Final Report to the Matagorda Bay Mitigation Trust (MBMT)

Contract No. 029

Project Title: Habitat Restoration of the Hog and Schwing Bayou Preserve

Submitted by: Guadalupe-Blanco River Trust (GBRT)

Reporting Period: August 1, 2022 – March 31, 2025

Executive Summary

The Guadalupe-Blanco River Trust (GBRT), under Contract No. 029 with MBMT, successfully implemented a comprehensive habitat restoration initiative at the Hog and Schwing Bayou Preserve. This multi-phase project focused on improving site access, conducting thorough habitat assessments, initiating invasive species control, and restoring historic trail corridors to support long-term ecological health and stewardship of the property.

All objectives outlined in the MBMT contract were achieved. GBRT leveraged additional community partnerships and volunteer involvement to extend the impact of MBMT funding, laying the groundwork for sustainable future management.

Major Activities and Milestones

1. Initial Access and Reconnaissance (CY2022 Q3–Q4)

- Conducted full-site reconnaissance through kayak surveys, UTV exploration, and drone mapping, covering 100% of the 800-acre Preserve area.
- Hosted a volunteer clean-up event on December 2, 2022, engaging 10 volunteers contributing over 30 hours to clear brush, mark initial trail corridors, and open the north and south entrances.
- Secured $53,000 in matching funds from the Guadalupe-Blanco River Authority (GBRA) and $7,000 from OneTreePlanted, significantly increasing project capacity.

2. Site Preparation and Vegetation Management (CY2023 Q1)

- Contracted Triton Environmental Services (TES) to perform mechanical clearing operations along 1.5 miles of historic access road and within 100 acres of the planned restoration zone.
- Implemented integrated vegetation management practices to remove woody invasive species, preparing the site for future ecological restoration activities.
- Completed critical trail clearing and entrance improvements to facilitate safe and ongoing site access for future field work.

3. Site Assessment and Habitat Surveys (CY2023 Q2–Q4) (Attachment 1)

- Issued a Request for Proposals (RFP) for habitat assessment services and selected Bio-West, Inc. following competitive review.
- Conducted detailed habitat and hydrologic surveys through multiple field visits in July, September, and October 2023.
- Received and reviewed the final Habitat Assessment Report in March 2024, providing an essential baseline for long-term habitat monitoring and restoration planning.

4. Access Improvements and Road Reclamation (CY2025 Q1–Q2) (Attachment 2)

- Conducted a comprehensive Site Access Feasibility Analysis, finalized on January 29, 2025, identifying sustainable access points with minimal ecological disturbance.
- Reclaimed approximately 1.5 miles of historical interior road through mechanical clearing and herbicide treatment, improving interior site navigation and management capacity.
- Installed a new steel entrance gate to control vehicle access, enhance security, and define authorized entry points for restoration activities.

Financial Summary

Category	MBMT Contributions	GBRT Match	Total
Direct Salaries/Payroll	$3,750.00	$788.80	$4,538.80
Construction	$5,762.00	$1,669.00	$7,431.00
Consultants/Contractual	$54,291.06	$32,544.07	$86,835.13
Professional Services	$13,320.75	$17,522.42	$30,843.17
Supplies/Materials	$0	$588.00	$588.00
Total	**$77,123.80**	**$53,112.29**	**$130,236.10**

Outcomes and Deliverables

- **Site Access Development:**
  - Successfully established and documented sustainable access routes across the Preserve.
  - Cleared, reclaimed, and geo-referenced approximately 1.5 miles of interior roadways.
  - Installed new entrance infrastructure to control site usage and support future management.
- **Habitat Restoration Foundations:**
  - Prepared over 100 acres for native habitat restoration through mechanical and chemical vegetation management.
  - Removed woody invasive species to improve native plant community recovery potential.
- **Baseline Ecological Assessment:**
  - Completed comprehensive habitat and hydrologic assessments to guide long-term monitoring and adaptive management strategies.
- **Public Engagement and Partnerships:**
  - Hosted a volunteer restoration event contributing 30 hours of service.
  - Secured nearly $60,000 in matching funds from GBRA and OneTreePlanted, strengthening financial support for the project.
- **Sustainability Planning:**
  - Laid critical groundwork for ongoing conservation, monitoring, and educational activities at Hog and Schwing Bayou Preserve.

Conclusion

The Guadalupe-Blanco River Trust (GBRT) has fully completed all tasks and deliverables outlined under Contract No. 029 with the Matagorda Bay Mitigation Trust (MBMT), successfully advancing the ecological restoration and stewardship goals for the Hog and Schwing Bayou Preserve.

Over the course of the project, GBRT made significant investments into site access development, habitat assessment, invasive species management, and public engagement — all critical foundations for long-term ecosystem resilience. By reclaiming 1.5 miles of historical roadways, implementing integrated vegetation management across over 100 acres, and conducting comprehensive habitat and vegetation surveys, GBRT has established both the physical and scientific infrastructure needed to sustain and enhance the ecological health of the Preserve into the future.

The completion of the Habitat and Vegetation Assessment provides a robust ecological baseline against which future restoration success can be measured. Moreover, the access improvements — including a new secured entrance and mapped internal routes — allow for ongoing stewardship activities such as monitoring, maintenance, education, and additional habitat enhancement projects.

Through the strategic use of MBMT funds and by securing additional matching support from partners such as the Guadalupe-Blanco River Authority and OneTreePlanted, GBRT maximized the project's reach and leveraged broader community support for conservation initiatives.

Importantly, this project has not only restored ecological function but has also laid the groundwork for greater public connection to the land, enhancing opportunities for environmental education, volunteerism, and future community engagement.

GBRT is deeply grateful for MBMT's support and partnership. The success of this project highlights the importance of collaboration, long-term investment in conservation, and a shared commitment to protecting and enhancing the unique landscapes of the Matagorda Bay watershed. Moving forward, GBRT remains committed to the continued stewardship of the Hog and Schwing Bayou Preserve, ensuring that the gains made under this project endure for generations to come.

Vegetation and Floral Survey

HOG AND SCHWINGS' BAYOUS PRESERVE

Calhoun, County Texas

Report compiled for:

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Summary

This report summarizes the surveys conducted by BIO-WEST, Inc. on the Guadalupe Blanco River Trust Hog Bayou tract. BIO-WEST conducted field surveys and mapping on July 25 - 26 and September 12 – 13 of 2023. The Hog Bayou property consists of multiple habitat types including aquatic, riparian, isolated wetland pools and coastal wetlands. Over the course of the survey, we documented 80 plant species and nine plant communities located on the property. The two most unique plant communities are the mature riparian forest located along the Hog Bayou property boundary and the pothole ponds located intermittently along the southwestern edge. The interior of the property is dominated by Spiny aster. In some areas the habitat quality of the landcover and vegetation is good while some areas, particularly those dominated by Spiny aster habitat, are of lower quality. Selective management of the property could vastly improve its ecological function.

1.Property Background

1.1 Property layout

The Hog Bayour property is situated in the mid Gulf Coast region of Texas and upper Coastal Bend subregion. Located in Calhoun County, it is 22 miles Southeast of Victoria, Texas and 58 miles northeast of Corpus Christi, Texas. The property is located near the Guadalupe River, a waterbody of environmental and economic significance in the state. The Guadalupe River Delta occurs just 9 miles south of the property. Green Lake, the largest natural freshwater lake within Texas, is located adjacent to the property on the opposite bank of Hog Bayou. The Hog Bayou property is located amongst a rapidly developing economic area with several large manufacturing facilities in close proximity. The overall local economy is supported by manufacturing followed by commercial fishing. Ranches and other undeveloped properties border the site, although the property is accessed through a rural lot housing development. The site is not open to the public and there are no constructed trails, stabilized roads, or pathways to or on the property. The main constructed feature is an old roadway bisecting the southern edge of the property parallel to State Highway 35. This roadway has mostly been reclaimed by nature and a majority of it is flooded.

1.2 Geological layout

Situated on the Gulf Coastal Plains, the property is low lying with few distinct topographic features. Site elevations range between one to seven feet above mean sea level. The property is bordered by Hog Bayou on the east side and Schwings Bayou on the west side. The property boundary along Hog Bayou has the highest elevation, up to seven feet above MSL. A vertical bank, one to three feet in profile, is present along most of the Hog Bayou shoreline. The northern edge is bordered by a canal linking Hog Bayou to the Guadalupe River. In this area the Guadalupe River has been diverted and channelized into multiple canals and interchanges before flowing into the Gulf of Mexico. The property boundary along Schwings Bayou is lower elevation and swampy although there is some vertical relief along this border.

The underlying geology of the area is Beaumont formation consisting primarily of unconsolidated fine detrital clay to 100 meters thick (**Bureau of Economic Geology, 1992**). The property is dominated by Austwell Clay (Au), 88% of the site, with Austwell Silty Clay (At), 9% of the site, present along Hog Bayou only (**Figure 1**). Austwell Clay is characterized as 0 to 1% slope and frequently flooded, occasionally ponded. Austwell silty clay is characterized as 0 to 1% slope frequently flooded, occasionally ponded (**Natural Resource Conservation Service, 2024**). Due to the low-lying elevation, geology, soil types and situation between two major streams, the entire property is flooded frequently and can stay wet for long periods of time. During our survey we encountered multiple observations of frequent flooding over most of the site including debris piles, bent vegetation and silt berms. At the time of our surveys the area was drier than usual due to a prolonged drought.

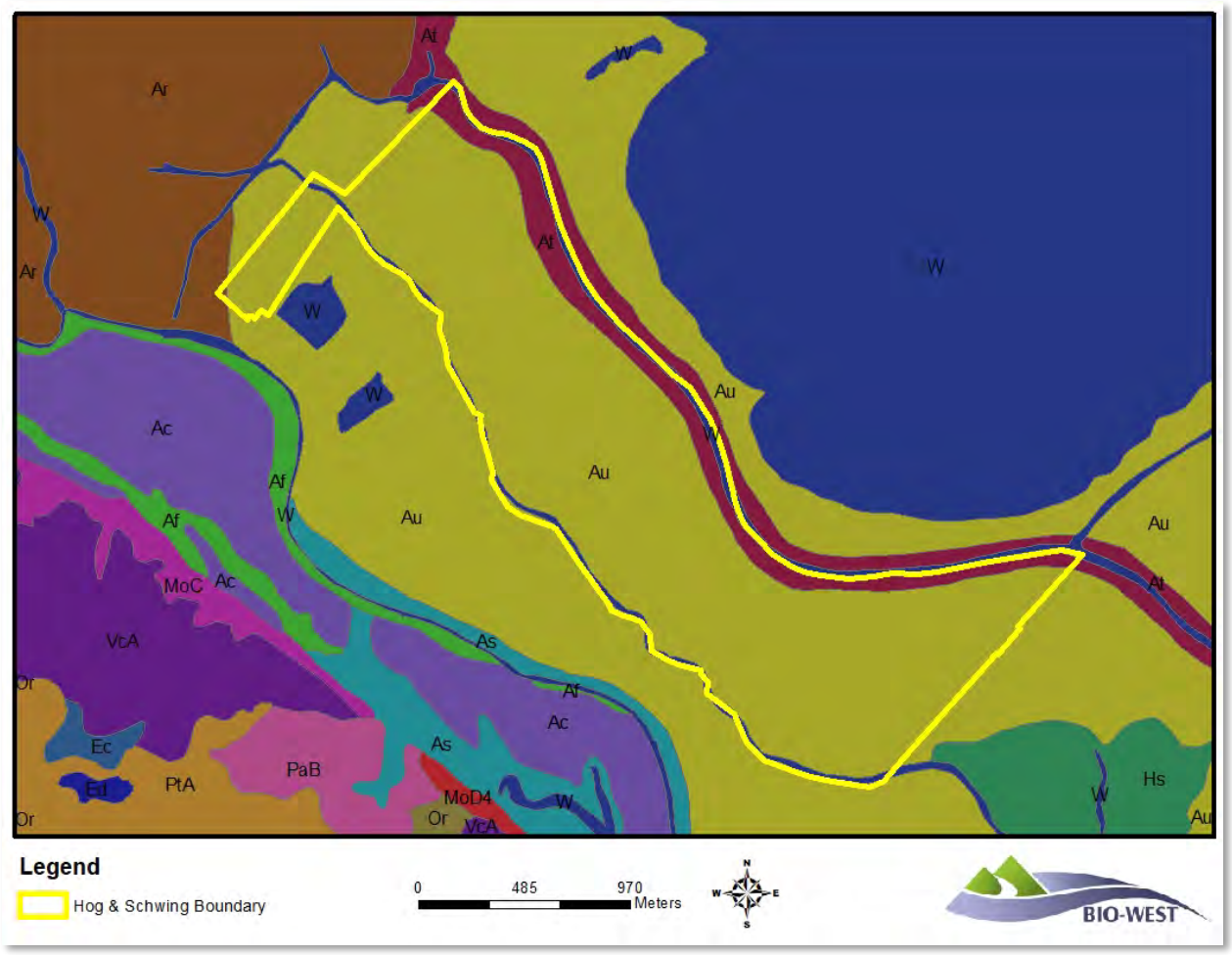

Figure 1. Soil map of property showing the dominant Austwell clay formation (yellow) with Austwell silty clay (mauve) located along Hog Bayou.

Erosional features were absent on the property and no gullies or washouts were noted. Shallow sloughs, small creeks and low areas were present along both Hog Bayou and Schwings Bayou. However, these seemed to be in a stable state with ample vegetation and natural debris present to prevent erosion. Several depressional wetlands “pothole ponds” were observed and mapped on the western edge of the property.

These were holding water and were abundant with wetland vegetation. The wetland ponds are occurring within the Ash/Swamp privet/Sea myrtle vegetation complex. The density of this complex made it impossible to observe and delineate all the pothole ponds. They likely occur intermittently within the Ash/Swamp privet/Sea myrtle complex adjacent to Schwings Bayou.

Due to the density of the woody cover it was difficult to access some areas. The southern third portion of the property as well as the panhandle portion were completely inaccessible by vehicle or walking. Based on aerial imagery and geological layout it is unlikely that any significant geological features were missed.

1.3 Manmade features

There are few distinctive manmade features and structures on this property. A constructed depressional wetland is present in the center of the property. This wetland is not connected to any waterbody and only receives water from rain or when over-bank events inundate the property. The wetland is laid out with a slight berm around a portion of the perimeter to collect pond water. Due to drought conditions at the time of the survey the wetland was empty although identifiable obligate wetland plants were present including Cattail, California bulrush and Creeping burhead in a small portion. The southern boundary of the property parallels State Highway 35. Adjacent to the highway within property boundaries is an historical county road. Although paved, the road is mostly covered in vegetation and flooded from Schwings Bayou. The only other significant constructed features noted during our survey was the presence of two cross fences. One fence (Fence A, coordinates 28° 29’37”N; 96° 51’33”W) cuts across the property 1,400 feet from Hog Bayou to a dense brush line located along the southwest edge of the property. In some areas the fence was intact and in others it was removed or downed. Large debris mats and driftwood were piled against the northern side of the fence, providing further evidence of inundation and water flow patterns across the property. The second fence (Fence B) is partially intact and runs across the northwestern portion of the property.

2. Floral Survey

2.1 Survey Methods

The primary objective for the property survey was to ascertain the vegetation communities on the property and compile a more thorough list of plant species present on site. To complete this task the survey team conducted meander surveys during July and September. During the July survey we accessed the property along Hog Bayou, kayaking from the Hog Bayou boat ramp to randomly selected survey points along the shoreline. This allowed us to identify plant species and delineate plant communities. At points where inland access was open, we hiked into the interior of the property to gather points and identify plant species present. We surveyed a total of 53 points (**Figure 2**), collecting a waypoint and recording observed vegetation species in the immediate area at each survey point. During the September survey event we utilized both kayak and UTV to access Schwings Bayou and the interior of the property following the same meandering methodology. During this time, we also mapped any notable features, structures and vegetation communities.

Access to the entirety of the property was difficult. Vegetation along both Hog Bayou and Schwings Bayou was dense and open areas to the interior of the property were limited. In some areas the vegetation in the interior of the property was waist- to neck-high and navigating longer distances was difficult. Use of a UTV allowed greater access at a faster pace, but there were still portions of the property the team could not acquire access to including a large portion of the southern third section and the panhandle. Despite this we were able to sample enough points to represent the vegetation communities. The point coordinates and their corresponding plant species are located in Appendix A.

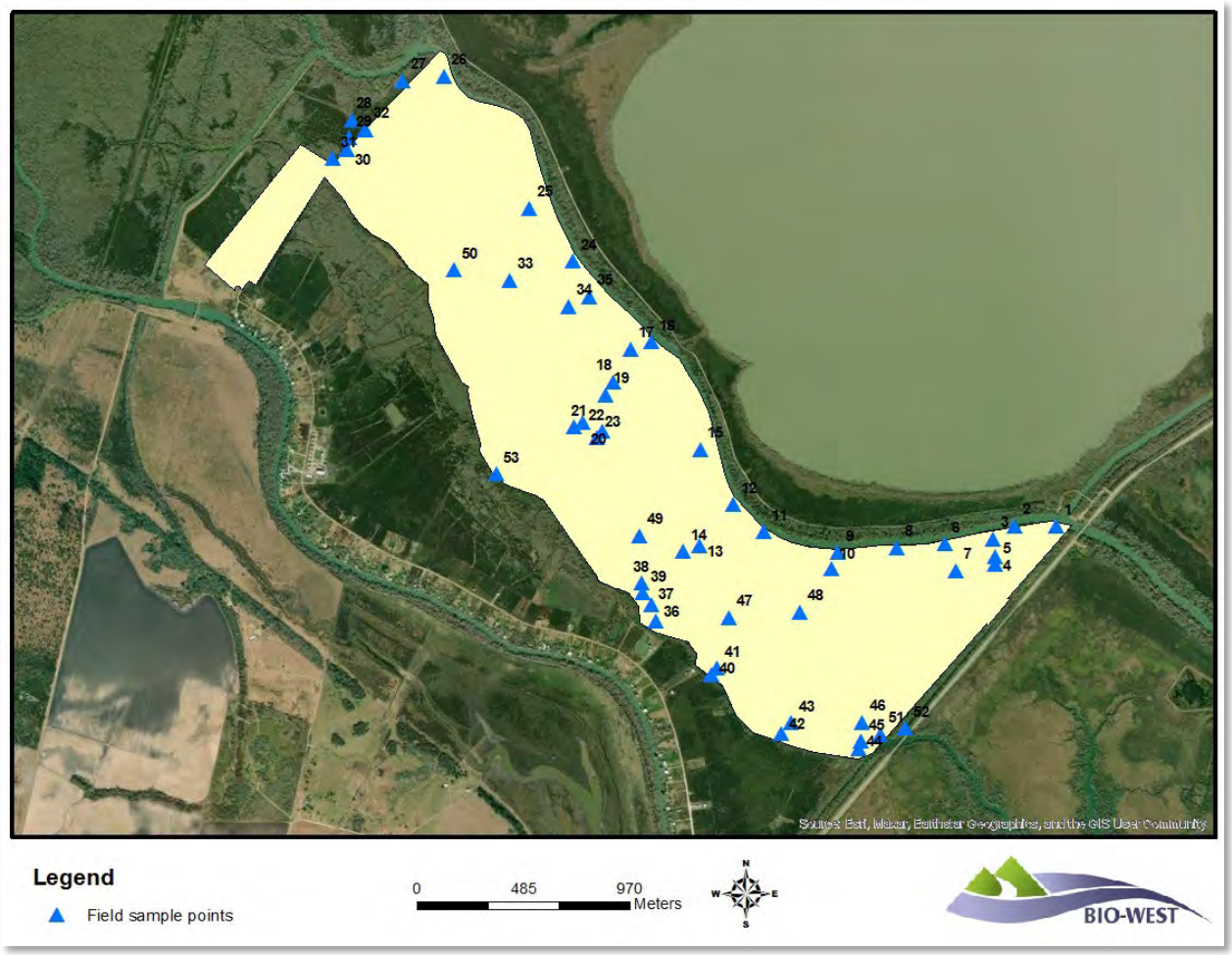

Figure 2. We sampled 53 vegetation survey points across the property.

2.2 Vegetation Community Complexes

We delineated five community habitat types (**Figure 3**) and described nine distinct vegetation communities. Vegetation communities can be further divided into multiple species complexes based on species patchiness (**Figure 4)**. Riparian plant communities were common along both Hog Bayou and Schwings Bayou with the interior of the property dominated by lowland forbs. Wetland plant communities were present in limited locations on the property. These regions were mostly intermixed with the riparian communities located along Schwings Bayou and consisted of small ravines and back

waters. The isolated wetlands we are referring to as “pothole ponds” were observed within the riparian community along Schwings Bayou but located more interior and away from the bayou itself and appeared to be small natural basins with connection to the water table. Despite the drought and dry conditions across the property these small wetlands were filled with water and heavily vegetated with aquatic plants.

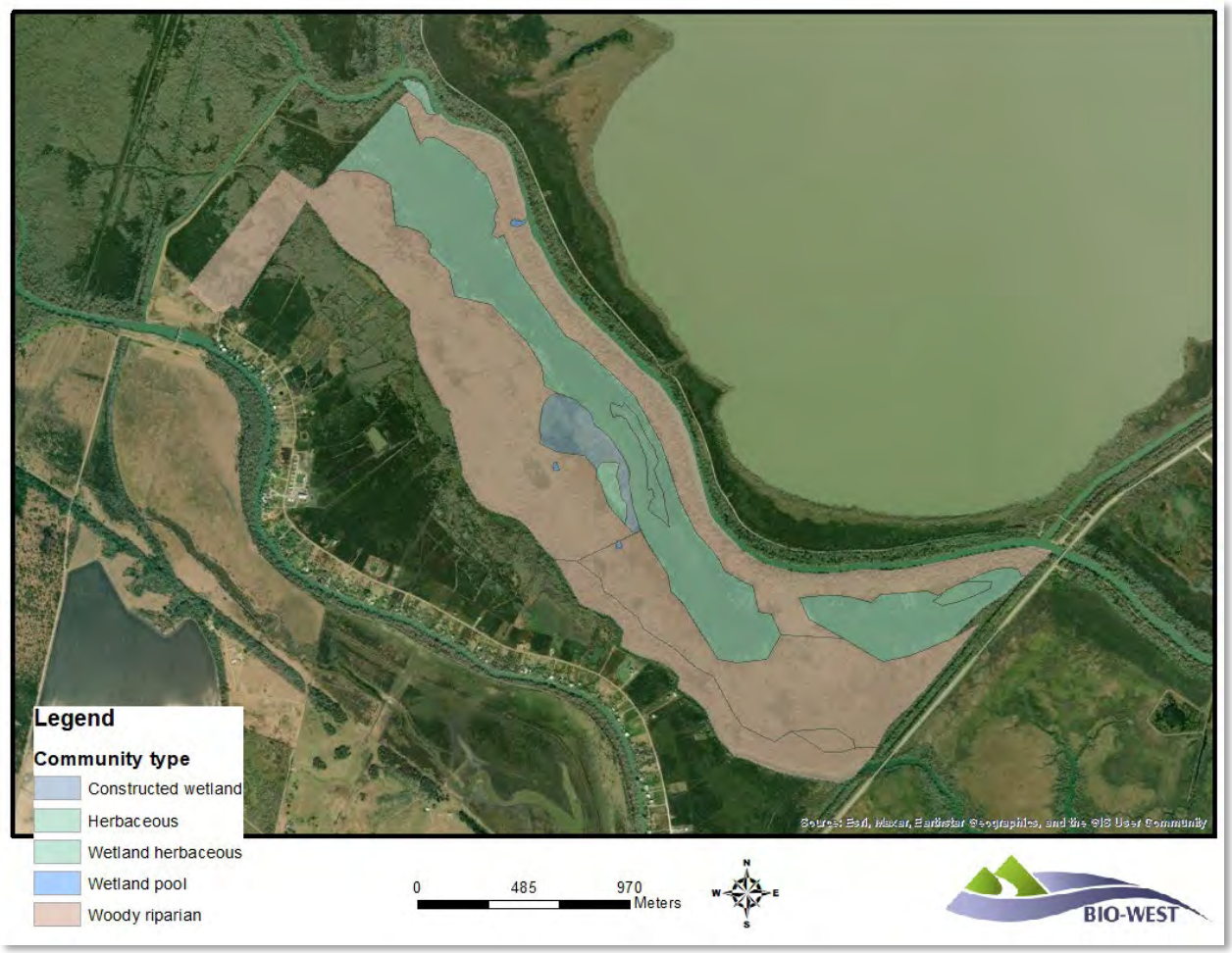

Figure 3. Vegetation community types mapped on the property.

Vegetation Community Descriptions

1. Ash/Elm/Hackberry/Sabal – This woody riparian vegetation community is located exclusively in a narrow band along Hog Bayou and associated with Austwell Silty Clay formation. The dominant trees in this community are Green ash (*Fraxinus pennsylvanica*), Cedar elm (*Ulmus crassifolia*) and Hackberry (*Celtis laevigata*). The native palm *Sabal* X *texensis* was also dominant throughout. Coastal Live oak (*Quercus virginiana*) was common. Montezuma cypress (*Taxodium mucronatum*) occur but are rare. The canopy height of this riparian forest exceeds 10 feet with dense canopy cover. While vegetation growth is dense where sunlight is available the habitat opens up further inward. An open but shady understory provides habitat for vines and other plants (**Figure 5**). Poison ivy is the most common understory plant

creating dense and sprawling growth. Other common species included Turk's cap, *Dicliptera brachiata* and *Ampelopsis arborea*.

2. Ash/Swamp privet/Sea myrtle – This woody riparian vegetation community is widespread across the property, occurring in wide bands along Schwings Bayou and extending well into the interior. It is also the dominant community type in the southern third of the property and occurs in a thin band adjacent to Elm/Hackberry/Oak/Sabal community. It is associated with the Austwell Clay formation. Berlandier ash (*Fraxinus berlandieriana*), Eastern swamp privet (*Forestiera acuminata*) and Sea myrtle (*Baccharis halimifolia*) are the dominant species within the community. These are small trees species with canopies topping 10 feet or less in height. Other tree species associated with the community include Black willow, Retama and Chinese tallow. In wetter areas *Sabal* X *texana* and buttonbush is present. Canopy structure is less dense for this community type and therefore more light is available for groundcovers and forbs. Spiny aster, Sumpweed and climbing hempvine are commonly associated forbs within this community.

3. Spiney aster/Sea tansy/Wolfberry – This forb community is the most widespread and dominant on the property and associated with the Austwell Silty Clay formation. Spiny aster (*Chloracantha spinosa*) is the most dominant single species found on the property. Occurring in the open areas of the property, Spiny aster reaches a height of four to five feet (**Figure 6**), making it extremely difficult to traverse during meander surveys. Although native, Spiny aster is an aggressive colonizer and competitor to disturbed soils and coverage of Spiny aster at any one location within this community was nearly 100%. Other associated species such as Sea tansy and Carolina wolfberry are common but rarely occur in dense quantities. In some locations Spiny aster gives way to a Sumpweed dominated community. In areas where the soil remains saturated patches of obligate wetland plants dominate. The dried carapaces of blue crab are commonly observed, indicating this habitat is regularly inundated.

4. Sumpweed – The Sumpweed community co-occurs with Spiny aster/Sea tansy/Wolfberry. Generally, it is found adjacent to Ash/Elm/Hackberry/Sabal community. Although Sumpweed is common throughout the property it is only dense within this community type. Associated species with Sumpweed include Spiny aster and Sea tansy.

5. Green Ash/Common Reed – This riparian wetland community occupies only a small portion of the property along Hog Bayou. Although associated with Ash/Elm/Hackberry/Sabal it is distinctive enough to be delineated and classified separately. This community is associated with the Austwell Silty Clay formation. It is characterized as a low lying and inundated wetland dominated by Green ash, Common reed and Giant cutgrass. Other associated species include Water primrose, Duck potato and White smartweed.

6. Sabal palm marsh – The Sabal palm marsh is yet another localized riparian community associated with the more extensive Ash/Swamp privet/Sea myrtle. The Sabal palm marsh occurs in a narrow band adjacent to Schwings Bayou in low lying areas. It is characterized by inundated or muddy bottoms with dense stands of *Sabal* X *texensis* and other wetland associates including American crinum lily, Bulltongue and Crowfoot sedge.

