

RESTORE Council FPL 3 Proposal Document

General Information

Sponsor:

U.S. Department of Agriculture

Title:

Enhancing Gulf Waters through Forested Watershed Restoration

Project Abstract:

The U.S. Department of Agriculture is requesting \$30.4M in Council-Selected Restoration Component funding for the proposed Enhancing Gulf Waters through Forested Watershed Restoration program. This would include \$1.5M in planning funds as FPL Category 1, as well as a separate \$28.9M implementation component as an FPL Category 2 priority for potential funding. The program will support the primary RESTORE Comprehensive Plan goal to restore water quality and quantity through activities to restore private and public forests by providing technical and financial assistance to private landowners and communities in watersheds where forest resources are instrumental to the health of the Gulf of Mexico. A coordinated cross-boundary effort will be led by state forestry agencies in Alabama, Florida, and Mississippi, leveraging the funding and activities of other organizations that are well established in the RESTORE zone. Activities include social marketing techniques to effectively reach landowners, implementation of best management practices, and use of science-based decision support tools to inform forest restoration investments and quantify outcomes.

A healthy Gulf stems from healthy estuaries, healthy estuaries depend on healthy watersheds, healthy watersheds flow from healthy forests, and healthy forests require engaged landowners. Anticipated environmental benefits from this program include improvements to water quality and quantity and wildlife and threatened and endangered species habitat through professional forest management, avoided land use conversion, and increased forest cover. Program duration is 7 years.

FPL Category: Cat1: Planning/ Cat1: Implementation

Activity Type: Program

Program: Enhancing Gulf Waters through Forested Watershed Restoration

Co-sponsoring Agency(ies):

MS

AL

FL

DOI/BIA

Is this a construction project?:

No

RESTORE Act Priority Criteria:

(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) Large-scale projects and programs that are projected to substantially contribute to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast ecosystem.

Priority Criteria Justification:

The Gulf Region is dominated by forest cover. In Mississippi, Alabama, and Florida alone there are more than 23 M acres of forest and 66% of those forests are privately owned (Hewes et al., 2017). Decades of research (Jackson et al., 2004; Lockaby et al. 2013) show that forests provide the cleanest and most stable water supply compared to other land uses (Giri et al., 2016; Brogna et al., 2018). Lasting improvements to water quality and quantity cannot be achieved without addressing the needs of this diminishing and threatened resource. The logic model for this Program rests on the fact that a healthy Gulf stems from healthy estuaries and healthy estuaries depend on healthy watersheds. Healthy watersheds are dependent on healthy forests which are dependent on engaged landowners. Shared stewardship is the key to success. The Program uses new, proven social marketing techniques to double or triple the engagement of private landowners over traditional outreach. It expands on current techniques for providing landowners with the financial and technological resources they need to protect and better manage their forests. Modest investments now will sustain water quality and quantity benefits for decades to come. To maximize expected impacts, science-based decision support tools using the SWAT model (Arnold et al., 2012) and other data, will inform forest restoration investments and quantify long-term water quality and quantity outcomes. SWAT has been well tested in more than 250 peer reviewed publications (Gassman et al., 2007). This multi-state, landscape level program will help ensure the sustainability and health of the forested watersheds and, therefore, water quality and quantity in the Gulf. The States have agreed to a common suite of best management practices (BMPs) that are time tested, scientifically proven, and overseen by trained professional foresters. Landscape scale benefits will be achieved through standardized restoration and monitoring techniques.

Project Duration (in years): 7

Goals

Primary Comprehensive Plan Goal:

Restore Water Quality and Quantity

Primary Comprehensive Plan Objective:

Restore, Improve, and Protect Water Resources

Secondary Comprehensive Plan Objectives:

Restore , Enhance, and Protect Habitats

Secondary Comprehensive Plan Goals:

Restore and Conserve Habitat

PF Restoration Technique(s):

Protect and conserve coastal, estuarine, and riparian habitats: Habitat management and stewardship

Reduce excess nutrients and other pollutants to watersheds: Agriculture and forest management

Reduce excess nutrients and other pollutants to watersheds: Stormwater management

Location

Location:

Priority watersheds as designated by State agencies including but not limited to: Pascagoula River, Biloxi Bay, Bay St. Louis, and the Pearl River (MS). Mobile Bay, Escatawpa River, Lower Alabama River (AL) Ochlocknee River and Bay, Apalachicola River, Suwannee River, Perdido River and Bay, Escambia, Blackwater, Pensacola Bay,

HUC8 Watershed(s):

South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Perdido Bay)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Choctawhatchee(Upper Choctawhatchee)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Escambia(Upper Conecuh)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Escambia(Lower Conecuh)
South Atlantic-Gulf Region(Alabama) - Alabama(Lower Alabama)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Mobile Bay-Tombigbee(Lower Tombigbee)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Mobile Bay-Tombigbee(Mobile-Tensaw)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Mobile Bay-Tombigbee(Mobile Bay)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Perdido)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Lower Leaf)
South Atlantic-Gulf Region(St. Johns) - St. Johns(Oklawaha)
South Atlantic-Gulf Region(St. Johns) - St. Johns(Lower St. Johns)
South Atlantic-Gulf Region(Suwannee) - Aucilla-Waccasassa(Waccasassa)
South Atlantic-Gulf Region(Suwannee) - Aucilla-Waccasassa(Econfina-Steinhatchee)
South Atlantic-Gulf Region(Suwannee) - Suwannee(Lower Suwannee)
South Atlantic-Gulf Region(Suwannee) - Suwannee(Santa Fe)
South Atlantic-Gulf Region(Ochlockonee) - Ochlockonee(Lower Ochlockonee)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(Apalachicola)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(New)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(Apalachicola Bay)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(St. Andrew-St. Joseph Bays)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Choctawhatchee Bay)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Pensacola Bay)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(Chipola)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Yellow)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Blackwater)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Choctawhatchee(Pea)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Choctawhatchee(Lower Choctawhatchee)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Escambia(Escambia)
South Atlantic-Gulf Region(Suwannee) - Aucilla-Waccasassa(Aucilla)
South Atlantic-Gulf Region(Ochlockonee) - Ochlockonee(Apalachee Bay-St. Marks)
Lower Mississippi Region(Lower Mississippi) - Lake Pontchartrain(Eastern Louisiana Coastal)
South Atlantic-Gulf Region(Pearl) - Pearl(Bogue Chitto)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Upper Leaf)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Pascagoula)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Black)
South Atlantic-Gulf Region(Pearl) - Pearl(Middle Pearl-Silver)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Lower Chickasawhay)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Escatawpa)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Mississippi Coastal)

South Atlantic-Gulf Region(Pearl) - Pearl(Lower Pearl)

State(s):

Alabama

Mississippi

Florida

County/Parish(es):

AL - Baldwin

AL - Clarke

AL - Conecuh

AL - Covington

AL - Dale

AL - Escambia

AL - Henry

AL - Houston

AL - Mobile

AL - Monroe

AL - Washington

AL - Coffee

FL - Escambia

AL - Geneva

FL - Calhoun

FL - Clay

FL - Columbia

FL - Dixie

FL - Franklin

FL - Gadsden

FL - Gilchrist

FL - Putnam

FL - Suwannee

FL - Taylor

FL - Union

FL - Wakulla

FL - Alachua

FL - Baker

FL - Bay

FL - Bradford

FL - Gulf

FL - Hamilton

FL - Santa Rosa

FL - Walton

FL - Washington

FL - Holmes

FL - Jackson

FL - Lafayette

FL - Leon

FL - Levy

FL - Liberty

FL - Madison

FL - Okaloosa

MS - Hancock

MS - Harrison
MS - Forrest
MS - George
MS - Greene
MS - Jackson
MS - Lamar
MS - Marion
MS - Pearl River
MS - Perry
MS - Stone
MS - Walthall

Congressional District(s):

FL - 3
AL - 2
MS - 3
AL - 1
FL - 5
MS - 4
FL - 1
FL - 2
AL - 7

Narratives

Introduction and Overview:

The Gulf Region is dominated by forest cover. In Mississippi, Alabama, and Florida alone there are more than 23 million acres of forest and 66% of those forests are privately owned (Hewes et al., 2017). Decades of research (Jackson et al., 2004; Lockaby et al. 2013) show that forests provide the cleanest and most stable water supply compared to other land uses (Giri et al., 2016; Brogna et al., 2018). The Gulf of Mexico's forests, when healthy, reduce sediment and nutrient runoff, regulate surface water flows, and improve groundwater recharge relative to other land uses (Sun et al., 2004; Lockaby et al. 2013). They offer recreational opportunities, wildlife habitat, improved air quality, support for the region's economy, and are an integral part of the carbon cycle. Protecting forests at risk of conversion to more intensive uses (Klepzig et al., 2014), restoring native species (Brantley et al., 2018), controlling invasive species, managing for resilience against catastrophic loss (e.g., wildfire, hurricane, drought, pests, etc.), and restoring forested wetlands, floodplains and riparian areas are vital to the health of the Gulf (Vose et al., 2011).

This proposal seeks to establish a large-scale Program that will substantially enhance and maintain water quality and quantity by managing and restoring forested ecosystems in a three-State region, at a total cost of \$30 million. The logic model for this Program rests on the fact that a healthy Gulf stems from healthy estuaries, healthy estuaries depend on healthy watersheds, healthy watersheds flow from healthy forests, and healthy forests require active landowners and managers. Investing in the region's forests, at a landscape scale, will advance the RESTORE Council's Goal 2: Restore Water Quality and Quantity; and Objective 2: Restore, Improve and Protect Water Resources. However, benefits will accrue in all goals, especially habitat.

The stressors addressed by this Program include water quality and quantity issues related to the conversion of the Gulf Region's forests to agricultural and urban land uses and the need for more active forest management. Indeed, among the major challenges in the 21st century will be to manage forests and water resources under development pressures and other environmental factors (NRC, 2008; Vose et al., 2011; Sun et al., 2016; Vose et al., 2016; Vose et al., 2019). Providing landowners with financial and technical assistance helps them effectively and efficiently manage their forest resource, making it less attractive to sell or convert the land to other uses. They have more options and those options help avoid conversion by making ownership more economically and environmentally sustainable.

Changes to more intensive land use increase point and non-point pollution, reduce aquifer recharge, accelerate stormwater release, and increase the amount of runoff. In addition, forest fragmentation negatively impacts wildlife habitat, limits forest management options, and reduces economic viability of forest ownership and reduces community resilience. For example, smaller forested tracts can be impractical and costly to apply prescribed fire solutions while few if any loggers find it profitable to harvest small and/or disconnected parcels. The reduced economic activity leads to instability of forest-dependent communities, leading to mill closings and loss of jobs.

Over a 7-year timeline, the Program will emphasize managing and restoring forests, including urban forests, in priority watersheds in Alabama, Florida and Mississippi where the need is great, and partners stand ready to assist and leverage investments. Priority will be driven by state-level plans, strategies, and assessments such as each State's Forest Action Plan and Wildlife Action Plan. It is a scalable, science-based approach implemented on public and private lands. It involves planning, coordination, and implementation activities, including:

- Coordinated landscape-scale delivery led by State Forestry Agencies.
- Focused recruitment of forest landowners in targeted watersheds.
- Verification, maintenance, and expansion of ongoing landowner activity by helping family

forest landowners through American Tree Farm System, Forest Stewardship, Treasure Forest, etc., and community forests through Tree City USA.

- Science-based decision support from the USDA Forest Service Southern Research Station using the Soil and Water Assessment Tool (SWAT) model and other tools to inform priorities, assess and monitor project impacts, and inform adaptive-management decisions.
- Potentially using a portion of funding for an open and competitive RFP to attract more partners and leverage; extending the reach of these efforts and cultivating more innovation.
- Alignment with federal, state, and non-federal programs as a program multiplier to conduct similar work upstream of the RESTORE coastal area.
- Use of USDA practices and standards to ensure compliance with environmental and cultural resource requirements.

These activities are designed to address the identified stressors and result in improved water quality and quantity, avoided land conversion and increased forest cover, increased use of forest BMPs, improved landowner understanding of the connection between good forest management and the restoration of the Gulf, improved wildlife habitat, and added community resilience.

The Program advances the Council's commitment to leveraging resources and partnerships by building on the relationships, skills, capacities, programs, and authorities of multiple partners across the region. It involves the collaborative efforts of three State Forestry Agencies and their State Forestry Associations; USDA's Natural Resources Conservation Service and Forest Service; the American Forest Foundation, the National Fish and Wildlife Foundation, the U.S. Endowment for Forestry and Communities, and The Nature Conservancy. It leverages the funding and activities of these organizations that operate in the RESTORE Council zone and multiplies the impact of forest restoration. It is designed to accommodate financial leverage through emerging carbon programs and biodiversity efforts.

The Council's commitment to increase public engagement, inclusion, and transparency will be advanced through direct contact with private forest landowners and communities. The Program will heighten awareness of the inter-connectedness that forest-resource decisions have on the Gulf of Mexico. Enhanced technical assistance, outreach, and education will build on existing techniques and incorporate newer proven social and electronic marketing techniques. Further connecting this audience to the health of the Gulf will attract new stakeholders committed to the sustainability and resilience of forested watersheds and, therefore, lasting improvements to the water quality and quantity, wildlife habitat, community resilience, and economy of the Gulf Region.

