

RESTORE Council FPL 3 Proposal Document

General Information

Proposal Sponsor:

Alabama Department of Conservation and Natural Resources

Title:

Perdido River Land Conservation and Habitat Enhancements

Project Abstract:

The proposed project consists of the acquisition and management of approximately 10,000-12,000 acres in the Perdido Watershed, located in Baldwin County, AL. One potential parcel identified for acquisition is known as the Magnolia South Tract. At 11,434 acres, this potential parcel is adjacent to existing conservation lands in public ownership in the Perdido Watershed, with extensive frontage along the Perdido River. This, or other suitable parcel(s), would supplement an existing 17,337 acres in public ownership in the watershed in Alabama, and roughly 12,400 acres in public ownership in the Florida portion of the watershed. Upon acquisition, the Alabama Department of Conservation and Natural Resources (ADCNR) would conduct habitat management and stewardship on the tract, which could include prescribed burning, invasive species removal, longleaf pine restoration, and protection and habitat enhancements for species including the gopher tortoise. Acquired land would become part of the Perdido Wildlife Management Area and be accessible to the public for recreational use.

FPL Category:

Cat1: Planning & Implementation / Cat2: Implementation

Activity Type: Project

Program: N/A

Co-sponsoring Agency(ies): N/A

Is this a construction project?: Yes

RESTORE Act Priority Criteria ^(I)

(I) Projects that are projected to make the greatest contribution to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region, without regard to geographic location within the Gulf Coast region.

(II) Projects contained in existing Gulf Coast State comprehensive plans for the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

Priority Criteria Justification:

Located in Southern Alabama (70% of the watershed) and Northwest Florida (30% of the watershed), the Perdido Watershed covers approximately 1,100 sq. miles (NFWFMD 2017b). The proposed project would increase habitat connectivity, thus helping to maintain genetic diversity for target species, and maintain key ecological processes such as succession, migration and the ability of a species to meet its habitat requirements (Crouzeilles et al. 2013, Ayram et al. 2015, Baldera et al. 2018). A recent 18-year study in a pine savanna ecosystem found that by increasing habitat connectivity and reducing fragmentation, biodiversity increased by 14% in connected habitats versus fragmented habitats, underscoring the critical role that large-size and connected habitats play in preserving and enhancing biodiversity (Damschen et al. 2019). Projects that enhance habitat connectivity will contribute greatly to the restoration and protection

of the target species and habitats; improving habitat connectivity in the watershed will provide large-scale benefits relative to the size of the watershed (PC1).

Habitat loss, degradation and fragmentation threaten species worldwide, and contribute to declines in biodiversity (Weigand et al., 2005). Preserving and enhancing biodiversity can be achieved via a number of actions, including active restoration of degraded areas, or by preserving, conserving, and actively managing/enhancing habitats and the species that live there (Ferraro and Simpson 2001). Undeveloped areas in the Perdido watershed act as natural filters, protecting water quality of coastal waters that sustain wildlife such as recreationally and commercially important fish and oyster resources (NFWFMD 2017b). Habitat loss as well as potential changes in water quality are two stressors associated with changes in land use as watersheds like the Perdido develop into more urbanized areas. The proposed acquisition(s) would increase the current acreage of property in state ownership in the Alabama portion of the watershed from approximately 17,000 to over 28,000, significantly reducing the development potential in the watershed. The acreage of the proposed acquisition(s) is large-scale in nature, especially when considered in the context of the size of the watershed (PC2).

Project Duration (in years): 10

Goals

Primary Comprehensive Plan Goal:
Restore and Conserve Habitat

Primary Comprehensive Plan Objective:
Restore , Enhance, and Protect Habitats

Secondary Comprehensive Plan Objectives:
Promote Natural Resource Stewardship and Environmental Education

Secondary Comprehensive Plan Goals: N/A

PF Restoration Technique(s):
Land Acquisition; Habitat Management and Stewardship

Location

Location:
Proposed acquisition(s) and habitat management actions would be located within the Perdido Watershed near the Perdido River in Baldwin County, Alabama.