7. Isolated pothole ponds – Several isolated wetlands were observed and delineated adjacent to Schwings Bayou and associated with the Ash/Swamp privet community. The ponds are inundated but have no obvious surface connection to Schwings Bayou. Wetland species including Smart weed, Giant cut grass and Delta duck potato are common. More of these features likely exist on the property than were mapped, and they are likely occurring within the Ash/Swamp privet/Sea myrtle community.

8. Chinese tallow mixed woodland – Although Chinese tallow is noted as intermixed within the wooded riparian habitats there are localized areas where this non-native species dominates. More of this community likely exist on the property than were mapped and it is likely occurring within the Ash/Swamp privet/Sea myrtle community.

9. Aquatic – Although not occurring directly on the property, the aquatic plant community cannot be disregarded. Hog Bayou and Schwings Bayou provide ample habitat for native and non-native aquatic plants. Water hyacinth and Alligatorweed are the two most abundant aquatic plant species within this community. Both species can float freely along the water's surface. Native species including Hornwort and Mosquito fern were observed but uncommon.

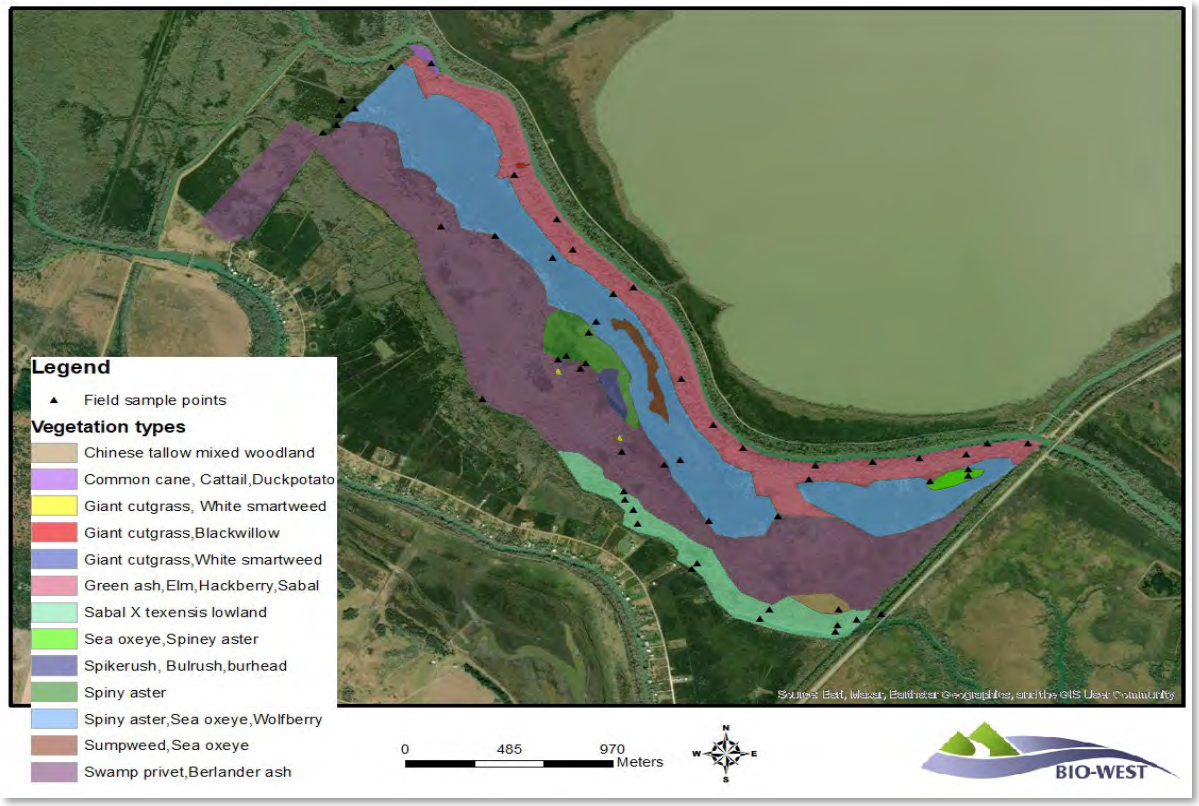

Figure 4. Mapped species complexes.

Figure 5. Open understory of the Ash/Elm/Hackberry/Sabal community.

Figure 6. Spiny aster dominates the interior of the property.

Table 1. Vegetation community descriptions.

Vegetation Communities	Habitat Type	Description
Elm, Hackberry, Oak, Sabal	Woody Riparian	Dominate trees include *Ulmus crassifolia*, *Celtis laevigata*, *Quercus virginiana*, *Sabal* X *texensis*. Other dominates include *Smilax bona-nox*, Turks cap, Poison ivy. Montezuma bald cypress rare.
Ash, Swamp privet, Sea myrtle	Woody Riparian	Dominated by Berlandier ash and swamp privet. Short woody vegetation with an understory of Spiny aster and Sumpweed.
Spiny aster, Sea tansy, Carolina wolfberry	Forb/Herbaceous	Dominated by spiny aster, sometimes a monoculture, but occasionally Sea tansy and Carolina wolfberry associated. Lack of woody species. Occasionally inundated.
Sumpweed	Forb/Herbaceous	A monoculture of Sumpweed with Sea tansy and Spiny aster sporadically associated. Occasionally inundated.
Green ash, Common reed	Woody Riparian	Mature Green ash with dense stands of Common reed. Other herbaceous wetland plants present. Inundated.
Sabal palm marsh	Woody Riparian	Dominated by large mature *Sabal* X *texensis* palm with mix of other various woody species. Inundated to wet, with wetland herbaceous species present.
Wetland pothole ponds	Forb/Herbaceous	Isolated wetland ponds dominated by Smart weed, Giant cut grass and Delta duck potato. Inundated even during drought.
Chinese tallow mixed woodland	Woody Riparian	Localized areas dominated by non-native Chinese tallow but also including a mix of other riparian trees.
Aquatic	Forb/Herbaceous	Open water habitat of Schwings and Hog Bayou with submerged and floating aquatic plant species including Water hyacinth, Alligatorweed and Water lettuce.

2.3 Site Flora

To gather a more complete list of plant species present on the property the team conducted a meandering survey as mentioned above. A significant portion of the property was surveyed to provide a more comprehensive list of plant species than previous surveys. Through the meander survey method, we collected plant species occurrences at 53 points. At each point we observed and identified the plant species within the immediate area and a combined list of species was composed from these 53 points. A total of 80 plant species were documented for the property during our survey (**Table 2**). While somewhat thorough in spatial extent more species could be documented during other seasons or during different growing conditions. Over half of the species documented require wetland conditions with a wetland indicator status of FACW or OBL (**United States Army Corps of Engineers, 2020**). The complete list of species and their indicator status can be found in Appendix A. Photographs of individual species and habitats can be found in Appendix B.

Grasses were uncommon and mostly nonexistent in the interior of the property. The most common herbaceous species encountered was Spiny aster (*Chloracantha spinosa*). This plant was found throughout the property both as a near monoculture but also associated with other vegetation communities and plant species. Species such as Carolina wolfberry (*Lycium carolinianum*) and Sea tansy (*Borrichia frutescens*) were commonly intermixed with Spiny aster. These two species are indicators of saline bottomlands. The woody riparian habitats present along Schwings Bayou and extending inward were dominated by Berlandier ash (*Fraxinus berlandieriana*) and Swamp privet (*Forestieria acuminata*), both short multi-branching trees with medium canopy density. Larger riparian trees were common along Hog Bayou. These included Green ash, Cedar elm and Hackberry. Live oak was common but not dominant. Montezuma bald cypress (*Taxodium distichum var. mexicanum*) was rare and indicative of freshwater wetlands with short duration or zero salinity influence. Other common plants in the riparian area along Hog Bayou included Turk's cap, Poison ivy, Tievine and Peppervine.

Several non-native species were observed occurring on the property. Chinese tallow was the most common and almost exclusively associated with the Ash/Swamp privet/Sea myrtle community along Schwings Bayou. Salt cedar was noted occurring intermittently within the center of the property. Aquatic non-native plants were observed with the most common species being Water hyacinth (*Eichhornia crassipes*). These species can form dense floating mats covering the entirety of the water surface.

No federal or state listed threatened or endangered plant species were encountered during our survey times and none are expected for Calhoun, County. However, **Table 3** lists the globally rare or endemic plant species (**TPWD**, **2024**) potentially present in Calhoun, County. The species highlighted have been collected and vouchered within a 20-mile radius of the Hog Bayou Property (**TORCH Portal, 2024**). Indianola beakrush (*Rhynchospora indianolensis*) has been collected from a nearby ranch pothole pond and could be present in the pothole ponds on the property. Marsh-elder dodder has not been vouchered nearby but it is heavily associated with the Sumpweed (*Iva annua*) community and could also exist on the property. We did identify Dodder (*Cuscuta*) at point 13 but it was not identified to species as this is difficult in the field. Texas pinkroot (*Spigelia texana*) is a Texas endemic plant which could likely be associated with the Elm, Hackberry, Oak, Sabal riparian community. It has not been collected or observed in Calhoun County but has been vouchered near Linn Bayou at Mcfaddin Ranch in southern Victoria County (**TORCH Portal, 2024**). Striped rosemallow (*Hibiscus striatus*) occurs along Highway 35 and Hog Bayou adjacent to, but not within, the Hog Bayou property. Although this species is not endemic to Texas it is rare.

Uncommon plants which do occur on the property include *Sabal* X *texana*, American crinum lily and Montezuma cypress.

Sabal X *texana* (**Figure 7**) is a natural hybrid between the native *Sabal mexicana* and *Sabal minor* palm trees. *Sabal* X *texana* is distributed intermittently along the Gulf coastal bend. Data is sparse on the exact taxonomy, ecology, and distribution of the plant with some botanical work completed on a population along Garcitas Creek near Matagorda Bay. It is a relatively new discovery (**Locket et al., 1991**). Its presumed parent species, *Sabal mexicana* and *Sabal minor*, are known to persist along water courses and in low-lying wetlands.

American crinum lily (*Crinum americanum*) (**Figure 8**) is more common along the Texas Gulf Coast east of Houston with a disjunct distribution located around the Guadalupe River Delta. American crinum lily was noted as quite common along both Hog Bayou and Schwings Bayou. The presence of the plant indicates the persistence of freshwater inflows as its salinity tolerance is very low (**Stutzenbaker, 1999**).

Montezuma bald cypress (*Taxodium distichium* var. *mexicanum*) is considered a unique subspecies of Bald cypress, the latter commonly found in acidic swamps and lowlands of east Texas except for human plantings along watercourses elsewhere (**Adams et al., 2012**). Montezuma bald cypress lacks the development of pneumatophore “knees” commonly associated with Eastern bald cypress. The root structure of Montezuma bald cypress is flared resulting in buttress roots and a wide spreading base (**Figure 9**). Montezuma bald cypress is also more pyramidal in growth form. The presumed distribution of Montezuma bald cypress in Texas includes the Rio Grande Valley, extending north into the Edwards Plateau region. The species distribution also extends along the Guadalupe River to the Guadalupe Delta as a disjunct arm. Montezuma bald cypress are known from the Guadalupe River at Gonzalez, Coleto Creek and the Guadalupe Delta. However, their occurrence is highly intermittent and uncommon in the watershed.

Table 2. Comprehensive species list

Tree	
Chinese tallow*	*Triadica sebifera* (L.) Small
Green ash	*Fraxinus pennsylvanica* Marshall
Berlandier ash	*Fraxinus berlandieriana* DC.
Montezuma bald cypress	*Taxodium distichum var. mexicanum (T. mucronatum)* Ten.
Live oak	*Quercus virginiana* Mill.
Slippery elm	*Ulmus rubra* Muhl.
Cedar elm	*Ulmus crassifolia* Nutt.
Boxelder	*Acer negundo* L.
Hackberry	*Celtis laevigata* Willd.
Pecan	*Carya illinoinensis* (Wangenh.) K. Koch
Salt cedar*	*Tamarix* (species uncertain)
Black willow	*Salix nigra* Marshall
Palo verde	*Parkinsonia aculeata* L.
Sabal palm hybrid	*Sabal × texensis*
Gum bumelia	*Sideroxylon lanuginosum* Michx.
Shrub	
Buttonbush	*Cephalanthus occidentalis* L.
Eastern swamp privet	*Forestiera acuminata* (Michx.) Poir.
Yaupon holly	*Ilex vomitoria* Aiton
Roughleaf dogwood	*Cornus drummondii* C. A. Mey.
Coral bean	*Erythrina herbacea* L.
Indigo bush	*Amorpha fruticosa* L.
Sea-myrtle	*Baccharis halimifolia* L.
Herb, Vine, Woody vine , Grass	
Heartleaf peppervine	*Ampelopsis cordata*
Peppervine	*Ampelopsis arborea*
Trumpet vine	*Campsis radicans*
Poison ivy	*Toxicodendron radicans*
Virginia creeper	*Parthenocissus quinquefolia* (L.) Planch
Dodder vine	*Cuscuta* sp.
Mustang grape	*Vitis mustangensis* Buckley

Sweet grape	*Vitis riparia* Michx.
Tievine	*Ipomoea cordatotriloba* Dennst.
Turks cap	*Malvaviscus arboreus* var. *drummondii* Cav.
Giant ragwed	*Ambrosia trifida* L.
Green briar	*Smilax bona nox* L.
Lanceleaf frogfruit	*Phyla lanceolata* (Michx.) Greene
Sea tansy	*Borrichia frutescens* DC.
Spiny aster	*Chloracantha spinosa* (Benth.) G.L. Nesom
Carolina wolfberry	*Lycium carolinianum* Walter
Southern dewberry	*Rubus trivialis* Michx.
Flatsedge	*Cyperus* undet.
Branched foldwing	*Dicliptera brachiata* (Pursh) Spreng.
Groundcherry	*Physalis* undet.
Drummond's leafflower	*Phylanthus abnormis Baill.*
Sumpweed	*Iva annua* (L.)
Jointed flatsedge	*Cyperus articulatus* L.
Winged loosestrife	*Lythrum alatum* Pursh
Shrubby boneset	*Ageratina havanensis* (Kunth) R.M.King & H.Rob.
Heliotrope	*Heliotropium angiospermum* Murray
Canadian germander	*Teucrium canadense* L.
Climbing hempvine	*Mikania scandens* (L.) Willd.
Wild petunia	*Ruellia* sp.
Common reed	*Phragmites australis* (Cav.) Trin. ex Steud.
Wild cow pea	*Vigna luteola* Benth.
Herbaceous Aquatic	
Giant cutgrass	*Zizaniopsis miliacea* (Michx.) Döll & Asch.
Alligatorweed*	*Alternanthera philoxeroides* (Mart.) Griseb.
Halberd leaf rosemallow	*Hibiscus laevis* All.
American crinum lily	*Crinum americanum* L.
Water lettuce*	*Pistia stratiotes* L.
Big foot water clover	*Marsilea macropoda* Engelm. ex A. Braun
Southern cut grass	*Leersia hexandra* Sw.
Water hyacinth*	*Eichhornia crassipes* (Mart.) Solms

Common duckweed	*Lemna minor* L.
Floating marsh pennywort	*Hydrocotyle ranunculoides* L. f.
Creeping water primrose	*Ludwigia peploides* (Kunth) P. H. Raven
Mosquito fern	*Azolla filiculoides* Lam.
Raven foot sedge	*Carex crus-corvi* Shuttlew. ex Kunze
Bulltongue sedge	*Sagittaria lancifolia* L.
Water primrose	*Ludwigia repens* J.R. Forst
Tall horn beak sedge	*Rhynchospora macrostachya* Torr. ex A. Gray
Southern cattail	*Typha domingensis* Pers.
Common spikerush	*Eleocharis palustris* (L.) Roem. & Schult.
Marsh fleabane	*Pluchea odorata* (L.) Cass.
Creeping burhead	*Echinodorus cordifolius* (L.) Griseb.
Creeping spotflower	*Acmella repens* (Walter) R.K. Jansen
Coastal water hyssop	*Bacopa monnieri* (L.) Pennell
California bulrush	S*choenoplectus californicus* (C.A. Mey.) Palla
Hornwort	*Ceratophyllum demersum* (L.)
Smooth beggar's ticks	*Bidens laevis* (L.) Britton, Sterns,& Poggenb.
Delta arrowhead	*Sagittaria platyphylla* (Engelm.) J.G. Sm.
White smartweed	*Persicaria hydropiperoides* (Michx.) Small
Angle stem primrose willow	*Ludwigia leptocarpa (Nutt.) H. Hara*

Table 3. Plant species of greatest conservation need in Calhoun, County. Bold represents species collected within a 20-mile radius of the property. Highlighted indicates plant species strongly associated with a specific vegetation community on the property.

Coastal gay-feather	*Liatris bracteata*
Indianola beakrush	***Rhynchospora indianolensis***
Marsh-elder dodder	*Cuscuta attenuata*
Sand Brazos mint	*Brazoria arenaria*
Seaside beebalm	*Monarda maritima*
Texas peachbush	***Prunus texana***
Texas willkommia	*Willkommia texana* var. *texana*
Threeflower broomweed	***Thurovia triflora***

Figure 7. *Sabal* X *texana*, a rare native palm tree common on the property.

Figure 8. A colony of American crinum lily.

Figure 9. A specimen of Montezuma bald cypress located along Hog Bayou.

2.4 Flora/Fauna Associations

Based on the vegetation community types and location the Hog Bayou property could serve as vital habitat for various animal species, some rare or imperiled. The property lies within the recognized wintering habitat and suitability area for the federally endangered Whooping Crane (*Grus americana*) (**Golden et al., 2022)**. There are multiple observations of Whooping Cranes within a 30-mile radius (**eBird**). The primary diet items for wintering Whooping Cranes include Blue crabs (*Callinectus sapidus*), Rangia clams (*Rangia cuneata*), Carolina wolfberry fruit, and Live oak acorns (**Nelson et al., 1996**). We observed blue crab carapaces, wolfberry and Live oak on the property. Crane habitat would most likely be associated with the herbaceous wetland plant community currently dominated by Spiny aster or Sumpweed. However, the tall, dense structure of these plant communities likely decreases the habitat suitability of the property for cranes. Additionally, the property becomes quite dry during periods of drought, as evidenced during our surveys, and probably will not harbor cranes during dry times. Despite these current circumstances it is likely the property could be managed to support Whooping Cranes to some degree. The intact forested riparian community is an important habitat for many migratory birds. During our survey we observed Yellow billed cuckoo (*Coccyzus americanus*) and American redstart (*Setophaga ruticilla*). Other avian species of concern which may be closely associated with or utilize vegetation communities on the property include the Reddish Egret (*Egretta rufescens*),

multiple rail species including the Black Rail (*Laterallus jamaicensis*) and Wood Stork (*Mycteria americana*) **(TPWD, 2023)**.

The Northern Yellow Bat (*Lasiurus intermedius*) is listed as a state species of greatest conservation need (**TPWD, 2023**) and could be closely associated with the wooded riparian community and Sabal palm marsh community on the property. It occurs mainly along the Gulf Coast and prefers roosting in Spanish moss and in the hanging fronds of palm trees. It can be common where this vegetation occurs, is found near water and forages over grassy, open areas (**TPWD, 2023**).

Several rare or imperiled reptile and amphibian species could be associated with the wetland pothole ponds and other aquatic habitats. Black Spotted Newt (*Notophthalmus meridionalis*) is a likely inhabitant in the pothole pond community and has been documented in similar habitat from nearby properties in Calhoun County (**Robinson et al., 2022**). The Saltmarsh Snake (*Nerodia clarkia*) has been observed along the Guadalupe River adjacent to Hog Bayou Property (**iNaturalist**). While this species is generally restricted to the brackish marshes and islands of the mid- and upper coastline it can be found further inland in shallow freshwater marshes (**TPWD, 2023**).

3 Restoration and Conservation Considerations

The Hog Bayou property contains a diverse suite of vegetation communities and these in turn can offer habitat for a wide array of plant and animal species. While some vegetation communities represent historical reference species composition others deviate from historical reference species composition. The Spiny aster/Sea tansy/Wolfberry community, although native, should be composed of a more diverse mix of coastal wetland grass and forb species based on soil type. These include Gulf cordgrass (*Sporobolus spartinae*), Marsh hay cordgrass (*Spartina patens*), Shoregrass (*Monanthochloe littoralis*), Seashore dropseed (*Sporobolus virginicus*) and Glasswort (*Salicornia* spp.). The reference community for the Austwell Clay soil calls for up to 75% shortgrass to midgrass cover (**Natural Resources Conservation Service, 2024**). Past human or natural disturbance to the site likely resulted in drastic changes to this vegetation community as mature vegetation was damaged and new seed sources were brought in. This is especially true for quick growing forb species including Spiny aster. Spiny aster is highly undesirable due to its lack of wildlife or agricultural value. Dense colonies of this plant can serve as a barrier to other animals **(Gonzalez et al., 2010**). Improvements to the Spiny aster/Sea tansy/Wolfberry community can be made. Spiny aster can be effectively controlled by specific herbicide application methods (**Gonzalez et al., 2010**) followed by successive rounds of seeding or sprigging of coastal grasses and forbs.

Non-native Chinese tallow (*Triadaca sebifera*) was interspersed and common within the Ash/Swamp privet /Sea myrtle community with some locally dense stands. It was present but uncommon in the Elm/Hackberry/Oak/Palm community. A relatively new invader to the mid-coastal region, Chinese tallow can spread aggressively especially after a natural disturbance such as a hurricane or flood event as seeds are mostly water dispersed. Management options are variable depending on site conditions, but can be successful (**DiTomaso and Keyser, 2010**).

Very few other non-native invasive species were observed on the Hog Bayou property. A few individual Salt cedar (*Tamarisk* sp.) were observed. Invasive aquatic plants including Water hyacinth, Alligatorweed and Water lettuce are managed by the local river authority (Guadalupe Blanco River Authority) and not a particular concern for conservation of habitat on the property.

The Hog Bayou property offers a multitude of conservation possibilities for a variety of common, rare and imperiled species. It is located within a valuable ecological region. The Guadalupe Delta/Green Lake area is home to multiple unique plants and animals. Some vegetation management to the property could improve ecological function for a variety of species and installation of some minor infrastructure could provide opportunities for coastal restoration research and education which is lacking in the area.

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Appendix A: Supporting tables and maps

Table A1. Complete plant list with site occurrence, common (c) or uncommon (uc), and wetland indicator status denoted.

Tree		Site Occurrence	Weltand Indicator status
Chinese tallow*	*Triadica sebifera* (L.) Small	c	FAC
Green ash	*Fraxinus pennsylvanica* Marshall	c	FACW
Berlander's ash	*Fraxinus berlandieriana* DC.	c	FAC
Montezuma bald cypress	*Taxodium distichum var.mexicanum (T.mucronatum)* Ten.	uc	OBL
Live oak	*Quercus virginiana* Mill.	c	FACU
Slippery elm	*Ulmus rubra* Muhl.	c	FAC
Cedar elm	*Ulmus crassifolia* Nutt.	c	FAC
Boxelder	*Acer negundo* L.	uc	FAC
Hackberry	*Celtis laevigata* Willd.	c	FACW
Pecan	*Carya illinoinensis* (Wangenh.) K. Koch	uc	FACU
Salt cedar*	*Tamarix* (species uncertain)	uc	FACW
Black willow	*Salix nigra* Marshall	c	OBL
Palo verde	*Parkinsonia aculeata* L.	uc	FAC
Sabal palm hybrid	*Sabal × texensis*	c	nd
Gum bumelia	*Sideroxylon lanuginosum* Michx.	uc	FACU
Shrub			
Buttonbush	*Cephalanthus occidentalis* L.	uc	OBL
Eastern swamp privet	*Forestiera acuminata* (Michx.) Poir.	c	OBL
Yaupon holly	*Ilex vomitoria* Aiton	c	FAC
Roughleaf dogwood	*Cornus drummondii* C. A. Mey.	uc	FAC
Coral bean	*Erythrina herbacea* L.	uc	nd
Indigo bush	*Amorpha fruticosa* L.	uc	FACW
Sea-myrtle	*Baccharis halimifolia* L.	c	FAC
Herb, Vine, Woody vine , Grass			
Heartleaf peppervine	*Ampelopsis cordata*	c	FAC
Peppervine	*Ampelopsis arborea*	c	FAC
Trumpet vine	*Campsis radicans*	uc	FAC
Poison ivy	*Toxicodendron radicans*	c	FAC
Virginia creeper	*Parthenocissus quinquefolia* (L.) Planch	uc	FACU
Dodder vine	*Cuscuta* sp.	uc	nd
Mustang grape	*Vitis mustangensis* Buckley	c	nd
Sweet grape	*Vitis riparia* Michx.	c	FACW
Tievine	*Ipomoea cordatotriloba* Dennst.	c	FACU
Turkscap	*Malvaviscus arboreus* var. *drummondii* Cav.	c	FAC
Giant ragwed	*Ambrosia trifida* L.	c	FAC
Green briar	*Smilax bona nox* L.	c	FAC

Lanceleaf frogfruit	*Phyla lanceolata* (Michx.) Greene	c	OBL
Sea tansy	*Borrichia frutescens* DC.	c	OBL
Spiny aster	*Chloracantha spinosa* (Benth.) G.L. Nesom	c	FACW
Carolina wolfberry	*Lycium carolinianum* Walter	c	FACW
Southern dewberry	*Rubus trivialis* Michx.	c	FACU
Flatsedge	*Cyperus* undet.	c	nd
Branched foldwing	*Dicliptera brachiata* (Pursh) Spreng.	c	FACW
Groundcherry	*Physalis* undet.	uc	nd
Drummond's leafflower	*Phylanthus abnormis* Baill.	uc	UPL
Sumpweed	*Iva annua* (L.)	c	FACW
Jointed flatsedge	*Cyperus articulatus* L.	c	OBL
Winged loosestrife	*Lythrum alatum* Pursh	c	OBL
Shrubby boneset	*Ageratina havanensis* (Kunth) R.M.King & H.Rob.	c	nd
Heliotrope	*Heliotropium angiospermum* Murray	uc	FACU
Candian germander	*Teucrium canadense* L.	uc	FACW
Climbing hempvine	*Mikania scandens* (L.) Willd.	c	FACW
Wild petunia	*Ruellia* sp.	c	nd
Common reed	*Phragmites australis* (Cav.) Trin. ex Steud.	c	FACW
Wild cow pea	*Vigna luteola* Benth.	c	FACW
Herbaceous Aquatic			
Giant cutgrass	*Zizaniopsis miliacea* (Michx.) Döll & Asch.	c	OBL
Alligator weed*	*Alternanthera philoxeroides* (Mart.) Griseb.	c	OBL
Halberd leaf rosemallow	*Hibiscus laevis* All.	uc	OBL
American crinum lily	*Crinum americanum* L.	c	OBL
Water lettuce*	*Pistia stratiotes* L.	c	OBL
Big foot water clover	*Marsilea macropoda* Engelm. ex A. Braun	c	OBL
Southern cut grass	*Leersia hexandra* Sw.	c	OBL
Water hyacinth*	*Eichhornia crassipes* (Mart.) Solms	c	OBL
Common duckweed	*Lemna minor* L.	c	OBL
Floating marsh pennywort	*Hydrocotyle ranunculoides* L. f.	c	OBL
Creeping water primrose	*Ludwigia peploides* (Kunth) P. H. Raven	c	OBL
Mosquito fern	*Azolla filiculoides* Lam.	c	OBL
Raven foot sedge	*Carex crus-corvi* Shuttlew. ex Kunze	c	OBL
Bull tongue sedge	*Sagittaria lancifolia* L.	uc	OBL
Water primrose	*Ludwigia repens* J.R. Forst	uc	OBL
Tall horn beak sedge	*Rhynchospora macrostachya* Torr. ex A. Gray	c	OBL
Southern cattail	*Typha domingensis* Pers.	uc	OBL
Common spikerush	*Eleocharis palustris* (L.) Roem. & Schult.	c	OBL
Marsh fleabane	*Pluchea odorata* (L.) Cass.	c	OBL
Creeping burhead	*Echinodorus cordifolius* (L.) Griseb.	uc	OBL
Creeping spotflower	*Acmella repens* (Walter) R.K. Jansen	uc	OBL
Coastal water hyssop	*Bacopa monnieri* (L.) Pennell	c	OBL
California bulrush	*Schoenoplectus californicus* (C.A. Mey.) Palla	uc	OBL
Hornwort	*Ceratophyllum demersum* (L.)	uc	OBL
Smooth beggar's ticks	*Bidens laevis* (L.) Britton, Sterns,& Poggenb.	uc	OBL
Delta arrowhead	*Sagittaria platyphylla* (Engelm.) J.G. Sm.	uc	OBL

White smartweed	*Persicaria hydropiperoides* (Michx.) Small	uc	OBL
Angle stem primrose willow	*Ludwigia leptocarpa (Nutt.) H. Hara*	uc	OBL

Table A2. Plant species of greatest conservation need from Calhoun, County.