The Council's commitment to science-based decision making will be advanced through the application of the state-of-the-art Soil and Water Assessment Tool (SWAT, Arnold et al., 2012) and other related data. SWAT has been well tested in more than 250 peer reviewed publications (Gassman et al., 2007) and has been included in the USEPA Better Assessment Science Integrating Point and Nonpoint Sources (BASINS) modeling framework for Clean Water Act Total Maximum Daily Load (TMDL) program development (DiLuzio et al., 2007). It is a daily timestep hydrologic and water quality model that can assist land managers in making informed decisions regarding the potential benefit of both the type and location of watershed restoration activities on hydrology and water quality. The Forest Service Southern Research Station will use SWAT to provide a framework for evaluating the potential water resource benefits of restoration activities such as reforestation, increased riparian buffer widths, species conversions, etc., for priority watersheds and will ensure that this work is subject to evaluation in peer-reviewed scientific journals. The SWAT model will be used to monitor impacts and inform adaptive management.

The Council's commitment to deliver results and measure impacts will be achieved through

standardized restoration and monitoring techniques. The States have agreed to a recognized suite of best management practices (BMPs) that are time tested, scientifically proven, and overseen by trained professional foresters. Technical and financial assistance to landowners and communities will be used to encourage and incentivize such BMPs as timber stand improvement, mechanical or chemical underbrush treatment, prescribed burning, treatment of invasive exotic plants, native understory establishment, environmentally-sensitive harvests in stream management zones, and other well-established restoration practices. Forest treatments will follow NRCS practice standards to ensure technical adequacy and compliance with environmental and cultural resource requirements. In addition, a standard set of metrics will be used to measure and report progress.

Generally, there are limited risks and uncertainties associated with this Program. However, amongst them are private landowner willingness to participate which can cause delays and require strategic adjustments; catastrophic events (e.g., hurricanes, wildfires) can alter the landscape and impact expected outcomes or staff availability; and weather extremes (e.g., droughts, excessive rain) can delay implementation.

All of the work in this Program will be limited to priority watersheds or the segments of watersheds that are within the geographic area of the RESTORE Council Planning Framework (see Program Map for more details). The Program is consistent with the Framework's restoration approaches and techniques.

Proposed Methods :

The Program will use an all-lands (private and public) strategy to address the stressors in the Gulf to make significant and lasting contributions to the goals and objectives of RESTORE Council's Comprehensive Plan. While the Program will engage public lands in forest restoration opportunities and communities around green infrastructure options, the focus will be on private landowners who are critical to the overall success of the restoration effort. The level and extent of targeting will be part of the adaptive management process. Below are the method and activities that will be used to restore the health of the working forests of the Gulf and help assure their contribution to the restoration of the Gulf of Mexico.

Private Forest Restoration:

A proven combination of technical and financial assistance will be the principle method for encouraging private landowners and communities to restore and manage their forests. This approach centers on providing the knowledge, tools, services, and incentives necessary to restore and maintain forests. Cost-effectiveness is achieved through 1) a landowner's interest in achieving the best result at the least cost, and 2) a field forester's professional opinion as to what would be most effective treatment. This design has been a cornerstone of successful programs for decades (e.g., the NRCS's Environmental Quality Incentives Program, Forest Service's State and Private Forestry Program, the American Tree Farm System, and State-funded forestry programs) and will compliment ongoing efforts.

Dedicated RESTORE funds will allow State Forestry agencies and aligned partners to increase the availability of professional services and incentives directed toward improving forest health in important coastal watersheds; enhancing water quality and quantity of the Gulf of Mexico.

Activities include:

A. Providing assistance to private landowners that promotes sustainable healthy working forests and protects water quality and quantity. Such as:

- providing professional management recommendations that build toward the common goal of sustainable working forests and improved water quality/quantity
- providing cost-share incentives to help cover the cost of essential BMPs (e.g., forest establishment, timber stand improvements, fire breaks, controlling nonnative invasive species, prescribed burning, and native understory establishment)
- identifying nonnative invasive species and provide control alternatives
- identifying critical habitats (e.g., gopher tortoise, red cockaded woodpecker, and USFWS strategic habitat units for aquatics)
- identifying potentially sensitive cultural resources
- drafting forest management plans that inventory forest resources, pinpoint restoration and management challenges, provide alternative solutions, and identify the BMPs that will achieve the goals and objectives of both the landowner and RESTORE Council's Comprehensive Plan.
- assisting landowners in achieving forest certification in Nationally recognized programs such as the American Tree Farm System (AFTS)
- monitoring active forest management sites for adherence with State BMPs for forestry, wildlife habitat, and water quality/quantity

B. Outreach and education tools, events, and systems, such as:

- recruiting landowners with assistance from traditional partners like State and County Forestry Associations, holding informational meetings and field days, deploying proven technology tools and public relations efforts
- using volunteers or call agents to screen responding landowners and connect them to the right resource
- providing agency access and information to landowners
- providing landowner education relating to forest stewardship and BMPs
- training loggers in the use of water quality BMPs for forestry during silvicultural operations
- encouraging landowners to utilize professional forestry assistance in managing their forests
- introducing landowners to forest product companies that may be interested in buying the wood produced in active management or in helping with tree planting and further leverage RESTORE investments
- making available carbon and wildlife markets to help finance landowner activities and further leverage RESTORE investments
- tracking landowner efforts through a Customer Relationship Management (CRM) system
- connecting the health of working forests to the water quality and quantity of the Gulf

Community Forest Restoration:

Healthy community forests and green infrastructure filter stormwater and regulate runoff (Kuehler et al., 2018). They do so while providing a host of social, aesthetic, climate, ecological and economic benefits (Tyrvaäinen et al. 2005). Activities to engage communities include:

- educate municipal leaders on the benefits of trees to the city landscape and their important ecological role as green infrastructure, especially in relation to reducing stormwater peak flows and flooding in coastal cities, resulting in cleaner water. (Inkilainen, et al. 2013)
- assist municipalities with public tree management plans and full participation in recognition programs, such as Arbor Day Foundation's Tree City USA, which promote community forest management planning; leading to improved water quality and quantity and sustained community forestry programs. (Berland, A., and Hopton, M.E. 2014)
- encourage citizens through educational events and publications to participate in Wildland Urban Interface (WUI) programs, minimizing the risk of wildfire and the concomitant erosion and watershed pollutants where forest lands are converted to urban uses.

Public Forest Restoration:

A forested watershed program that approaches the work at a landscape scale must consider restoration of public land in the Gulf Region to achieve multiple RESTORE Council goals and objectives. Restoration of public forests such as those that are managed by State Forest Agencies (e.g., State Forests and Section 16 school trust forests), will focus on treatments that offer long-term improvements to water quality and quantity, and wildlife habitat. Activities include:

- Documenting resource conditions and priority resource needs within the targeted forests,
- Determining which BMPs will contribute to the long-term water quality and quantity of the Gulf,
- Implementing treatments such as prescribed fire, control and eradication of exotic and invasive species, forest establishment, and timber stand improvement, and
- Where possible, highlighting activities, where forests are accessible and visible by the public, with on-site displays that educate visitors and connect restoration activities with the Gulf of Mexico.

Decision Factors for Project Selection:

- Contribution to the RESTORE Council's Comprehensive Plan and Planning Framework
- Consistency with the goals and objectives of the State's Forest Action, State and local watershed management plans, State Wildlife Action Plans, and other plans as appropriate.
- Geography – sites located within the designated priority watersheds
- Technical and financial assistance will be provided to landowners and communities, factoring in readiness and anticipated outcomes.
- Applications for financial assistance will be ranked using criteria that aligns with the Council's Planning Framework, such as:
 - Proximity to a stream, lake, or wetland
 - Connectivity to protected land
 - Impacts to water quality
 - Impacts to water quantity
 - Wildlife habitat variables
- SWAT modeling, landowner participation, progress toward achieving targets, on-the-ground feedback from landowners and private-sector forestry professionals; and other variables will be used to determine how more focused targeting would be beneficial and how such targeting could be most effectively achieved.

Complementary to the work of State Forestry agencies, a National Fish and Wildlife Foundation Led Competitive Grant Fund is envisioned that:

- Offers an additional path for attracting partners and investors, including conservation organizations, universities, local governments and other beyond the core partners whose expertise and resources are needed to expand the impact.
- Creates leverage beyond that which is currently identified
- Increases potential for innovative solutions
- Multiplies positive outcomes of forest restoration for the Gulf Region

Environmental Benefits:

The Program will directly impact approximately 20,000 acres of forested acres that are vital to the health of the Gulf Region. The proposed work will increase landowner understanding of the benefits of forest management and its importance to Gulf waters. In addition, it will improve forest health and productivity, strengthen the viability of forest-dependent community resilience, and hence, the likelihood of keeping forested lands on the landscape. Quantifiable environmental benefits include increases in forest cover, forest management, and wildlife habitat; improvements in the magnitude and distribution of stream flows; and reductions in the nutrients and sediment that are degrading water quality in Gulf Region. (Note, planting of invasive species is prohibited by policy in each

States.)

Decades of research (Jackson et al., 2004; Lockaby et al. 2013) show that forests provide the cleanest and most stable water supply compared to other land uses (Nagy et al., 2011; Figuepron, 2013; Giri et al., 2016; Brogna et al., 2018). For example, in a study of 37 mixed-use watersheds across the United States, Warziniak et al. (2017) found that increasing forest cover in a watershed by 1% reduces turbidity by 3% while increasing development by 1% increases turbidity by 3%. In addition to water quantity and quality benefits, forest lands in the region provide wildlife habitat and contribute to local economies.

While the potential of forest restoration to reduce water yield may have some impact on human water supply, there are benefits to forest restoration-driven changes to the water cycle, including regulation of high flows and reduced freshwater pulses that negatively affect estuary oyster populations (Parker et al., 2013) that far outweigh the risks, especially in high rainfall areas such as the southern US. In addition, baseflows are much more stable from forests, meaning that while overall annual flow may be lower in forests, forested watersheds are more likely to provide continuous streamflow even during low precipitation years (Vose et al. 2016).

Furthermore, while flows from highly urbanized and agricultural watersheds may be higher in some cases, drinking water facilities (and reservoirs that support them) may have a limited capacity to utilize the extra flow (Gorelick et al. 2020). In addition to examining potential responses in water quality, the proposed spatially explicit SWAT modeling approach will enable us to evaluate the potential change in water yield and streamflow regime in light of multiple watershed characteristics and restoration techniques applied as part of the decision support system.

In the priority watershed restoration areas of the three States, there are 12.2 million acres of forest land (73% of the proposed restoration areas), and 72% of these forested lands are privately owned (Hewes, et al., 2017). Private landowners are increasingly bearing the financial burden for the critical ecosystem services that their forests provide, and thus these forested lands are at risk of conversion to other land uses. Indeed, projections suggest that developed land use in the southern Gulf Region could increase by 2.8 million acres (+166%) by 2060, resulting in a loss of forest land of 2.2 million acres (-10.2%) over the region and more than 25% in some coastal counties (Wear and Greis, 2013).

Metrics:

Metric Title: COI003 : Outreach/ Education/ Technical Assistance - # people enrolled - BMPs
Target: 660

Narrative: Landowner participation is a derivative of the estimated total acres treated and the average size (30 acres) of a family forest in the South. (For 5-year Program. Calc: 20,000 acres divided by 30ac average size of family forest in the South.) Combined prior experience with private landowner programs across the partnering agencies and organizations has proven landowner interest in assistance programs, particularly cost-shares, remains high. For example, yearly applications from landowners for a NFWF-funded and state-administered cost-share to re-establish and restore longleaf pine forests in northern Florida consistently outpace available funding by 50-80%. This metric aligns with Goals 1: Restore and Conserve Habitat and 2: Restoring Water Quality Quantity of the Comprehensive Plan, and Objective 6: Promote Natural Resource Stewardship and Environmental Education. The number of landowners who enroll in BMP programs will add important information and compliment the acreage numbers collected in metric HM006. It will provide a measure of the individuals reached and engaged in the restoration of the Gulf. Data will be continuously

collected. Results will be reported annually.

Metric Title: HM004 : Sediment reduction - Lbs. sediment avoided or removed

Target: 2,700

Narrative: Calc: up to 90 lb/yr of sediment per acre of land reforested or kept in forest land use with 20% of the total 20,000 restored acres accrued each year over 5 years. The 90.0 lb/ac/yr loading estimate was calculated as the difference in loading between forest and agricultural land uses in the restoration areas, based on the US Geological Survey SPAtially Referenced Regression On Watershed attributes estimated 2012 total suspended sediment load delivered from catchments (~600 acres) in the priority watersheds to their respective stream not accounting for in-stream losses (Roland and Hoos, 2019). This metric aligns with Goal 2 of the Comprehensive Plan: Restore Water Quality and Quantity, Objective 2: Restore, Improve, and Protect Water Resources. Benefits to water quality will be quantified using a combination of modeling and analysis of monitoring data collected by State and federal agencies to quantify the effects of key management actions on sediment loading (e.g., reforestation, riparian buffer establishment, etc.). In addition, sediment loading avoided by keeping forest land forested will be projected by comparing modeled sediment loading from restoration areas under forest land use to that of alternative land uses (e.g., agriculture or urban). The outcomes will be a reduction in sediment loading and an improved quantification of forest management benefits to Gulf water quality now and in the future.

