not plentiful, or if other factors also contribute to their energetic costs. In most years when vegetation on the moist soil units is abundant, birds on the refuge do not have to fly far to find sufficient foraging habitat. Although ducks and geese tend to flush easily, refuge staff has observed that when birds are flushed due to a disturbance they do not fly very far and tend to stay within the refuge.

Korschgen and Dahlgren (1992) suggest management strategies to minimize the effects of disturbance such as increasing food sources to compensate for energetic costs, establishing screened buffer areas, creating sanctuaries, and reducing noise and rapid movement of vehicles and machines. Most vehicle traffic on the Wildlife Drive will be outside of migratory periods and will be traveling at slow speeds (posted 15 mph speed limit). The Wildlife Drive was designed to help concentrate use in one area while maintaining other large areas of the refuge as inaccessible, non-disturbed areas or “sanctuaries.” All of the designated trails, except the Wildlife Drive, are in forested habitats thus reducing potential disturbance on waterbirds and shorebirds.

During the breeding season bald eagles are sensitive to a variety of human activities. However, not all bald eagle pairs react to human activities in the same way. Some pairs nest successfully just dozens of yards from human activity, while others abandon nest sites in response to activities much farther away. This variability may be related to a number of factors, including visibility, duration, noise levels, extent of the area affected by the activity, prior experiences with humans, and tolerance of the individual nesting pair. If agitated by human activities, bald eagles may inadequately construct or repair their nest, may expend energy defending the nest rather than tending to their young, or may abandon the nest altogether. Activities that cause prolonged absences of adults from their nests can jeopardize eggs or young. Depending on weather conditions, eggs may overheat or cool too much and fail to hatch. Unattended eggs and nestlings are subject to predation. Young nestlings are particularly vulnerable because they rely on their parents to provide warmth or shade, without which they may die as a result of hypothermia or heat stress. If food delivery schedules are interrupted, the young may not

develop healthy plumage, which can affect their survival. In addition, adults startled while incubating or brooding young may damage eggs or injure their young as they abruptly leave the nest. Older nestlings no longer require constant attention from the adults, but they may be startled by loud or intrusive human activities and prematurely jump from the nest before they are able to fly or care for themselves. Once fledged, juveniles range up to ¼ mile from the nest site, often to a site with minimal human activity. During this period, until about six weeks after departure from the nest, the juveniles still depend on the adults to feed them. Because bald eagles nest immediately adjacent to the Wildlife Drive, the Wildlife Drive is not open to the public, including commercial uses, until June 1st to protect nesting bald eagles (USFWS 2007).

Birds often show negative responses to human activities, such as decreased reproductive success, elevated corticosterone stress responses or altered behavior (e.g. birds flee from the disturbance (Bisson et al. 2009). Commercially-guided and recreational wildlife observation of song birds is limited to the use of designated trails, observation decks or blinds, and the Wildlife Drive. As a result, a small fraction of the refuge is available for bird/wildlife observation and therefore any disturbance to song birds would be expected to be minimal.

In summary, there is a great deal of literature on impacts of disturbance to wildlife that illustrate that disturbance can alter behavior (e.g. foraging time), population structure, and distribution patterns of wildlife, particularly for large congregations of waterfowl and waterbirds. It is probable that commercially-guided wildlife observation and photography could cause some or all of these effects to some degree on refuge wildlife. However, commercially-guided tours for wildlife observation and photography is restricted to specific locations, roads, trails and observation facilities, and most use would occur outside of peak waterfowl migratory and bald eagle breeding periods. Therefore, impacts on wildlife are likely to be short-term and minimal. Damage to habitat by trampling is expected to be minimal and temporary because use is restricted to designated locations. Commercially-guided groups would use established foot trails or the Wildlife Drive with little or no impact on vegetation. There will be some temporary disturbance to wildlife due to boating and human activities on trails, primarily to mammals, songbirds, and wading birds. These disturbances are generally localized and would not adversely impact overall populations.

Long-term impacts:

Most of the impacts will be seasonal (typically in the fall and spring), but repeated disturbance of migrating ducks and geese could cause avoidance of portions of the refuge or reduced fitness. Closure of the Wildlife Drive avoids or reduces repeated disturbances of resting and feeding waterfowl and provides “sanctuaries” for wildlife to avoid human disturbances. Closure of the Wildlife Drive also avoids or reduces bald eagle disturbance during the critical nesting season. Increased vehicle use on the Wildlife Drive from commercial tours may cause additional mortality of reptiles and amphibians which could impact populations over time. There are signs at the entrance to the Wildlife Drive that wildlife may be on the roadway and to obey the posted 15 mph speed limit which will help reduce impacts to reptiles and amphibians. Restricting non-motorized uses within the forested environments to designated trails limits the potential disturbance to all other

wildlife to a small fraction of available habitat within the refuge, thereby minimizing long-term impacts.