Coastal gay-feather	*Liatris bracteata*	
Coastal prairie grasslands of various types, from salty prairie on low- lying somewhat saline clay loams to upland prairie on nonsaline clayey to sandy loams; flowering in fall		
Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G2G3	State Rank: S2S3
Indianola beakrush	*Rhynchospora indianolensis*	
Locally abundant in cattle pastures in some areas (at least during wet years), possibly becoming a management problem in such sites; Perennial; Flowering/Fruiting April-Nov		
Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3Q	State Rank: S3
Marsh-elder dodder	*Cuscuta attenuata*	**Could be present**
Parasitizes a particular sumpweed (Iva annua) almost exclusively as well as ragweed and heath aster. Host plants typically found in open, disturbed habitats like fallow fields and creek bottomlands; Annual; Flowering late summer through October		
Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G1G3	State Rank: S2
Sand Brazos mint	*Brazoria arenaria*	
Sandy areas in South Texas; Annual; Flowering/Fruiting March-April		
Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S3
Seaside beebalm	*Monarda maritima*	
Occurs in grasslands and pastures on sandy soil near the coast (Carr 2015).		
Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G2Q	State Rank: S2
Texas peachbush	*Prunus texana*	
Occurs at scattered sites in various well drained sandy situations; deep sand, plains and sand hills, grasslands, oak woods, 0-200 m elevation; Perennial; Flowering Feb-Mar; Fruiting Apr-Jun		
Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3G4	State Rank: S3S4
Texas willkommia	*Willkommia texana* var. *texana*	
Mostly in sparsely vegetated shortgrass patches within taller prairies on alkaline or saline soils on the Coastal Plain (Carr 2015).		
Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3G4T3	State Rank: S3
Threeflower broomweed	*Thurovia triflora*	
Near coast in sparse, low vegetation on a veneer of light colored silt or fine sand over saline clay along drier upper margins of ecotone between between salty prairies and tidal flats; further inland associated with vegetated slick spots on prairie mima mounds; flowering September-November		
Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G2G3	State Rank: S2S3
velvet spurge	*Euphorbia innocua*	
Open or brushy areas on coastal sands and the South Texas Sand Sheet; Perennial; Flowering Sept-April; Fruiting Nov-July		
Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S3

Table A3. Animal species of greatest conservation need from Calhoun, County which could be associated with delineated vegetation communities located on the property.

salt marsh snake	*Nerodia clarkii*	
This species is generally restricted to the brackish marshes and islands of the mid and upper coastline. It can be found further inland in shallow freshwater marshes.		
Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3
northern yellow bat	*Lasiurus intermedius*	
Occurs mainly along the Gulf Coast but inland specimens are not uncommon. Prefers roosting in spanish moss and in the hanging fronds of palm trees. Common where this vegtation occurs. Found near water and forages over grassy, open areas. Males usually roost solitarily, whereas females roost in groups of several individuals.		
Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4
black-spotted newt	*Notophthalmus meridionalis*	
Terrestrial and aquatic: Terrestrial habitats used by adults are typically poorly drained clay soils that allow for the formation of ephemeral wetlands. A wide variety of vegetation associations are known to be used, such as thorn scrub and pasture. Aquatic habitats used for reproduction are a variety of ephemeral and permanent water bodies.		
Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3
wallow-tailed kite	*Elanoides forficatus*	
The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Lowland forested regions, especially swampy areas, ranging into open woodland; marshes, along rivers, lakes, and ponds; nests high in tall tree in clearing or on forest woodland edge, usually in pine, cypress, or various deciduous trees.		
Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2B
whooping crane	*Grus americana*	
The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Small ponds, marshes, and flooded grain fields for both roosting and foraging. Potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties.		
Federal Status: LE	State Status: E	SGCN: Y
Endemic: N	Global Rank: G1	State Rank: S1S2N
wood stork	*Mycteria americana*	
The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Prefers to nest in large tracts of baldcypress (Taxodium distichum) or red mangrove (Rhizophora mangle); forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960.		
Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: SHB,S2N
western box turtle	*Terrapene ornata*	
Terrestrial: Ornate or western box trutles inhabit prairie grassland, pasture, fields, sandhills, and open woodland. They are essentially terrestrial but sometimes enter slow, shallow streams and creek pools. For shelter, they burrow into soil (e.g., under plants such as yucca) (Converse et al. 2002) or enter burrows made by other species.		
Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

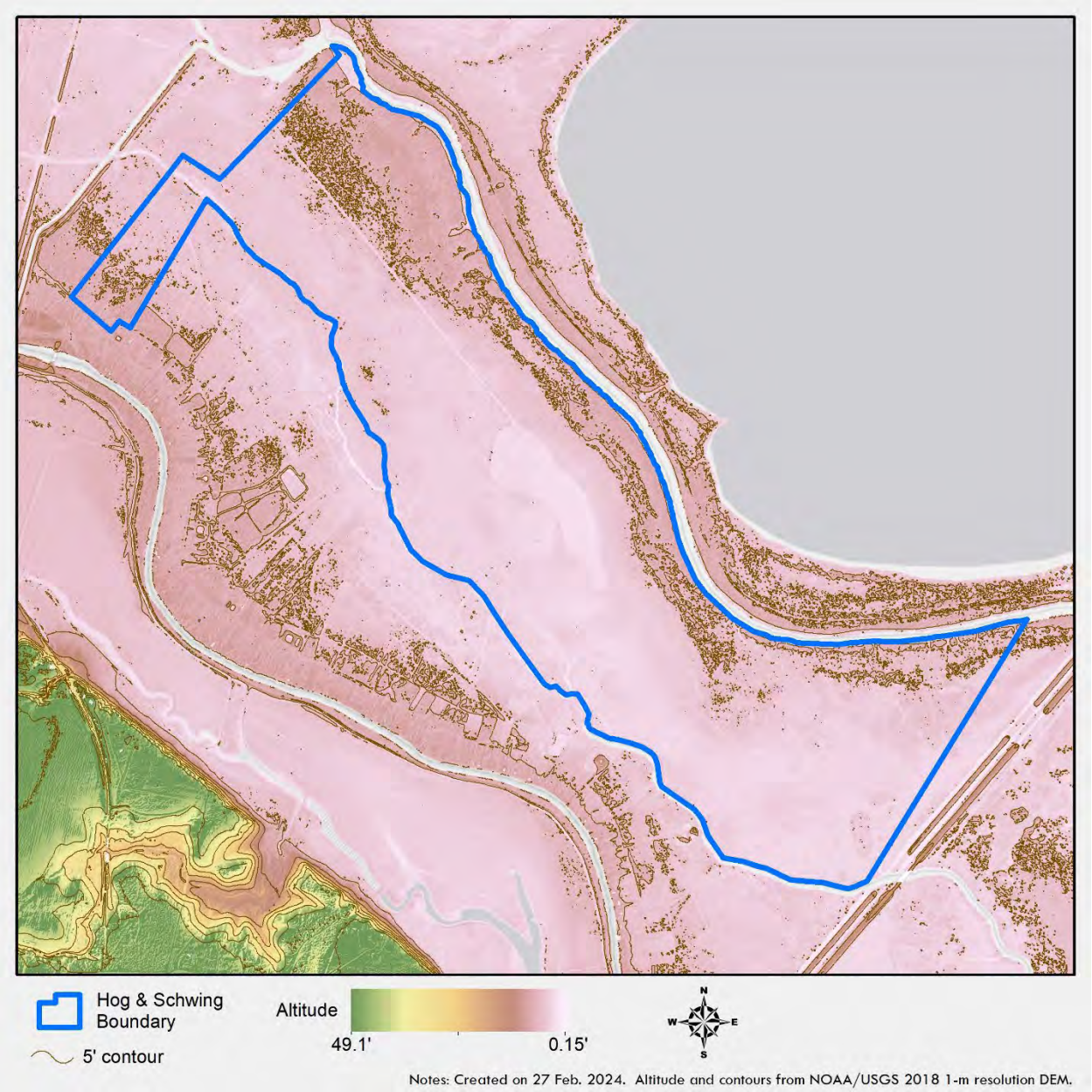

Figure A1. Elevation profile of the property and surrounding area.

1	2	3 dry waterway	4	5 inundated wetland
Chinese tallow	Coral bean	Giant ragweed	*Borrichia frutescens*	*Borrichia frutescens*
Zizaniopsis milacea	Mustang grape	*Smilax bona nox*	*Marsilea macropoda*	*Lycium carolinianum*
Aligator weed	*Ipomea sagittata*	*Phyla lanceolata*	Spiney aster	*Rubus trivialis*
water hyacinth	Turkscap	*Celtis*		*Baccharis halimifolia*
Black willow				*Taxodium mucronatum*
Hibiscus laevis				
Crinum americanum				
Vitis sp				
Water lettuce				
Green ash				
Buttonbush				
Roughleaf dogwood				
Sabal X *texensis*				
Ulmus americana				
Ulmus crassifolia				
Ampelopsis arborea				
Ampelopsis cordata				
Gum bumelia				
Campsis radicans				
Ilex vomitoria				
Toxicodendron radicans				

6 Good entry to interior

Cyperus sp
Diclipta brachiata

7

Retama
Spiny aster
Ampelopsis arborea
Ulmus crassifolia
Sabal X *texensis*
Marsilea macropoda

2 yellow billed cuckoos8

Live oak
Amorpha fruticosa
Virginia creeper
Pecan

American redstarts Riparian 9

Live oak
Acer negundo
Celtis
Ilex vomitoria
Sabal X *texensis*

10

Spiny aster

large tree 11

Taxodium mucronatum

12 good landing spot

Live oak
Green ash
Poison ivy

13

Borrichia frutescens
Teucrium canadense
Cuscuta sp.
Physalis sp.

14

Berlander's ash
Lycium carolinianum
spiny aster
Phyla lanceolata
Ampelospis arborea
Acmella repens
Ipomea cordatotriloba

15 Walkable	16 Walkable to interior	17	18	19	20
Green ash	Green ash	Cedar elm	*Boricchia frutescens*	*Phyla lanceolata*	Spiny aster
Poison ivy	Poison ivy	Spiny aster	Spiny aster	*Eleocharis palustris*	*Lycium carolinanum*
Ipomea sagittata	*Smilax bona nox*	*Marsilea macropoda*		*Pluchea odorata*	*Iva annua*
		Sabal X *texensis*		*Echinodorus cordifolius*	*Tamarix* sp
		Toxicodendron radicans		*Acmella repens*	*Borrichea frutescens*

21	22	23	Aquatic 24	25
Forresteria angustifolia	*Echinodorus cordifolious*	*Fraxinus berlanderi*	Coontail	*Iva annua*
Baccharis halimifolia	*Typha domingensis*	*Salix nigra*	*Bidens laevis*	*Ulmus crassifolia*
Spiny aster	*Eleocharis palustris*	*Eupatorium havanense*		Green ash
	Cyperus pendulatus	Spiny aster		*Sabal* X *texensis*
	Salix nigra	*Smilax bona nox*		*Baccharis halimifolia*
	Phyla lanceolata	*Baccharis halimifolia*		Spiny aster
	Lythrum alatum			
	Bacopa monierri			
	Schoenoplectus californicus			

swamp26	27	28	29
Green ash	*Ulmus crassifolia*	Fraxinus berlanderi	Spiney aster
Salix nigra	*Sabal* X *texensis*	spiney aster	Palo verde
Zizaniopsis milacea	Berlaners ash	*Iva annua*	*Fraxinus berlandieriana*
Sagittaria platyphylla	Spiny aster	*Phyla lanceolata*	
Cyperus sp.	Palo verde		
Iva annua	*Ilex vomitoria*		
Persicaria hydropeperoides	*Baccharis hamilifolia*		
Sabal X *texensis*	*Amplepsis arborea*		
Ludwigia peploides			
Phyla lanceolata			
Azolla filiculoides			
Hydrocotyle ranunculoides			
Heliotropium angiospermum			

old fence 30	31	along fence 32	Pasture road 33	34
Fraxinus berlandieriana	*Fraxinus berlandieriana*	*Lycium carolinianum*	*Phyla lanceolata*	*Sabal* X *brazoriensis*
Spiny aster	Spiny aster	*Iva annua*	*Borrichia frutescens*	spiney aster
Iva annua	Swamp privet	spiny aster	Spiny aster	Borrichia
Swamp privet	Iva annua	*Borrichea frutescens*	*Iva annua*	*marsilea macropoda*
	Rubus	*Marsilea macropoda*	*Eleocharis palustris*	*Ampelopsis arborea*
	Chinese tallow		Swamp privet	
	Cyperus sp.		Fraxinus berlanderi	
	Paspalum setaceum		Baccharis	
			Lycium caroliniana	

wooded 35	swamp 36	dense thicket 37	wooded wetland 38
Green ash	Black willow	Green ash	Green ash
Slippery elm	Green ash	Baccharis	Black willow
Live oak	*Sabal* X *texensis*	Chinese tallow	Chinese tallow
Baccharis hamilifolia	*Ilex vomitoria*	Black willow	Baccharis
Ilex vomitoria	Swamp privet	*Mikania scandens*	*Ilex vomitoria*
Celtis	Baccharis	*Ipomea cordotriloba*	*Crinum americanum*
Iva annua	*Crinum americanum*	spiney aster	*Rynchospora macrostaycha*
Cyperus sp.	*Rynchospora macrostachya*	*Phyla lanceolata*	*Hydrocotyle umbellata*
Toxicodendron radicans	*Carex crus corvi*	*Rynchospora macrostachya*	*Ipomea cordotriloba*
Ampelopsis cordata	*Sagittaria lancifolia*	*Acmella repens*	*Mikania scandens*
Ampelopsis arborea	*Ampelopsis cordata*		
Teucrum canadensis	*Ludwigia repens*		
Heliotropium angiospermum			

creek39	dry upland 40	41	42	dense growth 43
Buttonbush	Green ash	Swamp privet	*Fraxinus berlandieriana*	*Baccharis hamilifolia*
Crinum americanum	*Sabal* X *brazoriensis*	spiney aster	Black willow	Black willow
Green ash	*Ampelopsis arborea*	*Mikania scandens*	*Sabal* X *texensis*	Chinese tallow
Sabal X *brazoriensis*	Iva annua		buttonbush	*Fraxinus berlandieriana*
Leersia monandra	*Toxicodendron radicans*		*Zizaniopsis milacea*	Spiney aster
Baccharis	Baccharis		*Vigna luteola*	
Zizaniopsis milacea	*Ilex vomitoria*		*Carex crus corvi*	
Ampelopsis arborea	Spiney aster		*Leersia hexandra*	
Ilex vomitoria	*Mikania scandens*		*Crinum americanum*	
Mikania scandens			*Ilex vomitoria*	
Chinese tallow			*Rynchospora macrostachy*	
Ruellia nudiflora			Chinese tallow	
Phragmites australis			*Phyla lanceolata*	
Persicaria hydropiperoides				

44

Green ash
Chinese tallow
Black willow
Sabal X *texensis*
Buttonbush
Ilex vomitoria
Crinum americanum
Amplepsis arborea

45

Sagittaria lancifolia
Teucrum canadense
Schoenopectus californicus

46

Chinese tallow
Green ash
Phragmites australis
Blackwillow
Carex crus corvi
Mikania scandens
Panicum atidole

47

Green ash
Phyla lanceolata
Carex crus corvi
Acmella repens
Persicaria hydropiperoides
Pluchea odorata
Buttonbush

48

Spiney aster
Baccharis hamilifolia
Borrichea frutescens

49	50	51	flooded canal 52	53
Crinum americanum	Fraxinus berlanderi	*Colocasia esculenta*	*Mikania scandens*	*Crinum americanum*
black willow	spiney aster	*Crinum americanum*	*Phragmites australis*	*Mikania scandens*
Chinese tallow		*Hydrocotyle bonariensis*	Black willow	Water hyacinth
Ampelopsis arborea		Alligator weed	*Lemmna minor*	Alligator weed
Vigna luteola		Green ash	*Ludwigia repens*	Swamp privet
Leersia hexandra		*Sabal* X *texensis*		Chinese tallow
Ilex vomitoria		Spiney aster		*Vigna luteola*
		Chinese tallow		*Ampelopsis arborea*
		Sagittari latifolia		
		Ampelopsis arborea		
		Zizaniopsis milacea		
		Mikania scandens		
		Phragmites australis		
		Black willow		
		Lemmna minor		
		Ludwigia repens		

1	28°29'46.8"N	96°50'39.4"W
2	28°29'47.0"N	96°50'46.5"W
3	28°29'45.1"N	96°50'50.2"W
4	28°29'42.4"N	96°50'49.9"W
5	28°29'41.3"N	96°50'49.8"W
6	28°29'44.5"N	96°50'58.3"W
7	28°29'40.5"N	96°50'56.4"W
8	28°29'44.1"N	96°51'06.3"W
9	28°29'43.5"N	96°51'16.1"W
10	28°29'41.2"N	96°51'17.3"W
11	28°29'46.8"N	96°51'28.6"W
12	28°29'50.9"N	96°51'33.6"W
13	28°29'44.9"N	96°51'39.4"W
14	28°29'44.1"N	96°51'42.2"W
15	28°29'59.1"N	96°51'39.0"W
16	28°30'15.2"N	96°51'46.9"W
17	28°30'14.2"N	96°51'50.3"W
18	28°30'09.4"N	96°51'53.4"W
19	28°30'07.5"N	96°51'54.7"W
20	28°30'03.4"N	96°51'58.6"W
21	28°30'02.8"N	96°51'60.0"W
22	28°30'02.1"N	96°51'55.3"W
23	28°30'01.1"N	96°51'56.2"W
24	28°30'27.4"N	96°51'59.7"W
25	28°30'35.3"N	96°52'07.0"W
26	28°30'55.1"N	96°52'20.9"W
27	28°30'54.6"N	96°52'27.8"W
28	28°30'48.9"N	96°52'36.3"W
29	28°30'46.2"N	96°52'36.9"W
30	28°30'44.5"N	96°52'37.3"W
31	28°30'43.2"N	96°52'39.8"W
32	28°30'47.4"N	96°52'34.2"W
33	28°30'24.7"N	96°52'10.5"W
34	28°30'20.7"N	96°52'00.6"W
35	28°30'22.1"N	96°51'57.2"W

36	28°29'33.8"N	96°51'47.0"W
37	28°29'36.2"N	96°51'47.7"W
38	28°29'39.5"N	96°51'49.2"W
39	28°29'38.0"N	96°51'49.0"W
40	28°29'25.7"N	96°51'37.7"W
41	28°29'26.7"N	96°51'36.9"W
42	28°29'16.9"N	96°51'26.2"W
43	28°29'18.4"N	96°51'24.5"W
44	28°29'14.4"N	96°51'13.2"W
45	28°29'15.5"N	96°51'12.9"W
46	28°29'18.3"N	96°51'12.7"W
47	28°29'34.2"N	96°51'34.6"W
48	28°29'34.8"N	96°51'22.8"W
49	28°29'46.5"N	96°51'49.5"W
50	28°30'26.4"N	96°52'19.8"W
51	28°29'16.5"N	96°51'09.6"W
52	28°29'17.3"N	96°51'05.3"W
53	28°29'56.0"N	96°52'13.3"W

Tree		Site Occurrence
Chinese tallow*	*Triadica sebifera* (L.) Small	c
Green ash	*Fraxinus pennsylvanica* Marshall	c
Berlander's ash	*Fraxinus berlandieriana* DC.	c
Montezuma bald cypress	*Taxodium distichum var.mexicanum (T.mucronatum)* Ten.	uc
Live oak	*Quercus virginiana* Mill.	c
Slippery elm	*Ulmus rubra* Muhl.	c
Cedar elm	*Ulmus crassifolia* Nutt.	c
Boxelder	*Acer negundo* L.	uc
Hackberry	*Celtis laevigata* Willd.	c
Pecan	*Carya illinoinensis* (Wangenh.) K. Koch	uc
Salt cedar*	*Tamarix* (species uncertain)	uc
Black willow	*Salix nigra* Marshall	c
Palo verde	*Parkinsonia aculeata* L.	uc
Sabal palm hybrid	*Sabal × texensis*	c
Gum bumelia	*Sideroxylon lanuginosum* Michx.	uc
Shrub		
Buttonbush	*Cephalanthus occidentalis* L.	uc
Eastern swamp privet	*Forestiera acuminata* (Michx.) Poir.	c
Yaupon holly	*Ilex vomitoria* Aiton	c
Roughleaf dogwood	*Cornus drummondii* C. A. Mey.	uc
Coral bean	*Erythrina herbacea* L.	uc
Indigo bush	*Amorpha fruticosa* L.	uc
Sea-myrtle	*Baccharis halimifolia* L.	c
Herb, Vine, Woody vine , Grass		
Heartleaf peppervine	*Ampelopsis cordata*	c
Peppervine	*Ampelopsis arborea*	c
Trumpet vine	*Campsis radicans*	uc
Poison ivy	*Toxicodendron radicans*	c
Virginia creeper	*Parthenocissus quinquefolia* (L.) Planch	uc
Dodder vine	*Cuscuta* sp.	uc
Mustang grape	*Vitis mustangensis* Buckley	c
Sweet grape	*Vitis riparia* Michx.	c
Tievine	*Ipomoea cordatotriloba* Dennst.	c

Turkscap	*Malvaviscus arboreus* var. *drummondii* Cav.	c
Giant ragwed	*Ambrosia trifida* L.	c
Green briar	*Smilax bona nox* L.	c
Lanceleaf frogfruit	*Phyla lanceolata* (Michx.) Greene	c
Sea tansy	*Borrichia frutescens* DC.	c
Spiny aster	*Chloracantha spinosa* (Benth.) G.L. Nesom	c
Carolina wolfberry	*Lycium carolinianum* Walter	c
Southern dewberry	*Rubus trivialis* Michx.	c
Flatsedge	*Cyperus* undet.	c
Branched foldwing	*Dicliptera brachiata* (Pursh) Spreng.	c
Groundcherry	*Physalis* undet.	uc
Sumpweed	*Iva annua* (L.)	c
Jointed flatsedge	*Cyperus articulatus* L.	c
Winged loosestrife	*Lythrum alatum* Pursh	c
Shrubby boneset	*Ageratina havanensis* (Kunth) R.M.King & H.Rob.	c
Heliotrope	*Heliotropium angiospermum* Murray	uc
Candian germander	*Teucrium canadense* L.	uc
Climbing hempvine	*Mikania scandens* (L.) Willd.	c
Wild petunia	*Ruellia* sp.	c
Common reed	*Phragmites australis* (Cav.) Trin. ex Steud.	c
Wild cow pea	*Vigna luteola* Benth.	c
Herbaceous Aquatic		
Giant cutgrass	*Zizaniopsis miliacea* (Michx.) Döll & Asch.	c
Alligator weed*	*Alternanthera philoxeroides* (Mart.) Griseb.	c
Halberd leaf rosemallow	*Hibiscus laevis* All.	uc
American crinum lily	*Crinum americanum* L.	c
Water lettuce*	*Pistia stratiotes* L.	c
Big foot water clover	*Marsilea macropoda* Engelm. ex A. Braun	c
Southern cut grass	*Leersia hexandra* Sw.	c
Water hyacinth*	*Eichhornia crassipes* (Mart.) Solms	c
Common duckweed	*Lemna minor* L.	c
Floating marsh pennywort	*Hydrocotyle ranunculoides* L. f.	c
Creeping water primrose	*Ludwigia peploides* (Kunth) P. H. Raven	c
Mosquito fern	*Azolla filiculoides* Lam.	c

Raven foot sedge	*Carex crus-corvi* Shuttlew. ex Kunze	c
Bull tongue sedge	*Sagittaria lancifolia* L.	uc
Water primrose	*Ludwigia repens* J.R. Forst	uc
Tall horn beak sedge	*Rhynchospora macrostachya* Torr. ex A. Gray	c
Southern cattail	*Typha domingensis* Pers.	uc
Common spikerush	*Eleocharis palustris* (L.) Roem. & Schult.	c
Marsh fleabane	*Pluchea odorata* (L.) Cass.	c
Creeping burhead	*Echinodorus cordifolius* (L.) Griseb.	uc
Creeping spotflower	*Acmella repens* (Walter) R.K. Jansen	uc
Coastal water hyssop	*Bacopa monnieri* (L.) Pennell	c
California bulrush	S*choenoplectus californicus* (C.A. Mey.) Palla	uc
Hornwort	*Ceratophyllum demersum* (L.)	uc
Smooth beggar's ticks	*Bidens laevis* (L.) Britton, Sterns,& Poggenb.	uc
Delta arrowhead	*Sagittaria platyphylla* (Engelm.) J.G. Sm.	uc
White smartweed	*Persicaria hydropiperoides* (Michx.) Small	uc
Angle stem primrose willow	*Ludwigia leptocarpa (Nutt.) H. Hara*	uc

Weltand Indicator status
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APPENDIX C Supporting photographs

Figure C1. Riparian habitat along Hog Bayou

Figure C2. Riparian habitat along Hog Bayou

Figure C3 Wetland forb community dominated by Spiny aster.

Figure C4 Wetland forb community dominated by Spiny aster.

Figure C5 Debris pile along center fence indicating inundation of the wetland forb community.

Figure C6. (Left) Carapace of blue crab found while surveying the wetland forb community a clear indication of inundation. (Right) Surveying the waist high vegetation.

Figure C7. Pothole ponds were clearly inundated despite the dry conditions.

Figure C8. Ash/ Swamp privet/ Sea myrtle vegetation complex.

Figure C9. Sabal palm marsh vegetation complex.

Figure C10. Riparian habitat along Schwings Bayou.

11

12

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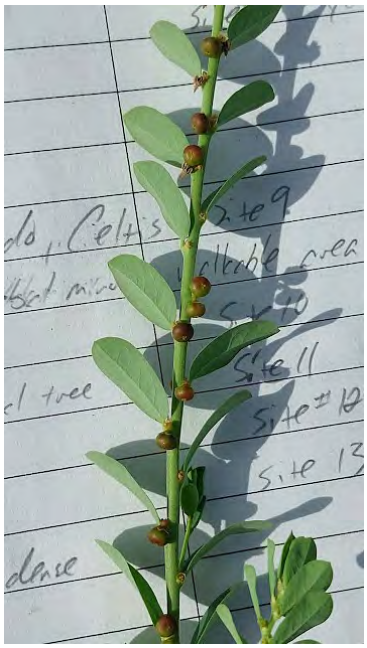

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15

16

Figure C 11-12 *Phyla lanceolata.* Figure C 13. *Teucrium canadense.* Figure C 14*. Phylanthus abnormis.* Figure C 15*. Cuscuta* species*.* Figure C 16. *Ipomea cordatotriloba*

17

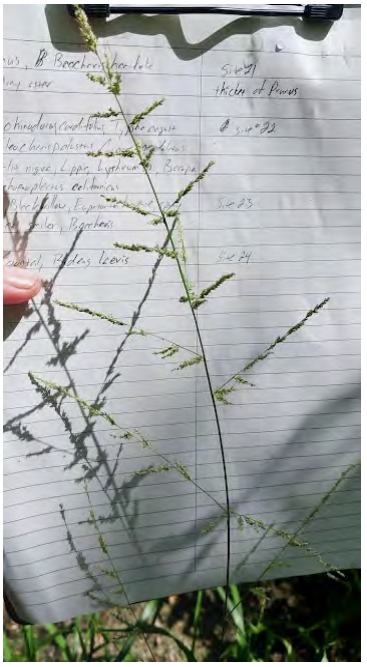

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Figure C 17 Lythrum alatum. Figure C 18. *Leersia hexandra.* Figure C 19. *Heliotropum angiospermum.* Figure C 20. *Carex crus corvi.* Figure C 21. *Rynchospora macrostachya.* C 22. *Tamarix* sp.