HUC8 Watershed(s):
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Perdido)

State(s):
Alabama

County/Parish(es):
AL - Baldwin

Congressional District(s):
AL - 1

Narratives

Introduction and Overview:

Located in Southern Alabama (70 percent of the watershed) and Northwest Florida (30 percent of the watershed), the Perdido Watershed covers approximately 1,100 square miles and is dominated by the 63 mile-long Perdido River, designated as an outstanding Florida waterway (NFWFMD 2017b). The Perdido River provides most of Perdido Bay's freshwater. The watershed includes floodplain forests, hydric pine forests, longleaf pine forests, and freshwater wetlands.

The Perdido Watershed plays a critical role in the health of the ecosystem of Southeast Alabama and Northwest Florida. The components of the watershed, including the tributaries, floodplains, bayous, and wetlands of the Perdido provide water quality and quantity protection through healthy floodplains; healthy floodplains store and disperse runoff from storms and recharge aquifers. Undeveloped areas act as natural filters, protecting water quality of coastal waters that sustain wildlife such as recreationally and commercially important fish and oyster resources. The wetlands of the Perdido Watershed and coastal barrier islands also provide resiliency and protection against climate risks, hurricanes, and other storm events (NFWFMD 2017b).

Stressors in the watershed include water quality issues emanating from nonpoint source pollution, including the use of onsite septic systems and runoff associated with agriculture and silviculture activities (NFWFMD 2017b). Land use conversion and urbanization have contributed to the loss of habitats, including 80 percent of historic seagrass habitats, and have impaired the water quality of waterbody segments in both Alabama and Florida (Kirschenfeld et al. 2007).

This project proposes to acquire and place into state conservation management approximately 10,000-12,000 acres in the Perdido Watershed. The parcel(s) contemplated are currently in silviculture. ADCNR has been engaged in conversation with a landowner about potential acquisition, and as of January 1, 2020, a Yellowbook appraisal is being finalized. Upon acquisition, ADCNR would develop a management plan to identify and prioritize management and restoration activities, with an emphasis on enhancement and protection of gopher tortoise (*Gopherus polyphemus*) habitat. The proposed project contributes toward the Council's Comprehensive Plan goal to Restore and Conserve Habitat as the proposed project will result in the placement of several thousand acres of habitat into conservation (eliminating potential for future development). Management activities will contribute to the Council's goal of Replenishing and Protecting Living Coastal and Marine Resources through activities such as planting of native species and the enhancement of habitats to support native flora such as the longleaf pine (*Pinus palustris*) and fauna such as the gopher tortoise (*Gopherus polyphemus*), a keystone species in the longleaf ecosystem.

Alabama contemplates seven activities under this project with a total project cost of \$28,000,000.

Activity 1. Acquire Magnolia South Tract (or other suitable parcel(s)) through fee-simple acquisition.

Stressors addressed by this activity include the potential for future impacts associated with development of the tract, water quality impacts associated with silviculture activities on the site, and habitat fragmentation. Related to a reduction in those stressors, environmental benefits include: increased habitat connectivity, improved water quality, and maintenance of pervious cover (prevented development).

Activity 2. Develop a management plan for acquired lands. The management plan will be based on/a supplement to the Alabama Forever Wild Land Trust Management Plan for Perdido Longleaf Hills Tract and Swift Addition.

Goal of the management plan: inventory, manage, enhance and protect the biodiversity of the natural communities now on the acquired land and those which may naturally succeed the existing communities

following habitat enhancement activities with an emphasis on those species found within the longleaf pine ecosystem.

This goal will be achieved via completion of the following items in the management plan:

- a. Inventory the flora and faunal species and habitat characteristics of the tract;
- b. Identify and prioritize habitat enhancement and management activities for the tract;
- c. Identify management activities to provide for controlled public access to the tract consistent with the primary goal of the project to restore and enhance habitats;
- d. Determine public recreation demand for use of the tract and formulate measures to accommodate the demand while providing full protection of the resource;

Activity 3. Conduct immediate management activities for security purposes, including protection of boundaries, marking property lines, construction of a barn for equipment storage and security, and installation of security gates.