Metric Title: HM006 : Habitat management and stewardship - Acres under improved management

Target: 20,000

Narrative: Based on a \$1,300 per acre estimated cost of restoration when applying a suite of forest treatments that are typical for the region (i.e., prescribed fire, timber stand improvement, etc.). Treatments are based on the standards established in the NRCS Technical Guide and costs were corroborated with NRCS's payment schedules. (For 5-year Program. Calc: \$25,500,000 divided by \$1,300 per acre). This metric aligns with Goal 2: Restore Water Quality and Quantity, Objective 2: Restore, Improve, and Protect Water Resources; and Goal 1: Restore and Conserve Habitat, Objective 1: Restore, Enhance, and Protect Habitats of the Comprehensive Plan. The purpose of the metric is to track implementation of improved forest management practices within the designated priority watersheds. Acres of improved management will be tracked monthly and reported annually. The outcome will be an increase in forested acres under improved management in the region, resulting in quantifiable reductions to nutrient and sediment loads and enhancements to wildlife habitat in the Gulf.

Metric Title: COI002 : Outreach/ Education/ Technical Assistance - # people reached

Target: 23,000

Narrative: This metric aligns with Goals 1: Restore and Conserve Habitat and 2: Restoring Water Quality Quantity of the Comprehensive Plan, and Objective 6: Promote Natural Resource Stewardship and Environmental Education. The number of stakeholders in attendance at informational meetings, workshops, or other events will be tracked. It will also include the number of participants in workshops, classes, field days, and/or webinars used to inform forest resource managers, timber purchasers, loggers, vendors, forest engineers, aboriculturalists, etc., about the Program and the linkages to the health of the Gulf Region.

Risk and Uncertainties:

There are limited risks and uncertainties associated with the activities proposed in the Program. Of those limited risks, some are the result of mega factors that would likely impact the long-term

success of the entire Gulf restoration effort. Others are mid or short-term in nature and may require adaptive management to guide changes to the Program.

It should be noted that State Forestry Agencies have extensive experience dealing with short and mid-term risks, with an established institutional framework and reciprocal agreements in place for addressing unforeseen events. In addition, by supporting multiple landowners and a variety of forest management practices, all efforts do not rest on the success of one project, meaning risk is dispersed across a diverse portfolio of projects and sites. The healthy and resilient forests created and supported by the Program will enhance and protect habitat and water resources in the Gulf region in the face of large-scale and uncertain stressors over the long term. In general, the Program, and its landscape scale multi-landowner approach, should be considered as a hedge against risk and uncertainty.

Relatively short-term delays may be caused by weather extremes (e.g., droughts, excessive rain). Localized events such as hurricanes and wildfires can alter the landscape and shift priorities for landowners and communities. Damage assessments, funding limitations, and other programmatic concerns (i.e., staff availability) related to such an event, could delay implementation or reshape expected outcomes. For example, the Program's emphasis in the affected area may need to shift from prescribed fire to hurricane clean-up and reforestation for a limited time.

If an event occurs during a critical time of the year or if an event is wide-spread, delays may be compounded by limitations on the availability of staff, contractors, materials, and equipment. An example would be heavy landowner demand for foundational treatments, such as invasive species controls or prescribed fire, that is driven by favorable conditions after a drought. However, by adjusting the type and schedule of forest treatments for the conditions, most short-term delays can be ameliorated. For example, tree planting delayed by drought can be rescheduled for the next planting season, while other treatments, such as timber stand improvements, can be accelerated. In addition, the landscape scale of the Program provides the flexibility needed to address short-term risks by shifting resources to address Program needs.

From a mid-term outlook, if the willingness and/or ability of private landowners and communities to engage in the restoration effort are diminished, the implementation of the Program could be significantly delayed and require strategic adjustments or timeline modifications. For example, if the Region or the Nation suffers a severe economic downturn or, as is the currently the case, experiences a pandemic disease outbreak the rate of forest restoration would be impacted; resulting in significant delays but not necessarily threatening the expected outcome of the restoration. Such delays could be mitigated by employing adaptive responses to landowner needs and agility in restructuring program resources to meet changing demands.

From a long-term perspective, shifts in climate patterns and accompanying increases in air temperature and precipitation variability could result in changes to species ranges, diversity, and forest productivity (Fei et al., 2017). Insects, diseases, wildfires, and invasive species could also cause long-term changes in forest composition and condition, either directly or through interactions with climate change (Wear and Greis, 2013). Forests in the Gulf region and the benefits they provide will be impacted by these long-term stressors with or without active management, however the trajectories of forest change and associated risks could be minimized with active management supported by the Program.

As for anticipated sea level rise, most Program activities will be performed in areas away from the coast and are not likely to be impacted. That said, sea level rise and additional impacts of climate change have been anticipated and are addressed in each State's Forest Action Plan. Mitigation

strategies (i.e., selecting the correct tree species that can thrive in future conditions) have been developed and will be refined as States employ adaptive management.

In addition to climate and natural disturbances, the Region's population and economic growth have and likely will continue to drive a loss of forests to more intensive land uses. Policy decisions, outside the scope of the Program, could play an important role in determining the trajectory of continued growth and its long-term impact on forest restoration. Recent projections suggest that developed land use in the southern Gulf Region could increase by 2.8 million acres (+166%) by 2060, resulting in a loss of 2.2 million acres (-10.2%) of the forest land across the region and more than 25% in some coastal counties (Wear and Greis, 2013).

Private landowners are increasingly bearing the financial burden for the critical ecosystem services that their forests provide, and thus these forested lands are at risk of conversion to other land uses. Providing private forest landowners with technical and financial assistance as described in this proposal will help them make a viable living on their forest land and will reduce the risk that their land will be converted to other land uses. Keeping these forests in forest, so they continue to provide vital water quality, habitat, and economic benefits is critical to the health of the Gulf Region.

Without the Program, passive or a lack of management could lead to undesirable forest conditions during periods of transition that will have a negative impact on forest health, productivity, wildfire potential, and water resources. Alternatively, active and adaptive forest management, such as the activities proposed here, could facilitate a more rapid and smooth transition to a new and perhaps novel future forest condition with lower risk to forests, habitat, and local economies, while providing water-related benefits (Vose and Elliott, 2016; Sun and Vose, 2016). Taken together, the potential benefits of the Program far outweigh the risks and implementing the Program as planned at a landscape across a variety of public and private ownerships will help mitigate the effects indeed include mitigation of future risks.

Monitoring and Adaptive Management:

Data collection and monitoring will track implementation and guide adaptive management of the Program on private, public, and community forests. Site level data, collected on the quality (as compared to practice standards) and the extent of individual treatments, will feed Program metrics and provide a finer measure of progress. Water quality BMP monitoring (SGSFWRC, 2007) will be used to track compliance with Clean Water Act requirements and ensure that silvicultural activities, including timber harvesting, site preparation, and associated road construction, are conducted in a way that takes into account potential nonpoint source pollutant delivery to surface waters.

SWAT modeling (Arnold et al., 2012) will be used to predict water quality improvements and inform adaptive management decisions. Modeling will be performed at a spatial resolution within and across watersheds to evaluate forest restoration alternatives in different locations (e.g., headwaters, uplands, riparian zones, urban areas). Each watershed will be subdivided into smaller sub-watersheds that are further divided into Hydrological Response Units (HRUs), with each HRU having similar land use, soils, topography within (Arnold et al., 2012). In this way, spatial variability within each watershed will be accounted for and the water quantity and quality effects of forest restoration implemented in various locations within the watershed will be quantified.

Publicly available sampling platforms, such as the US Geological Survey water quality and streamflow gauging network will be used to calibrate the model. The calibration ensures that the SWAT is accurately estimating water quality and quantity under current conditions, as well as providing a baseline for evaluating change. SWAT will be used as a tool to help managers make decisions (i.e., identify priority locations and best management practices) based on expected water quality and

quantity outcomes from restoration and management activities. In addition, SWAT model outputs will be used to document and monitor short and long-term restoration benefits.

Once field activities have been initiated, SWAT will be applied to restored watersheds to project short (1-5 yrs.) and long-term (5+ yrs.) water resource benefits. This approach is necessary because benefits are likely to continue to accrue well past the project period. In addition to predicting water benefits as restoration acres accrue, SWAT may be used to project out 20 years into the future to show how water benefits change over time as restoration actions mature (e.g., as a forest stand develops after reforestation).

Site specific water quality monitoring and cross-checking with data from available sampling platforms will also be initiated on a subset of restored watersheds to validate model performance and quantify uncertainty. During calibration, the model parameters that govern within-watershed hydrologic processes will be adjusted, within recommended bounds, to achieve the best match between model predictions and publicly available observed streamflow and water quality measurements in the place and at the time the measurements were taken.

Similar to the use of SWAT for monitoring water quality and quantity improvements, the National Fish and Wildlife Foundation's modeling expertise will be used to estimate the benefits of the Program on wildlife habitat and advise leadership on potential opportunities to improve program direction. NFWF investments are guided by 10-year Business Plans that set species specific goals which have to factor spatial variability into account. As NFWF sets up any competitive RFP process, those business plan goals will be factored. Example business plan..

<https://www.nfwf.org/sites/default/files/2019-12/longleaf-forests-rivers-business-plan.pdf>.

Forest sustainability programs and certifications (e.g., Forest Stewardship, American Tree Farm System, Treasure Forest, Tree City USA etc.,) will be used to verify practices, evaluate progress toward long-term sustainability and provide resources for landowners to make further management improvements. To monitor progress toward achieving outreach and education goals, States will track the number of landowners participating or enrolled in the Program, the nature and scope of their management activities, the number of social marketing and website engagements, and the number of stakeholders attending meetings, workshops, and training opportunities.

Program monitoring will be initiated within the first 6 months of implementation. Data will be collected continuously throughout the life of the Program. Results will be reported annually. The outcomes will be improved transparency, increased confidence in the program direction and performance, and a better understanding of the long-term benefits that forest management has on water quality and quantity, and wildlife habitat of the Gulf Region.

Data Management:

To the extent practicable, all field data such as site-specific treatment recommendations, BMP standards and specifications, environmental and cultural resource assessments, and data generated during monitoring activities will be documented using standardized field datasheets. If standardized forms are unavailable or not readily amendable to record project-specific data, then project-specific datasheets will be drafted prior to conducting project implementation and monitoring. Electronic files of field sheets, notebooks, GIS data, photographs, certifications, authorizations, and payments will be retained by the State Forestry Agency. Data will be available to the public and retained for a minimum of 5 years.

State Forestry Agencies must comply with State Records Management requirements. They collect and digitize large amounts of data in the general course of doing business and report their activities

to various funders and stakeholders (e.g., State leadership and federal agencies). The amount of data and level of detail could easily exceed the public's and the RESTORE Council's expectations and need. Additional information and a data management plan can be provided in the future.

Collaboration:

This cross-boundary proposal involves the collaborative efforts of State Forestry Agencies in Alabama, Florida, and Mississippi; USDA, the American Forest Foundation, the National Fish and Wildlife Foundation (NFWF), the U.S. Endowment for Forestry and Communities, and The Nature Conservancy. It leverages the funding and activities of these organizations that operate in the RESTORE Council zone and multiplies the impact of forest restoration in the proposal. Conservative estimates place the value of leverage at nearly \$55 million. In addition, enhanced collaboration with NFWF may offer significant co-funding leverage. With sufficient RESTORE funds, NFWF would provide leadership to establish a competitive RFP that could leverage sub-grantee contributions and provide a vehicle for partner investments to maximize outcomes. The funding would target priority landowners, both private and public, and forest management practices that improve water quality/quantity and wildlife habitat.

Public Engagement, Outreach, and Education:

To align the key services of the Program with the resource needs of a priority watershed, traditional partners (i.e., State and County Forestry Associations, forest industry interests, and conservation organizations) will be asked to assist with meetings, workshops, and other public information efforts. The State forestry agencies and their partners (including the Sustainable Forestry and African American Land Retention Network) will also work to ensure historically underserved populations and communities are aware of and engaged in the Program. Landowners and communities will be encouraged to engage resource professionals and their peers through such programs as the American Tree Farm System, the Forest Stewardship Program, and the Tree City USA Program. These programs offer technical assistance through planning and implementation, verification of practices, third-party certification to nationally and internationally recognized standards, and landowner recognition for their contributions to sustainability. Among other planning tools, Landscape Management Plans will be used to help guide landowners and professionals in prioritizing water quality and quantity; and wildlife habitat conservation needs. These plans will assist in unifying the efforts of many family landowners towards a larger conservation goal of improving the health and resiliency of the Gulf Region. The American Forest Foundation's WoodsCamp platform, which employs proven social media and innovative marketing tools, will be used to identify key landowners and connect them with qualified resource professionals and opportunities for forest management and restoration. An integrated Customer Relationship Management tool will track each landowner's journey towards measurable conservation improvements while supporting natural resource professionals in delivering a more rapid, complete and satisfying experience for landowners. The States will collaboratively develop a shared message regarding the importance of keeping forest in forest and the role of professional forest management in supporting the health of the Gulf Region promote this message within priority watersheds. Key touch points (i.e., community meetings, site visits with resource professionals, and State forest entrances) will be used as opportunities to educate landowners, communities, and the public about the connection between forest resource management and the water quality/quantity and wildlife habitat resources of the Gulf Region.

Leveraging:

Funds: \$250,000.00

Type: Adjoining

Status: Received

Source Type: Other Federal

Description: An early investment showing commitment to the Program which helped establish a pilot project in Mississippi. This project is helping the partners refine attributes and learn while demonstrating the ability of States and partners to deliver meaningful results.

Funds: \$1,500,000.00

Type: Adjoining

Status: Received

Source Type: Other Federal

Description: GOMESA funding is being used to jump start the Enhancing Gulf Waters through Forested Watershed Restoration RESTORE Program in Alabama. The Project leverages existing funding from USDA, and/or tools from various partners including the American Forest Foundation, the National Fish and Wildlife Foundation, and the Mobile Bay National Estuary Program.