Figure C 23. (Left) Palm frond of *Sabal* X *texana.* (Right) Collecting a data point.

Figure C 24. Kayaking Hog Bayou.

SITE ACCESS FEASIBILITY ASSESSMENT

Site Access Improvements – Entrance Enhancement and Interior Pathway Reestablishment
for Hog & Schwing Bayou Preserve (Approx. 817-Acres)
Tivoli, Calhoun County, Texas

January 15, 2024

Prepared for:
Guadalupe-Blanco River Trust
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1.0 Background & Introduction

Triton Environmental Solutions, LLC (Triton) was contracted by the Guadalupe-Blanco River Trust (GBRT) to conduct a feasibility assessment aimed at evaluating site access improvements for the Hog & Schwing Bayou Preserve (Preserve), located near Tivoli, Calhoun County, Texas (Figure 1). The Preserve and associated Project Review Area (PRA) encompasses approximately 817-acres and is uniquely positioned between Hog Bayou on the eastern property boundary and Schwing Bayou to the southwest. The PRA is delineated by or nearby a network of interconnected bayous, canals, and channels extending from the Guadalupe River to the north, east, and west, and Highway 35 to the south. Guadalupe-Blanco River Authority (GBRA), the local water controlling authority, owns the connecting property to the north. This parcel currently provides access to the property for GBRT staff, via land use agreement. GBRT is a 501(c)(3) nonprofit land trust whose mission serves to protect and preserve the natural heritage of the Guadalupe River watershed by protecting open landscapes including habitat of important wildlife and associated aquatic resources. Hog & Schwing Bayou Preserve is one of eighteen properties managed or protected by GBRT across 15 counties within the Guadalupe River Basin. In total, GBRT activities have conserved, preserved, and restored or enhanced approximately 16,400-acres of land in the watershed (https://gbrtx.org/).

This site access feasibility assessment provides a summary of findings from a desktop and historical review of the PRA and a topographic survey conducted on August 6 – 7, 2024. The subsequent sections will detail the project constraints, feasibility parameters, present a summary of findings (i.e., evaluation of constraints and feasibility parameters), and offer recommendations based on the desktop and subsequent onsite topographic assessment.

1.1 Purpose & Need of Feasibility Study

The purpose of the feasibility assessment is to evaluate the property's current and historical access locations and identify the optimal, minimally invasive, and cost-effective route to enhance overall site access providing long-term interior site accessibility. Improved access will facilitate and better support management activities of the property including conservation initiatives such as habitat restoration and enhancement, invasive species control, site maintenance, and improved visitor access and outreach capabilities. The ideal access route would be contained solely on GBRT property, minimize or avoid adverse impacts to sensitive habitats, not require major construction activities (i.e., earthwork including excavation and/or placement of fill) or require the need to install water control structures (i.e., culverts, bridge overpass) to maintain existing hydrology. Major construction activities or the need to install water control structures would likely necessitate regulatory coordination and/or permits from various agencies, particularly the U.S. Army Corps of Engineers (USACE) with review from U.S. Fish and Wildlife Service (USFWS), Texas Commission on Environmental Quality (TCEQ), Texas General Land Office (GLO), and Texas Historical Commission (THC). More specifically, the preferred access route would serve as a pathway that could be created with minimal invasive activity and construction such as the reclamation of historical pathways through an integrated vegetation management approach (i.e., utilizing small equipment such as skid steer with rotary cutter and herbicides). Conceptually, this approach would avoid and/or minimize adverse impacts to important wetland habitat communities in the site.

Currently, most the Preserve's landscape features are only partially accessible by foot, UTV, or boat due to the extensive vegetative growth and high prevalence of invasive species such as spiny aster

(*Chloracantha spinosa*) and Chinese Tallow (*Triadica sebifera*). The Preserve's current conditions pose considerable access challenges for staff to properly implement management and maintenance strategies and substantially limit outreach activities and visitor access throughout the site. Establishing a vehicle-accessible route will significantly improve both staff and visitor access to the Preserve. Additionally, it will facilitate more effective and comprehensive property management. A more effective property management strategy will further enhance, preserve, and protect important habitats and associated wildlife utilization within the Hog & Schwing Bayou Preserve, increasing its overall ecosystem function and value. Ultimately, the project goal is to provide GBRT a recommendation for the most cost-effective and minimally invasive construction activities to provide long-term interior site accessibility at the Preserve.

2.0 Study Area

2.1 Description of Study Area

Hog and Schwing Bayou Preserve is located along the mid-Texas coast and is situated within Texas Ecoregion 34h Mid-Coast Barrier Islands and Coastal Marshes or western Gulf Coast Plains (Griffith et al. 2007). This area is comprised primarily of marshland that includes saline, brackish, and freshwater habitats. Historically, the vegetative communities were made up of grasses, sedges, and rushes with few to no trees. The geology of the inland portions of this ecoregion contains deposits of the Pleistocene barrier islands (i.e., Beaumont Formation) and typical soil types include delta sand, silt, and clay (Griffith et al. 2007). Elevations within the ecoregion typically range from sea level to +25 feet, suggesting the PRA is likely comprised of relatively flat, low-lying topography with occasional rises.

A desktop review of historical aerial imagery (Figure 2), available Light Detection and Ranging (Lidar) data (Figure 3), USFWS National Wetlands Inventory (NWI) database (Figure 4), Natural Resources Conservation Service (NRCS) Web Soil Survey and Federal Emergency Management Agency (FEMA) 100-year floodplain data (Figure 5), and THC cultural resources database (Figure 6) was conducted to identify historical utilization of the PRA, topography, and habitat community types, and other important landscape features.

A review of aerial imagery illustrates historic and current site access. Historically, the interior portions of the property were accessed from State Highway (HWY) 35, via an apparent unimproved pathway (i.e., road) crossing the property along the northern and eastern boundaries and running adjacent to Hog Bayou (Figure 2). This unimproved pathway is long overgrown and currently does not provide access to the interior portions of the property. As mentioned in the succeeding section and illustrated on current imagery, the Preserve is currently accessed through the River Road entrance, then through GBRA property at its northwestern boundary.

Evaluation of Lidar data suggests elevations generally range from 0.9 to 11.4 feet (Figure 3). Higher elevations are primarily located along the riparian ridge of Hog Bayou at the northeastern portion of the Preserve. Elevation gradients across the site slope to the southwest towards Schwing Bayou (Figure 3).

According to the NWI database, four wetland community types are present: freshwater emergent wetland, freshwater forested/shrub wetland, freshwater pond, and riverine (Figure 4). No upland vegetation communities were illustrated within the 817-acre Preserve.

The NRCS Web Soil Survey identified two primary soil series (Figure 5).

NRCS Soil Types:

1. Aransas Clay, 0-1% slopes, slightly saline, moderately sodic, frequently flooded
2. Austwell Silty Clay, high bottom, frequently flooded, occasionally ponded
3. Austwell Clay, 0-1% slopes, frequently flooded, occasionally ponded
4. Water

Both Aransas and Austwell series are rated as a hydric soil according to the NRCS State Soil Data Access (SDA) Hydric Soils List. Official Soils Series Descriptions (OSD) for Aransas and Austwell are provided in Exhibit A.

According to FEMA's floodplain data, the entire site lies in Special Flood Hazard Zone AE subject to inundation by the 100-year flood (Figure 5).

Based on review of the THC online cultural resources database, no cultural resources have been documented or identified in the PRA. The closest site of historical significance is located approximately 2.2 miles from the northeast boundary of the PRA (THC Historical Marker No. 18201; Figure 6). Accordingly, no disturbance to historical or archeological sites across any of the proposed access routes is anticipated.

A vegetation and floral survey was performed by BIO-WEST in 2023 providing additional habitat characteristics and vegetation community information. Results of the survey identified nine distinct vegetative communities present consisting of either woody riparian (i.e., forested/shrub wetlands) or forb/herbaceous (i.e., freshwater emergent) habitat types (BIO-WEST 2023). The table below provides a brief description of vegetative communities and their associated wetland habitat type.

Table 1. Summary of vegetative communities observed in vegetation and floral survey (BIO-WEST 2023).

Vegetation Community Description	Wetland Habitat Type
Elm, Hackberry, Oak, Sabal	Woody Riparian
Ash, Swamp Privet, Sea Myrtle	Woody Riparian
Spiny Aster, Sea Tansy, Carolina Wolfberry	Forb/Herbaceous
Sumpweed	Forb/Herbaceous
Green Ash, Common Reed	Woody Riparian
Sabal Palm Marsh	Woody Riparian
Wetland Pothole Ponds	Forb/Herbaceous
Chinese Tallow Mixed Woodlands	Woody Riparian
Aquatic	Forb/Herbaceous

3.0 Project Constraints

Potential project constraints to reestablish interior property access to the Preserve were analyzed. Specifically, a review of the GLO GIS Map and Data database and Texas Railroad Commission (TxRRC) Resource Center GIS database was conducted to examine the potential presence of hard mineral leases, miscellaneous easements, oil and gas leases and units (active/inactive), priority protection habitat areas (PPAs), state agency lands, pipelines, wells, and/or upland leases contained within the PRA or in the vicinity of the PRA (GLO 2024; TxRRC 2024). None of the above were found to be present within the PRA. However, inactive oil and gas leases, PPAs, and miscellaneous easements are located in close proximity to the PRA.

Table 2. Summary evaluation of potential constraints within or close proximity to the Hog & Schwing Bayou Preserve.

Feature Type	Description	Feature Location
Oil and Gas Lease (Inactive)	T-C Oil Company; Lease Owner	Guadalupe River
Oil and Gas Lease (Inactive)	Cummins & Walker Oil Company; Lease Owner	Green Lake & Guadalupe River
Oil and Gas Lease (Inactive)	Land Title Solutions; Lease Owner	Green Lake
Priority Protection Areas	Victoria Barge Canal	Northeast of Green Lake
Priority Protection Areas	Guadalupe Delta Wildlife Management Area	Adjacent (abutting) the PRA to the south; across HWY 35
Miscellaneous Easement	Fiber Optic Cable and Electric Line; AEP Texas, Inc.	East-southeast of the PRA; across HWY 35
Miscellaneous Easement	Fiber Optic Cable; Spectrum Gulf Coast, LLC	Southeast of the PRA; across HWY 35
Miscellaneous Easement	Fiber Optic Cable and Electric Line; AEP Texas, Inc.	Southeast of the PRA; across HWY 35
Miscellaneous Easement	Pipeline-Petroleum Products; Equistar Chemicals, LP	West of the PRA; located in the Guadalupe River
Miscellaneous Easement	Pipeline-Hazardous Material; Ingleside Ethylene, LLC	West of the PRA; located in the Guadalupe River
Pipeline	Highly Volatile Liquid; Permico Midstream Partners, LLC	West-northwest of the PRA
Pipeline	Natural Gas; Florida Gas Transmission Company, LLC	West-northwest of the PRA
Pipeline	Highly Volatile Liquid; Buckeye Dev. & Logistics I, LLC	West-northwest of the PRA
Pipeline	Refined Liquid Product; United Brine Pipeline Company, LLC	West-northwest of the PRA
Pipeline	Highly Volatile Liquid; Enterprise Products Operations, LLC	West-northwest of the PRA

Pipeline	Highly Volatile Liquid; Equistar Chemicals, LP	West-northwest of the PRA
Pipeline	Highly Volatile Liquid; Equistar Chemicals, LP	West-northwest of the PRA
Pipeline	Highly Volatile Liquid; Permico Midstream Partners, LLC	West-northwest of the PRA
Surface & Bottom Well	Surface ID: 1102442	North of the PRA; West of Green Lake
Surface & Bottom Well	Surface ID: 85945	Adjacent to the westernmost corner of the PRA; west of the River Rd. entrance
Surface & Bottom Well	Surface ID: 85615	Green Lake
Surface & Bottom Well	Surface ID: 83967	South-southwest of the central portion of the PRA; north of the Guadalupe River and south of Schwing Bayou
Surface & Bottom Well	Surface ID: 83968	South of the PRA; along Guadalupe River Dr.
Surface & Bottom Well	Surface ID: 83969	South of the PRA; along Guadalupe River Dr.
Surface & Bottom Well	Surface ID: 83972	East of the PRA; across HWY 35
Surface & Bottom Well	Surface ID: 83971	East of the PRA; across HWY 35

None of the following leases, PPAs, miscellaneous easements, pipelines, or wells should pose any constraint or limitation for the re-establishment and enhancement of site access to the Preserve.

In the event the available data is inaccurate or dated, it is recommended that any person planning any earth-moving activity contact Texas811 (https://texas811.org/) prior to initiating any digging or excavating activities.

Additionally, parcel data for Calhoun County indicates sole ownership of the 817-acre PRA by GBRT. The GBRA owns a narrow strip of land abutting the Preserve at the north-northwest boundary of the PRA. This land is currently utilized by GBRT staff to access the property with permission from GBRA. Development of the current access pathway utilized by GBRT would require additional coordination of land-use agreements and the potential investment of infrastructure in non-owned GBRT property.

4.0 Feasibility Parameters

To meet GBRT's broader management goals for the Preserve, an important first step is to evaluate the feasibility or viability of several access alternatives. This essential evaluation will inform selection of the most appropriate and cost-effective long-term solution in providing interior site accessibility. Specific goals for reestablishing interior site access include situating an access pathway where existing site conditions and maintenance activities would facilitate route establishment. Ideally, route establishment would be achieved through managing existing vegetation (i.e., mowing, targeted herbicide applications) and would not require the placement of substantial fill or structures to construct the pathway. Maintaining existing hydrology and hydrological connectivity while also minimizing impacts to wetlands are other important project goals.

The evaluation involved an analysis of three (N = 3) access pathways across several feasibility parameters including distance to property interior, property ownership, technical/construction feasibility (i.e., major construction activities), legal and regulatory considerations (i.e., access and land lease agreements, permitting requirements), long-term maintenance, operational impact and environmental implications such as changes to hydrology, impacts to wetlands and cultural resources, and finally project cost relative to each proposed alternative route. By evaluating these parameters, identifying the most suitable (i.e., feasible) alternative aligning with the project purpose and goals, while also minimizing constraints, impacts, and cost can be achieved. The table below defines the feasibility parameters utilized in this assessment including a brief description and relative significance in informing the decision-making process.

Table 3. List of feasibility parameters, description, and relative significance of parameters in assessing proposed alternative access pathways.

Parameter	Description	Significance
Distance to Property Interior	Total distance (miles) of access route to centroid of property interior	Affects timelines, project cost, and future maintenance activities required
Property Ownership	Identifies landownership across the proposed alternative access routes.	Ensuring access is solely contained on GBRT property and prevents the potential for legal dispute; ensures established access is maintained.
Access or Land Lease Agreement	Identifies the need for lease agreements to secure long-term access.	Secures legal right to use land or established access pathways.
Major Construction	Identifies the relative scope of construction activities as significant. For example, the need for engineered plans, earthwork, installation of water control structures, etc.	Impacts budget, resource allocation, project timeline, permitting needs, long-term maintenance, and overall project complexity.
Long-Term Maintenance	Identifies the need or requirements for ongoing maintenance activities of the access route or other associated infrastructure.	Ensures long-term sustainability of access pathways. Impacts budget and resource allocation.
Impacts to Site Hydrology	Effects on local hydrology, including drainage and water quality.	Maintains existing site hydrology, mitigates, or minimizes environmental impacts.
Impacts to Wetlands	Effects on wetlands.	Identifies adverse or permanent impacts to wetlands. Help identify any necessary regulatory coordination or permitting.

Impacts to Cultural Resources	Effects on cultural resources or historical sites.	Identifies potential impacts to cultural resources or historical sites. Help identify any necessary regulatory coordination or permitting.
Permitting Requirements	Identifies the need for permits from regulatory agencies.	Ensures regulatory compliance. Affects timeline and overall project cost.
Need for Additional Survey(s)	Requirement for additional surveys before project implementation.	Impact to project timeline and overall project cost.
Cost	Ranks construction costs and relative effort among each proposed access pathway (i.e., least expensive to most expensive) and identifies if the access pathway construction and relative effort is anticipated to result in low or high construction costs[1].	Determines whether the project fits within the allocated budget ensuring financial resources are available to complete the initial project scope.

[1]Low costs are defined as construction costs < $100,000.00 whereas high construction costs are > $100,000.00.

5.0 Proposed Access Routes

5.1 Alternative Access Pathway 1

5.1.1 Access Route Description and Distance to Property Interior

Alternative access route 1 begins at the River Road entrance at the southwest corner of the PRA. It follows an existing pathway traveling northwest approximately 0.23 miles and on to GBRA property. Once the pathway intersects the water diversion canal, the route turns north traversing along an existing upland berm and parallel to the diversion canal for approximately 0.32 miles before intersecting an existing waterway, Schwing Bayou, and an associated overflow or erosional washout feature. The pathway continues north for 0.19 miles, then turns east down a mostly straight line and crossing back into GBRT property until it reaches the identified interior center point 1.33 miles away. The total distance of the proposed route is 2.07 miles (Figure 7).

Of the total 2.07-mile access route, 0.51 miles comprises an upland berm (based on site visit). The remaining 1.56 miles consisted of freshwater emergent wetlands (Figure 4). Portions of the pathway located on GBRA property (including the upland berm) are maintained with regular mowing providing partial access. Elevations within alternative access route 1 averaged 4.3 feet and ranged from 1.5 to 10.3 feet NAVD 88 (Figure 8). Elevations on the upland berm ranged from 5.1 to 10.3 feet, with a mean of 7.5 feet NAVD 88.

This route requires crossing an overflow point or low water washout area associated with the crossing (i.e., intersection) of Schwing Bayou. The crossing occurs at an elevation of approximately 2.3 feet NAVD 88 and would require the installation of a water control structure to maintain existing hydrology. Access

to portions of this pathway would likely be restricted during periods of heavy precipitation or flooding events due to its location in the 100-year floodplain and adjacency to several waterbodies (Figure 5).

5.1.2 Property Ownership and Land Lease Agreements

Alternative access route 1 is sited within both Guadalupe-Blanco River Trust and Guadalupe-Blanco River Authority property, respectively (Figure 7). Accordingly, a land lease or access agreement with GBRA and investment in non-GBRT-owned land would be required to further develop this access pathway.

5.1.3 Construction, Impacts to Site Hydrology & Wetlands, and Long-Term Maintenance

One of the project's primary goals is to develop the proposed access route with minimal construction effort and ensure there is no adverse impact on site hydrology or existing wetland features. As noted, the proposed route primarily traverses freshwater shrub and emergent wetlands (herbaceous) vegetation communities. Accordingly, most of the access route would be developed using methods that do not require extensive earthwork or placement of fill resulting in permanent impacts to wetlands, such as integrated vegetation management through mowing and targeted herbicide applications. However, this pathway would likely require installing a water control structure on the downstream side of Schwing Bayou where it intersects with the water diversion canal. Installation of a water control structure (e.g., overflow, culvert) would necessitate the need for engineered plans to maintain or enhance existing site hydrology and ensure structural integrity. As such, no negative impacts to site hydrology are anticipated to develop alternative access route 1. The installation of a water control structure, however, would require the placement of fill (i.e., aggregate, concrete) and use of heavy equipment (e.g., excavator) which would likely result in impacts to wetlands and require regulatory approvals.

The remaining construction process would involve a small skid steer and tractor equipped with a rotary head to mow vegetation along the designated footprint. Chemical herbicide applications would be utilized along the pathway (as necessary) to manage unwanted vegetation, particularly invasive species, including spiny aster, Chinese tallow, and salt cedar. These vegetation management methods are designed to avoid permanent impacts to the current wetland features while achieving the project purpose.

Long-term maintenance of the access route will necessitate regular mowing and/or vegetation management (i.e., selective herbicide applications) to ensure the pathway remains accessible for long-term use. Regular inspection, maintenance, and/or repair would be required of any installed water control feature, if installed, as well as ensuring the structure remained free of debris impeding the flow of water.

5.1.4 Regulatory Permitting Requirements and Need for Additional Survey(s)

The Hog & Schwing Bayou Preserve is a diverse ecosystem playing an important supporting role in its respective ecoregion. As described in Section 2.0, above, many habitats present are consistent with waters of the U.S. (WOUS) and would be subject to the jurisdiction of and thereby regulated by the USACE via Section 404 of the Clean Water Act (CWA) and/or Section 10 of the Rivers and Harbors Act (RHA). Site design and construction methodology (i.e., earth-moving) will inform the level of permitting required but it should be noted that any proposed features such as installation of roadbed, installation of water control structures (e.g., bridge, culverts), installation of parking facilities should be closely vetted with the USACE to determine if their footprints would result in placement of fill into WOUS. The quantity of impacts associated with these activities will determine the required USACE permitting path, including the need to obtain a Nationwide Permit (NWP) or Individual Permit (IP).

Based on Triton's current understanding of construction activities likely required to develop access route 1, GBRT would need to obtain regulatory approval through the USACE NWP program. More specifically, the installation of water control structures in association with the development of alternative access route 1 (as described in Section 5.1.3), would likely require the need to obtain clearance via NWP 14 (Linear Transportation Projects) or NWP 18 (Minor Discharges) and possible submittal of a Pre-Construction Notification (PCN) since the activity would discharge fill material (e.g., culvert) into wetlands. See Exhibit B for additional details regarding NWP 14, NWP 18, and special permit conditions, including requirements for submitting a PCN.

In addition to USACE permitting, a Water Quality Certification (WQC) would be required from TCEQ. Appropriate best management practices (BMPs) to control stormwater would need to be implemented for the duration of any significant construction activities such as earthwork (i.e., excavation) or the placement of fill.

If a PCN is necessary to fulfill the requirement of an applicable NWP, a formal WOUS wetland delineation would be required. Moreover, additional topographic survey data would be needed to design an appropriate water control system. Once construction is completed, an as-built survey would be necessary to confirm elevations and document the location and dimensions of the installed structure(s).

5.1.5 Cost

Relative to baseline construction cost and the other proposed alternatives, the cost to develop access route 1 would fall into the high (> $100,000.00) category and depending on design criteria and associated construction costs, likely rank as the second most expensive access route alternative. This is primarily attributed to added costs and the need to install a water control structure or repair the existing overflow located along the berm at the Schwing Bayou crossing. This would necessitate substantial additional costs including engineered design, agency coordination and permitting, additional survey work, and added construction and material costs. In addition to quarterly vegetation management activities (i.e., mowing), the installation of a water control structure would require additional long-term maintenance (i.e., inspections, debris removal, repair, etc.) costs.

5.2 Alternative Access Pathway 2

5.2.1 Access Route Description and Distance to Property Interior

Alternative access route 2 begins at the River Road entrance and follows a path along the property fence line bearing north. At approximately 0.41 miles the pathway encounters Schwing Bayou, then continues north for another 0.20 miles. The access pathway then turns east and follows the exact route as alternative access route 1 for 1.09 miles until it reaches the end destination within the identified interior center point of the PRA. The total distance of this proposed access route is 1.70 miles (Figure 7).

The first 0.24 miles of this proposed access route is comprised of freshwater emergent wetlands and an associated herbaceous and forb vegetation community. As the pathway continues habitat transitions into freshwater forested/shrub wetlands for approximately 0.17 miles until reaching Schwing Bayou, an identified riverine feature (Figure 4), spanning roughly 15 – 20 feet from streambank to streambank. Upon crossing Schwing Bayou, the route consists of freshwater forested/shrub wetlands for approximately 0.07 miles. The remaining 1.22 miles (approx.) is comprised of freshwater emergent wetlands including a mixed dominance of shrub and/or herbaceous and forb vegetative communities. No portion of alternative access

route 2 has been maintained making the path difficult to traverse. Elevations within alternative access route 2 averaged 3.2 feet and ranged from 1.5 to 9.0 feet NAVD 88 (Figure 8).

Notably, this access pathway involves a 15 – 20-foot crossing of Schwing Bayou, requiring the need to construct a bridge or some other water control structure to span the waterway and maintain existing hydrology. The crossing occurs at an elevation of approximately 2.2 to 2.8 feet NAVD 88. As above, access to portions of this route would be restricted during heavy precipitation or inundation, particularly around the lower elevations adjacent to Schwing Bayou and the constructed wetland pond feature (Figure 8).

5.2.2 Property Ownership and Land Lease Agreements

Alternative access route 2 is contained solely within GBRT property (Figure 7). Accordingly, no access or land lease agreements are required to develop access route 2.

5.2.3 Construction, Impacts to Site Hydrology & Wetlands, and Long-Term Maintenance

The construction of alternative access route 2 will likely necessitate a greater level of effort compared to access route 1. Similar construction methods would be employed as outlined for alternative access route 1; however, the development of access route 2 would require additional construction and materials to install an appropriate water control structure (e.g., bridge, series of culverts) to cross Schwing Bayou. Moreover, the presence of forested wetlands should not significantly hinder the development of access route 2 but would need additional effort in site preparation (i.e., removal of trees) where the water control structure would be installed. The installation of a water control structure spanning Schwing Bayou should be designed by a qualified engineer to ensure structural integrity and site hydrology is maintained or enhanced. Consequently, no negative impacts to site hydrology are anticipated to develop alternative access route 2. The installation of a water control structure, however, would result in the placement of fill (i.e., piles, aggregate, concrete) and use of heavy land-clearing or earth moving equipment (e.g., dozer, excavator). These construction activities may cause permanent impacts to wetlands and would likely require regulatory clearances.

The remaining construction process would involve a small skid steer or tractor equipped with a rotary head to mow vegetation along the designated footprint. Herbicide applications would be utilized along the pathway (as necessary) to manage unwanted vegetation, including invasive species, such as spiny aster, Chinese tallow, and salt cedar. Avoidance of desired and/or native trees would be implemented to maintain the diversity and integrity of the forested wetland community. The integrated vegetation management approach is designed as minimally invasive to avoid permanent impacts to the existing wetland features while attaining the project purpose.

Long-term maintenance of the access route will necessitate regular mowing and/or vegetation management (i.e., herbicide applications) to ensure the pathway remains accessible for long-term use. Regular inspection, maintenance, and/or repair would be required of any installed water control features, as well as ensuring the structures remained free and clear of debris impeding the flow of water.

5.2.4 Regulatory Permitting Requirements and Need for Additional Survey(s)

Based on Triton's current understanding of construction activities likely required to develop access route 2, GBRT would need to obtain a permit from the USACE. Though the design dependent, the installation of water control structures in association with the construction of alternative access route 2 (as described in Section 5.2.3), could be approved via NWP 14 or NWP 18. This permitting approach would likely require submitting a PCN since the activity would discharge fill material (e.g., bridge, culvert) into wetlands. Refer

to Exhibit B for additional details regarding NWP 14, NWP 18, and special permit conditions, including the submission of a PCN.

In addition, a Water Quality Certification (WQC) would be attained from TCEQ through the USACE permitting process. Appropriate construction BMPs to control stormwater would need to be implemented for the duration of any significant construction activities such as earthwork (i.e., excavation) or the placement of fill.

If a PCN is needed to fulfill the requirement of an applicable NWP, a formal WOUS wetland delineation would be necessary. Further, additional topographic survey data would be needed to design an appropriate water control system. Once construction is completed, an as-built survey would be required to confirm elevations and document the location and dimensions of the installed structure(s).

5.2.5 Cost

Relative to construction baseline cost and the other proposed alternatives, the cost to develop alternative access route 2 would fall into the high (> $100,000.00) category and depending on design criteria and associated construction costs, would likely rank as the most expensive access route alternative. This is primarily attributed to added costs and the need to install a water control structure (i.e., bridge, culverts) spanning the Schwing Bayou crossing, which would result in substantial additional costs including design, agency coordination and permitting, additional survey work, and added construction and material costs. In addition to frequent (i.e., quarterly) vegetation management activities (i.e., mowing), the installation of a water control structure would require additional long-term maintenance (i.e., inspections, debris removal, repair, etc.) costs.