Activity 4. Conduct habitat management and restoration activities, which could include the following:

- a. Select, minimal thinning of existing forested areas to facilitate future management and restoration actions.
- b. Conduct minimal hydrologic restoration activities to include the mitigation of impacts of ditches and/or roads that are interrupting sheet flow.
- c. Prescribed burning and preparation of sites for burning, which could include vegetation management activities to reduce fuel load.
- d. Invasive species removal.
- e. Planting of native species including longleaf pine and groundcover species.
- f. Implementation of management activities for priority species, including longleaf pine and gopher tortoise.

Stressors addressed by this activity include the potential reduction of water quality impacts associated with silviculture activities on the site, and habitat fragmentation, loss, and degradation. Related to a reduction in those stressors, environmental benefits include: increased habitat connectivity, enhanced habitat quality, improved water quality, and support of native species.

Activity 5. Conduct education and outreach activities including the erection of signage and an educational display about the Perdido Watershed and the Perdido Blueway Trail.

Activity 6. Identify and prioritize (in coordination with watershed stakeholders and entities) additional projects in the Perdido Watershed for funding in future FPLs that could further enhance habitat connectivity, improve water quality and/or facilitate the development of the assessment of restoration progress in the watershed.

Together, these activities meet the following Council Comprehensive Plan Objectives: Objective 1: Restore, Enhance and Protect Habitat—through acquisition of undeveloped forest and wetland areas, this project will serve to protect existing habitats from development pressure. Additionally, restoration and enhancement activities proposed will serve to enhance ecosystem form and function of both wetland and forest habitats. Secondary objective that this project addresses is: Objective 6: Promote Natural Resource Stewardship and Environmental Education. The project will enhance habitat for the gopher tortoise and other species that depend on the tortoise in its role as a keystone species. Additionally, Alabama proposes to incorporate education features on the property including signage and an educational kiosk to support an

increased understanding of the value of habitat conservation and how people can participate in conserving and protecting valuable habitats.

Timeline for completion is estimated to be up to ten years total. Acquisition activities would be complete by the end of Year 2, with immediate management activities (Activity 3) taking place upon completion of acquisition. The management plan would be completed in Year 2 and habitat restoration, enhancement and management activities would proceed in years 3-10.

Education and outreach partners potentially include the Pensacola and Perdido Bay Estuary Program, the State of Florida, and local non-governmental organizations active in the area such as The Nature Conservancy.

The Perdido geographic area was included in the RESTORE Council Planning Framework, and the proposed project is consistent with identified restoration approaches and techniques.

Proposed Methods:

Fee simple acquisition of these lands and ownership by the ADCNR is preferred over acquisition by conservation easement. These habitats typically require active management to maintain and improve habitat condition. Introduction of fire, restoration of hydrology where it has been altered by previous land use, and control of exotic and invasive species is often required, and a state or federal owner is more likely to invest the needed time and money to maintain this level of management. In addition, a public owner is generally in a better position to offer an appropriate level of public access to these special places for recreation and education.

Following acquisition, a management plan will be developed based on the existing Perdido WMA Management Plan (ADCNR 2012) that will identify and prioritize management and stewardship activities. The potential activities could include: (1) Select, minimal thinning of existing forested areas to facilitate future management and restoration actions; (2) Conduct minimal hydrologic restoration activities to include the mitigation of impacts of ditches and/or roads that are interrupting sheet flow; (3) Prescribed burning and preparation of sites for burning, which could include vegetation management activities to reduce fuel load; (4) Invasive species removal; (5) Planting of native species including longleaf pine and groundcover species; and (6) Implementation of management activities for priority species, including longleaf pine and gopher tortoise. These activities are proven to be effective in similar habitats and have been implemented successfully across the Southeastern United States. (Outcalt and Brockway, 2010; NRCS 2012; Kirschman, 2018; USFWS (N.D.).