Funds: \$1,100,000.00

Type: Adjoining

Status: Received

Source Type: Not For Profit

Description: Ongoing activities and initiatives that are included as elements in the Program such as: WoodsCamp, landscape management plans, and American Tree Farm System implementation.

Funds: \$3,900,000.00

Type: Adjoining

Status: Received

Source Type: Not For Profit

Description: Existing grants to communities in and near the priority watersheds of the Program. For example, a "Nine Healthy Watershed Consortium Grant" that was awarded to Alabama, Florida, and Mississippi; and NRCS Regional Conservation Partnership Program award for working forests conservation easements and longleaf Pine restoration.

Funds: \$25,000,000.00

Type: Adjoining

Status: Committed

Source Type: Not For Profit

Description: Existing and future grants to partners (federal, state, local unites of government, non-profit, academic institutions and others) that further the goals of this RESTORE Forestry Program. These monies have either already been awarded under existing NFWF grants and have yet to be spent or are expected to be awarded during the performance period of this RESTORE grant (in other words, there may be future opportunities to leverage and expand the Program benefits through complimentary investments under the GEBF and perhaps other DWH funding). Work includes similar activities on forestlands (financial and technical assistance on private and public lands) or is building on related water quality work.

Funds: \$10,000,000.00

Type: Adjoining

Status: Received

Source Type: Other Federal

Description: Existing and future grants from NRCS through NFWF to improve water quality practices (such as riparian restoration, head cutting gully restoration, and other forest and agricultural BMPs on cropland, pasture, and forestland in the coastal counties of the three-state region. These monies have either already been awarded under existing NFWF grants and not spent yet or are expected to be awarded during the performance period of this RESTORE grant.

Funds: \$5,000,000.00

Type: Co-funding

Status: Proposed

Source Type: Not For Profit

Description: NFWF would like to put forward a competitive RFP that could extend impact and innovation by further leveraging sub-grantee contributions and provide a vehicle for other outside partner investments. The funding would target priority landowners, both private and public, and provide assistance for forest management practices that improve water quality/quantity and wildlife habitat. This funding is contingent upon a similar matching level from RESTORE and NFWF will strive to co-fund that amount up to \$5 million.

Environmental Compliance:

The planned activities associated with the Enhancing Gulf Waters through Forested Watershed Restoration Program are covered by Restore Council and USDA Categorical Exclusions (CEs). CEs for the planned activities are consistent with Section 4(d)(4) of the Council's National Environmental Policy Act (NEPA) Procedures, which enables the Council to use member CEs, where appropriate. Potential extraordinary circumstances, including potential negative effects to threatened and endangered species, essential fish habitat, Tribal interests, and historic properties have been considered and determined that no such circumstances apply. In using these CEs, USDA will employ the mitigation measures included in the CE documentation pertaining to aquatic resources, protected species, and cultural and archaeological resources. Forestry practices will be implemented according to NRCS conservation practices standards and specifications (covered by the aforementioned CEs). State Agencies will complete on-site environmental evaluations (EE) and performance monitoring to identify practices that are not installed to standards. The EE will be documented on Form NRCS-CPA52, "Environmental Evaluation Worksheet." State Forestry Agencies will then work with landowners to address deficiencies and offer adaptive management options to ensure that all practices are functioning as planned and contributing to positive environmental outcomes. Based on the EE, avoidance and minimization measures will be outlined to address potential environmental concerns. At a minimum, 10 percent of the EEs will be submitted to the Council.

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- <http://www.stateforesters.org/forest-action-plans/alabama>

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Budget

Project Budget Narrative:

The budget request for this program is \$30,400,000 (Approximately \$10 Million for each of the three participating Gulf states). 85% of the funds will be used for conservation practice implementation.

Total FPL 3 Project/Program Budget Request:

\$ 30,400,000.00

Estimated Percent Monitoring and Adaptive Management: 4 %

Estimated Percent Planning: 5 %

Estimated Percent Implementation: 85 %

Estimated Percent Project Management: 0 %

Estimated Percent Data Management: 3.5 %

Estimated Percent Contingency: 2.5 %

Is the Project Scalable?:

Yes

If yes, provide a short description regarding scalability.:

To make a measurable and meaningful contribution to the RESTORE Council's goals and objectives, the Program is proposed at \$30.4 million. This funding will engage more than 660 private landowners in shared stewardship of the Gulf Region and treat over 20,000 forested acres in priority watersheds; a state-of-the-art SWAT model will be developed; and a competitive RFP may be established. With the exception of limited fixed costs (some of which are not scalable), all funding will be directed toward on-the-ground forest restoration activities. This work is scalable, up or down. Watersheds can be expanded or contracted to meet available funding. Land treatment goals can be adjusted. More or fewer landowners can be engaged. The Program's positive impact on Gulf restoration will scale along with dollars invested. An increase over the request will allow more forested acres to be treated and result in larger improvements to water quality/quantity and wildlife habitat. It will create an opportunity to engage more landowners, involve more partners, and leverage the work and funding of more organizations. It would help engrain the Program as a long-term solution and expand the watershed scale awareness that is needed to successfully address the many challenges facing the Gulf Region. A reduction will diminish the reach of the Program in terms of participation, partnerships, collaboration, leverage, knowledge, longevity, and outcomes. If funding limitations require a reduction in the menu of treatments or a reduced cost-share percentage, landowner participation will fall. Partners may be less likely to invest time and energy in a smaller program. Other organizations may be less likely to contribute to the competitive grant element. The information and knowledge gained from the SWAT model may not be as robust. In addition, there will be a diminished opportunity for shared stewardship and, if severe enough, on-the-ground activities may not be substantial enough to realize measurable change. In turn, this will lead to a reduced opportunity to contribute to existing plans and goals. For example, the Surface Water Improvement and Management plan for the Choctawhatchee River and Bay (FL) identifies silviculture BMPs as "some of the most important tools for protecting water quality and wetland and aquatic habitat..." Any of these impacts could significantly reduce the Program's outcomes, and therefore, contributions to the RESTORE Council's goals and objectives.

Environmental Compliance¹

Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g., title and date of document, permit number, weblink etc.)
National Environmental Policy Act	No	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This evaluation will be documented in the environmental evaluation before conservation/restoration implementation is initiated. Avoidance and minimization measures will be applied to ensure there are no adverse impacts to resources of concern.
Endangered Species Act	No	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This evaluation will be documented in the environmental evaluation before conservation/restoration implementation is initiated. Avoidance and minimization measures will be applied to ensure there are no adverse impacts to threatened and endangered species.
National Historic Preservation Act	No	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This evaluation will be documented in the environmental evaluation before conservation/restoration implementation is initiated. Avoidance and minimization measures will be applied to ensure there are no adverse impacts to cultural resources.
Magnuson-Stevens Act	N/A	Note not provided.

¹ Environmental Compliance document uploads available by request (restorecouncil@restorethegulf.gov).

Fish and Wildlife Conservation Act	No	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This evaluation will be documented in the environmental evaluation before conservation/restoration implementation is initiated. Avoidance and minimization measures will be applied to ensure there are no adverse impacts fish and wildlife.
Coastal Zone Management Act	Yes	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This evaluation will be documented in the environmental evaluation before conservation/restoration implementation is initiated. Avoidance and minimization measures will be applied to ensure there are no adverse impacts to coastal resources.
Coastal Barrier Resources Act	Yes	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This evaluation will be documented in the environmental evaluation before conservation/restoration implementation is initiated. Avoidance and minimization measures will be applied to ensure there are no adverse impacts to coastal barrier resources.
Farmland Protection Policy Act	Yes	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. Avoidance and minimization measures will be applied to ensure there are no adverse impacts to prime, unique, or

		agricultural lands of importance.
Clean Water Act (Section 404)	No	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This evaluation will be documented in the environmental evaluation before conservation/restoration implementation is initiated. Avoidance and minimization measures will be applied to ensure there are no adverse impacts to waters of the United States.
River and Harbors Act (Section 10)	Yes	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This evaluation will be documented in the environmental evaluation before conservation/restoration implementation is initiated. Avoidance and minimization measures will be applied to ensure there are no adverse impacts to rivers and harbors.
Marine Protection, Research and Sanctuaries Act	N/A	Note not provided.
Marine Mammal Protection Act	N/A	Note not provided.
National Marine Sanctuaries Act	N/A	Note not provided.
Migratory Bird Treaty Act	Yes	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This evaluation will be documented in the environmental evaluation before conservation/restoration implementation is initiated. Avoidance and minimization measures will be applied to ensure there are no adverse impacts to migratory birds.
Bald and Golden Eagle Protection Act	Yes	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This evaluation will be documented in the

		environmental evaluation before conservation/restoration implementation is initiated. Avoidance and minimization measures will be applied to ensure there are no adverse impacts to Bald or Golden Eagles.
Clean Air Act	No	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This evaluation will be documented in the environmental evaluation before conservation/restoration implementation is initiated. Avoidance and minimization measures will be applied to ensure there are no adverse impacts to air quality.
Other Applicable Environmental Compliance Laws or Regulations	N/A	https://restorethegulf.gov/sites/default/files/FPL_EClib_GW_Gulf_Coast_Conservation_Reserve_CE_signed.pdf (also attached).

Maps, Charts, Figures

Enhancing Gulf Waters through Forested Watershed Restoration

Priority Watershed Restoration Areas in the RESTORE Region

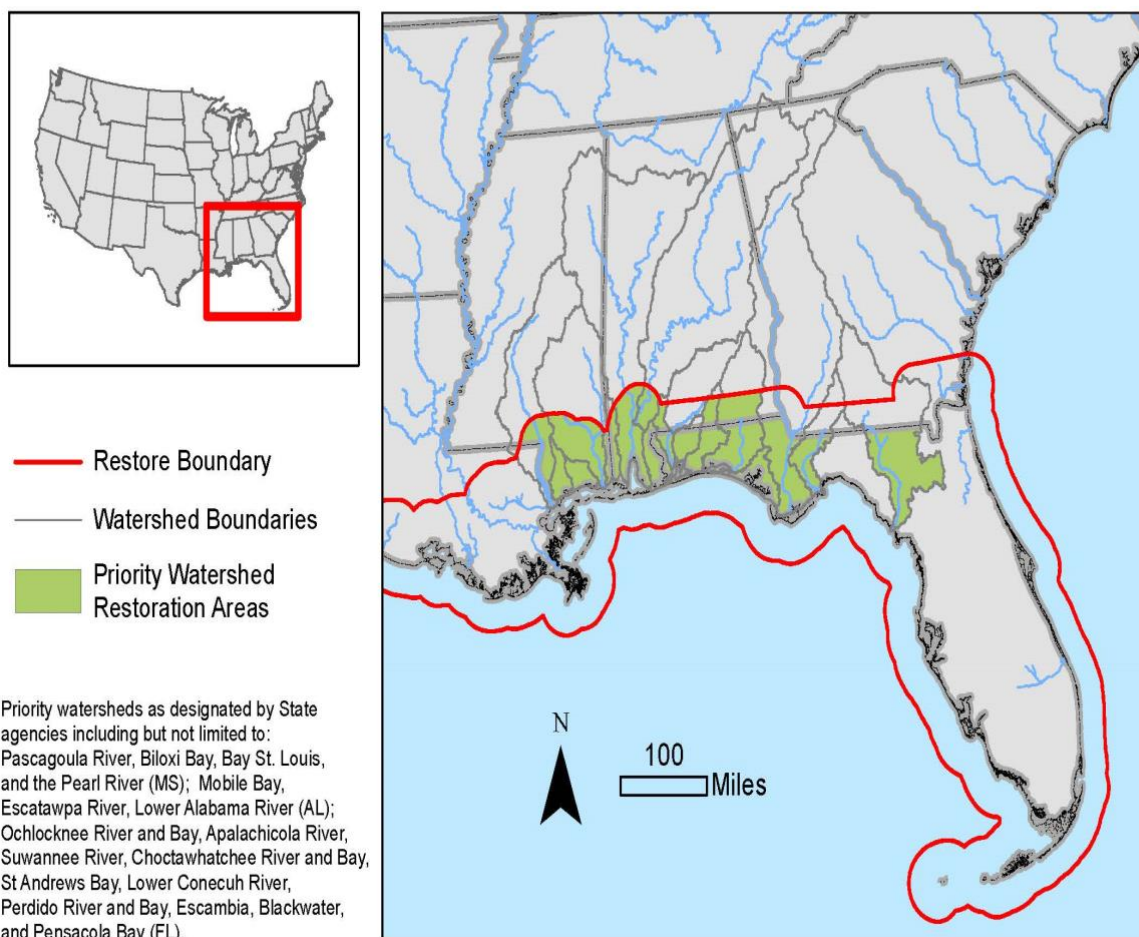


Figure 1: Project Location



RESTORE Council Members
c/o Administrator, Andrew Wheeler
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

December 17, 2019

RESTORE Council Members:

The Alabama Forestry Association fully supports the proposal to Enhance Gulf Waters through Forested Watershed Restoration developed by the USDA, Alabama Forestry Commission, Florida Forest Service, Mississippi Forestry Commission, and partnering organizations. With more than 23 million acres of forests in the Gulf Region of these three states and with 66% of those acres owned by families, any landscape scale restoration endeavor should work to identify, engage and support these key landowners.

The Alabama Forestry Association is a non-profit trade association representing Alabama's forestry community including landowners, loggers, natural resource professionals and forest products companies. Alabama's 23 million acres of sustainably managed forests provide the raw material for the state's second largest manufacturing industry. We recognize the important role these Gulf Region forests play in producing clean and abundant waters, providing wildlife habitat, creating resilient communities, and building economic strength. And we are especially pleased that this is a cross-boundary effort that lets us work with our sister state associations.