5.3 Alternative Access Pathway 3

5.3.1 Access Route Description and Distance to Property Interior

Alternative access route 3 starts at the eastern corner of the PRA and utilizes an existing yet abandoned entrance located off HWY 35. Upon entry there is a small clearing containing an old concrete slab that may have served as a roadbed or former parking and staging area. From this point, the access route follows a historically utilized unimproved road (Figure 2) that has naturalized (i.e., understory vegetative regrowth) over time. This unimproved pathway runs parallel with Hog Bayou, which serves as the northern boundary of the PRA, and is approximately 1.56 miles in length. The access route then turns southwest toward the interior center point of the PRA, for approximately 0.12 miles. The total distance of the proposed access route is 1.68 miles (Figure 7).

The initial 0.87 miles of the access route is primarily characterized by freshwater forested/shrub wetland community with a developed understory. The remaining 0.81 miles is comprised of freshwater emergent wetlands including a mixed dominance of shrub and/or herbaceous and forb vegetative communities. This portion of the pathway aligns immediately adjacent to the forested wetland community until turning southwest toward the interior of the Preserve. Invasive spiny aster and Chinese tallow are also present and interspersed in several areas of this pathway. No portion of access route 3 has been maintained in recent years making the path difficult to traverse. Elevations within access route 3 averaged 4.8 feet and ranged from 2.0 to 12.4 feet NAVD 88 (Figure 8). This location of the property exhibits greater elevations relative to the interior or south and western portions of the Preserve and drains toward Schwing Bayou (Figures 3 and 8).

No waterway crossings are required to develop this access route, and therefore, no water control structures would be necessary. Access to portions of this pathway would likely be restricted during periods of heavy precipitation or flooding events due to its location in the 100-year floodplain and adjacency to Hog Bayou (Figure 5). However, relative to access routes 1 and 2, route 3 exhibits higher elevations and should be inundated less frequently, providing increased site accessibility (Figures 3 and 8).

5.3.2 Property Ownership and Land Lease Agreements

Alternative access route 3 is situated solely within GBRT property (Figure 7) omitting the need for access or land lease agreements to develop route 3.

5.3.3 Construction, Impacts to Site Hydrology & Wetlands, and Long-Term Maintenance

The development of alternative access route 3 would involve the least amount of effort relative to alternative access routes 1 and 2. As proposed, the reclamation of access route 3 would be completed utilizing minimally invasive methods (i.e., not require earthwork or placement of fill). More specifically, the re-establishment of this historically utilized access pathway (Figure 2) would be conducted solely through vegetation management. These activities would include the use of a small skid steer or tractor equipped with a rotary head to mow and clear the dense understory and vegetative regrowth along the designated pathway. Herbicide applications would be utilized (as necessary) to manage unwanted vegetation, particularly invasive or nuisance species, including spiny aster, Chinese tallow, and salt cedar; which are prevalent on this route. Avoidance of desirable native trees would be implemented to maintain the diversity and integrity of the forested wetland community. These vegetation management methods are designed to be minimally invasive, thereby avoiding adverse or permanent impacts to existing wetland features.

Notably, development of access pathway 3 does not require the crossing of an existing waterway, eliminating the need for culverts or bridges, or other water control structures. No changes to existing hydrology are anticipated, and all elevations would be returned to pre-construction grade (if applicable).

Long-term maintenance of the pathway will require consistent mowing and/or herbicide applications to ensure the access route remains clear and accessible for long-term utilization. By combining proactive maintenance with ecological sensitivity, the long-term access plan aims to support both the functionality of the access route and the overall health and hydrological connectivity of the wetland ecosystem.

5.3.4 Regulatory Permitting Requirements and Need for Additional Survey(s)

The development of alternative access route 3, as outlined above (i.e., vegetation management), should not require regulatory agency coordination to complete the work. No supplemental surveying would be necessary.

5.3.5 Cost

Relative to construction baseline cost and the other proposed alternatives, the cost to develop alternative access route 3 would fall into the low (< $100,000.00) category and would rank as the least expensive access route to develop. This pathway does not require a water control structure; thereby substantially reducing project costs and the need for engineered design, regulatory coordination, and added construction and material costs. Long-term maintenance costs associated with construction of this alternative would be relatively minimal, including quarterly mowing and targeted herbicide applications (as needed) at the property entrance and access pathway.

6.0 Comparison of Alternative Access Pathways

Table 4 below provides a summary and brief comparison of the evaluated feasibility parameters across the three proposed access routes. Each alternative access route will be accompanied by a brief description and/or finding of the parameter assessment.

Table 4. Summary of alternative access routes based on feasibility parameter evaluation.

Parameter	Access Route 1	Access Route 2	Access Route 3*
Distance to Property Interior	2.07 miles	1.70 miles	1.68 miles
Property Ownership	GBRT & GBRA	GBRT	GBRT
Access or Land Lease Agreement	Will require access agreement	Will not require access agreement	Will not require access agreement
Major Construction	Potential major construction needed (culvert and/or berm repair)	Potential major construction needed (bridge and/or culvert)	No major construction needed
Long-Term Maintenance	Vegetation management (mowing, herbicide application) debris removal, additional fill, repair or replace structure(s)	Vegetation management (mowing, herbicide application) debris removal, additional fill, repair or replace structure(s)	Vegetation management (mowing, herbicide application)
Impacts on Site Hydrology	None anticipated	None anticipated	None anticipated
Impacts on Wetlands	Yes (construction of water control structure and/or placement of fill)	Yes (construction of water control structure and/or placement of fill)	None anticipated
Impacts on Cultural Resources	None anticipated	None anticipated	None anticipated
Permitting Coordination	Yes	Yes	No
Need for Additional Survey(s)	Yes	Yes	No
Cost[1]	High (2)	High (1)	Low (3)

[1]Number in parenthesis indicates numeric cost rank where: 1 = most expensive cost & 3 = least expensive cost.
*Indicates preferred alternative access route.

Based on comparison of feasibility parameters and as indicated in Table 4, all access routes exhibited some similar characteristics. Specifically, impacts to site hydrology or cultural resources are not anticipated with the development of any access pathway. On the other hand, the construction of water control structures necessary to develop access routes 1 and 2 (at the intersection of Schwing Bayou) could result in permanent impacts to wetlands and thereby require permitting coordination and additional surveys (e.g., formal WOUS, topographic, as built) to ensure the necessary regulatory approvals are obtained. Alternatively, no adverse impacts to wetlands, permit coordination, or additional surveys are anticipated with the reestablishment of access route 1.

Regarding the distance to interior of the property, access route 3 exhibits the shortest pathway (1.68 miles) followed closely by route 2 (1.70 miles), where route 1 registers the greatest distance (2.07 miles), considerably farther than routes 2 and 3. Elevations (feet NAVD 88) across pathways varied and on average were highest at route 3 (mean = 4.8; range: 2.0 – 12.4), followed by route 1 (mean = 4.3; range: 1.5 – 10.3) and route 2 (mean = 3.2; range: 1.5 – 9.0), respectively (Figure 8). These field data are supported by desktop review of LIDAR data (Figure 3) and collectively help illustrate the susceptibility and periodicity of inundation (i.e., flooding) is slightly less at route 3 relative to routes 1 and 2.

Relating to property ownership, routes 2 and 3 are contained exclusively on GBRT property, whereas route 1 traverses GBRA property and would require additional coordination to obtain a land lease or access agreement. Specific to construction methods, the process to reestablish access route 1 would be minimally invasive (i.e., vegetation management), and would not require major construction activities (i.e., earthwork) including the installation of water control structures as needed for routes 1 and 2. Long-term maintenance would be relatively similar (i.e., mowing, targeted herbicide applications, invasive species management) across alternatives less the additional maintenance required for the installation of water control structures associated with routes 1 and 2. Finally, while rough in estimation, the relative costs to establish and maintain pathways 1 and 2 would be considerably higher relative to the reclamation of historic access pathway 1, primarily attributed to implementation of major construction for installation of water control structures requiring engineering design and regulatory coordination.

7.0 Discussion & Recommendation

A comprehensive review of available desktop data and the collection of supplemental topographic data enabled the identification of potential project constraints (Table 2), evaluation of feasibility parameters (Table 4), and comparison of elevation data (Figures 3 and 8) across the PRA and proposed access pathways. As indicated in Table 4, access route 3 is the only alternative to score positive constructs for all evaluation criteria while also achieving the project purpose and need to provide cost-effective, long-term interior property access while minimizing impacts to hydrologic connectivity and wetlands. Specifically, pathway 3 provides the shortest distance to the property interior, is wholly contained on GBRT property, and would not require major construction or need for agency coordination. Importantly, the development of route 3 is not anticipated to impact existing hydrology, wetlands, or cultural resources. Collectively, and in light of GBRT's project goals, it is Triton's recommendation to reestablish the historical pathway (i.e., access route 3) which should provide cost-efficient, long-term interior property access with minimum adverse impact to natural and cultural resources.

8.0 References

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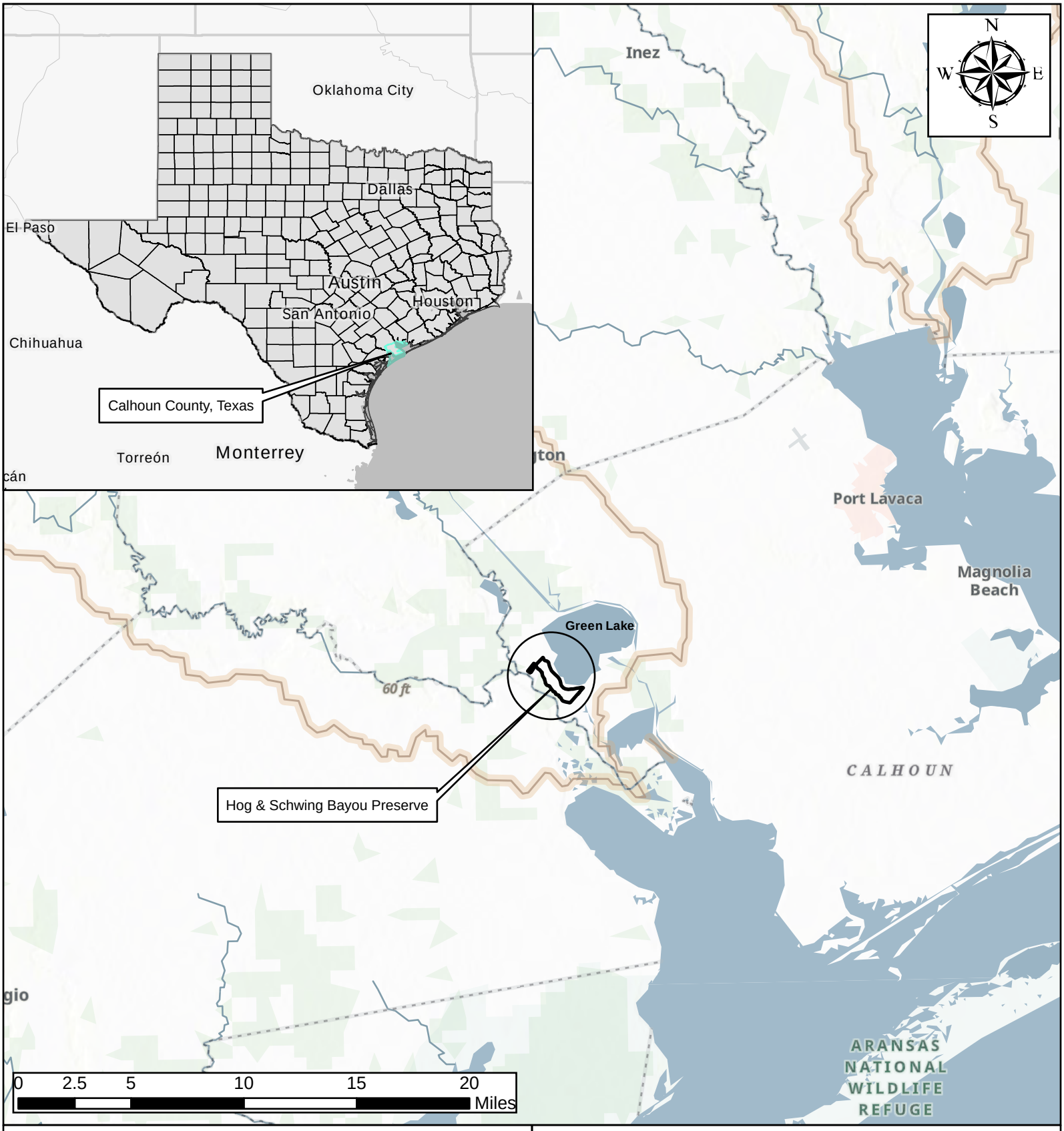
Figure 1. Vicinity Map



Vicinity Map

Site Access Improvement Project
Hog and Schwing Bayou Preserve, Tivoli, Calhoun County, Texas

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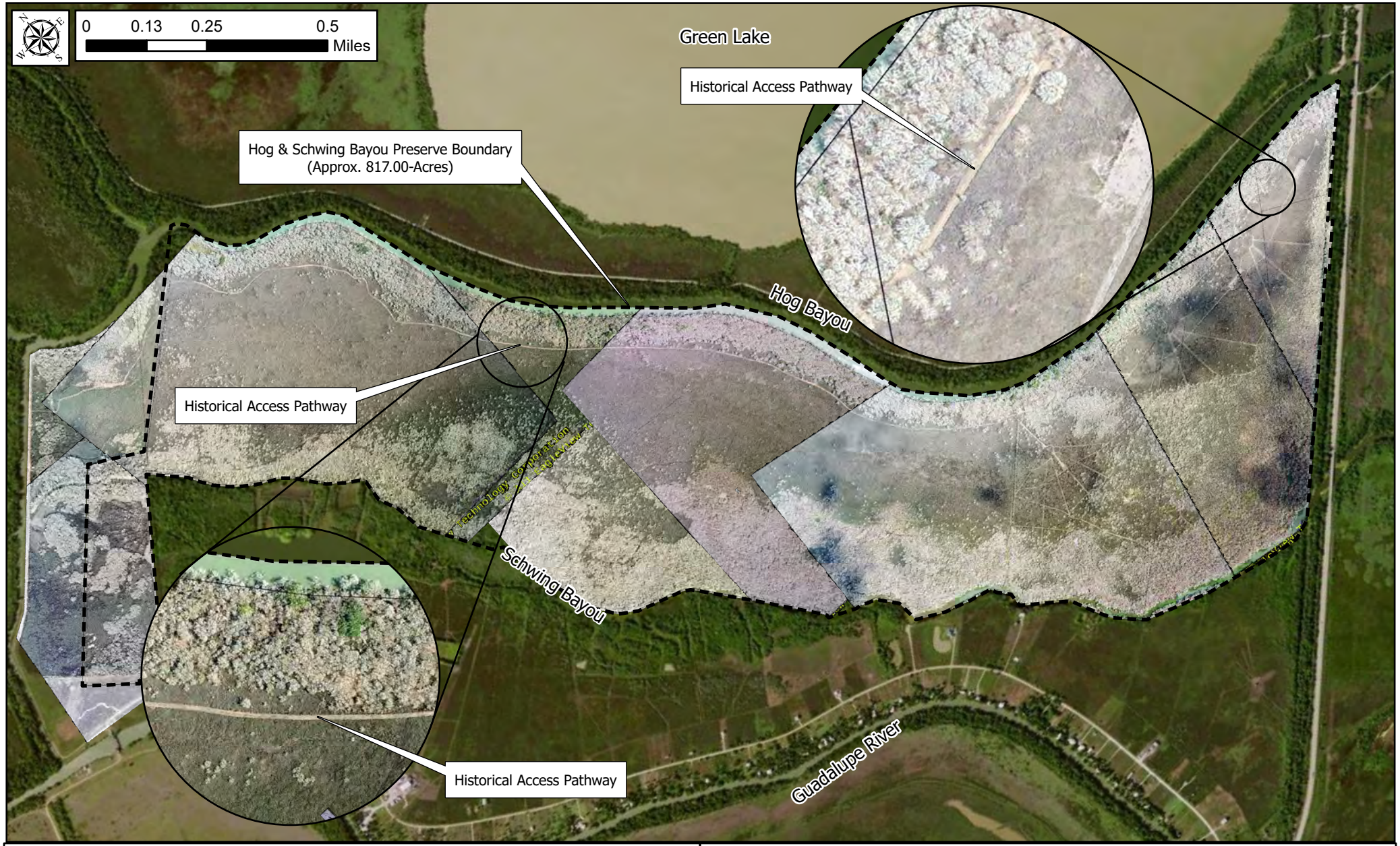
Seguin, TX 78156

Map Notes:
For planning and permitting only, not for construction.
Base Map Source: ESRI Environmental base imagery.
Property Boundaries Georeferenced from Client Information.
Map Preparation Date: 01/02/25 (SP)

Figure 2. Historical Aerial Imagery Overview Map



Site Access Historical Overview Map (2009)

Site Access Improvement Project
Hog and Schwing Bayou Preserve, Tivoli, Calhoun County, TX

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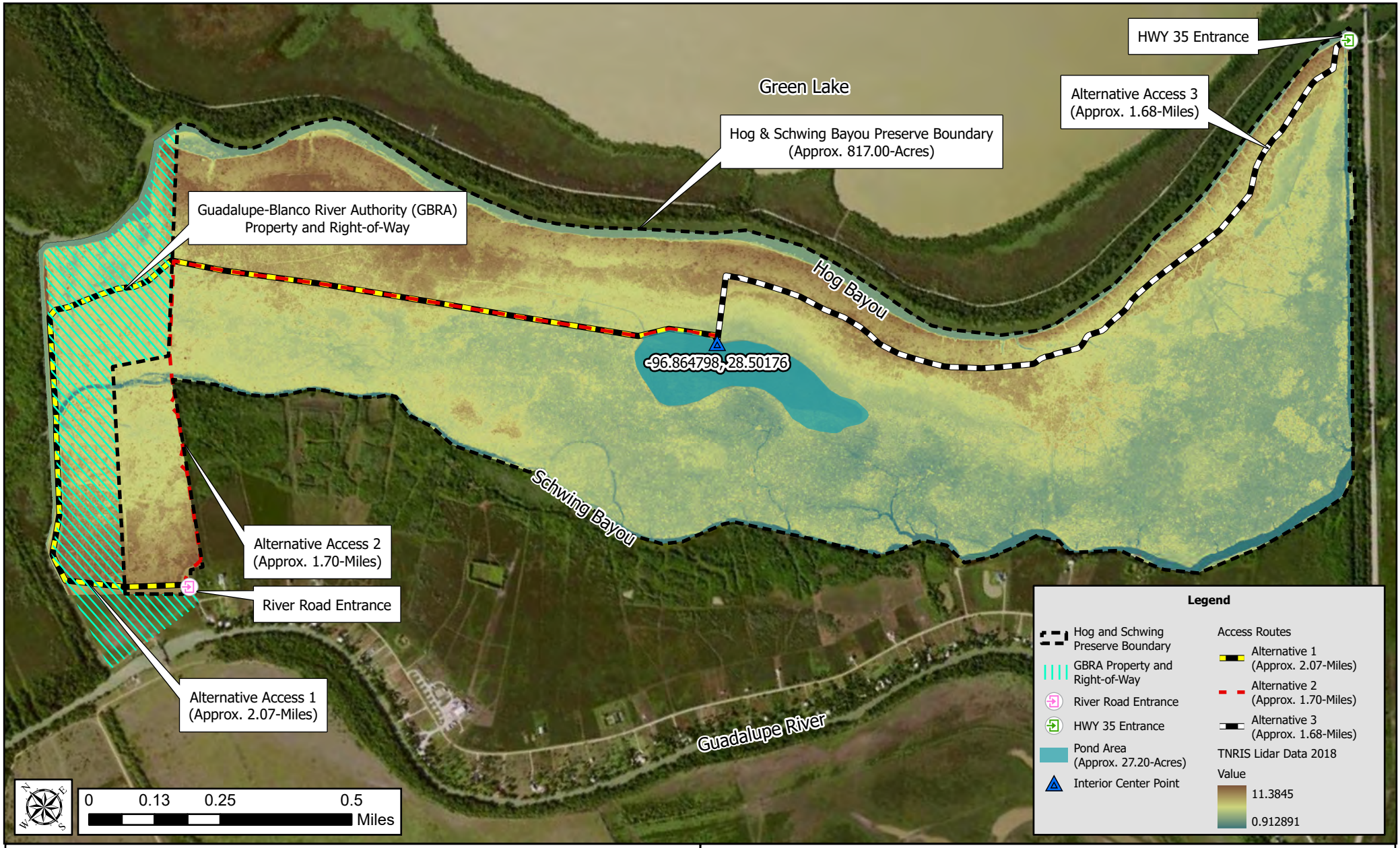
Map Notes:
For planning and permitting only, not for construction.
Base Map Source: EagleView Connect Explorer February 12, 2009.
Map Preparation Date: 12/20/24 (ANF).
Property Boundary Georeferenced from Client Information.

Figure 3. Lidar Overview Map



Lidar Overview Map

Site Access Improvement Project
Hog and Schwing Bayou Preserve, Tivoli, Calhoun County, TX

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Map Notes:
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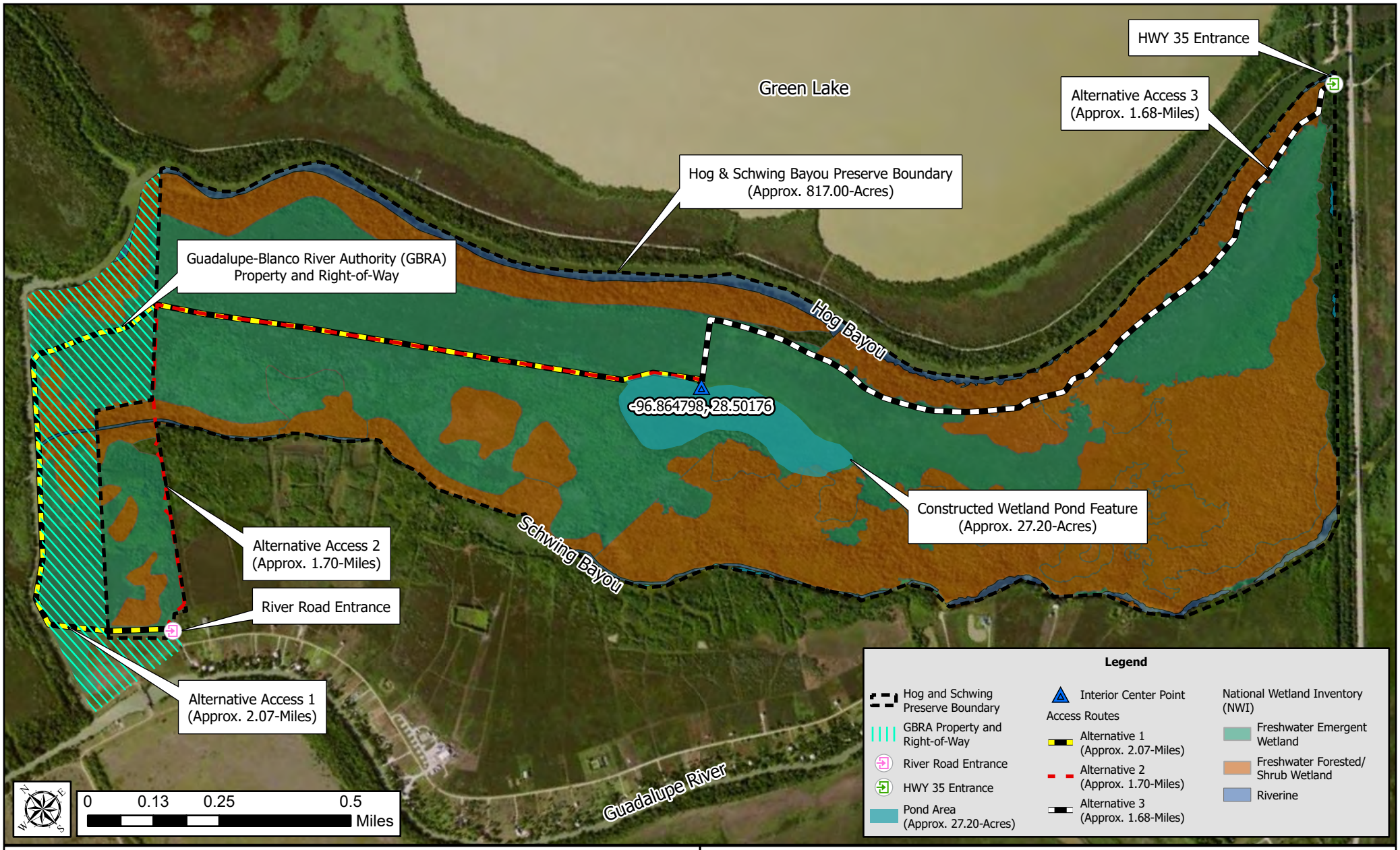
Base Map Source: ESRI NAIP Base Imagery.
Map Preparation Date: 12/20/24 (ANF).
Property Boundaries Georeferenced from Client Information.

Figure 4. National Wetlands Inventory Overview Map



National Wetland Inventory (NWI) Overview

Site Access Improvement Project
Hog and Schwing Bayou Preserve, Tivoli, Calhoun County, TX

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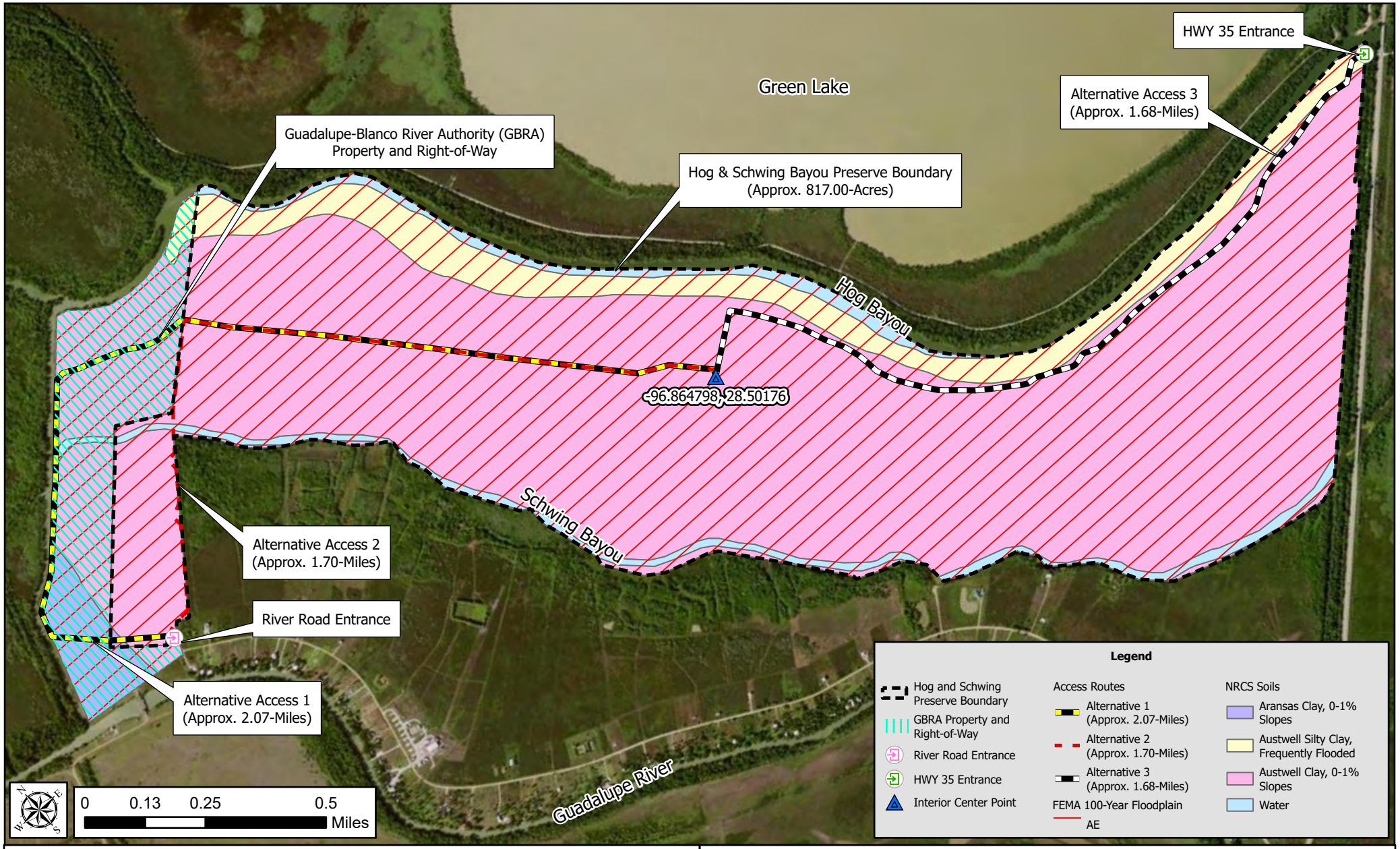
Map Notes:
For planning and permitting only, not for construction.
Base Map Source: ESRI NAIP Base Imagery.
Map Preparation Date: 12/20/24 (ANF).
Property Boundaries Georeferenced from Client Information.