Environmental Benefits:

This area of Baldwin County is rapidly urbanizing, with significant development pressures. Acquiring this property in the Perdido watershed can reduce the amount of land available for development and the associated ecosystem stressors that are the inevitable result of urbanization.

If successful, this acquisition, or acquisition of other suitable parcel(s) with similar connectivity benefits would connect with public lands to the north and south. The Perdido Wildlife Management Area is located to the north, and Forever Wild Land Trust holdings as well as the Lillian Swamp Mitigation Bank are to the south. Additionally, this action would serve as a cornerstone for a broader ecosystem conservation and restoration effort where stressors affecting water quality and habitat quality and function could be addressed synergistically. Together, all of these lands are under active management based on a watershed-specific management plan. More information about the Perdido Watershed Management Area can be found at <https://www.alabamaforeverwild.com/perdido-river-wma-spotlight>.

Upon acquisition and with subsequent management and stewardship, the overall project outcomes would

be increased habitat connectivity and quality, enhanced recreational access, and increased acreage of land under conservation protection.

As coastal development pressure increases, the need to preserve species and habitats is likely to increase. Acquiring lands for conservation and management purposes is generally accepted as a cost-effective method to maintain and improve ecosystem form and function. Although in some cases, the use of conservation easements may be less expensive in the short-term, fee simple acquisition provides managers the opportunity to conduct restoration activities on the site that could be expected to provide additional habitat and species benefits. The development of a management plan prior to implementation of stewardship activities will allow restoration managers to identify, prioritize, and plan activities that will be most effective at achieving desired habitat goals in the most cost-effective manner possible.

Metrics:

Metric Title: HC003 : Land acquisitions - Acres acquired in fee : Habitat Conservation

Target: 10,000 acres

Narrative: This metric aligns with Goal 1 of the Comprehensive Plan: Restore and Conserve Habitat. The purpose of the metric is to verify that acquisition has been completed, the performance measure will be an executed deed. Upon transfer of the parcel into ADCNR ownership, this metric will be complete. The outcome will be an increase in acres under conservation management in the Perdido Watershed.

Metric Title: HM006 : Improved management practices - Acres under improved management

Target: 10,000 acres

Narrative: This metric aligns with Goal 1 of the Comprehensive Plan: Restore and Conserve Habitat. The purpose of the metric is to verify that the acreage acquired is being managed for conservation purposes. The performance measure will be an executed deed with appropriate conservation language. Additionally, ADCNR will provide an update annually on the total number of acres in active management and the types of activities conducted. The outcome will be an increase in acres under conservation management in the Perdido Watershed.

Metric Title: PRM003 : Management or Governance Planning - # plans developed : Planning, Research, Monitoring

Target: 1 plan

Narrative: This metric aligns with Goal 1 of the Comprehensive Plan: Restore and Conserve Habitat. The purpose of the metric is to verify that a management plan to guide habitat management activities has been developed. Upon completion, ADCNR will provide a copy of the Management Plan to the Council.

Metric Title: RES005 : Recreational improvements - # improvements to recreation infrastructure

Target: 4 improvements

Narrative: This metric aligns with Goal 1 of the Comprehensive Plan: Restore and Conserve Habitat and aligns with Objective 6: Promote Natural Resource Stewardship and Environmental Education. The target performance criteria for this project is the placement of 4 signs and 2 kiosks (2 signs at each kiosk and one standalone sign) that provide information about the project and the Perdido Watershed. Successful completion of this metric will occur once signs and kiosks have been placed on site.

Risk and Uncertainties:

Given the potential development pressure for this riparian corridor, strategic land conservation and land-use management are low risk methods to mitigate impacts from future development. Uncertainties arise from the balance of providing adequate buffers from conservation lands protecting against the unknown future extent and location of urbanization impacts.