The work proposed by the USDA and State forestry agencies is exactly the kind of systematic landscape-scale effort the Gulf of Mexico needs to restore, enhance, and sustain water quality and quantity over the long haul. The work is foundational and easily scalable. It will make a measurable difference in the health and resilience of the coastal forests and, as a result, the water that flows from them into the Gulf. In addition, it is important to note, that this proposal builds upon and amplifies work of a remarkable partnership of federal, State, and non-profit organizations. Funding this proposal will result in immediate, long-lasting, and meaningful results. It will strengthen our economy and our forest products industry stands ready to provide markets that can help incentivize the active management of these lands.

Thank you for the opportunity to provide input to the RESTORE funding process. Please contact me if you have any questions regarding our endorsement of this proposal.

Best Regards

Chris V. Isaacson
Executive Vice President



P.O. Box 1696
Tallahassee, Florida 32302
Phone: 850.222.5646
www.FloridaForest.org

December 20, 2019

RESTORE Council Members
c/o Administrator, Andrew Wheeler
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Dear RESTORE Council Members:

The Florida Forestry Association fully supports the proposal to Enhance Gulf Waters through Forested Watershed Restoration developed by the USDA, Alabama Forestry Commission, Florida Forest Service, Mississippi Forestry Commission, and partnering organizations. With more than 23 million acres of forest in these three states alone and with 66% of those acres owned by families, any landscape scale restoration endeavor in the Gulf Region should work to identify, engage and support these key landowners.

The Florida Forestry Association is a statewide trade association whose membership represents all sectors of the forestry community. We strive to foster regulatory, economic, and social climates that allow forestry in Florida to not only survive, but to thrive. Our mission is to promote the responsible and sustainable use of Florida's forest resources so that future generations may also enjoy the many environmental and economic benefits provided by forests.

The work proposed by the USDA and state forestry agencies is exactly the kind of systematic landscape-scale effort the Gulf of Mexico needs to restore, enhance, and sustain water quality and quantity over the long haul. The work is foundational and easily scalable. It will make a measurable difference in the health and resilience of the coastal forests and, as a result, the water that flows from them into the Gulf. In addition, this proposal builds upon and amplifies work of a remarkable partnership of federal, state, and non-profit organizations. Funding this proposal will result in immediate, long-lasting, and meaningful results. It will strengthen our economy. Our forest products industry stands ready to provide markets that can help incentivize the active management of these lands.

Thank you for the opportunity to provide input to the RESTORE funding process. Please contact me if you have any questions regarding our endorsement of this proposal.

Sincerely,

Alan Shelby
Executive Vice President



Robert L. Bendick, Jr.
Director, Gulf of Mexico Program
The Nature Conservancy
2500 Maitland Center Parkway, Suite 311
Maitland, Florida 32751

rbendick@tnc.org
Tel: 407-389-4816

April 17, 2020

RESTORE Council Members
C/O Administrator Andrew Wheeler
U.S. EPA
1200 Pennsylvania Avenue, NW
Washington, D.C. 20004

Dear RESTORE Council Members:

I am writing to support the proposal to the RESTORE Council for funding during round 3b of the RESTORE process entitled "Enhancing Gulf Waters through Forested Watershed Restoration: The RESTORE Forestry Program". This Program will restore private and public forests by providing technical and financial assistance to private landowners and communities in watersheds where forest resources are instrumental to the health of the Gulf of Mexico.

The Nature Conservancy has been engaged in land and water conservation in the Gulf of Mexico region for more than 40 years including work on many forest conservation and restoration initiatives. Following the Deepwater Horizon Oil Spill in 2010, we established a Gulf of Mexico Program to coordinate and collaborate with our five Gulf state chapters on Gulf restoration. Our analysis of the problems and threats facing the Gulf confirms that the health of the Gulf of Mexico as a whole depends heavily on the health of its estuaries and that the health of these estuaries depends upon the use of land in the watersheds of those estuaries. Maintenance of healthy forest land in watersheds is critically important to sustaining the supply of clean freshwater into estuarine systems. The RESTORE Forestry Program being proposed by the U.S. Department of Agriculture, the Florida, Alabama and Mississippi forestry agencies, and other partners is expressly designed to maintain healthy forests in the watersheds of Gulf rivers. TNC has been involved in the drafting of this proposal and believes that it is worthy of funding because the program:

- Recognizes that the great majority of forest land in Gulf watersheds is privately owned, so the project places appropriate emphasis on providing technical and financial support to maintaining healthy watershed forests.
- Allows assistance to the most strategic public forest lands.
- Delivers services to landowners through existing agency channels, so time and effort will not be expended setting up new mechanisms.
- Has involved a wide range of non-profit and agency groups in the design and drafting of the proposal and includes multiple partners in implementation.
- Leverages funding from sources other than the RESTORE Program.
- Establishes sound criteria for selection of forest tracts for assistance that assures achieving program goals.
- Includes a science-based monitoring program to measure progress and results.
- Works across state and local boundaries to address whole watersheds.

In our view this project represents the kind of large scale/long term thinking needed to restore the health of the Gulf of Mexico and to achieve the restoration objectives set out by the

RESTORE Council in its Comprehensive Plan for the Gulf. The Nature Conservancy endorses its selection for funding.

Thank you for consideration of our views.

Respectfully,

A handwritten signature in blue ink that reads "Robert Bendick". The signature is written in a cursive, flowing style.

Robert Bendick
Director
Gulf of Mexico Program



MISSISSIPPI FORESTRY ASSOCIATION

6311 Ridgewood Road, Suite W405 • Jackson Mississippi 39211 • Phone 601.354.4936 • Fax 601-354-4937

January 6, 2020

RESTORE Council Members
c/o Administrator, Andrew Wheeler
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

RESTORE Council Members:

The Mississippi Forestry Association (MFA) fully supports the proposal to Enhance Gulf Waters through Forested Watershed Restoration developed by the USDA, Alabama Forestry Commission, Florida Forest Service, Mississippi Forestry Commission, and partnering organizations. With more than 23 million acres of forest in these three states alone, and with 66% of those acres owned by families, any landscape scale restoration endeavor in the Gulf Region should work to identify, engage, and support these key landowners.

MFA's vision is to serve as the "Voice of Forestry" in Mississippi. MFA's mission is leading diverse groups to promote landowner rights, environmental stewardship, member prosperity, and community understanding. We recognize the important role America's forests and forest products industry play in producing clean and abundant waters, providing wildlife habitat, creating resilient communities, and building economic strength. And we are especially pleased that this is a cross-boundary effort that lets us work with our sister state associations.

The work proposed by the USDA and State forestry agencies is exactly the kind of systematic landscape-scale effort the Gulf of Mexico needs to restore, enhance, and sustain water quality and quantity over the long haul. The work is foundational and easily scalable. It will make a measurable difference in the health and resilience off the coastal forests and, as a result, the water that flows from them into the Gulf. In addition, it is important to note that this proposal builds upon and amplifies work of a remarkable partnership of federal, State, and non-profit organizations. Funding this proposal will result in immediate, long-lasting, and meaningful results. It will strengthen our economy, and our forest products industry stands ready to provide markets that can help incentivize the active management of these lands.

Thank you for the opportunity to provide input to the RESTORE funding process. Please contact me if you have any questions regarding our endorsement of this proposal.

Sincerely,

J. Tedrick Ratcliff
Executive Vice President
Mississippi Forestry Association



October 24, 2019

RESTORE Council Members
c/o Administrator, Andrew Wheeler
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

RESTORE Council Members:

The U.S. Endowment for Forestry and Communities (Endowment) supports the proposal to *Enhance Gulf Waters through Forested Watershed Restoration* developed by the USDA, Alabama Forestry Commission, Florida Forest Service, Mississippi Forestry Commission and partnering organizations. Of the 23 million acres of forest in these three states, two-thirds is owned by families. This proposal seeks to better engage family forest owners in projects that will enhance Gulf of Mexico restoration and resiliency.

The Endowment is a public charity that collaborates with partners in the public and private sectors to improve the health of working forests and to expand forest sector jobs. The Endowment is a catalyst for innovation that invigorates forest-rich, rural communities by keeping working forests as forests for all their environmental, societal and economic benefits. The Gulf state's rich forests play an important role producing clean and abundant water, creating wildlife habitat, fostering resilient communities and building economic strength.

The work proposed by the USDA and state forestry agencies is exactly the kind of systematic, landscape-scale effort needed to help restore, enhance and sustain water quality and quantity in the Gulf for generations to come. The proposed work is foundational and scalable. It will make a measurable difference in the health and resilience of coastal forests and the water that flows from them into the Gulf. It is important to note that this proposal builds upon and amplifies work of a remarkable partnership of federal, state and non-profit organizations. Funding this proposal will result in immediate, long-lasting and meaningful results.

Thank you for the opportunity to provide input to the RESTORE funding process. Please contact me if you have any questions regarding our endorsement of this proposal.

Sincerely,

A handwritten signature in blue ink, appearing to read "Carlton N. Owen".

Carlton N. Owen
President and CEO

Copy: USDA Under Secretary for Natural Resources and Environment

908 East North Street
Greenville, SC 29601

(864) 233-7646 (phone)
(864) 235-3842 (fax)
www.usendowment.org

RESTORE Council FPL 3 Proposal Document

General Information

Sponsor:

U.S. Department of Agriculture

Title:

Enhancing Gulf Waters through Forested Watershed Restoration

Project Abstract:

The Program will restore private and public forests by providing technical and financial assistance to private landowners and communities in watersheds where forest resources are instrumental to the health of the Gulf of Mexico. A coordinated cross-boundary effort will be led by State Forestry Agencies in Alabama, Florida, and Mississippi; and leverage the funding and activities of organizations [e.g., USDA, the American Forest Foundation, the National Fish and Wildlife Foundation (NFWF), the U.S. Endowment for Forestry and Communities, and The Nature Conservancy] that are well established in the RESTORE zone. The logic model for this program rests on the fact that a healthy Gulf stems from healthy estuaries, healthy estuaries depend on healthy watersheds, healthy watersheds flow from healthy forests, and healthy forests require engaged landowners. Activities include new, proven social marketing techniques to effectively reach landowners, implementation of best management practices (e.g., establishing forests, prescribed fire, and controlling invasive exotic species), and use of science-based decision support tools to inform forest restoration investments and quantify long-term outcomes. Anticipated results include improvements to water quality and quantity; and wildlife and T&E species habitat through professional forest management, avoided land use conversion, and increased forest cover. To achieve these outcomes \$30.4 million is requested over 7 years.

FPL Category: Cat1: Planning/ Cat1: Implementation

Activity Type: Program

Program: Enhancing Gulf Waters through Forested Watershed Restoration

Co-sponsoring Agency(ies):

MS

AL

FL

DOI/BIA

Is this a construction project?:

No

RESTORE Act Priority Criteria:

(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) Large-scale projects and programs that are projected to substantially contribute to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast ecosystem.

Priority Criteria Justification:

The Gulf Region is dominated by forest cover. In Mississippi, Alabama, and Florida alone there are more than 23 M acres of forest and 66% of those forests are privately owned (Hewes et al., 2017). Decades of research (Jackson et al., 2004; Lockaby et al. 2013) show that forests provide the cleanest and most stable water supply compared to other land uses (Giri et al., 2016; Brogna et al., 2018). Lasting improvements to water quality and quantity cannot be achieved without addressing the needs of this diminishing and threatened resource. The logic model for this Program rests on the fact that a healthy Gulf stems from healthy estuaries and healthy estuaries depend on healthy watersheds. Healthy watersheds are dependent on healthy forests which are dependent on engaged landowners. Shared stewardship is the key to success. The Program uses new, proven social marketing techniques to double or triple the engagement of private landowners over traditional outreach. It expands on current techniques for providing landowners with the financial and technological resources they need to protect and better manage their forests. Modest investments now will sustain water quality and quantity benefits for decades to come. To maximize expected impacts, science-based decision support tools using the SWAT model (Arnold et al., 2012) and other data, will inform forest restoration investments and quantify long-term water quality and quantity outcomes. SWAT has been well tested in more than 250 peer reviewed publications (Gassman et al., 2007). This multi-state, landscape level program will help ensure the sustainability and health of the forested watersheds and, therefore, water quality and quantity in the Gulf. The States have agreed to a common suite of best management practices (BMPs) that are time tested, scientifically proven, and overseen by trained professional foresters. Landscape scale benefits will be achieved through standardized restoration and monitoring techniques.