Figure 5. NRCS Soils and FEMA 100-Year Floodplain Overview Map



NRCS Soils & FEMA 100-Year Floodplain Overview

Site Access Improvement Project
Hog and Schwing Bayou Preserve, Tivoli, Calhoun County, TX

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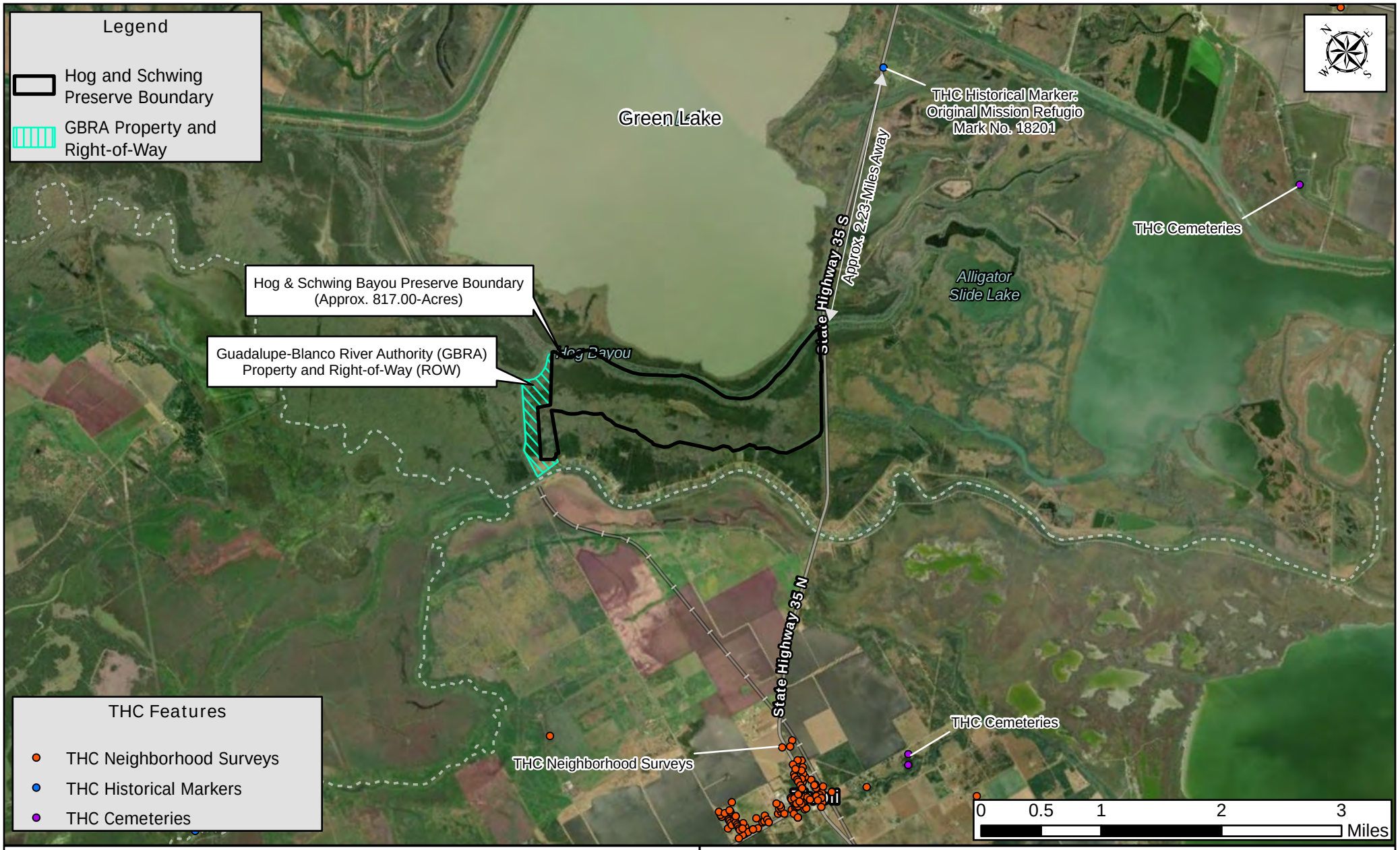
Map Notes:
For planning and permitting only, not for construction.
Base Map Source: ESRI NAIP Base Imagery.
Map Preparation Date: 12/20/24 (ANF).
Property Boundaries Georeferenced from Client Information.

Figure 6. Texas Historical Commission Cultural Resources Overview Map



Texas Historical Commission (THC) Database

Site Access Improvement Project
Hog & Schwing Bayou Preserve, Tivoli, Calhoun County, Texas

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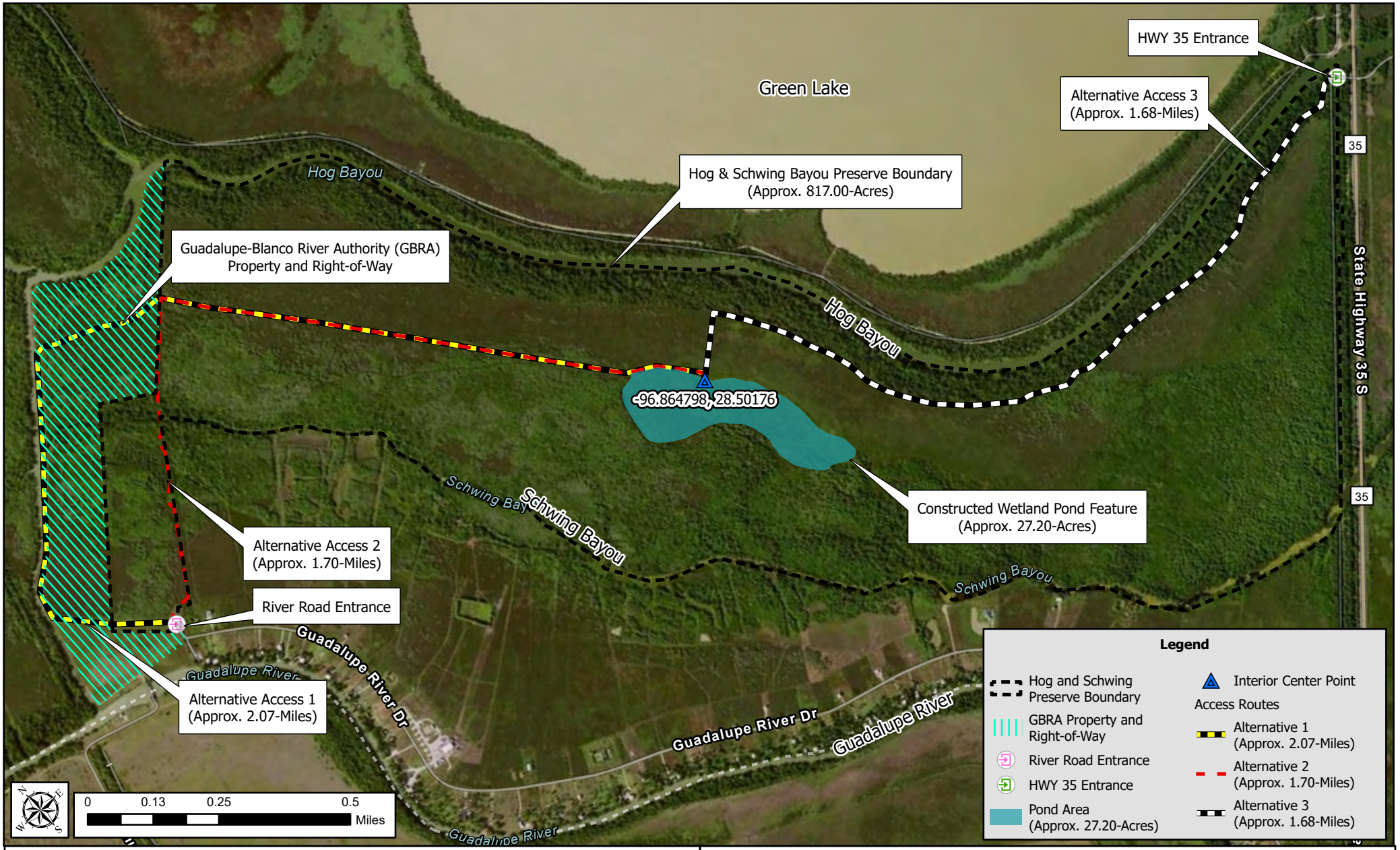
Map Notes:
For planning and permitting only, not for construction.
Base Map Source: ESRI World Hybrid basemap imagery.
Property Boundaries Georeferenced from Client Information.
Map Preparation Date: 1/15/25 (SP).

Figure 7. Alternative Access Route Overview Map



Site Access Feasibility Assessment and Alternative Access Overview

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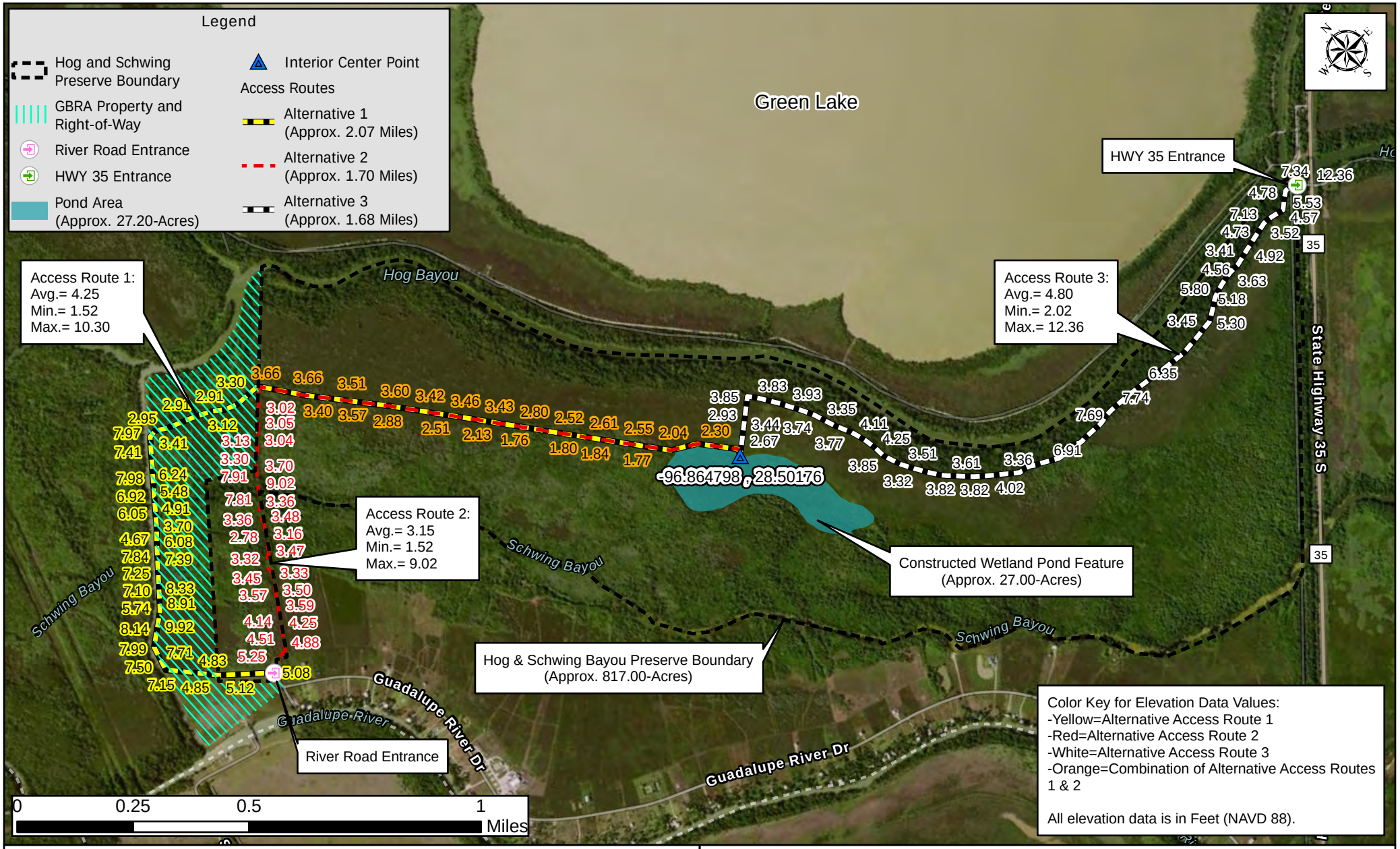
Map Notes:
For planning and permitting only, not for construction.
Base Map Source: ESRI NAIP Base Imagery.
Map Preparation Date: 12/20/24 (ANF).
Property Boundaries Georeferenced from Client Information.

Figure 8. Elevation Data Overview Map



Elevation Data Overview for Alternative Access Routes

Site Access Improvement Project
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Map Notes:
For planning and permitting only, not for construction.
Base Map Source: ESRI NAIP Hybrid base map imagery.
Property Boundaries Georeferenced from Client Information.
Elevation data collected by Triton (8/12 & 13/2024).
Map Preparation Date: 1/17/25 (SP).

Exhibit A. Official Soil Series Descriptions (OSD) – Aransas and Austwell

LOCATION ARANSAS TX

Established Series
WJG-CLN-RM
03/2016

ARANSAS SERIES

The Aransas series consists of very deep, poorly drained, very slowly permeable soils that formed in clayey alluvial sediments of Holocene age. These nearly level soils are on flood plains on the south Texas coastal plain. Slope ranges from 0 to 1 percent. Mean annual air temperature is about 22 degrees C (72 degrees F) and mean annual precipitation is about 838 mm (33 in).

TAXONOMIC CLASS: Fine, smectitic, hyperthermic Typic Natraquerts

TYPICAL PEDON: Aransas clay, on a nearly level flood plain in rangeland at an elevation of 3 m (10 ft). (Colors are for moist soils unless otherwise stated.)

A1--0 to 28 cm (0 to 11 in); very dark gray (10YR 3/1) clay; dark gray (10YR 4/1) dry; moderate very fine and fine granular structure; hard, firm, moderately sticky, moderately plastic; many fine roots; many fine pores; few worm casts; electrical conductivity is 6; sodium adsorption ration is 21; slightly saline; strongly effervescent; neutral; clear smooth boundary. (5 to 38 cm [2 to 15 in] thick)

A2--28 to 61 cm (11 to 24 in); very dark gray (10YR 3/1) clay; dark gray (10YR 4/1) dry; moderate fine subangular structure; very hard, very firm, moderately sticky, moderately plastic; common fine roots; common fine pores; 1 percent very fine threads and masses of calcium carbonate in matrix; electrical conductivity is 5; sodium adsorption ratio is 22; slightly saline; strongly effervescent, moderately alkaline; gradual wavy boundary. (13 to 64 cm [5 to 25 in])

Bss1--61 to 89 cm (24 to 35 in); very dark gray (10YR 3/1) clay; dark gray (10YR 4/1) dry; moderate medium wedge structure parting to moderate fine and medium angular blocky; extremely hard, extremely firm, moderately sticky, moderately plastic; few fine roots; few very fine pores; few faint slickensides; 2 percent fine nodules of calcium carbonate; 1 percent fine weakly cemented iron manganese concretions; electrical conductivity is 15: sodium adsorption ratio is 47; moderately saline; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bss2--89 to 112 cm (35 to 44 in); grayish brown (10YR 5/2) clay, light brownish gray (10YR 6/2), dry; moderate medium wedge structure parting to moderate medium angular blocky; extremely hard, very firm, moderately sticky, moderately plastic; few very fine pores; common distinct slickensides; 3 percent fine and medium masses and nodules of calcium carbonate; 1 percent fine weakly cemented iron manganese concretions; 1 percent fine crystals of salt; electrical conductivity is 14; sodium adsorption ratio is 43; moderately saline; strongly effervescent; strongly alkaline; gradual wavy boundary.

Bss3--112 to 135 cm (44 to 53 in); grayish brown (10YR 5/2) clay, light brownish gray (10YR 6/2), dry; moderate medium wedge structure parting to moderate medium and coarse angular blocky; extremely hard, very firm, moderately sticky, moderately plastic; few very fine pores; common distinct slickensides; 3 percent fine nodules of calcium carbonate; 1 percent fine weakly cemented iron manganese concretions; 2 percent fine crystals of salt; electrical conductivity is 23; sodium adsorption ratio is 54; strongly saline; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bss4--135 to 178 cm (53 to 70 in); 60 percent grayish brown (10YR 5/2) and 40 percent brown (10YR 5/3) clay, light brownish gray (10YR 6/2) and pale brown (10YR 6/3) dry; moderate medium wedge structure parting to moderate coarse angular blocky; extremely hard, very firm, moderately sticky, moderately plastic; few very fine pores; common distinct slickensides; 2 percent fine nodules of calcium carbonate; 1 percent fine weakly cemented iron manganese concretions; 1 percent fine crystals of salt; electrical conductivity is 23; sodium adsorption ratio is 53; strongly saline; strongly effervescent; moderately alkaline; gradual wavy boundary. (Combined thickness of the Bss horizons is 26 to 117 cm [10 to 46 in])

Bk--178 to 231 cm (70 to 91 in); brown (10YR 5/3) clay, pale brown (10YR 6/3) dry; weak coarse subangular blocky structure; extremely hard, very firm, moderately sticky, moderately plastic; few very fine pores; 2 percent fine nodules of calcium carbonate; 2 percent fine masses of calcium carbonate; 1 percent fine crystals of salt; electrical conductivity is 17.8; sodium adsorption ratio is 53; strongly saline; strongly effervescent; moderately alkaline.

TYPE LOCATION: San Patricio County, Texas; from the intersection of U.S. Highway 181 and U.S. Highway 77 on the east side of Sinton; 7.4 miles northeast on U.S. Highway 77 to the Rob and Bessie Welder Wildlife Refuge; 6.5 miles east of refuge headquarters on private road to Yegua tank; 200 ft south of Yegua Tank in Mare Pasture in rangeland. Rincon Bend, Texas USGS topographic quad; NAD 83; Latitude: 28 degrees 7 minutes 16.9 seconds North; Longitude: 97 degrees 15 minutes 56.1 seconds West.

RANGE IN CHARACTERISTICS:
Soil Moisture: These soils have an aquic moisture regime.
Depth to secondary carbonates: 33 to 64 cm (13 to 25 in)
Depth to salt accumulations: 33 to 64 cm (13 to 25 in)
Depth to redox concentrations: 33 to 64 cm (13 to 25 in)
Depth to slickensides: 33 to 64 cm (13 to 25 in)

Particle-size control section (weighted average)
Clay content: 45 to 55 percent
COLE ranges from 0.09 to 0.22

A1 horizons:
Hue: 10YR
Value: 2 or 3
Chroma: 1
Texture: clay or silty clay
Clay content: 40 to 50
Electrical Conductivity: 1 to 12
Sodium Adsorption Ratio: 2 to 30
Effervescence: none to strong

Reaction: neutral to moderately alkaline

A2 horizons:
Hue: 10YR
Value: 2 to 4
Chroma: 1
Texture: clay or silty clay
Clay content: 40 to 60
Electrical Conductivity: 1 to 22
Sodium Adsorption Ratio: 4 to 60
Effervescence: none to strong
Reaction: slightly or moderately alkaline

Bss horizons:
Hue: 10YR
Value: 2 to 5
Chroma: 1 or 2
Texture: clay loam, silty clay loam, clay or silty clay
Clay content: 29 to 60
Electrical Conductivity: 4 to 25
Sodium Adsorption Ratio: 15 to 60
Effervescence: slight to strong
Reaction: slightly to strongly alkaline

Bk horizon:
Hue: 10YR or 2.5Y
Value: 4 to 7
Chroma: 1 to 2
Texture: clay loam, silty clay loam, clay or silty clay
Clay content: 29 to 55
Electrical Conductivity: 9 to 32
Sodium Adsorption Ratio: 20 to 70
Effervescence: slightly to strongly
Reaction: slightly alkaline or moderately alkaline

COMPETING SERIES: This is the Franeau (TX) and Harris (TX) series. Similar soils include the Austwell (TX), Edroy (TX), Gepford (CA), and Surfside (TX) series.
Franeau and Harris soils: are noneffervescent; located in areas of higher rainfall; Harris soils have redoximorphic concentrations throughout
Austwell soils: have an ochric epipedon
Edroy soils: have noneffervescent sola and mixed clay mineralogy
Gepford soils: formed in sediments derived from granite and are in the thermic temperature regime

Surfside soils: have a very-fine particle-size control section

GEOGRAPHIC SETTING:
Parent material: clayey alluvial sediments of Holocene age.
Landscape: nearly level coastal plains
Landform: flood plains of streams subject to flooding by saltwater during high storm tides
Slope: 0 to 1 percent
Mean annual air temperature: 20.6 to 22.8 degrees C (69 to 73 degrees F)
Mean annual precipitation: 635 to 1143 mm (25 to 45 in)
Frost-free period: 273 to 340 days
Elevation: 0 to 94 m (0 to 300 ft) but mostly between 0 to 6.1 m (0 to 20 ft)
Thornthwaite annual P-E indices: 31 to 44

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Odem, Sinton, Austwell, Placedo and Swan series.
Odem and Sinton soils: occur on similar landforms and are loamy throughout
Austwell soils: are on similar landforms and have an ochric epipedon
Placedo and Swan soils: are on similar landforms and do not have slickensides

DRAINAGE AND PERMEABILITY: Poorly drained. Permeability is very slow. Runoff is high. The soil is frequently to occasionally flooded by over-bank flow, and also occasionally to rarely flooded with salt water resulting from tidal surge during tropical storm events.

USE AND VEGETATION: Used for livestock grazing and wildlife habitat. Native vegetation includes cordgrass, sedges, water hyacinth, and spiny aster. Some areas produce buffalograss, species of paspalum, curly mesquite grass, little bluestem, and switchgrass.

DISTRIBUTION AND EXTENT: South Texas along major rivers; Land Resource Region: T; MLRA: Gulf Coast Saline Prairies (MLRA 150B). Series is of large extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Temple, Texas

SERIES ESTABLISHED: San Patricio County, Texas; 1971.

REMARKS: Classification changed from Vertic Haplaquolls to Typic Natraquerts 11/2000 based on typifying pedon description.
Diagnostic horizons and features recognized in pedon are:

Mollic epipedon: 0 to 89 cm (0 to 35 in). (A and Bkss horizons)
Redoximorphic concentrations: 61 to 178 cm (24 to 70 in). (Bkss horizons)
Slickensides: 61 to 178 cm (24 to 70 in). (Bkss horizons)
Aquic conditions: 0 to 135 cm (0 to 53 in). (A and Bkss horizons)

ADDITIONAL DATA: KSSL data on lab pedon number 09N1065. This pedon is in the same delineation as the type location. The particle-size distribution for this pedon is within range for the series but not typical.

Taxonomic Version: Keys to Soil Taxonomy, Twelfth Edition, 2014

National Cooperative Soil Survey
U.S.A.

LOCATION AUSTWELL TX

Established Series
ICM-ALN-KBH-AKS
07/2019

AUSTWELL SERIES

The Austwell series consists of very deep, poorly drained, very slowly permeable soils that formed in saline, calcareous, alluvial sediments high in smectitic clays . These nearly level soils occur on flood plains on low coastal plains. Slopes are less than 1 percent. Mean annual precipitation is about 889 mm (35 in) and the mean annual air temperature is about 22 degrees C (71 degrees F).

TAXONOMIC CLASS: Fine, smectitic, calcareous, hyperthermic Vertic Endoaquepts

TYPICAL PEDON: Austwell clay--rangeland. (Colors are for moist soil unless otherwise stated.)

A--0 to 20 cm (0 to 8 in); dark gray (10YR 4/1) clay, dark gray (10YR 4/1) dry; moderate coarsesubangular blocky structure; extremely hard, very firm, very sticky and plastic; common fine roots; electrical conductivity of the saturation extract is 9.0 dS/m; strongly effervescent; moderately alkaline; gradual wavy boundary. (Thickness is 10 to 66 cm [4 to 26 in])

Bnzg1--20 to 66 cm (8 to 26 in); dark gray (10YR 4/1) clay, dark gray (N 4/) dry; moderate medium subangular and angular blocky structure; extremely hard, very firm, very sticky and plastic; few fine roots; many fine crystals of salt; electrical conductivity of the saturation extract is 9.0 dS/m; strongly effervescent; moderately alkaline; gradual smooth boundary. (Combined thickness is 40 to 106 cm [16 to 42 in])

Bnzg2--66 to 107 cm (26 to 42 in); dark gray (10YR 4/1) clay, gray (10YR 5/1) dry; moderate coarse angular blocky structure; extremely hard, very firm, very sticky and plastic; few fine roots; few fine faint brown (10YR 4/3) iron concentrations; few fragments of shells; common crystals of salt; electrical conductivity of the saturation extract is 10.0 dS/m; strongly effervescent; moderately alkaline; gradual smooth boundary.

Czg--107 to 218 cm (42 to 86 in); gray (10YR 5/1) silty clay loam, gray (10YR 6/1) dry; massive; hard, firm, sticky and plastic; common fine and medium distinct yellowish brown (10YR 5/4) iron concentrations; ; electrical conductivity of the saturation extract is 10.0 dS/m strongly effervescent; moderately alkaline. (Thickness is 87 to 153 cm [34 to 60 in])

TYPE LOCATION:
Calhoun County, Texas; about 15 miles southwest of Port Lavaca in flood plain of Guadalupe River; 4 miles west of intersection of Texas Highways 35 and 185; 85 feet south of Texas Highway 35 right-of-way; 1,200 feet west of Hog Bayou in rangeland.

USGS topographic quadrangle: Austwell, TX

Latitude: 28 degrees, 29 minutes, 35.209 seconds N
Longitude: 96 degrees, 50 minutes, 44.117 seconds W
Datum: WGS 84
UTM Easting 710882.30 m
UTM Northing 3153721.13 m
UTM Zone: 14

RANGE IN CHARACTERISTICS:
Soil Moisture: A peraquic soil moisture regime.
Mean annual soil temperature: 21.7 to 22.2 degrees C (71 to 72 degrees F)

Particle-size control section (weighted average):
Clay content: 40 to 60 percent

A horizon:
Hue: 10YR, 2.5Y, N/
Value: 4 or 5
Chroma: 1 or less
Texture: clay
Fragments: amount-0 to 3 percent; size-2 to 5 mm-; kind-shell
Electrical conductivity: 2 to 16 dS/M
Sodium adsorption ratio (SAR): 4 to 16
Effervescence: strong
Reaction (pH): moderately alkaline (7.9 to 8.4)

Bnzg horizon:
Hue: 10YR, 2.5Y, 5Y, or N/
Value: 4 to 7
Chroma: 2 or less. .
Texture: clay or silty clay
Redox concentrations: 1 to 20 percent; shades of brown, yellow, or red
Fragments: amount-0 to 3 percent; size-2 to 5 mm-; kind-shell
Electrical conductivity: 2 to 16 dS/m
Sodium adsorption ratio (SAR): 4 to 16
Effervescence: strong
Reaction (pH): moderately alkaline (7.9 to 8.4)

Czg horizon:
Hue: 10YR, 2.5Y, 5Y, or N/
Value: 4 to 7
Chroma: 2 or less. .