Additional risks include being unable to acquire the specific tracts currently contemplated. If negotiations with the seller are unsuccessful, Alabama would identify additional parcels with similar benefits in terms of habitat connectivity within the watershed. ADCNR is actively engaged in conversations with a landowner about potential acquisition and a draft Yellowbook appraisal is being finalized (expected early 2020). If negotiations are not successful, ADCNR would identify alternate parcel(s) for acquisition and management based on the following criteria: (a.) Parcel(s) are currently nominated or could be nominated for acquisition into the State's Forever Wild program; (b.) Parcel(s) are located in the Perdido Watershed; (c.) Parcel(s) are adjacent to or near existing lands under conservation management; (d.) Habitat characteristics are similar to target parcel such that management measures could be expected to yield the same or similar benefits. Utilizing these criteria, there are currently a number of alternative parcels that could be suitable for acquisition and management.

Wang and Kalin (2018) examined different land use change scenarios in concert with projected climate change impacts in the Wolf Bay watershed (within the Perdido Watershed) related to changes in Total Suspended Solids (TSS), Total Nitrogen (TN), and Total Phosphorous (TP). Land use change would be expected to result in a decrease in TN as agricultural lands are converted to urban uses, but climate change is expected to increase precipitation and flows, which will impact pollution, particularly in spring and fall. Overall, when considering both projected changes in land use as well as climate change, TSS and TP are expected to increase, while TN is expected to decrease. Overall increases in surface runoff and decreases in baseflows are also predicted. Projects like large-scale habitat acquisition and stewardship consider these projected land use changes. Additionally, project implementors will take into account future projected climate change scenarios when developing management actions. In particular, protecting riparian buffers to lower sediment loading could help offset these anticipated future impacts.

In general, land acquisition is a low-risk method to preserve and protect critical habitats. The stewardship activities being proposed are proven to be effective as well as cost-effective.

Monitoring and Adaptive Management:

Monitoring related to Metric 1 HC003: Land acquisition - Acres acquired in fee will take place immediately following acquisition of the parcel(s). Acres acquired will be verified by survey during the acquisition process, a standard procedure for evaluating area.

Monitoring related to Metric 2, HM006: Habitat management and stewardship - Acres under improved management will be monitored immediately following acquisition of the parcel. Area will be determined by habitat type via the use of aerial imagery, as discussed in DWH Trustees (2017). Results will be validated via ground truthing. Habitat management activities will be reported on an annual basis beginning in the year stewardship activities begin (estimated in Years 3-10). ADCNR will also provide information on the type and extent of measures implemented as well (e.g., X acres of prescribed burning, X number of native species planted).

Monitoring related to Metric 3, PRM003 will be complete when the management plan is developed, provided to Council staff, and made available publicly. This will likely take place in Year 2, though the timing could change based on acquisition time for the parcel.

Monitoring related to Metric 4, RES005 - Recreational improvements - # improvements to recreational infrastructure will take place following completion and erection of the signage. ADCNR will provide a summary of sign wording, location information and photographs of all signs as the method for determining compliance with this metric.

Data Management:

To the extent practicable, all environmental and biological data generated during monitoring activities will

be documented using standardized field datasheets. If standardized datasheets are unavailable or not readily amendable to record project-specific data, then project-specific datasheets will be drafted prior to conducting any project monitoring activities. Original hardcopy datasheets, notebooks, and photographs will be retained by the ADCNR. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file that describes when the file was created and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy will be made and the original preserved. Data will be made publicly available and accessible on a website that is still to be determined.

Collaboration:

Through the FPL collaborative planning process, Alabama has identified an opportunity for a large-scale, multi-member, coordinated program in the Perdido Watershed. The States of Alabama and Florida share the watershed and the Perdido River as a border. Conservation work and habitat conservation benefit both states and provide future opportunities for additional collaboration around potential projects such as the expansion of the Perdido Canoe Trail and additional water quality and habitat restoration activities throughout the watershed. The State of Alabama, via the Mobile Bay National Estuary Program, has funded the development of a Perdido watershed management plan. The Pensacola and Perdido Bay Estuary Program in Florida will also work to identify priority conservation activities in the watershed. This proposed project supports existing conservation efforts and can anchor future projects throughout the watershed due to the project's central location in the watershed.