Project Duration (in years): 7

Goals

Primary Comprehensive Plan Goal:

Restore Water Quality and Quantity

Primary Comprehensive Plan Objective:

Restore, Improve, and Protect Water Resources

Secondary Comprehensive Plan Objectives:

Restore , Enhance, and Protect Habitats

Secondary Comprehensive Plan Goals:

Restore and Conserve Habitat

PF Restoration Technique(s):

Protect and conserve coastal, estuarine, and riparian habitats: Habitat management and stewardship
Reduce excess nutrients and other pollutants to watersheds: Agriculture and forest management
Reduce excess nutrients and other pollutants to watersheds: Stormwater management

Location

Location:

Priority watersheds as designated by State agencies including but not limited to: Pascagoula River,

Biloxi Bay, Bay St. Louis, and the Pearl River (MS). Mobile Bay, Escatawpa River, Lower Alabama River (AL) Ochlocknee River and Bay, Apalachicola River, Suwannee River, Perdido River and Bay, Escambia, Blackwater, Pensacola Bay,

HUC8 Watershed(s):

South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Perdido Bay)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Choctawhatchee(Upper Choctawhatchee)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Escambia(Upper Conecuh)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Escambia(Lower Conecuh)
South Atlantic-Gulf Region(Alabama) - Alabama(Lower Alabama)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Mobile Bay-Tombigbee(Lower Tombigbee)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Mobile Bay-Tombigbee(Mobile-Tensaw)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Mobile Bay-Tombigbee(Mobile Bay)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Perdido)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Lower Leaf)
South Atlantic-Gulf Region(St. Johns) - St. Johns(Oklawaha)
South Atlantic-Gulf Region(St. Johns) - St. Johns(Lower St. Johns)
South Atlantic-Gulf Region(Suwannee) - Aucilla-Waccasassa(Waccasassa)
South Atlantic-Gulf Region(Suwannee) - Aucilla-Waccasassa(Econfina-Steinhatchee)
South Atlantic-Gulf Region(Suwannee) - Suwannee(Lower Suwannee)
South Atlantic-Gulf Region(Suwannee) - Suwannee(Santa Fe)
South Atlantic-Gulf Region(Ochlockonee) - Ochlockonee(Lower Ochlockonee)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(Apalachicola)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(New)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(Apalachicola Bay)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(St. Andrew-St. Joseph Bays)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Choctawhatchee Bay)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Pensacola Bay)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(Chipola)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Yellow)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Blackwater)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Choctawhatchee(Pea)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Choctawhatchee(Lower Choctawhatchee)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Escambia(Escambia)
South Atlantic-Gulf Region(Suwannee) - Aucilla-Waccasassa(Aucilla)
South Atlantic-Gulf Region(Ochlockonee) - Ochlockonee(Apalachee Bay-St. Marks)
Lower Mississippi Region(Lower Mississippi) - Lake Pontchartrain(Eastern Louisiana Coastal)
South Atlantic-Gulf Region(Pearl) - Pearl(Bogue Chitto)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Upper Leaf)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Pascagoula)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Black)
South Atlantic-Gulf Region(Pearl) - Pearl(Middle Pearl-Silver)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Lower Chickasawhay)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Escatawpa)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Mississippi Coastal)
South Atlantic-Gulf Region(Pearl) - Pearl(Lower Pearl)

State(s):

Alabama
Mississippi
Florida

County/Parish(es):

AL - Baldwin	AL - Conecuh
AL - Clarke	AL - Covington
	AL - Dale

AL - Escambia
AL - Henry
AL - Houston
AL - Mobile
AL - Monroe
AL - Washington
AL - Coffee
FL - Escambia
AL - Geneva
FL - Calhoun
FL - Clay
FL - Columbia
FL - Dixie
FL - Franklin
FL - Gadsden
FL - Gilchrist
FL - Putnam
FL - Suwannee
FL - Taylor
FL - Union
FL - Wakulla
FL - Alachua
FL - Baker
FL - Bay
FL - Bradford

FL - Gulf
FL - Hamilton
FL - Santa Rosa
FL - Walton
FL - Washington
FL - Holmes
FL - Jackson
FL - Lafayette
FL - Leon
FL - Levy
FL - Liberty
FL - Madison
FL - Okaloosa
MS - Hancock
MS - Harrison
MS - Forrest
MS - George
MS - Greene
MS - Jackson
MS - Lamar
MS - Marion
MS - Pearl River
MS - Perry
MS - Stone
MS - Walthall

Congressional District(s):

FL - 3
AL - 2
MS - 3
AL - 1
FL - 5
MS - 4
FL - 1
FL - 2
AL - 7

Narratives

Introduction and Overview:

The Gulf Region is dominated by forest cover. In Mississippi, Alabama, and Florida alone there are more than 23 million acres of forest and 66% of those forests are privately owned (Hewes et al., 2017). Decades of research (Jackson et al., 2004; Lockaby et al. 2013) show that forests provide the cleanest and most stable water supply compared to other land uses (Giri et al., 2016; Brogna et al., 2018). The Gulf of Mexico's forests, when healthy, reduce sediment and nutrient runoff, regulate surface water flows, and improve groundwater recharge relative to other land uses (Sun et al., 2004; Lockaby et al. 2013). They offer recreational opportunities, wildlife and T&E species habitat, improved air quality, support for the region's economy, and are an integral part of the carbon cycle. Protecting forests at risk of conversion to more intensive uses (Klepzig et al., 2014), restoring native species (Brantley et al., 2018), controlling invasive species, managing for resilience against catastrophic loss (e.g., wildfire, hurricane, drought, pests, etc.), and restoring forested wetlands, floodplains, maritime habitat, and riparian areas are vital to the health of the Gulf (Vose et al., 2011).

This proposal seeks to establish a large-scale Program that will substantially enhance and maintain water quality and quantity by managing and restoring forested ecosystems in a three-State region, at a total cost of \$30.4 million. The logic model for this Program rests on the fact that a healthy Gulf stems from healthy estuaries, healthy estuaries depend on healthy watersheds, healthy watersheds flow from healthy forests, and healthy forests require active landowners and managers. Investing in the region's forests, at a landscape scale, will advance the RESTORE Council's Goal 2: Restore Water Quality and Quantity; and Objective 2: Restore, Improve and Protect Water Resources. However, benefits will accrue in all goals, especially habitat.

The stressors addressed by this Program include water quality and quantity issues related to the conversion of the Gulf Region's forests to agricultural and urban land uses and the need for more active forest management. Indeed, among the major challenges in the 21st century will be to manage forests and water resources under development pressures and other environmental factors (NRC, 2008; Vose et al., 2011; Sun et al., 2016; Vose et al., 2016; Vose et al., 2019). Providing landowners with financial and technical assistance helps them effectively and efficiently manage their forest resource, making it less attractive to sell or convert the land to other uses. They have more options and those options help avoid conversion by making ownership more economically and environmentally sustainable.

Changes to more intensive land use increase point and non-point pollution, reduce aquifer recharge, accelerate stormwater release, and increase the amount of runoff. In addition, forest fragmentation negatively impacts wildlife habitat, limits forest management options, and reduces economic viability of forest ownership and reduces community resilience. For example, smaller forested tracts can be impractical and costly to apply prescribed fire solutions while few if any loggers find it profitable to harvest small and/or disconnected parcels. The reduced economic activity leads to instability of forest-dependent communities, leading to mill closings and loss of jobs.

Over a 7-year timeline, the Program will emphasize managing and restoring forests, including urban forests and coastal woodlands/thickets, in priority watersheds in Alabama, Florida and Mississippi where the need is great, and partners stand ready to assist and leverage investments. Priority will be driven by state-level plans, strategies, and assessments such as each State's Forest Action Plan and Wildlife Action Plan. It involves planning, coordination, and implementation activities, including:

- Coordinated landscape-scale delivery led by State Forestry Agencies.
- Focused recruitment of forest landowners in targeted watersheds.

- Verification, maintenance, and expansion of ongoing landowner activity by helping family forest landowners through American Tree Farm System, Forest Stewardship, Treasure Forest, etc., and community forests through Tree City USA.
- Science-based decision support from the USDA Forest Service Southern Research Station using the Soil and Water Assessment Tool (SWAT) model and other tools to inform priorities, assess and monitor project impacts, and inform adaptive-management decisions.
- Potentially using a portion of funding for an open and competitive RFP to attract more partners and leverage; extending the reach of these efforts and cultivating more innovation.
- Alignment with federal, state, and non-federal programs as a program multiplier to conduct similar work upstream of the RESTORE coastal area.
- Use of USDA practices and standards to ensure compliance with environmental and cultural resource requirements.

These activities are designed to address the identified stressors and result in improved water quality and quantity, avoided land conversion and increased forest cover, increased use of forest BMPs, improved landowner understanding of the connection between good forest management and the restoration of the Gulf, improved wildlife habitat, and added community resilience.

The Program advances the Council's commitment to leveraging resources and partnerships by building on the relationships, skills, capacities, programs, and authorities of multiple partners across the region. It involves the collaborative efforts of three State Forestry Agencies and their State Forestry Associations; USDA's Natural Resources Conservation Service and Forest Service; the American Forest Foundation, the National Fish and Wildlife Foundation, the U.S. Endowment for Forestry and Communities, and The Nature Conservancy. It leverages the funding and activities of these organizations that operate in the RESTORE Council zone and multiplies the impact of forest restoration. It is designed to accommodate financial leverage through emerging carbon programs and biodiversity efforts.

The Council's commitment to increase public engagement, inclusion, and transparency will be advanced through direct contact with private forest landowners and communities. The Program will heighten awareness of the inter-connectedness that forest-resource decisions have on the Gulf of Mexico. Enhanced technical assistance, outreach, and education will build on existing techniques and incorporate newer proven social and electronic marketing techniques. Further connecting this audience to the health of the Gulf will attract new stakeholders committed to the sustainability and resilience of forested watersheds and, therefore, lasting improvements to the water quality and quantity, wildlife habitat, community resilience, and economy of the Gulf Region.

The Council's commitment to science-based decision making will be advanced through the application of the state-of-the-art Soil and Water Assessment Tool (SWAT, Arnold et al., 2012) and other related data. SWAT has been well tested in more than 250 peer reviewed publications (Gassman et al., 2007) and has been included in the USEPA Better Assessment Science Integrating Point and Nonpoint Sources (BASINS) modeling framework for Clean Water Act Total Maximum Daily Load (TMDL) program development (DiLuzio et al., 2007). It is a daily timestep hydrologic and water quality model that can assist land managers in making informed decisions regarding the potential benefit of both the type and location of watershed restoration activities on hydrology and water quality. The Forest Service Southern Research Station will use SWAT to provide a framework for evaluating the potential water resource benefits of restoration activities such as reforestation, increased riparian buffer widths, species conversions, etc., for priority watersheds and will ensure that this work is subject to evaluation in peer-reviewed scientific journals. The SWAT model will be used to monitor impacts and inform adaptive management.

The Council's commitment to deliver results and measure impacts will be achieved through standardized restoration and monitoring techniques. Technical and financial assistance to landowners and communities will be used to encourage and incentivize such BMPs as timber stand improvement, mechanical or chemical underbrush treatment, prescribed burning, treatment of invasive exotic plants, native understory establishment, environmentally-sensitive harvests in stream management zones, and other well-established restoration practices. Forest treatments will follow NRCS practice standards to ensure technical adequacy and compliance with environmental and cultural resource requirements. In addition, a standard set of metrics will be used to measure and report progress.

Generally, there are limited risks and uncertainties associated with this Program. However, amongst them are private landowner willingness to participate which can cause delays and require strategic adjustments; catastrophic events (e.g., hurricanes, wildfires) can alter the landscape and impact expected outcomes or staff availability; and weather extremes (e.g., droughts, excessive rain) can delay implementation.

All of the work in this Program will be limited to priority watersheds or the segments of watersheds that are within the geographic area of the RESTORE Council Planning Framework.

Proposed Methods :

The Program will use an all-lands (private and public) strategy to address the stressors in the Gulf to make significant and lasting contributions to the goals and objectives of RESTORE Council's Comprehensive Plan. While the Program will engage public lands in forest restoration opportunities and communities around green infrastructure options, the focus will be on private landowners who are critical to the overall success of the restoration effort. Below are the method and activities that will be used to restore the health of the working forests of the Gulf and help assure their contribution to the restoration of the Gulf of Mexico.

Private Forest Restoration:

A proven combination of technical and financial assistance will be the principle method for encouraging private landowners and communities to restore and manage their forests. This approach centers on providing the knowledge, tools, services, and incentives necessary to restore and maintain forests. It has been a cornerstone of successful programs for decades (e.g., the NRCS's Environmental Quality Incentives Program, Forest Service's State and Private Forestry Program, the American Tree Farm System, and State-funded forestry programs) and will compliment ongoing efforts. Dedicated RESTORE funds will allow State Forestry agencies and aligned partners to increase the availability of professional services and incentives directed toward improving forest health in important coastal watersheds; enhancing water quality and quantity of the Gulf of Mexico. Activities include:

- A. Providing assistance to private landowners that promotes sustainable healthy working forests and protects water quality and quantity. Such as:
 - providing professional management recommendations that build toward the common goal of sustainable working forests and improved water quality/quantity
 - providing cost-share incentives to help cover the cost of essential BMPs (e.g., forest establishment, timber stand improvements, fire breaks, controlling nonnative invasive species, prescribed burning, and native understory establishment)
 - identifying nonnative invasive species and provide control alternatives
 - identifying critical habitats (e.g., gopher tortoise, red cockaded woodpecker, and USFWS strategic habitat units for aquatics)• identifying potentially sensitive cultural resources
 - drafting forest management plans that inventory forest resources, pinpoint restoration and management challenges, provide alternative solutions, and identify the BMPs that

will achieve the goals and objectives of both the landowner and RESTORE Council's Comprehensive Plan.