Texture: silty clay loam, clay, or silty clay
Some pedons are stratified with clayey and loamy layers
Redox concentrations: 1 to 20 percent; shades of brown, yellow, or red
Fragments: amount-0 to 3 percent; size-2 to 5 mm-; kind-shell
Sodium adsorption ratio (SAR): 4 to 16
Effervescence: strong
Reaction (pH): moderately alkaline (7.9 to 8.4)

COMPETING SERIES: There are no other series in this family. Similar soils are the Grulla, and Placedo series.
Grulla soils: do not have a cambic horizon; mixed mineralogy; cracks when dry
Placedo soils: do not have a cambic horizon; not calcareous; more acidic

GEOGRAPHIC SETTING:
Parent material: saline, calcareous, alluvial sediments high in smectitic clays
Landscape: low coastal plains
Landform: flood plains
Slope: less than 1 percent
Mean annual precipitation: 762 to 1016 mm (30 to 40 in)
Thornthwaite P-E Index: 40 to 64
Mean annual air temperature: 21.1 to 22.8 degrees C (70 degrees to 73 degrees F)
Frost-free period: 290 to 310 days
Elevation: 0 to 4.9 m (0 to 16 ft)

GEOGRAPHICALLY ASSOCIATED SOILS:
These are the Aransas, Laewest, and Victoria series.
Aransas soils: have a mollic epipedon;on similar landform.
Laewest and Victoria soils: are better drained; on a higher non-flooded landform

DRAINAGE AND PERMEABILITY:
Drainage class: Poorly
Permeability class: very slow
Runoff: high on slopes less than 1 percent
Flooding: floods from the rivers and streams occur 1 to 3 times a year for 1 to 3 weeks. Flooding occurs occasionally from storm tides from the Gulf of Mexico . The soils are saturated for long periods and are seldom dry below 30 cm (12 in).

USE AND VEGETATION:
Major uses: rangeland and wildlife.
Native vegetation: Gulf cordgrass, bushy sea-oxeye, spiny aster, marshhay cordgrass, and sedges.

Ecological sites assigned to phases and components of this series are listed below. Current ecological site assignments are in Web Soil Survey.
Components of this series include the following ecological sites: Salty Bottomland

DISTRIBUTION AND EXTENT:
General area: Flood plains near sea level in the central part of the Gulf Coast of Texas

Land Resource Region: T (Atlantic and Gulf Coast Lowland Forest and Crop Region)
Major Land Resource Area: (150B)- Gulf Coast Saline Prairies
Extent: moderate

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Temple, Texas

SERIES ESTABLISHED: Calhoun County, Texas; 1972.

REMARKS: Classification changed from Typic Haplaquepts to Vertic Endoaquepts 11/2000 based on typifying pedon description. Some limited data indicate these soils may be Vertisols. Further study and characterization data of the series is needed to verify hydrology and classification.

Diagnostic horizons and features recognized in this pedon are:

Ochric epipedon: 0 to 20 cm (0 to 8 in) (A horizon).
Cambic horizon: 20 to 107 cm (8 to 42 in) (Bnzg1 and Bnzg2)

ADDITIONAL DATA: none

Taxonomic Version: Keys to Soil Taxonomy, Twelfth Edition, 2014.

National Cooperative Soil Survey
U.S.A.

Exhibit B. USACE Nationwide Permits 14 and 18

Nationwide Permit 14 - Linear Transportation Projects
Effective Date: February 25, 2022; Expiration Date: March 14, 2026
(NWP Final Notice, 86 FR 73522)

Nationwide Permit 14 - Linear Transportation Projects. Activities required for crossings of waters of the United States associated with the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, driveways, airport runways, and taxiways) in waters of the United States. For linear transportation projects in non-tidal waters, the discharge of dredged or fill material cannot cause the loss of greater than 1/2-acre of waters of the United States. For linear transportation projects in tidal waters, the discharge of dredged or fill material cannot cause the loss of greater than 1/3-acre of waters of the United States. Any stream channel modification, including bank stabilization, is limited to the minimum necessary to construct or protect the linear transportation project; such modifications must be in the immediate vicinity of the project.

This NWP also authorizes temporary structures, fills, and work, including the use of temporary mats, necessary to construct the linear transportation project. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges of dredged or fill material, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

This NWP cannot be used to authorize non-linear features commonly associated with transportation projects, such as vehicle maintenance or storage buildings, parking lots, train stations, or aircraft hangars.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) the loss of waters of the United States exceeds 1/10-acre; or (2) there is a discharge of dredged or fill material in a special aquatic site, including wetlands. (See general condition 32.) (Authorities: Sections 10 and 404)

Note 1: For linear transportation projects crossing a single waterbody more than one time at separate and distant locations, or multiple waterbodies at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. Linear transportation projects must comply with 33 CFR 330.6(d).

Note 2: Some discharges of dredged or fill material for the construction of farm roads or forest roads, or temporary roads for moving mining equipment, may qualify for an exemption under Section 404(f) of the Clean Water Act (see 33 CFR 323.4).

Note 3: For NWP 14 activities that require pre-construction notification, the PCN must include any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings that require Department of the Army authorization but do not require pre-construction notification (see paragraph (b)(4) of general condition 32). The district engineer will evaluate the PCN in accordance with Section D, "District Engineer's Decision." The district engineer may require mitigation to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see general condition 23).

2021 Nationwide Permit General Conditions

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as applicable, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP. Every person who may wish to obtain permit authorization under one or more NWPs, or who is currently relying on an existing or prior permit authorization under one or more NWPs, has been and is on notice that all of the provisions of 33 CFR 330.1 through 330.6 apply to every NWP authorization. Note especially 33 CFR 330.5 relating to the modification, suspension, or revocation of any NWP authorization.

1. **Navigation.** (a) No activity may cause more than a minimal adverse effect on navigation.

(b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.

(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his or her authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. **Aquatic Life Movements.** No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain

low flows to sustain the movement of those aquatic species. If a bottomless culvert cannot be used, then the crossing should be designed and constructed to minimize adverse effects to aquatic life movements.

3. **Spawning Areas.** Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. **Migratory Bird Breeding Areas.** Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. **Shellfish Beds.** No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.

6. **Suitable Material.** No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see section 307 of the Clean Water Act).

7. **Water Supply Intakes.** No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. **Adverse Effects From Impoundments.** If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. **Management of Water Flows.** To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. **Fills Within 100-Year Floodplains.** The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. **Equipment.** Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. **Soil Erosion and Sediment Controls.** Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides.

13. **Removal of Temporary Structures and Fills.** Temporary structures must be removed, to the maximum extent practicable, after their use has been discontinued. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. **Proper Maintenance.** Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. **Single and Complete Project.** The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. **Wild and Scenic Rivers.** (a) No NWP activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status.

(b) If a proposed NWP activity will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, the permittee must submit a pre-construction notification (see general condition 32). The district engineer will coordinate the PCN with the Federal agency with direct management responsibility for that river. Permittees shall not begin the NWP activity until notified by the district engineer that the Federal agency with direct management responsibility for that river has determined in writing that the proposed NWP activity will not adversely affect the Wild and Scenic River designation or study status.

(c) Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service). Information on these rivers is also available at: http://www.rivers.gov/.

17. **Tribal Rights.** No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

18. **Endangered Species.** (a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify designated critical habitat or critical habitat proposed for such designation. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless ESA section 7 consultation addressing the consequences of the proposed activity on listed species or critical habitat has been completed. See 50 CFR 402.02 for the definition of "effects of the action" for the purposes of ESA section 7 consultation, as well as 50 CFR 402.17, which provides further explanation under ESA section 7 regarding "activities that are reasonably certain to occur" and "consequences caused by the proposed action."

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA (see 33 CFR 330.4(f)(1)). If pre-construction notification is required for the proposed activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation has not been submitted, additional ESA section 7 consultation may be necessary for the activity and the respective federal agency would be responsible for fulfilling its obligation under section 7 of the ESA.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed such designation) might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat or critical habitat proposed for such designation, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation), the pre-construction notification must include the name(s) of the endangered or threatened species (or species proposed for listing) that might be affected by the proposed activity or that utilize the designated critical habitat (or critical habitat proposed for such designation) that might be affected by the proposed activity. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete pre-construction notification. For activities where the non-Federal applicant has identified listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation) that might be affected or is in the vicinity of the activity, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification that the proposed activity will have "no effect" on listed species (or species proposed for listing or designated critical habitat (or critical habitat proposed for such designation), or until ESA section 7 consultation or conference has been completed. If the non-Federal

applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(d) As a result of formal or informal consultation or conference with the FWS or NMFS the district engineer may add species-specific permit conditions to the NWPs.

(e) Authorization of an activity by an NWP does not authorize the “take” of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with “incidental take” provisions, etc.) from the FWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word “harm” in the definition of “take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) If the non-federal permittee has a valid ESA section 10(a)(1)(B) incidental take permit with an approved Habitat Conservation Plan for a project or a group of projects that includes the proposed NWP activity, the non-federal applicant should provide a copy of that ESA section 10(a)(1)(B) permit with the PCN required by paragraph (c) of this general condition. The district engineer will coordinate with the agency that issued the ESA section 10(a)(1)(B) permit to determine whether the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation conducted for the ESA section 10(a)(1)(B) permit. If that coordination results in concurrence from the agency that the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation for the ESA section 10(a)(1)(B) permit, the district engineer does not need to conduct a separate ESA section 7 consultation for the proposed NWP activity. The district engineer will notify the non-federal applicant within 45 days of receipt of a complete pre-construction notification whether the ESA section 10(a)(1)(B) permit covers the proposed NWP activity or whether additional ESA section 7 consultation is required.

(g) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the FWS and NMFS or their world wide web pages at http://www.fws.gov/ or http://www.fws.gov/ipac and http://www.nmfs.noaa.gov/pr/species/esa/ respectively.

19. **Migratory Birds and Bald and Golden Eagles.** The permittee is responsible for ensuring that an action authorized by an NWP complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting the appropriate local office of the U.S. Fish and Wildlife Service to determine what measures, if any, are necessary or appropriate to reduce adverse effects to migratory birds or eagles, including whether "incidental take" permits are necessary and

available under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act for a particular activity.

20. **Historic Properties.** (a) No activity is authorized under any NWP which may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)(1)). If pre-construction notification is required for the proposed NWP activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation is not submitted, then additional consultation under section 106 may be necessary. The respective federal agency is responsible for fulfilling its obligation to comply with section 106.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the NWP activity might have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties might have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of, or potential for, the presence of historic properties can be sought from the State Historic Preservation Officer, Tribal Historic Preservation Officer, or designated tribal representative, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts commensurate with potential impacts, which may include background research, consultation, oral history interviews, sample field investigation, and/or field survey. Based on the information submitted in the PCN and these identification efforts, the district engineer shall determine whether the proposed NWP activity has the potential to cause effects on the historic properties. Section 106 consultation is not required when the district engineer determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). Section 106 consultation is required when the district engineer determines that the activity has the potential to cause effects on historic properties. The district engineer will conduct consultation with consulting parties identified under 36 CFR 800.2(c) when he or she makes any of the following effect determinations for the purposes of section 106 of the NHPA: no historic properties affected, no adverse effect, or adverse effect.

(d) Where the non-Federal applicant has identified historic properties on which the proposed NWP activity might have the potential to cause effects and has so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects to historic properties or that NHPA section 106 consultation has been completed. For non-federal permittees, the district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA section 106 consultation is required. If NHPA section 106 consultation is required, the district engineer will notify the non-Federal applicant that he or she cannot begin the activity until section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (54 U.S.C. 306113) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. **Discovery of Previously Unknown Remains and Artifacts.** Permittees that discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by an NWP, they must immediately notify the district engineer of what they have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. **Designated Critical Resource Waters.** Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, 52, 57 and 58 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, 38, and 54, notification is required in accordance with general condition 32, for any activity proposed by permittees in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after she or he determines that the impacts to the critical resource waters will be no more than minimal.

23. **Mitigation.** The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects.

(d) Compensatory mitigation at a minimum one-for-one ratio will be required for all losses of stream bed that exceed 3/100-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. This compensatory mitigation requirement may be satisfied through the restoration or enhancement of riparian areas next to streams in accordance with paragraph (e) of this general condition. For losses of stream bed of 3/100-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects. Compensatory mitigation for losses of streams should be provided, if practicable, through stream

rehabilitation, enhancement, or preservation, since streams are difficult-to-replace resources (see 33 CFR 332.3(e)(3)).

(e) Compensatory mitigation plans for NWP activities in or near streams or other open waters will normally include a requirement for the restoration or enhancement, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, the restoration or maintenance/protection of riparian areas may be the only compensatory mitigation required. If restoring riparian areas involves planting vegetation, only native species should be planted. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to restore or maintain/protect a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or maintaining/protecting a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of minimization or compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(f) Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in no more than minimal adverse environmental effects. For the NWPs, the preferred mechanism for providing compensatory mitigation is mitigation bank credits or in-lieu fee program credits (see 33 CFR 332.3(b)(2) and (3)). However, if an appropriate number and type of mitigation bank or in-lieu credits are not available at the time the PCN is submitted to the district engineer, the district engineer may approve the use of permittee-responsible mitigation.

(2) The amount of compensatory mitigation required by the district engineer must be sufficient to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see 33 CFR 330.1(e)(3)). (See also 33 CFR 332.3(f).)

(3) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, aquatic resource restoration should be the first compensatory mitigation option considered for permittee-responsible mitigation.

(4) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan

may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) through (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)). If permittee-responsible mitigation is the proposed option, and the proposed compensatory mitigation site is located on land in which another federal agency holds an easement, the district engineer will coordinate with that federal agency to determine if proposed compensatory mitigation project is compatible with the terms of the easement.

(5) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan needs to address only the baseline conditions at the impact site and the number of credits to be provided (see 33 CFR 332.4(c)(1)(ii)).

(6) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan (see 33 CFR 332.4(c)(1)(ii)).

(g) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any NWP activity resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that an NWP activity already meeting the established acreage limits also satisfies the no more than minimal impact requirement for the NWPs.

(h) Permittees may propose the use of mitigation banks, in-lieu fee programs, or permittee-responsible mitigation. When developing a compensatory mitigation proposal, the permittee must consider appropriate and practicable options consistent with the framework at 33 CFR 332.3(b). For activities resulting in the loss of marine or estuarine resources, permittee-responsible mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(i) Where certain functions and services of waters of the United States are permanently adversely affected by a regulated activity, such as discharges of dredged or fill material into waters of the United States that will convert a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may

be required to reduce the adverse environmental effects of the activity to the no more than minimal level.

24. **Safety of Impoundment Structures.** To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state or federal, dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. **Water Quality.** (a) Where the certifying authority (state, authorized tribe, or EPA, as appropriate) has not previously certified compliance of an NWP with CWA section 401, a CWA section 401 water quality certification for the proposed discharge must be obtained or waived (see 33 CFR 330.4(c)). If the permittee cannot comply with all of the conditions of a water quality certification previously issued by certifying authority for the issuance of the NWP, then the permittee must obtain a water quality certification or waiver for the proposed discharge in order for the activity to be authorized by an NWP.

(b) If the NWP activity requires pre-construction notification and the certifying authority has not previously certified compliance of an NWP with CWA section 401, the proposed discharge is not authorized by an NWP until water quality certification is obtained or waived. If the certifying authority issues a water quality certification for the proposed discharge, the permittee must submit a copy of the certification to the district engineer. The discharge is not authorized by an NWP until the district engineer has notified the permittee that the water quality certification requirement has been satisfied by the issuance of a water quality certification or a waiver.

(c) The district engineer or certifying authority may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. **Coastal Zone Management.** In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). If the permittee cannot comply with all of the conditions of a coastal zone management consistency concurrence previously issued by the state, then the permittee must obtain an individual coastal zone management consistency concurrence or presumption of concurrence in order for the activity to be authorized by an NWP. The district engineer or a state may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. **Regional and Case-By-Case Conditions.** The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state,

Indian Tribe, or U.S. EPA in its CWA section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. **Use of Multiple Nationwide Permits.** The use of more than one NWP for a single and complete project is authorized, subject to the following restrictions:

(a) If only one of the NWPs used to authorize the single and complete project has a specified acreage limit, the acreage loss of waters of the United States cannot exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

(b) If one or more of the NWPs used to authorize the single and complete project has specified acreage limits, the acreage loss of waters of the United States authorized by those NWPs cannot exceed their respective specified acreage limits. For example, if a commercial development is constructed under NWP 39, and the single and complete project includes the filling of an upland ditch authorized by NWP 46, the maximum acreage loss of waters of the United States for the commercial development under NWP 39 cannot exceed 1/2-acre, and the total acreage loss of waters of United States due to the NWP 39 and 46 activities cannot exceed 1 acre.

29. **Transfer of Nationwide Permit Verifications.** If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

"When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below."

_____
(Transferee)

_____
(Date)

30. **Compliance Certification.** Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and implementation of any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:

(a) A statement that the authorized activity was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;

(b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and

(c) The signature of the permittee certifying the completion of the activity and mitigation.

The completed certification document must be submitted to the district engineer within 30 days of completion of the authorized activity or the implementation of any required compensatory mitigation, whichever occurs later.

31. **Activities Affecting Structures or Works Built by the United States.** If an NWP activity also requires review by, or permission from, the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers (USACE) federally authorized Civil Works project (a "USACE project"), the prospective permittee must submit a pre-construction notification. See paragraph (b)(10) of general condition 32. An activity that requires section 408 permission and/or review is not authorized by an NWP until the appropriate Corps office issues the section 408 permission or completes its review to alter, occupy, or use the USACE project, and the district engineer issues a written NWP verification.

32. **Pre-Construction Notification.** (a) *Timing*. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

(1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

(2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or are in the vicinity of the activity, or to notify the Corps pursuant to general condition 20 that the activity might have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)) has been completed. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) *Contents of Pre-Construction Notification*: The PCN must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed activity;

(3) Identify the specific NWP or NWP(s) the prospective permittee wants to use to authorize the proposed activity;

(4) (i) A description of the proposed activity; the activity's purpose; direct and indirect adverse environmental effects the activity would cause, including the anticipated amount of loss of wetlands, other special aquatic sites, and other waters expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; a description of any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed activity; and any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings for linear projects that require Department of the Army authorization but do not require pre-construction notification. The description of the proposed activity and any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no

more than minimal and to determine the need for compensatory mitigation or other mitigation measures.

(ii) For linear projects where one or more single and complete crossings require pre-construction notification, the PCN must include the quantity of anticipated losses of wetlands, other special aquatic sites, and other waters for each single and complete crossing of those wetlands, other special aquatic sites, and other waters (including those single and complete crossings authorized by an NWP but do not require PCNs). This information will be used by the district engineer to evaluate the cumulative adverse environmental effects of the proposed linear project, and does not change those non-PCN NWP activities into NWP PCNs.

(iii) Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the activity and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);

(5) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial and intermittent streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. Furthermore, the 45-day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;

(6) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands or 3/100-acre of stream bed and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse environmental effects are no more than minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(7) For non-federal permittees, if any listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation) might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat (or critical habitat proposed for such designation), the PCN must include the name(s) of those endangered or threatened species (or species proposed for listing) that might be affected by the proposed activity or utilize the designated critical habitat (or critical habitat proposed for such designation) that might be affected by the proposed activity. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with the Endangered Species Act;

(8) For non-federal permittees, if the NWP activity might have the potential to cause effects to a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, the PCN must state which historic property might have the potential to be affected by the proposed activity or include a vicinity map indicating the location of the historic property. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with section 106 of the National Historic Preservation Act;

(9) For an activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, the PCN must identify the Wild and Scenic River or the "study river" (see general condition 16); and

(10) For an NWP activity that requires permission from, or review by, the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from, or review by, the Corps office having jurisdiction over that USACE project.

(c) *Form of Pre-Construction Notification*: The nationwide permit pre-construction notification form (Form ENG 6082) should be used for NWP PCNs. A letter containing the required information may also be used. Applicants may provide electronic files of PCNs and supporting materials if the district engineer has established tools and procedures for electronic submittals.

(d) *Agency Coordination*: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the activity's adverse environmental effects so that they are no more than minimal.

(2) Agency coordination is required for: (i) all NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States; (ii) NWP 13 activities in excess of 500 linear feet, fills greater than one cubic yard per running foot, or involve discharges of dredged or fill material into special aquatic sites; and (iii) NWP 54 activities in excess of 500 linear feet, or that extend into the waterbody more than 30 feet from the mean low water line in tidal waters or the ordinary high water mark in the Great Lakes.

(3) When agency coordination is required, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (FWS, state natural resource or water quality agency, EPA, and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to notify the district engineer via telephone, facsimile

transmission, or e-mail that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse environmental effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure that the net adverse environmental effects of the proposed activity are no more than minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(4) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(5) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

2021 District Engineer's Decision

1. In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If a project proponent requests authorization by a specific NWP, the district engineer should issue the NWP verification for that activity if it meets the terms and conditions of that NWP, unless he or she determines, after considering mitigation, that the proposed activity will result in more than minimal individual and cumulative adverse effects on the aquatic environment and other aspects of the public interest and exercises discretionary authority to require an individual permit for the proposed activity. For a linear project, this determination will include an evaluation of the single and complete crossings of waters of the United States that require PCNs to determine whether they individually satisfy the terms and conditions of the NWP(s), as well as the cumulative effects caused by all of the crossings of waters of the United States authorized by an NWP. If an applicant requests a waiver of an applicable limit, as provided for in NWPs 13, 36, or 54, the district engineer will only grant the waiver upon a written determination that the NWP activity will result in only minimal individual and cumulative adverse environmental effects.

2. When making minimal adverse environmental effects determinations the district engineer will consider the direct and indirect effects caused by the NWP activity. He or she will also consider the cumulative adverse environmental effects caused by activities authorized by an NWP and whether those cumulative adverse environmental effects are no more than minimal. The district engineer will also consider site specific factors, such as the environmental setting in the vicinity of the NWP activity, the type of resource that will be affected by the NWP activity, the functions provided by the aquatic resources that will be affected by the NWP activity, the degree or magnitude to which the aquatic resources perform those functions, the extent that aquatic resource functions will be lost as a result of the NWP activity (e.g., partial or complete loss), the duration of the adverse effects (temporary or permanent), the importance of the aquatic resource functions to the region (e.g., watershed or ecoregion), and mitigation required by the district engineer. If an appropriate functional or condition assessment method is available and practicable to use, that assessment method may be used by the district engineer to assist in the minimal adverse environmental effects determination. The district engineer may add case-specific special conditions to the NWP authorization to address site-specific environmental concerns.

3. If the proposed activity requires a PCN and will result in a loss of greater than 1/10-acre of wetlands or 3/100-acre of stream bed, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for NWP activities with smaller impacts, or for impacts to other types of waters. The district engineer will consider any proposed compensatory mitigation or other mitigation measures the applicant has included in the proposal in determining whether the net adverse environmental effects of the proposed activity are no more than minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse environmental effects are no more than minimal, after considering mitigation, the district engineer will notify the permittee and include any activity-specific conditions in the NWP verification the district engineer deems necessary. Conditions for compensatory mitigation requirements must comply with the appropriate provisions at 33 CFR 332.3(k). The district engineer must approve the final mitigation plan before the permittee commences work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the proposed compensatory mitigation plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure that the NWP activity results in no more than minimal adverse environmental effects. If the net adverse environmental effects of the NWP activity (after consideration of the mitigation proposal) are determined by the district engineer to be no more than minimal, the district engineer will provide a timely written response to the applicant. The response will state that the NWP activity can proceed under the terms and conditions of the NWP, including any activity-specific conditions added to the NWP authorization by the district engineer.

4. If the district engineer determines that the adverse environmental effects of the proposed activity are more than minimal, then the district engineer will notify the applicant either: (a) that the activity does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (b) that the activity is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal; or (c) that the activity is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse environmental effects, the activity will be authorized within the 45-day PCN period (unless additional time is required to comply with general conditions 18, 20, and/or 31), with activity-specific conditions that state the mitigation requirements. The authorization will include the necessary conceptual or detailed mitigation plan or a requirement that the applicant submit a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal. When compensatory mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan or has determined that prior approval of a final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation.

2021 Further Information

1. District engineers have authority to determine if an activity complies with the terms and conditions of an NWP.

2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.

3. NWPs do not grant any property rights or exclusive privileges.

4. NWPs do not authorize any injury to the property or rights of others.

5. NWPs do not authorize interference with any existing or proposed Federal project (see general condition 31).

2021 Nationwide Permit Definitions

Best management practices (BMPs): Policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural.

Compensatory mitigation: The restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purposes of offsetting unavoidable adverse impacts which

remain after all appropriate and practicable avoidance and minimization has been achieved.

Currently serviceable: Useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Direct effects: Effects that are caused by the activity and occur at the same time and place.

Discharge: The term "discharge" means any discharge of dredged or fill material into waters of the United States.

Ecological reference: A model used to plan and design an aquatic habitat and riparian area restoration, enhancement, or establishment activity under NWP 27. An ecological reference may be based on the structure, functions, and dynamics of an aquatic habitat type or a riparian area type that currently exists in the region where the proposed NWP 27 activity is located. Alternatively, an ecological reference may be based on a conceptual model for the aquatic habitat type or riparian area type to be restored, enhanced, or established as a result of the proposed NWP 27 activity. An ecological reference takes into account the range of variation of the aquatic habitat type or riparian area type in the region.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

Establishment (creation): The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area.

High Tide Line: The line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

Historic Property: Any prehistoric or historic district, site (including archaeological site), building, structure, or other object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This

term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR part 60).

Independent utility: A test to determine what constitutes a single and complete non-linear project in the Corps Regulatory Program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

Indirect effects: Effects that are caused by the activity and are later in time or farther removed in distance, but are still reasonably foreseeable.

Loss of waters of the United States: Waters of the United States that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. The loss of stream bed includes the acres of stream bed that are permanently adversely affected by filling or excavation because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is a threshold measurement of the impact to jurisdictional waters or wetlands for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services. Waters of the United States temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of waters of the United States. Impacts resulting from activities that do not require Department of the Army authorization, such as activities eligible for exemptions under section 404(f) of the Clean Water Act, are not considered when calculating the loss of waters of the United States.

Navigable waters: Waters subject to section 10 of the Rivers and Harbors Act of 1899. These waters are defined at 33 CFR part 329.

Non-tidal wetland: A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. Non-tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Open water: For purposes of the NWPs, an open water is any area that in a year with normal patterns of precipitation has water flowing or standing above ground to the extent that an ordinary high water mark can be determined. Aquatic vegetation within the area of flowing or standing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. Examples of “open waters” include rivers, streams, lakes, and ponds.

Ordinary High Water Mark: The term ordinary high water mark means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Perennial stream: A perennial stream has surface water flowing continuously year-round during a typical year.

Practicable: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Pre-construction notification: A request submitted by the project proponent to the Corps for confirmation that a particular activity is authorized by nationwide permit. The request may be a permit application, letter, or similar document that includes information about the proposed work and its anticipated environmental effects. Pre-construction notification may be required by the terms and conditions of a nationwide permit, or by regional conditions. A pre-construction notification may be voluntarily submitted in cases where pre-construction notification is not required and the project proponent wants confirmation that the activity is authorized by nationwide permit.

Preservation: The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

Re-establishment: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.

Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.

Riffle and pool complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic

characteristics. The rapid movement of water over a course substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

Riparian areas: Riparian areas are lands next to streams, lakes, and estuarine-marine shorelines. Riparian areas are transitional between terrestrial and aquatic ecosystems, through which surface and subsurface hydrology connects riverine, lacustrine, estuarine, and marine waters with their adjacent wetlands, non-wetland waters, or uplands. Riparian areas provide a variety of ecological functions and services and help improve or maintain local water quality. (See general condition 23.)