Vehicles and motorized boats cause noise and pollution; however, the number of vehicles and boats may not be great enough to be significant in this regard. Maintenance of roads may be required over time if increased traffic leads to more wear and tear on refuge roads than current uses.

Cumulative impacts:

Other public uses in addition to commercially-guided wildlife observation and photography may cumulatively add to wildlife disturbance. This includes individuals conducting wildlife observations and photography on their own or in small groups, which would have similar impacts as those described above for commercially-guided trips. As with commercially guided groups, all recreational uses are limited to specific areas and specific times of the year or day. Other public uses on the refuge are fishing from shore (at 4 designated locations) and from boats, uses of the Cass River boat launch, deer and goose hunting, and environmental education. Refuge management activities such as surveys, research, habitat management and infrastructure maintenance may also cause some additive disturbance to wildlife.

Wetlands are generally separated from roads by a small dike and the potential for disturbance to wetland wildlife from vehicles is minimal as long as the vehicles are moving at a slow speed, people remain in the vehicles and only get out at designated locations. Outside of the spring and fall migrations, there are not typically large congregations of birds or other wildlife on the refuge. Therefore, vehicles travelling the road ways do not appear to appreciably disturb wildlife, but people stopping and making noise, or getting out of their vehicles are known to disturb wildlife.

Fishing activities on the refuge is separated from the designated hiking trails and Wildlife Drive where most wildlife observation and photography occurs. Therefore, there is little potential for cumulative impacts from fishing.

Hunting also occurs on the refuge in the fall. To minimize conflict between users, refuge trails are closed during active hunts. Hunting tends to occur when people are not generally fishing or hiking because of cold weather. Therefore, no cumulative impacts are expected from hunting.

Environmental education programs occur up to 12 times per year using the trails, overlooks, and Wildlife Drive, although most activities are concentrated at the Green Point Environmental Learning Center and associated trail system. These are guided hikes or programs with classroom sized groups. These programs are usually conducted during the spring and fall and occur on the north side of the Shiawassee River away from the greatest concentrations of wildlife and other refuge users.

The greatest potential for cumulative impacts is associated with the Wildlife Drive. The road is used by refuge staff for management purposes with 1 to 5 trips per day, 5 days per week. Staff includes permanent staff, interns, researchers and volunteers. This use is in addition to all public uses. Peak staff use is typically in the summer months when wetlands have been drained and moist soil manipulation and dike maintenance is taking place. Equipment such as tractors and pumps operate in the area seasonally and occasionally. There are utilities near or crossing the Wildlife Drive that occasionally require maintenance, but again this is usually accomplished when wildlife populations are at their lowest point in the year. Staff vehicle trips during the spring and fall closure period are kept to a minimum for maintaining pumps and conducting waterfowl surveys. In addition, a volunteer conducts weekly bird surveys using the Wildlife Drive. To prevent the disturbance and flushing of large numbers of birds, staff try to avoid using the Wildlife Drive early in the morning and during sensitive times of the year. Hunters may also use the Wildlife Drive during deer hunts to access hunt locations, but these numbers are generally less than 10 hunters per day.

Thus far, both commercially guided and recreational public wildlife observation and photography has shown no obvious environmental impacts to the refuge, its habitats, or wildlife species under current conditions and restrictions. In 2015 there were approximately 105,000 visits to the refuge, including the Green Point area. Of this, 76,400 visits included hiking, biking, cross-country skiing, wildlife watching and photography and approximately 16,400 visits to the Wildlife Drive. In addition, approximately 11,000 anglers fished the rivers and approximately 1,600 visits were conducted for deer and goose hunting. These numbers have remained fairly stable and we do not anticipate appreciable changes in any one category.

Cumulative vehicle use on the Wildlife Drive is expected to be heaviest in June and September and sporadic throughout the summer. Staff use of the Wildlife Drive during closures will be minimal. Because of road closures, slow speeds, designated stopping/viewing locations and wildlife's experience with activity on the Wildlife Drive, anticipated cumulative effects from commercially-guided, non-commercial and refuge use of the Wildlife Drive is not anticipated to have unreasonable impacts on wildlife. Winter activities pose no impacts to waterfowl and little impact to vegetation. The winter disturbance to resident wildlife is temporary and minor.