Public Engagement, Outreach, and Education:

Public comments received at the Alabama Restoration Summit (November 2018) as well as public meetings for the Council framework indicated broad support for work in the watershed. A recent (September 2019) NRDA public meeting in Alabama featured a different proposed acquisition in the Perdido Watershed, and public support for that project and projects in the Perdido watershed more generally received positive comments. Excerpt from recent (Sept 2019) public comment received on a similar project proposed in the Perdido Watershed: "You have seen me before and I'm from Florida but we share a watershed. We share a couple. And I can't thank you enough from the bottom of my heart for including the Molpus Tract in this property... if we get people out in the water and in the resource, they will understand how restoring Longleaf impacts water quality which then flows into the bay which then restores the Gulf. And the only way we are going to do that is to give people access..."

Leveraging:

Funds: \$5,075,840

Type: Adjoining

Status: Proposed

Source: NRDA AL TIG Draft Restoration Plan III

Source Type: Other

Description: The DWH NRDA AL TIG recently published Draft Restoration Plan III, which proposes two projects in the Perdido Watershed: the acquisition of a large tract of land for conservation (MOLPUS Tract) and recreational access and a public access and shoreline protection project in Perdido Beach, AL.

Funds: \$3,000,000.00

Type: Building on Others

Status: Received

Source: NFWF-GEBF, RESTORE Bucket 2

Source Type: Other

Description: In the 2015 Initial FPL, the Council funded the development of watershed plans for this geographic area, the establishment of an estuary program, and the implementation of submerged aquatic vegetation (SAV) restoration and monitoring. Investments in the Perdido River and Bay area have also been made by other federal, state, and non-profit organizations. For example, projects have been funded to restore dune habitat and to construct and enhance artificial reef habitat in waters offshore of Perdido Bay, through DWH NRDA (DWH NRDA 2015, DWH NRDA 2016b) and NFWF GEBF respectively.

Environmental Compliance:

This proposal involves both planning and implementation activities. FPL Category 1 planning actions will be covered by the Council's NEPA Categorical Exclusion (CE) for planning, research or design activities (Section 4(d)(3) of the Council's NEPA Procedures). The Council may also use member NEPA CEs where appropriate (Section 4(d)(4) of the Council's NEPA Procedures). Category 1 implementation actions will be covered by use of four Council member CEs. These CEs are: USDA's CE- 36 CFR 220.6(d)(6) and FWS's CEs- 516 DM 6 (B)(3), 516 DM 6 (B)(4), and 516 DM 6 (B)(6). Category 2 implementation activities will be subject to additional environmental compliance review as appropriate.

Budget

Project Budget Narrative:

A total of \$28,000,000 is being requested from FPL 3a to fund the acquisition and management of approximately 10,000-12,000 acres in the Perdido watershed. The total amount of funding requested as Category 1 is \$26,880,000 and the total amount of funding requested as Category 2 is \$1,120,000. The funds being requested are broken out into Category 1 planning, Category 1 implementation, and Category 2 implementation activities. Approximately 5% of the funds will be attributed to Category 1 planning funds. Planning activities will include staff time for grant management and project oversight. An estimated 86% of this request is for implementation activities consisting of both Category 1 and Category 2 funds. Category 1 project implementation funding will involve acquisition and due diligence, staff time for stewardship activities, travel, equipment and supplies, and habitat management and restoration activities such as prescribed burning and the planting of native species. An estimated 4 % of this request is for Category 2 project implementation activities allocated to activities such as selective thinning, invasive species removal, and minimal hydrologic restoration work. An estimated 5% is being requested for project management activities. An estimated 0.2% is being requested for reporting on monitoring and adaptive management activities, and .05% is being requested for data management activities. Finally, approximately 3.75% of funds are being requested for contingency planning.