Shellfish seeding: The placement of shellfish seed and/or suitable substrate to increase shellfish production. Shellfish seed consists of immature individual shellfish or individual shellfish attached to shells or shell fragments (i.e., spat on shell). Suitable substrate may consist of shellfish shells, shell fragments, or other appropriate materials placed into waters for shellfish habitat.

Single and complete linear project: A linear project is a project constructed for the purpose of getting people, goods, or services from a point of origin to a terminal point, which often involves multiple crossings of one or more waterbodies at separate and distant locations. The term "single and complete project" is defined as that portion of the total linear project proposed or accomplished by one owner/developer or partnership or other association of owners/developers that includes all crossings of a single water of the United States (i.e., a single waterbody) at a specific location. For linear projects crossing a single or multiple waterbodies several times at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

Single and complete non-linear project: For non-linear projects, the term "single and complete project" is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. A single and complete non-linear project must have independent utility (see definition of "independent utility"). Single and complete non-linear projects may not be "piecemealed" to avoid the limits in an NWP authorization.

Stormwater management: Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse effects of changes in land use on the aquatic environment.

Stormwater management facilities: Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and best management practices, which retain water for a period of time to control runoff and/or

improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

Stream bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

Stream channelization: The manipulation of a stream's course, condition, capacity, or location that causes more than minimal interruption of normal stream processes. A channelized jurisdictional stream remains a water of the United States.

Structure: An object that is arranged in a definite pattern of organization. Examples of structures include, without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other manmade obstacle or obstruction.

Tidal wetland: A tidal wetland is a jurisdictional wetland that is inundated by tidal waters. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line.

Tribal lands: Any lands title to which is either: 1) held in trust by the United States for the benefit of any Indian tribe or individual; or 2) held by any Indian tribe or individual subject to restrictions by the United States against alienation.

Tribal rights: Those rights legally accruing to a tribe or tribes by virtue of inherent sovereign authority, unextinguished aboriginal title, treaty, statute, judicial decisions, executive order or agreement, and that give rise to legally enforceable remedies.

Vegetated shallows: Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

Waterbody: For purposes of the NWPs, a waterbody is a "water of the United States." If a wetland is adjacent to a waterbody determined to be a water of the United States, that waterbody and any adjacent wetlands are considered together as a single aquatic unit (see 33 CFR 328.4(c)(2)).

ADDITIONAL INFORMATION

Information about the U.S. Army Corps of Engineers Regulatory Program, including nationwide permits, may also be accessed at

http://www.swt.usace.army.mil/Missions/Regulatory.aspx or
http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits.aspx

Nationwide Permit 18 - Minor Discharges
Effective Date: February 25, 2022; Expiration Date: March 14, 2026
(NWP Final Notice, 86 FR 73522)

Nationwide Permit 18 - Minor Discharges. Minor discharges of dredged or fill material into all waters of the United States, provided the activity meets all of the following criteria:

(a) The quantity of discharged dredged or fill material and the volume of area excavated do not exceed 25 cubic yards below the plane of the ordinary high water mark or the high tide line;

(b) The discharge of dredged or fill material will not cause the loss of more than 1/10-acre of waters of the United States; and

(c) The discharge of dredged or fill material is not placed for the purpose of a stream diversion.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) the discharge of dredged or fill material or the volume of area excavated exceeds 10 cubic yards below the plane of the ordinary high water mark or the high tide line, or (2) the discharge of dredged or fill material is in a special aquatic site, including wetlands. (See general condition 32.) (Authorities: Sections 10 and 404)

2021 Nationwide Permit General Conditions

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as applicable, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP. Every person who may wish to obtain permit authorization under one or more NWPs, or who is currently relying on an existing or prior permit authorization under one or more NWPs, has been and is on notice that all of the provisions of 33 CFR 330.1 through 330.6 apply to every NWP authorization. Note especially 33 CFR 330.5 relating to the modification, suspension, or revocation of any NWP authorization.

1. **Navigation.** (a) No activity may cause more than a minimal adverse effect on navigation.

(b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.

(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his or her authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. **Aquatic Life Movements.** No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species. If a bottomless culvert cannot be used, then the crossing should be designed and constructed to minimize adverse effects to aquatic life movements.

3. **Spawning Areas.** Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. **Migratory Bird Breeding Areas.** Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. **Shellfish Beds.** No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.

6. **Suitable Material.** No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see section 307 of the Clean Water Act).

7. **Water Supply Intakes.** No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. **Adverse Effects From Impoundments.** If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. **Management of Water Flows.** To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. **Fills Within 100-Year Floodplains.** The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. **Equipment.** Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. **Soil Erosion and Sediment Controls.** Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides.

13. **Removal of Temporary Structures and Fills.** Temporary structures must be removed, to the maximum extent practicable, after their use has been discontinued. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. **Proper Maintenance.** Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. **Single and Complete Project.** The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. **Wild and Scenic Rivers.** (a) No NWP activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status.

(b) If a proposed NWP activity will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for

possible inclusion in the system while the river is in an official study status, the permittee must submit a pre-construction notification (see general condition 32). The district engineer will coordinate the PCN with the Federal agency with direct management responsibility for that river. Permittees shall not begin the NWP activity until notified by the district engineer that the Federal agency with direct management responsibility for that river has determined in writing that the proposed NWP activity will not adversely affect the Wild and Scenic River designation or study status.

(c) Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service). Information on these rivers is also available at: http://www.rivers.gov/.

17. **Tribal Rights.** No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

18. **Endangered Species.** (a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify designated critical habitat or critical habitat proposed for such designation. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless ESA section 7 consultation addressing the consequences of the proposed activity on listed species or critical habitat has been completed. See 50 CFR 402.02 for the definition of "effects of the action" for the purposes of ESA section 7 consultation, as well as 50 CFR 402.17, which provides further explanation under ESA section 7 regarding "activities that are reasonably certain to occur" and "consequences caused by the proposed action."

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA (see 33 CFR 330.4(f)(1)). If pre-construction notification is required for the proposed activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation has not been submitted, additional ESA section 7 consultation may be necessary for the activity and the respective federal agency would be responsible for fulfilling its obligation under section 7 of the ESA.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed such designation) might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat or critical habitat proposed for such designation, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed

endangered or threatened species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation), the pre-construction notification must include the name(s) of the endangered or threatened species (or species proposed for listing) that might be affected by the proposed activity or that utilize the designated critical habitat (or critical habitat proposed for such designation) that might be affected by the proposed activity. The district engineer will determine whether the proposed activity “may affect” or will have “no effect” to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps’ determination within 45 days of receipt of a complete pre-construction notification. For activities where the non-Federal applicant has identified listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation) that might be affected or is in the vicinity of the activity, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification that the proposed activity will have “no effect” on listed species (or species proposed for listing or designated critical habitat (or critical habitat proposed for such designation), or until ESA section 7 consultation or conference has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(d) As a result of formal or informal consultation or conference with the FWS or NMFS the district engineer may add species-specific permit conditions to the NWPs.

(e) Authorization of an activity by an NWP does not authorize the “take” of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with “incidental take” provisions, etc.) from the FWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word “harm” in the definition of “take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) If the non-federal permittee has a valid ESA section 10(a)(1)(B) incidental take permit with an approved Habitat Conservation Plan for a project or a group of projects that includes the proposed NWP activity, the non-federal applicant should provide a copy of that ESA section 10(a)(1)(B) permit with the PCN required by paragraph (c) of this general condition. The district engineer will coordinate with the agency that issued the ESA section 10(a)(1)(B) permit to determine whether the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation conducted for the ESA section 10(a)(1)(B) permit. If that coordination results in concurrence from the agency that the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation for the ESA section 10(a)(1)(B) permit, the district engineer does not need to conduct a separate ESA section 7 consultation for the proposed NWP activity. The district

engineer will notify the non-federal applicant within 45 days of receipt of a complete pre-construction notification whether the ESA section 10(a)(1)(B) permit covers the proposed NWP activity or whether additional ESA section 7 consultation is required.

(g) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the FWS and NMFS or their world wide web pages at http://www.fws.gov/ or http://www.fws.gov/ipac and http://www.nmfs.noaa.gov/pr/species/esa/ respectively.

19. **Migratory Birds and Bald and Golden Eagles.** The permittee is responsible for ensuring that an action authorized by an NWP complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting the appropriate local office of the U.S. Fish and Wildlife Service to determine what measures, if any, are necessary or appropriate to reduce adverse effects to migratory birds or eagles, including whether "incidental take" permits are necessary and available under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act for a particular activity.

20. **Historic Properties.** (a) No activity is authorized under any NWP which may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)(1)). If pre-construction notification is required for the proposed NWP activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation is not submitted, then additional consultation under section 106 may be necessary. The respective federal agency is responsible for fulfilling its obligation to comply with section 106.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the NWP activity might have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties might have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of, or potential for, the presence of historic properties can be sought from the State Historic Preservation Officer, Tribal Historic Preservation Officer, or designated tribal representative, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of section 106 of

the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts commensurate with potential impacts, which may include background research, consultation, oral history interviews, sample field investigation, and/or field survey. Based on the information submitted in the PCN and these identification efforts, the district engineer shall determine whether the proposed NWP activity has the potential to cause effects on the historic properties. Section 106 consultation is not required when the district engineer determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). Section 106 consultation is required when the district engineer determines that the activity has the potential to cause effects on historic properties. The district engineer will conduct consultation with consulting parties identified under 36 CFR 800.2(c) when he or she makes any of the following effect determinations for the purposes of section 106 of the NHPA: no historic properties affected, no adverse effect, or adverse effect.

(d) Where the non-Federal applicant has identified historic properties on which the proposed NWP activity might have the potential to cause effects and has so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects to historic properties or that NHPA section 106 consultation has been completed. For non-federal permittees, the district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA section 106 consultation is required. If NHPA section 106 consultation is required, the district engineer will notify the non-Federal applicant that he or she cannot begin the activity until section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (54 U.S.C. 306113) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. **Discovery of Previously Unknown Remains and Artifacts.** Permittees that discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by an NWP, they must immediately notify

the district engineer of what they have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. **Designated Critical Resource Waters.** Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, 52, 57 and 58 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, 38, and 54, notification is required in accordance with general condition 32, for any activity proposed by permittees in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after she or he determines that the impacts to the critical resource waters will be no more than minimal.

23. **Mitigation.** The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that

compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects.

(d) Compensatory mitigation at a minimum one-for-one ratio will be required for all losses of stream bed that exceed 3/100-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. This compensatory mitigation requirement may be satisfied through the restoration or enhancement of riparian areas next to streams in accordance with paragraph (e) of this general condition. For losses of stream bed of 3/100-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects. Compensatory mitigation for losses of streams should be provided, if practicable, through stream rehabilitation, enhancement, or preservation, since streams are difficult-to-replace resources (see 33 CFR 332.3(e)(3)).

(e) Compensatory mitigation plans for NWP activities in or near streams or other open waters will normally include a requirement for the restoration or enhancement, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, the restoration or maintenance/protection of riparian areas may be the only compensatory mitigation required. If restoring riparian areas involves planting vegetation, only native species should be planted. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to restore or maintain/protect a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or maintaining/protecting a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of minimization or compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(f) Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in no more than minimal adverse environmental effects. For the NWPs, the preferred mechanism for providing compensatory mitigation is mitigation bank credits or in-lieu fee program credits (see 33 CFR 332.3(b)(2) and (3)). However, if an appropriate

number and type of mitigation bank or in-lieu credits are not available at the time the PCN is submitted to the district engineer, the district engineer may approve the use of permittee-responsible mitigation.

(2) The amount of compensatory mitigation required by the district engineer must be sufficient to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see 33 CFR 330.1(e)(3)). (See also 33 CFR 332.3(f).)

(3) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, aquatic resource restoration should be the first compensatory mitigation option considered for permittee-responsible mitigation.

(4) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) through (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)). If permittee-responsible mitigation is the proposed option, and the proposed compensatory mitigation site is located on land in which another federal agency holds an easement, the district engineer will coordinate with that federal agency to determine if proposed compensatory mitigation project is compatible with the terms of the easement.

(5) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan needs to address only the baseline conditions at the impact site and the number of credits to be provided (see 33 CFR 332.4(c)(1)(ii)).

(6) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan (see 33 CFR 332.4(c)(1)(ii)).

(g) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any NWP activity resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that an NWP activity already meeting the established acreage limits also satisfies the no more than minimal impact requirement for the NWPs.

(h) Permittees may propose the use of mitigation banks, in-lieu fee programs, or permittee-responsible mitigation. When developing a compensatory mitigation proposal, the permittee must consider appropriate and practicable options consistent with the framework at 33 CFR 332.3(b). For activities resulting in the loss of marine or estuarine resources, permittee-responsible mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(i) Where certain functions and services of waters of the United States are permanently adversely affected by a regulated activity, such as discharges of dredged or fill material into waters of the United States that will convert a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse environmental effects of the activity to the no more than minimal level.

24. **Safety of Impoundment Structures.** To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state or federal, dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. **Water Quality.** (a) Where the certifying authority (state, authorized tribe, or EPA, as appropriate) has not previously certified compliance of an NWP with CWA section 401, a CWA section 401 water quality certification for the proposed discharge must be obtained or waived (see 33 CFR 330.4(c)). If the permittee cannot comply with all of the conditions of a water quality certification previously issued by certifying authority for the issuance of the NWP, then the permittee must obtain a water quality certification or waiver for the proposed discharge in order for the activity to be authorized by an NWP.

(b) If the NWP activity requires pre-construction notification and the certifying authority has not previously certified compliance of an NWP with CWA section 401, the proposed discharge is not authorized by an NWP until water quality certification is obtained or waived. If the certifying authority issues a water quality certification for the proposed discharge, the permittee must submit a copy of the certification to the district engineer. The discharge is not authorized by an NWP until the district engineer has notified the permittee that the water quality certification requirement has been satisfied by the issuance of a water quality certification or a waiver.

(c) The district engineer or certifying authority may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. **Coastal Zone Management.** In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). If the permittee cannot comply with all of the conditions of a coastal zone management consistency concurrence previously issued by the state, then the permittee must obtain an individual coastal zone management consistency concurrence or presumption of concurrence in order for the activity to be authorized by an NWP. The district engineer or a state may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. **Regional and Case-By-Case Conditions.** The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its CWA section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. **Use of Multiple Nationwide Permits.** The use of more than one NWP for a single and complete project is authorized, subject to the following restrictions:

(a) If only one of the NWPs used to authorize the single and complete project has a specified acreage limit, the acreage loss of waters of the United States cannot exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

(b) If one or more of the NWPs used to authorize the single and complete project has specified acreage limits, the acreage loss of waters of the United States authorized by those NWPs cannot exceed their respective specified acreage limits. For example, if a commercial development is constructed under NWP 39, and the single and complete project includes the filling of an upland ditch authorized by NWP 46, the maximum acreage loss of waters of the United States for the commercial development under NWP 39 cannot exceed 1/2-acre, and the total acreage loss of waters of United States due to the NWP 39 and 46 activities cannot exceed 1 acre.

29. **Transfer of Nationwide Permit Verifications.** If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

"When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s)

of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below."

_____
(Transferee)

_____
(Date)

30. **Compliance Certification.** Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and implementation of any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:

(a) A statement that the authorized activity was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;

(b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and

(c) The signature of the permittee certifying the completion of the activity and mitigation.

The completed certification document must be submitted to the district engineer within 30 days of completion of the authorized activity or the implementation of any required compensatory mitigation, whichever occurs later.

31. **Activities Affecting Structures or Works Built by the United States.** If an NWP activity also requires review by, or permission from, the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers (USACE) federally authorized Civil Works project (a "USACE project"), the prospective permittee must submit a pre-construction notification. See paragraph (b)(10) of general condition 32. An activity that requires section 408 permission and/or review is not authorized by an NWP until the appropriate Corps office issues the section 408 permission or completes its review to alter, occupy, or use the USACE project, and the district engineer issues a written NWP verification.

32. **Pre-Construction Notification.** (a) *Timing*. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

(1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

(2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or are in the vicinity of the activity, or to notify the Corps pursuant to general condition 20 that the activity might have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)) has been completed. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) *Contents of Pre-Construction Notification*: The PCN must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed activity;

(3) Identify the specific NWP or NWP(s) the prospective permittee wants to use to authorize the proposed activity;

(4) (i) A description of the proposed activity; the activity's purpose; direct and indirect adverse environmental effects the activity would cause, including the anticipated amount of loss of wetlands, other special aquatic sites, and other waters expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; a description of any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed activity; and any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings for linear projects that require Department of the Army authorization but do not require pre-construction notification. The description of the proposed activity and any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or other mitigation measures.

(ii) For linear projects where one or more single and complete crossings require pre-construction notification, the PCN must include the quantity of anticipated losses of wetlands, other special aquatic sites, and other waters for each single and complete crossing of those wetlands, other special aquatic sites, and other waters (including those single and complete crossings authorized by an NWP but do not require PCNs). This information will be used by the district engineer to evaluate the cumulative adverse environmental effects of the proposed linear project, and does not change those non-PCN NWP activities into NWP PCNs.

(iii) Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the activity and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);

(5) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial and intermittent streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. Furthermore, the 45-day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;

(6) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands or 3/100-acre of stream bed and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse environmental effects are no more than minimal and why

compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(7) For non-federal permittees, if any listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation) might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat (or critical habitat proposed for such designation), the PCN must include the name(s) of those endangered or threatened species (or species proposed for listing) that might be affected by the proposed activity or utilize the designated critical habitat (or critical habitat proposed for such designation) that might be affected by the proposed activity. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with the Endangered Species Act;

(8) For non-federal permittees, if the NWP activity might have the potential to cause effects to a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, the PCN must state which historic property might have the potential to be affected by the proposed activity or include a vicinity map indicating the location of the historic property. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with section 106 of the National Historic Preservation Act;

(9) For an activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, the PCN must identify the Wild and Scenic River or the “study river” (see general condition 16); and

(10) For an NWP activity that requires permission from, or review by, the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from, or review by, the Corps office having jurisdiction over that USACE project.

(c) *Form of Pre-Construction Notification*: The nationwide permit pre-construction notification form (Form ENG 6082) should be used for NWP PCNs. A letter containing the required information may also be used. Applicants may provide electronic files of PCNs and supporting materials if the district engineer has established tools and procedures for electronic submittals.

(d) *Agency Coordination*: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity’s compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the activity’s adverse environmental effects so that they are no more than minimal.

(2) Agency coordination is required for: (i) all NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States; (ii) NWP 13 activities in excess of 500 linear feet, fills greater than one cubic yard per running foot, or involve discharges of dredged or fill material into special aquatic sites; and (iii) NWP 54 activities in excess of 500 linear feet, or that extend into the waterbody more than 30 feet from the mean low water line in tidal waters or the ordinary high water mark in the Great Lakes.

(3) When agency coordination is required, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (FWS, state natural resource or water quality agency, EPA, and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to notify the district engineer via telephone, facsimile transmission, or e-mail that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse environmental effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure that the net adverse environmental effects of the proposed activity are no more than minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(4) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(5) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

2021 District Engineer's Decision

1. In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If a project proponent requests authorization by a specific NWP, the district engineer should

issue the NWP verification for that activity if it meets the terms and conditions of that NWP, unless he or she determines, after considering mitigation, that the proposed activity will result in more than minimal individual and cumulative adverse effects on the aquatic environment and other aspects of the public interest and exercises discretionary authority to require an individual permit for the proposed activity. For a linear project, this determination will include an evaluation of the single and complete crossings of waters of the United States that require PCNs to determine whether they individually satisfy the terms and conditions of the NWP(s), as well as the cumulative effects caused by all of the crossings of waters of the United States authorized by an NWP. If an applicant requests a waiver of an applicable limit, as provided for in NWPs 13, 36, or 54, the district engineer will only grant the waiver upon a written determination that the NWP activity will result in only minimal individual and cumulative adverse environmental effects.

2. When making minimal adverse environmental effects determinations the district engineer will consider the direct and indirect effects caused by the NWP activity. He or she will also consider the cumulative adverse environmental effects caused by activities authorized by an NWP and whether those cumulative adverse environmental effects are no more than minimal. The district engineer will also consider site specific factors, such as the environmental setting in the vicinity of the NWP activity, the type of resource that will be affected by the NWP activity, the functions provided by the aquatic resources that will be affected by the NWP activity, the degree or magnitude to which the aquatic resources perform those functions, the extent that aquatic resource functions will be lost as a result of the NWP activity (e.g., partial or complete loss), the duration of the adverse effects (temporary or permanent), the importance of the aquatic resource functions to the region (e.g., watershed or ecoregion), and mitigation required by the district engineer. If an appropriate functional or condition assessment method is available and practicable to use, that assessment method may be used by the district engineer to assist in the minimal adverse environmental effects determination. The district engineer may add case-specific special conditions to the NWP authorization to address site-specific environmental concerns.

3. If the proposed activity requires a PCN and will result in a loss of greater than 1/10-acre of wetlands or 3/100-acre of stream bed, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for NWP activities with smaller impacts, or for impacts to other types of waters. The district engineer will consider any proposed compensatory mitigation or other mitigation measures the applicant has included in the proposal in determining whether the net adverse environmental effects of the proposed activity are no more than minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse environmental effects are no more than minimal, after considering mitigation, the district engineer will notify the permittee and include any activity-specific conditions in the NWP verification the district engineer deems necessary. Conditions for compensatory mitigation requirements must comply with the appropriate provisions at 33 CFR 332.3(k). The district engineer must approve the final mitigation plan before the

permittee commences work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the proposed compensatory mitigation plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure that the NWP activity results in no more than minimal adverse environmental effects. If the net adverse environmental effects of the NWP activity (after consideration of the mitigation proposal) are determined by the district engineer to be no more than minimal, the district engineer will provide a timely written response to the applicant. The response will state that the NWP activity can proceed under the terms and conditions of the NWP, including any activity-specific conditions added to the NWP authorization by the district engineer.

4. If the district engineer determines that the adverse environmental effects of the proposed activity are more than minimal, then the district engineer will notify the applicant either: (a) that the activity does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (b) that the activity is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal; or (c) that the activity is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse environmental effects, the activity will be authorized within the 45-day PCN period (unless additional time is required to comply with general conditions 18, 20, and/or 31), with activity-specific conditions that state the mitigation requirements. The authorization will include the necessary conceptual or detailed mitigation plan or a requirement that the applicant submit a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal. When compensatory mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan or has determined that prior approval of a final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation.

2021 Further Information

1. District engineers have authority to determine if an activity complies with the terms and conditions of an NWP.

2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.

3. NWPs do not grant any property rights or exclusive privileges.

4. NWPs do not authorize any injury to the property or rights of others.

5. NWPs do not authorize interference with any existing or proposed Federal project (see general condition 31).

2021 Nationwide Permit Definitions

Best management practices (BMPs): Policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural.

Compensatory mitigation: The restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

Currently serviceable: Useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Direct effects: Effects that are caused by the activity and occur at the same time and place.

Discharge: The term "discharge" means any discharge of dredged or fill material into waters of the United States.

Ecological reference: A model used to plan and design an aquatic habitat and riparian area restoration, enhancement, or establishment activity under NWP 27. An ecological reference may be based on the structure, functions, and dynamics of an aquatic habitat type or a riparian area type that currently exists in the region where the proposed NWP 27 activity is located. Alternatively, an ecological reference may be based on a conceptual model for the aquatic habitat type or riparian area type to be restored, enhanced, or established as a result of the proposed NWP 27 activity. An ecological reference takes into account the range of variation of the aquatic habitat type or riparian area type in the region.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

Establishment (creation): The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area.

High Tide Line: The line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

Historic Property: Any prehistoric or historic district, site (including archaeological site), building, structure, or other object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR part 60).

Independent utility: A test to determine what constitutes a single and complete non-linear project in the Corps Regulatory Program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

Indirect effects: Effects that are caused by the activity and are later in time or farther removed in distance, but are still reasonably foreseeable.

Loss of waters of the United States: Waters of the United States that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. The loss of stream bed includes the acres of stream bed that are permanently adversely affected by filling or excavation because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is a threshold measurement of the impact to jurisdictional waters or wetlands for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services. Waters of the United States temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of waters of the United States. Impacts resulting from activities that do not require Department of the Army authorization, such as activities eligible for exemptions under section 404(f) of the Clean Water Act, are not considered when calculating the loss of waters of the United States.

Navigable waters: Waters subject to section 10 of the Rivers and Harbors Act of 1899. These waters are defined at 33 CFR part 329.

Non-tidal wetland: A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. Non-tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Open water: For purposes of the NWPs, an open water is any area that in a year with normal patterns of precipitation has water flowing or standing above ground to the extent that an ordinary high water mark can be determined. Aquatic vegetation within the area of flowing or standing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. Examples of "open waters" include rivers, streams, lakes, and ponds.

Ordinary High Water Mark: The term ordinary high water mark means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Perennial stream: A perennial stream has surface water flowing continuously year-round during a typical year.

Practicable: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Pre-construction notification: A request submitted by the project proponent to the Corps for confirmation that a particular activity is authorized by nationwide permit. The request may be a permit application, letter, or similar document that includes information about the proposed work and its anticipated environmental effects. Pre-construction notification may be required by the terms and conditions of a nationwide permit, or by regional conditions. A pre-construction notification may be voluntarily submitted in cases where pre-construction notification is not required and the project proponent wants confirmation that the activity is authorized by nationwide permit.

Preservation: The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

Re-establishment: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.

Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.

Riffle and pool complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a course substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

Riparian areas: Riparian areas are lands next to streams, lakes, and estuarine-marine shorelines. Riparian areas are transitional between terrestrial and aquatic ecosystems, through which surface and subsurface hydrology connects riverine, lacustrine, estuarine, and marine waters with their adjacent wetlands, non-wetland waters, or uplands. Riparian areas provide a variety of ecological functions and services and help improve or maintain local water quality. (See general condition 23.)

Shellfish seeding: The placement of shellfish seed and/or suitable substrate to increase shellfish production. Shellfish seed consists of immature individual shellfish or individual shellfish attached to shells or shell fragments (i.e., spat on shell). Suitable substrate may consist of shellfish shells, shell fragments, or other appropriate materials placed into waters for shellfish habitat.

Single and complete linear project: A linear project is a project constructed for the purpose of getting people, goods, or services from a point of origin to a terminal point, which often involves multiple crossings of one or more waterbodies at separate and distant locations. The term “single and complete project” is defined as that portion of the total linear project proposed or accomplished by one owner/developer or partnership or other association of owners/developers that includes all crossings of a single water of the United States (i.e., a single waterbody) at a specific location. For linear projects crossing a single or multiple waterbodies several times at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

Single and complete non-linear project: For non-linear projects, the term "single and complete project" is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. A single and complete non-linear project must have independent utility (see definition of "independent utility"). Single and complete non-linear projects may not be "piecemealed" to avoid the limits in an NWP authorization.

Stormwater management: Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse effects of changes in land use on the aquatic environment.

Stormwater management facilities: Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and best management practices, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

Stream bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

Stream channelization: The manipulation of a stream's course, condition, capacity, or location that causes more than minimal interruption of normal stream processes. A channelized jurisdictional stream remains a water of the United States.

Structure: An object that is arranged in a definite pattern of organization. Examples of structures include, without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other manmade obstacle or obstruction.

Tidal wetland: A tidal wetland is a jurisdictional wetland that is inundated by tidal waters. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line.

Tribal lands: Any lands title to which is either: 1) held in trust by the United States for the benefit of any Indian tribe or individual; or 2) held by any Indian tribe or individual subject to restrictions by the United States against alienation.

Tribal rights: Those rights legally accruing to a tribe or tribes by virtue of inherent sovereign authority, unextinguished aboriginal title, treaty, statute, judicial decisions, executive order or agreement, and that give rise to legally enforceable remedies.

Vegetated shallows: Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

Waterbody: For purposes of the NWPs, a waterbody is a "water of the United States." If a wetland is adjacent to a waterbody determined to be a water of the United States, that waterbody and any adjacent wetlands are considered together as a single aquatic unit (see 33 CFR 328.4(c)(2)).

ADDITIONAL INFORMATION

Information about the U.S. Army Corps of Engineers Regulatory Program, including nationwide permits, may also be accessed at http://www.swt.usace.army.mil/Missions/Regulatory.aspx or http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits.aspx