- assisting landowners in achieving forest certification in Nationally recognized programs such as the American Tree Farm System (AFTS)
 - monitoring active forest management sites for adherence with State BMPs for forestry, wildlife habitat, and water quality/quantity
- B. Outreach and education tools, events, and systems, such as:
- recruiting landowners with assistance from traditional partners like State and County Forestry Associations, holding informational meetings and field days, deploying proven technology tools and public relations efforts
 - using volunteers or call agents to screen responding landowners and connect them to the right resource
 - providing agency access and information to landowners
 - providing landowner education relating to forest stewardship and BMPs
 - training loggers in the use of water quality BMPs for forestry during silvicultural operations
 - encouraging landowners to utilize professional forestry assistance in managing their forests
 - introducing landowners to forest product companies that may be interested in buying the wood produced in active management or in helping with tree planting and further leverage RESTORE investments
 - making available carbon and wildlife markets to help finance landowner activities and further leverage RESTORE investments
 - tracking landowner efforts through a Customer Relationship Management (CRM) system
 - connecting the health of working forests to the water quality and quantity of the Gulf

Community Forest Restoration:

Healthy community forests and green infrastructure filter stormwater and regulate runoff (Kuehler et al., 2018). They do so while providing a host of social, aesthetic, climate, ecological and economic benefits (Tyrvaäinen et al. 2005). Activities to engage communities include:

- educate municipal leaders on the benefits of trees to the city landscape and their important ecological role as green infrastructure, especially in relation to reducing stormwater peak flows and flooding in coastal cities, resulting in cleaner water. (Inkilainen, et al. 2013)
- assist municipalities with public tree management plans and full participation in recognition programs, such as Arbor Day Foundation's Tree City USA, which promote community forest management planning; leading to improved water quality and quantity and sustained community forestry programs. (Berland, A., and Hopton, M.E. 2014)
- encourage citizens through educational events and publications to participate in Wildland Urban Interface (WUI) programs, minimizing the risk of wildfire and the concomitant erosion and watershed pollutants where forest lands are converted to urban uses.

Public Forest Restoration:

A forested watershed program that approaches the work at a landscape scale must consider restoration of public land in the Gulf Region to achieve multiple RESTORE Council goals and objectives. Restoration of public forests such as those that are managed by State Forest Agencies (e.g., State Forests and Section 16 school trust forests), will focus on treatments that offer long-term improvements to water quality and quantity, and wildlife habitat. Activities include:

- Documenting resource conditions and priority resource needs within the targeted forests,
- Determining which BMPs will contribute to the long-term water quality and quantity of the Gulf,
- Implementing treatments such as prescribed fire, control and eradication of exotic and invasive species, forest establishment, and timber stand improvement, and
- Where possible, highlighting activities, where forests are accessible and visible by the public, with on-site displays that educate visitors and connect restoration activities with the Gulf of Mexico.

Decision Factors for Project Selection:

- Contribution to the RESTORE Council's Comprehensive Plan and Planning Framework
- Consistency with the goals and objectives of the State's Forest Action, State and local watershed management plans, State Wildlife Action Plans, and other plans as appropriate.
- Geography – sites located within the designated priority watersheds
- Technical and financial assistance will be provided to landowners and communities, factoring in readiness and anticipated outcomes.
- Applications for financial assistance will be ranked using criteria that aligns with the Council's Planning Framework, such as:
 - Proximity to a stream, lake, or wetland
 - Connectivity to protected land
 - Impacts to water quality
 - Impacts to water quantity
 - Wildlife habitat variables

Complementary to the work of State Forestry agencies, a National Fish and Wildlife Foundation Led Competitive Grant Fund is envisioned that:

- Offers an additional path for attracting partners and investors, including conservation organizations, universities, local governments and other beyond the core partners whose expertise and resources are needed to expand the impact.
- Creates leverage beyond that which is currently identified
- Increases potential for innovative solutions
- Multiplies positive outcomes of forest restoration for the Gulf Region

Environmental Benefits:

Decades of research (Jackson et al., 2004; Lockaby et al. 2013) show that forests provide the cleanest and most stable water supply compared to other land uses (Nagy et al., 2011; Figuepron, 2013; Giri et al., 2016; Brogna et al., 2018). For example, in a study of 37 mixed-use watersheds across the United States, Warziniak et al. (2017) found that increasing forest cover in a watershed by 1% reduces turbidity by 3% while increasing development by 1% increases turbidity by 3%. In addition to water quantity and quality benefits, forest lands in the region provide wildlife habitat and contribute to local economies.

In the priority watershed restoration areas of the three States, there are 12.2 million acres of forest land (73% of the proposed restoration areas), and 72% of these forested lands are privately owned (Hewes, et al., 2017). Private landowners are increasingly bearing the financial burden for the critical ecosystem services that their forests provide, and thus these forested lands are at risk of conversion to other land uses. Indeed, projections suggest that developed land use in the southern Gulf Region could increase by 2.8 million acres (+166%) by 2060, resulting in a loss of forest land of 2.2 million acres (-10.2%) over the region and more than 25% in some coastal counties (Wear and Greis, 2013).

The Program will directly impact approximately 20,000 acres of forested acres that are vital to the health of the Gulf Region. The proposed work will increase landowner understanding of the benefits

of forest management and its importance to Gulf waters. In addition, it will improve forest health and productivity, strengthen the viability of forest-dependent community resilience, and hence, the likelihood of keeping forested lands on the landscape. Quantifiable environmental benefits include increases in forest cover, forest management, and wildlife habitat; improvements in the magnitude and distribution of stream flows; and reductions in the nutrients and sediment that are degrading water quality in Gulf Region.

Metrics:

Metric Title: COI003 : Outreach/ Education/ Technical Assistance - # people enrolled - BMPs : Capacity, Outreach, Incentives

Target: 660

Narrative: This metric aligns with Goals 1: Restore and Conserve Habitat and 2: Restoring Water Quality Quantity of the Comprehensive Plan, and Objective 6: Promote Natural Resource Stewardship and Environmental Education. The number of landowners who enroll in BMP programs will add important information and compliment the acreage numbers collected in metric HM006. It will provide a measure of the individuals reached and engaged in the restoration of the Gulf. Data will be continuously collected. Results will be reported annually.

Metric Title: HM004 : Sediment reduction - Lbs. sediment avoided or removed : Habitat Management

Target: 2,700

Narrative: This metric aligns with Goal 2 of the Comprehensive Plan: Restore Water Quality and Quantity, Objective 2: Restore, Improve, and Protect Water Resources. Benefits to water quality will be quantified using a combination of modeling and analysis of monitoring data collected by State and federal agencies to quantify the effects of key management actions on sediment loading (e.g., reforestation, riparian buffer establishment, etc.). In addition to quantifying the effects of management actions implemented (i.e., sediment removed), sediment loading avoided by keeping forest land forested will be projected by comparing modeled sediment loading from restoration areas under forest land use to that of alternative land uses (e.g., agriculture or urban). Modeling of outcomes will begin in the second year of the Program and be conducted annually throughout the life of the Program as restoration activities are implemented. The amount of sediment prevented from entering the system will be reported annually. The outcomes will be a reduction in sediment loading and an improved quantification of forest management benefits to Gulf water quality now and in the future.

Metric Title: HM006 : Habitat management and stewardship - Acres under improved management : Habitat Management

Target: 20,000

Narrative: This metric aligns with Goal 2: Restore Water Quality and Quantity, Objective 2: Restore, Improve, and Protect Water Resources; and Goal 1: Restore and Conserve Habitat, Objective 1: Restore, Enhance, and Protect Habitats of the Comprehensive Plan. The purpose of the metric is to track implementation of improved forest management practices within the designated priority watersheds. Acres of improved management will be tracked monthly and reported annually. The outcome will be an increase in forested acres under improved management in the region, resulting in quantifiable reductions to nutrient and sediment loads and enhancements to wildlife habitat in the Gulf.

Metric Title: COI002 : Outreach/ Education/ Technical Assistance - # people reached : Capacity, Outreach, Incentives

Target: 23,000

Narrative: This metric aligns with Goals 1: Restore and Conserve Habitat and 2: Restoring Water Quality Quantity of the Comprehensive Plan, and Objective 6: Promote Natural Resource Stewardship and Environmental Education. The number of stakeholders in attendance at informational meetings, workshops, or other events will be tracked. It will also include the number of participants in workshops, classes, field days, and/or webinars used to inform forest resource managers, timber purchasers, loggers, vendors, forest engineers, aboriculturalists, etc., about the Program and the linkages to the health of the Gulf Region.

Risk and Uncertainties:

There are limited risks and uncertainties associated with the activities proposed in the Program. Of those limited risks, some are the result of mega factors that would likely impact the long-term success of the entire Gulf restoration effort. Others are mid or short-term in nature and may require adaptive management to guide changes to the Program.

It should be noted that State Forestry Agencies have extensive experience dealing with short and mid-term risks, with an established institutional framework and reciprocal agreements in place for addressing unforeseen events. In addition, by supporting multiple landowners and a variety of forest management practices, all efforts do not rest on the success of one project, meaning risk is dispersed across a diverse portfolio of projects and sites. The healthy and resilient forests created and supported by the Program will enhance and protect habitat and water resources in the Gulf region in the face of large-scale and uncertain stressors over the long term. In general, the Program, and its landscape scale multi-landowner approach, should be considered as a hedge against risk and uncertainty.

Relatively short-term delays may be caused by weather extremes (e.g., droughts, excessive rain). Localized events such as hurricanes and wildfires can alter the landscape and shift priorities for landowners and communities. Damage assessments, funding limitations, and other programmatic concerns (i.e., staff availability) related to such an event, could delay implementation or reshape expected outcomes. For example, the Program's emphasis in the affected area may need to shift from prescribed fire to clean-up and reforestation for a limited time

.The timing of such events and natural disasters could result in additional short-term delays. If events occur during critical times of the year, one could expect delays of several months to a year. For example, if a period of drought extends into tree planting season (late Fall to early Spring) a landowner may choose to wait for the next seasonal opportunity rather than risk the cost of replanting. If the event is wide-spread, delays may be compounded by limitations on the availability of staff, contractors, materials, and equipment during peak periods of demand. An example would be heavy landowner demand for foundational treatments such as invasive species controls or prescribed fire that is driven by favorable conditions after a drought.

From a mid-term outlook, if the willingness and/or ability of private landowners and communities to engage in the restoration effort are diminished, the implementation of the Program could be significantly delayed and require strategic adjustments or timeline modifications. For example, if the Region or the Nation suffers a severe economic downturn or, as is the currently the case, experiences a pandemic disease outbreak the rate of forest restoration would be impacted; resulting in significant delays but not necessarily threatening the expected outcome of the restoration. Such delays could be mitigated by employing adaptive responses to landowner needs and agility in restructuring program resources to meet changing demands.

From a long-term perspective, shifts in climate patterns and accompanying increases in air temperature and precipitation variability could result in changes to species ranges, diversity, and forest productivity (Fei et al., 2017). Insects, diseases, wildfires, and invasive species could also cause long-term changes in forest composition and condition, either directly or through interactions with climate change (Wear and Greis, 2013). Forests in the Gulf region and the benefits they provide will be impacted by these long-term stressors with or without active management, however the trajectories of forest change and associated risks could be minimized with active management supported by the Program.

In addition to climate and natural disturbances, the Region's population and economic growth have and likely will continue to drive a loss of forests to more intensive land uses. Policy decisions, outside the scope of the Program, could play an important role in determining the trajectory of continued growth and its long-term impact on forest restoration. Recent projections suggest that developed land use in the southern Gulf Region could increase by 2.8 million acres (+166%) by 2060, resulting in a loss of 2.2 million acres (-10.2%) of the forest land across the region and more than 25% in some coastal counties (Wear and Greis, 2013).

Private landowners are increasingly bearing the financial burden for the critical ecosystem services that their forests provide, and thus these forested lands are at risk of conversion to other land uses. Providing private forest landowners with technical and financial assistance as described in this proposal will help them make a viable living on their forest land and will reduce the risk that their land will be converted to other land uses. Keeping these forests in forest, so they continue to provide vital water quality, habitat, and economic benefits is critical to the health of the Gulf Region.

Without the Program, passive or a lack of management could lead to undesirable forest conditions during periods of transition that will have a negative impact on forest health, productivity, wildfire potential, and water resources. Alternatively, active and adaptive forest management, such as the activities proposed here, could facilitate a more rapid and smooth transition to a new and perhaps novel future forest condition with lower risk to forests, habitat, and local economies, while providing water-related benefits (Vose and Elliott, 2016; Sun and Vose, 2016). Taken together, the potential benefits of the Program far outweigh the risks and implementing the Program as planned at a landscape across a variety of public and private ownership will help mitigate the effects indeed include mitigation of future risks.

Monitoring and Adaptive Management:

Data collection and monitoring will track implementation and guide adaptive management of the Program on private, public, and community forests. Site level data, collected on the quality (as compared to practice standards) and the extent of individual treatments, will feed Program metrics and provide a finer measure of progress. Water quality BMP monitoring (SGSFWRC, 2007) will be used to track compliance with Clean Water Act requirements and ensure that silvicultural activities, including timber harvesting, site preparation, and associated road construction, are conducted in a way that takes into account potential nonpoint source pollutant delivery to surface waters.

SWAT modeling (Arnold et al., 2012) will be used to predict water quality improvements and inform adaptive management decisions. In addition to predicting water benefits as restoration acres accrue, SWAT may be used to project out 20 years into the future to show how water benefits change over time as restoration actions mature (e.g., as a forest stand develops after reforestation).

Similar to the use of SWAT for monitoring water quality and quantity improvements, the National Fish and Wildlife Foundation's modeling expertise will be used to estimate the benefits of the Program on wildlife habitat and advise leadership on potential opportunities to improve program direction.

Forest sustainability programs and certifications (e.g., Forest Stewardship, American Tree Farm System, Treasure Forest, Tree City USA etc.) will be used to verify practices, evaluate progress toward long-term sustainability and provide resources for landowners to make further management improvements. To monitor progress toward achieving outreach and education goals, States will track the number of landowners participating or enrolled in the Program, the nature and scope of their management activities, the number of social marketing and website engagements, and the number of stakeholders attending meetings, workshops, and training opportunities.