Total FPL 3 Project/Program Budget Request: \$28,000,000.00

Estimated Percent Monitoring and Adaptive Management: 0.2 %

Estimated Percent Planning: 5 %

Estimated Percent Implementation: 86 %

Estimated Percent Project Management: 5 %

Estimated Percent Data Management: 0.05 %

Estimated Percent Contingency: 3.75 %

Is the Project Scalable?

Yes

If yes, provide a short description regarding scalability:

The number of years of active stewardship and management can be scaled down. However, given that management is a relatively small portion of the budget compared to acquisition costs, a longer period of management will provide a greater return on investment.

Environmental

Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g., title and date of document, permit number, weblink etc.)
National Environmental Policy Act	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Section 4(d)(3) of Council NEP Procedures, USDA CE- 36 CFR 220.6(d)(6); and FWS CEs- 516 DM 6 (B)(3), 516 DM 6 (B)(4), and 516 DM 6 (B)(6)
Endangered Species Act	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	FWS letter dated Jan. 15, 2020
National Historic Preservation Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	USDA CE- 36 CFR 220.6(d)(6); and FWS CEs- 516 DM 6 (B)(3), 516 DM 6 (B)(4), and 516 DM 6 (B)(6)
Magnuson-Stevens Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Fish and Wildlife Coordination Act	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	FWS letter dated Jan. 15, 2020
Coastal Zone Management Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	If future restoration actions require authorization, coordination will be initiated.
Coastal Barrier Resources Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Farmland Protection Policy Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Clean Water Act Section 404	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	If future restoration actions require authorization, coordination will be initiated.
River and Harbors Act Section 10	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	If future restoration actions require authorization, coordination will be initiated.
Clean Water Act Section 401	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	If future restoration actions require authorization, coordination will be initiated.
Marine Protection, Research and Sanctuaries Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Marine Mammal Protection Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
National Marine Sanctuaries Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Migratory Bird Treaty Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Bald and Golden Eagle Protection Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Clean Air Act	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Maps, Charts, Figures



Figure 1: Map of the Perdido Bay watershed showing the proposed acquisition area and the parcel of interest, known as Magnolia South.

Bibliography

Alabama Department of Conservation (ADCNR). 2012. Alabama Forever Wild Land Trust Management Plan. Accessed October 1, 2019.

http://conservationgis.alabama.gov/Documents/ManagementPlans/FW48_Perdido.pdf.

Alabama Department of Conservation (ADCNR). 2019. Website: Wildlife Management Areas. Accessed October 6, 2019. <https://www.outdooralabama.com/hunting/wildlife-management-areas>.

Ayram, C. A. C., Mendoza, M. E., Etter, A., & Salicrup, D. R. P. (2015). Habitat connectivity in biodiversity conservation. *Progress in Physical Geography: Earth and Environment*, 40(1), 7–37. doi: 10.1177/0309133315598713

Baldera, A., Hanson, D. A., & Kraft, B. (2018). Selecting indicators to monitor outcomes across projects and multiple restoration programs in the Gulf of Mexico. *Ecological Indicators*, 89, 559–571. doi: 10.1016/j.ecolind.2018.01.025

Crouzeilles R, Lorini M.L. and Grelle C.E.V.(2013). The importance of using sustainable use protected areas for functional connectivity. *Biological Conservation* 159: 450–457.

Damschen, E. I., Brudvig, L. A., Burt, M. A., Fletcher, R. J., Haddad, N. M., Levey, D. J., ... Tewksbury, J. J. (2019). Ongoing accumulation of plant diversity through habitat connectivity in an 18-year experiment. *Science*, 365(6460), 1478–1480. doi: 10.1126/science.aax8992

DWH NRDA (Deepwater Horizon Natural Resource Damage Assessment Trustees). 2015. “Phase I Early Restoration Plan - Florida Boat Ramp Enhancement and Construction Project.” Accessed Jan. 2019. National Oceanic and Atmospheric Administration on Behalf of the Deepwater Horizon National Resource Damage Assessment Trustees. Silver Spring, MD. Accessed 10 Jan. 2019. <https://www.gulfspillrestoration.noaa.gov/sites/default/files/wpcontent/uploads/2012/04/FloridaBoatRampF.pdf>.