The cumulative disturbance caused by commercial wildlife observation and photography and all other public uses occurring on the refuge is not expected to adversely affect fish and wildlife populations or their habitats. A number of factors including suitable site conditions, presence of facilities, access limitations, and seasonal restrictions or other regulations tend to concentrate commercial and public uses on the refuge. At any one time, most of the refuge is unaffected by these commercial and non-commercial uses and is free of disturbance.

All commercially-guided activities will follow all applicable laws, regulations, and policies; including the Migratory Bird Conservation Act, 50 CFR, National Wildlife Refuge System manual, National Wildlife Refuge System goals and objectives, and Shiawassee NWR CCP

goals and objectives. These activities are compliant with the purpose of the refuge and the National Wildlife Refuge System mission. Conducting these activities does not alter the refuge's ability to meet habitat goals, provide for the safety of citizens, and support several of the primary objectives of the refuge.

Public Review and Comment:

Wildlife observation and photography by the public was previously determined compatible as part of the refuge's CCP in 2001. This draft Compatibility Determination is similar, but expands this use to include commercial guiding for wildlife observation and photography.

A public review and comment period will be provided for 14 days from May 31 through June 14, 2017. Solicitations for comment will be distributed via a news release. Comments will be requested on the refuge's Facebook page and website. Paper copies of the document will be available at the refuge headquarters (6975 Mower Road, Saginaw, MI 48601).

Determination:

Use is Not Compatible

Use is Compatible with Following Stipulations:

Stipulations Necessary to Ensure Compatibility:

To ensure compatibility with National Wildlife Refuge System and Shiawassee NWR CCP goals and objectives the activities can only occur under the following stipulations:

1. The Wildlife Drive will be closed to commercial use from October 1 through May 31.
2. Commercial access to the refuge is restricted to sunrise to sunset.
3. Commercial access is restricted to the Wildlife Drive, trails and other designated locations as specified in a Special Use Permit.
4. Commercial guiding activities will be monitored to ensure compliance with all stipulations in this Compatibility Determination, their Special Use Permit and all applicable laws, regulations, and policies.
5. All commercial guides will be required to report their actual use by December 31 of each year.
6. Boating is only allowed on navigable waters.
7. Controlled access with signs and notices will be posted providing seasonal uses and stipulations.
8. Trail and road maintenance will be completed, as necessary, to provide a safe and enjoyable experience. Trails and roads may be closed for extended periods due to flooding and associated cleanup and repairs.
9. Commercial use will primarily be directed to public use facilities which are not in or near sensitive areas.

10. Observation decks will continue to provide wildlife viewing scopes to enhance viewing from a distance which reduces disturbance.
11. Trail layout and design will continue to ensure adequate adjacent cover for wildlife and avoid sensitive wildlife areas or habitat.
12. Interpretive presentations and products will include messages on minimizing disturbance to wildlife.
13. Managers will monitor public use patterns and densities and make adjustments in timing, location, and duration as needed to limit disturbance.
14. All commercial guides are required to apply for a Special Use Permit. Refuge staff will consider activity location, timing, frequency, group size, mode of transportation, and this Compatibility Determination when determining whether or not to approve the permit.

Literature Cited

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Justification:

Most uses will occur, or be directed to, existing facilities in strategic locations providing quality wildlife observation and photography opportunities while limiting wildlife and habitat disturbance. Stipulations limit frequency of disturbance and limit activity to times of day, and times of year, that are less disturbing. Disturbance to wildlife is also limited by the size and remote nature of other parts of the Refuge. Disturbance is also generally short-term and only temporarily displaces wildlife, and adequate adjacent habitat is usually available for wildlife. Vehicle use of the Wildlife Drive will be monitored.

Wildlife observation and photography are priority public uses listed in the National Wildlife Refuge System Improvement Act. By facilitating these uses on the refuge, we will increase visitors' knowledge and appreciation of fish and wildlife, which will lead to increased public stewardship of fish and wildlife and their habitats on the refuge and in general. Increased public stewardship will support and complement the Service's actions in achieving the refuge's purposes and the mission of the National Wildlife Refuge System and will not materially interfere with or detract from the mission of the Refuge System or purposes for which the refuge was established.

Signature: Refuge Manager: _____
Signature and Date

Concurrence: Regional Chief: _____
Signature and Date

Mandatory 10- or 15-year Re-evaluation date: 2032