DWH NRDA (Deepwater Horizon Natural Resource Damage Assessment Trustees). 2016b. “Phase V Early Restoration Project - Florida Coastal Access Project.” Deepwater Horizon National Resource Damage Assessment Trustees. Silver Spring, MD. Accessed 11 Jan. 2019. https://www.gulfspillrestoration.noaa.gov/sites/default/files/wp-content/uploads/Final-PhaseV-Factsheet_Feb-2016.pdf.

DWH NRDA (Deepwater Horizon Natural Resource Damage Assessment Trustees). 2017. Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December. Available: <http://www.gulfspillrestoration.noaa.gov/>.

Ferraro, P.J. and Simpson, David R. (2001). Cost-effective Conservation: A Review of What Works to Preserve Biodiversity. Resources for the Future.

Hanski I. (1998). Metapopulation dynamics. *Nature*, 396, 41–49. <https://doi.org/10.1038/23876>.

Kirschenfeld, T., Turpin, R. K., & Handley, L. R. 2007. “Perdido Bay.” In *Seagrass Status and Trends in the Northern Gulf of Mexico: 1940-2002*, Edited by L. Handley, D. Altsman, and R. DeMay. U.S. Geological Survey Scientific Investigations Report 2006–5287, 267, U.S. Department of the Interior. Washington, DC. (Report 855-R-04-003) Accessed 10 Jan. 2019. <https://pubs.usgs.gov/sir/2006/5287/pdf/PerdidoBay.pdf>.

Kirschman, Julia E., comp. 2018. Proceedings of the 19th biennial southern silvicultural research conference. e-Gen. Tech. Rep. SRS-234. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 444 p.

Natural Resources Conservation Service (NRCS). 2012. Gopher Tortoise Habitat Improvement Alabama Guide Sheet No. AL645H. Accessible at: <https://efotg.sc.egov.usda.gov/references/public/AL/al645H.pdf>.

NFWFMD (Northwest Florida Water Management District). 2017b. "Perdido River and Bay. Surface Water Improvement and Management (SWIM) Plan." in NFWFMD Program Development Series. Northwest Florida Water Management District. Tallahassee, FL. Accessed 10 Jan. 2019.
https://www.nfwwater.com/content/download/16009/110908/Perdido%20River%20and%20Bay%20SWIM%20Plan%20October%202017_erata.pdf.

Outcalt, K. W., & Brockway, D. G. (2010). Structure and composition changes following restoration treatments of longleaf pine forests on the Gulf Coastal Plain of Alabama. *Forest Ecology and Management*, 259(8), 1615–1623. doi: 10.1016/j.foreco.2010.01.039

River Friends. "Canoe Launch Improves River Access, Reduces Bank Erosion." (n.d.). Accessed October 5, 2019. <https://riverfriends.org/canoe-launch-improves-river-access-reduces-bank-erosion/>.

Samiappan, S.; Shamaskin, A.; Liu, J.; Roberts, J.; Linhoss, A.; Evans, K. (2019). Land Conservation in the Gulf of Mexico Region: A Comprehensive Review of Plans, Priorities, and Efforts. *Land* 2019, 8, 84.

U.S. Fish and Wildlife Service (USFWS). No date. Recommended Habitat Management Guidelines for the Gopher Tortoise in Longleaf Pine Habitat. Available at:
<https://www.fws.gov/southeast/pdf/guidelines/recommended-habitat-management-guidelines-for-the-gopher-tortoise-in-longleaf-pine-habitat.pdf>.

Wang, R. & Kalin, L. (2018). Combined and synergistic effects of climate change and urbanization on water quality in the Wolf Bay watershed, southern Alabama. *Journal of Environmental Sciences* 64: 107-121.

Wiegand, T., Revilla, E., & Moloney, K. A. (2005). Effects of Habitat Loss and Fragmentation on Population Dynamics. *Conservation Biology*, 19(1), 108–121. doi: 10.1111/j.1523-1739.2005.00208.x