Program monitoring will be initiated within the first 6 months of implementation. Data will be collected continuously throughout the life of the Program. Results will be reported annually. The outcomes will be improved transparency, increased confidence in the program direction and performance, and a better understanding of the long-term benefits that forest management has on water quality and quantity, and wildlife habitat of the Gulf Region.

Data Management:

To the extent practicable, all field data such as site-specific treatment recommendations, BMP standards and specifications, environmental and cultural resource assessments, and data generated during monitoring activities will be documented using standardized field datasheets. If standardized forms are unavailable or not readily amendable to record project-specific data, then project-specific datasheets will be drafted prior to conducting project implementation and monitoring. Electronic files of field sheets, notebooks, GIS data, photographs, certifications, authorizations, and payments will be retained by the State Forestry Agency. Data will be available to the public consistent with each State's Records Management requirements and retained for a minimum of 5 years.

Collaboration:

This cross-boundary proposal involves the collaborative efforts of State Forestry Agencies in Alabama, Florida, and Mississippi; USDA, the American Forest Foundation, the National Fish and Wildlife Foundation (NFWF), the U.S. Endowment for Forestry and Communities, and The Nature Conservancy. It leverages the funding and activities of these organizations that operate in the RESTORE Council zone and multiplies the impact of forest restoration in the proposal. Conservative estimates place the value of leverage at nearly \$55 million.

In addition, enhanced collaboration with NFWF may offer significant co-funding leverage. With sufficient RESTORE funds, NFWF would provide leadership to establish a competitive RFP that could leverage sub-grantee contributions and provide a vehicle for partner investments to maximize outcomes. The funding would target priority landowners, both private and public, and forest management practices that improve water quality/quantity and wildlife habitat.

Public Engagement, Outreach, and Education:

To align the key services of the Program with the resource needs of a priority watershed, traditional partners (i.e., State and County Forestry Associations, forest industry interests, and conservation organizations) will be asked to assist with meetings, workshops, and other public information efforts. The State forestry agencies and their partners (including the Sustainable Forestry and African American Land Retention Network) will also work to ensure historically underserved populations and communities are aware of and engaged in the Program. Landowners and communities will be encouraged to engage resource professionals and their peers through such programs as the American Tree Farm System, the Forest Stewardship Program, and the Tree City USA Program. These programs offer technical assistance through planning and implementation, verification of practices, third-party certification to nationally and internationally recognized standards, and landowner recognition for their contributions to sustainability.

Among other planning tools, Landscape Management Plans will be used to help guide landowners and professionals in prioritizing water quality and quantity; and wildlife habitat conservation needs. These plans will assist in unifying the efforts of many family landowners towards a larger conservation goal of improving the health and resiliency of the Gulf Region. The American Forest Foundation's WoodsCamp platform, which employs proven social media and innovative marketing tools, will be used to identify key landowners and connect them with qualified resource professionals and opportunities for forest management and restoration. An integrated Customer Relationship Management tool will track each landowner's journey towards measurable conservation improvements while supporting natural resource professionals in delivering a more rapid, complete and satisfying experience for landowners.

The States will collaboratively develop a shared message regarding the importance of keeping forest in forest and the role of professional forest management in supporting the health of the Gulf Region promote this message within priority watersheds. Key touch points (i.e., community meetings, site visits with resource professionals, and State forest entrances) will be used as opportunities to educate landowners, communities, and the public about the connection between forest resource management and the water quality/quantity and wildlife habitat resources of the Gulf Region.

Leveraging:

Funds: \$250,000.00

Type: Adjoining

Status: Received

Source Type: Other Federal

Description: An early investment showing commitment to the Program which helped establish a pilot project in Mississippi. This project is helping the partners refine attributes and learn while demonstrating the ability of States and partners to deliver meaningful results.

Funds: \$1,500,000.00

Type: Adjoining

Status: Received

Source Type: Other Federal

Description: GOMESA funding is being used to jump start the Enhancing Gulf Waters through Forested Watershed Restoration RESTORE Program in Alabama. The Project leverages existing funding from USDA, and/or tools from various partners including the American Forest Foundation, the National Fish and Wildlife Foundation, and the Mobile Bay National Estuary Program.

Funds: \$1,100,000.00

Type: Adjoining

Status: Received

Source Type: Not For Profit

Description: Ongoing activities and initiatives that are included as elements in the Program such as: WoodsCamp, landscape management plans, and American Tree Farm System implementation.

Funds: \$3,900,000.00

Type: Adjoining

Status: Received

Source Type: Not For Profit

Description: Existing grants to communities in and near the priority watersheds of the Program. For example, a "Nine Healthy Watershed Consortium Grant" that was awarded to Alabama, Florida, and Mississippi; and NRCS Regional Conservation Partnership Program award for working forests conservation easements and longleaf Pine restoration.

Funds: \$25,000,000.00

Type: Adjoining

Status: Committed

Source Type: Not For Profit

Description: Existing and future grants to partners (federal, state, local unites of government, non-profit, academic institutions and others) that further the goals of this RESTORE Forestry Program. These monies have either already been awarded under existing NFWF grants and have yet to be spent or are expected to be awarded during the performance period of this RESTORE grant (in other words, there may be future opportunities to leverage and expand the Program benefits through complimentary investments under the GEBF and perhaps other DWH funding). Work includes similar activities on forestlands (financial and technical assistance on private and public lands) or is building on related water quality work.

Funds: \$10,000,000.00

Type: Adjoining

Status: Received

Source Type: Other Federal

Description: Existing and future grants from NRCS through NFWF to improve water quality practices (such as riparian restoration, head cutting gully restoration, and other forest and agricultural BMPs on cropland, pasture, and forestland in the coastal counties of the three-state region. These monies have either already been awarded under existing NFWF grants and not spent yet or are expected to be awarded during the performance period of this RESTORE grant.

Funds: \$5,000,000.00

Type: Co-funding

Status: Proposed

Source Type: Not For Profit

Description: NFWF would like to put forward a competitive RFP that could extend impact and innovation by further leveraging sub-grantee contributions and provide a vehicle for other outside partner investments. The funding would target priority landowners, both private and public, and provide assistance for forest management practices that improve water quality/quantity and wildlife habitat. This funding is contingent upon a similar matching level from RESTORE and NFWF will strive to co-fund that amount up to \$5 million.

Environmental Compliance:

The planned activities associated with the Enhancing Gulf Waters through Forested Watershed Restoration Program are covered by Restore Council and USDA Categorical Exclusions (CEs). CEs for the planned activities are consistent with Section 4(d)(4) of the Council's National Environmental Policy Act (NEPA) Procedures, which enables the Council to use member CEs, where appropriate. Potential extraordinary circumstances, including potential negative effects to threatened and endangered species, essential fish habitat, Tribal interests, and historic properties have been considered and determined that no such circumstances apply. In using these CEs, USDA will employ

the mitigation measures included in the CE documentation pertaining to aquatic resources, protected species, and cultural and archaeological resources.

Forestry practices will be implemented according to NRCS conservation practices standards and specifications (covered by the aforementioned CEs). State Agencies will complete on-site environmental evaluations (EE) and performance monitoring to identify practices that are not installed to standards. The EE will be documented on Form NRCS-CPA52, "Environmental Evaluation Worksheet." State Forestry Agencies will then work with landowners to address deficiencies and offer adaptive management options to ensure that all practices are functioning as planned and contributing to positive environmental outcomes. Based on the EE, avoidance and minimization measures will be outlined to address potential environmental concerns. At a minimum, 10 percent of the EEs will be submitted to the Council.

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Budget

Project Budget Narrative:

The budget request for this program is \$30,400,000 (Approximately \$10 Million for each of the three participating Gulf states). 85% of the funds will be used for conservation practice implementation.

Total FPL 3 Project/Program Budget Request:

\$ 30,000,000.00

Estimated Percent Monitoring and Adaptive Management: 4 %

Estimated Percent Planning: 5 %

Estimated Percent Implementation: 85 %

Estimated Percent Project Management: 0 %

Estimated Percent Data Management: 3.5 %

Estimated Percent Contingency: 2.5 %

Is the Project Scalable?:

Yes

If yes, provide a short description regarding scalability.:

To make a measurable and meaningful contribution to the RESTORE Council's goals and objectives, the Program is proposed at \$30.4 million. This funding will engage more than 660 private landowners in shared stewardship of the Gulf Region and treat over 20,000 forested acres in priority watersheds; a state-of-the-art SWAT model will be developed; and a competitive RFP may be established. With the exception of limited fixed costs (some of which are not scalable), all funding will be directed toward on-the-ground forest restoration activities.

This work is scalable, up or down. Watersheds can be expanded or contracted to meet available funding. Land treatment goals can be adjusted. More or fewer landowners can be engaged. The Program's positive impact on Gulf restoration will scale along with dollars invested.

An increase over the request will allow more forested acres to be treated and result in larger improvements to water quality/quantity and wildlife habitat. It will create an opportunity to engage more landowners, involve more partners, and leverage the work and funding of more organizations. It would help engrain the Program as a long-term solution and expand the watershed scale awareness that is needed to successfully address the many challenges facing the Gulf Region.

A reduction will diminish the reach of the Program in terms of participation, partnerships, collaboration, leverage, knowledge, longevity, and outcomes. If funding limitations require a reduction in the menu of treatments or a reduced cost-share percentage, landowner participation will fall. Partners may be less likely to invest time and energy in a smaller program. Other organizations may be less likely to contribute to the competitive grant element. The information and knowledge gained from the SWAT model may not be as robust.

In addition, there will be a diminished opportunity for shared stewardship and, if severe enough, on-the-ground activities may not be substantial enough to realize measurable change. In turn, this will lead to a reduced opportunity to contribute to existing plans and goals. For example, the Surface Water Improvement and Management plan for the Choctawhatchee River and Bay (FL) identifies silviculture BMPs as "some of the most important tools for protecting water quality and wetland and aquatic habitat..." Any of these impacts could significantly reduce the Program's outcomes, and therefore, contributions to the RESTORE Council's goals and objectives.

Environmental Compliance¹

Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g., title and date of document, permit number, weblink etc.)
National Environmental Policy Act	Yes	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This evaluation will be documented in the environmental evaluation before conservation/restoration implementation is initiated. Avoidance and minimization measures will be applied to ensure there are no adverse impacts to resources of concern.
Endangered Species Act	N/A	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This evaluation will be documented in the environmental evaluation before conservation/restoration implementation is initiated. Avoidance and minimization measures will be applied to ensure there are no adverse impacts to threatened and endangered species.
National Historic Preservation Act	Yes	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This evaluation will be documented in the environmental evaluation before conservation/restoration implementation is initiated. Avoidance and minimization measures will be applied to ensure there are no adverse impacts to cultural resources.
Magnuson-Stevens Act	N/A	Note not provided.
Fish and Wildlife Conservation Act	Yes	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This evaluation will be documented in the environmental evaluation before conservation/restoration implementation is initiated. Avoidance and minimization measures will be applied to

¹ Environmental Compliance document uploads available by request (restorecouncil@restorethegulf.gov).

		ensure there are no adverse impacts fish and wildlife.
Coastal Zone Management Act	Yes	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This evaluation will be documented in the environmental evaluation before conservation/restoration implementation is initiated. Avoidance and minimization measures will be applied to ensure there are no adverse impacts to coastal resources.
Coastal Barrier Resources Act	Yes	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This evaluation will be documented in the environmental evaluation before conservation/restoration implementation is initiated. Avoidance and minimization measures will be applied to ensure there are no adverse impacts to coastal barrier resources.
Farmland Protection Policy Act	Yes	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. Avoidance and minimization measures will be applied to ensure there are no adverse impacts to prime, unique, or agricultural lands of importance.
Clean Water Act (Section 404)	Yes	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This evaluation will be documented in the environmental evaluation before conservation/restoration implementation is initiated. Avoidance and minimization measures will be applied to ensure there are no adverse impacts to waters of the United States.
River and Harbors Act (Section 10)	Yes	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This evaluation will be documented in the environmental evaluation before conservation/restoration implementation is initiated. Avoidance and minimization measures will be applied to

		ensure there are no adverse impacts to rivers and harbors.
Marine Protection, Research and Sanctuaries Act	N/A	Note not provided.
Marine Mammal Protection Act	N/A	Note not provided.
National Marine Sanctuaries Act	N/A	Note not provided.
Migratory Bird Treaty Act	Yes	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This evaluation will be documented in the environmental evaluation before conservation/restoration implementation is initiated. Avoidance and minimization measures will be applied to ensure there are no adverse impacts to migratory birds.
Bald and Golden Eagle Protection Act	Yes	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This evaluation will be documented in the environmental evaluation before conservation/restoration implementation is initiated. Avoidance and minimization measures will be applied to ensure there are no adverse impacts to Bald or Golden Eagles.
Clean Air Act	Yes	These program activities are covered by USDA-NRCS Categorical Exclusions. NRCS undertakes site specific environmental evaluations to address NEPA requirements, other requirements for protection of the environment, and NRCS regulations. This evaluation will be documented in the environmental evaluation before conservation/restoration implementation is initiated. Avoidance and minimization measures will be applied to ensure there are no adverse impacts to air quality.
Other Applicable Environmental Compliance Laws or Regulations	N/A	https://restorethegulf.gov/sites/default/files/FPL_EClib_GW_Gulf_Coast_Conservation_Reserve_CE_signed.pdf (also attached).

Maps, Charts, Figures

Enhancing Gulf Waters through Forested Watershed Restoration

Priority Watershed Restoration Areas in the RESTORE Region

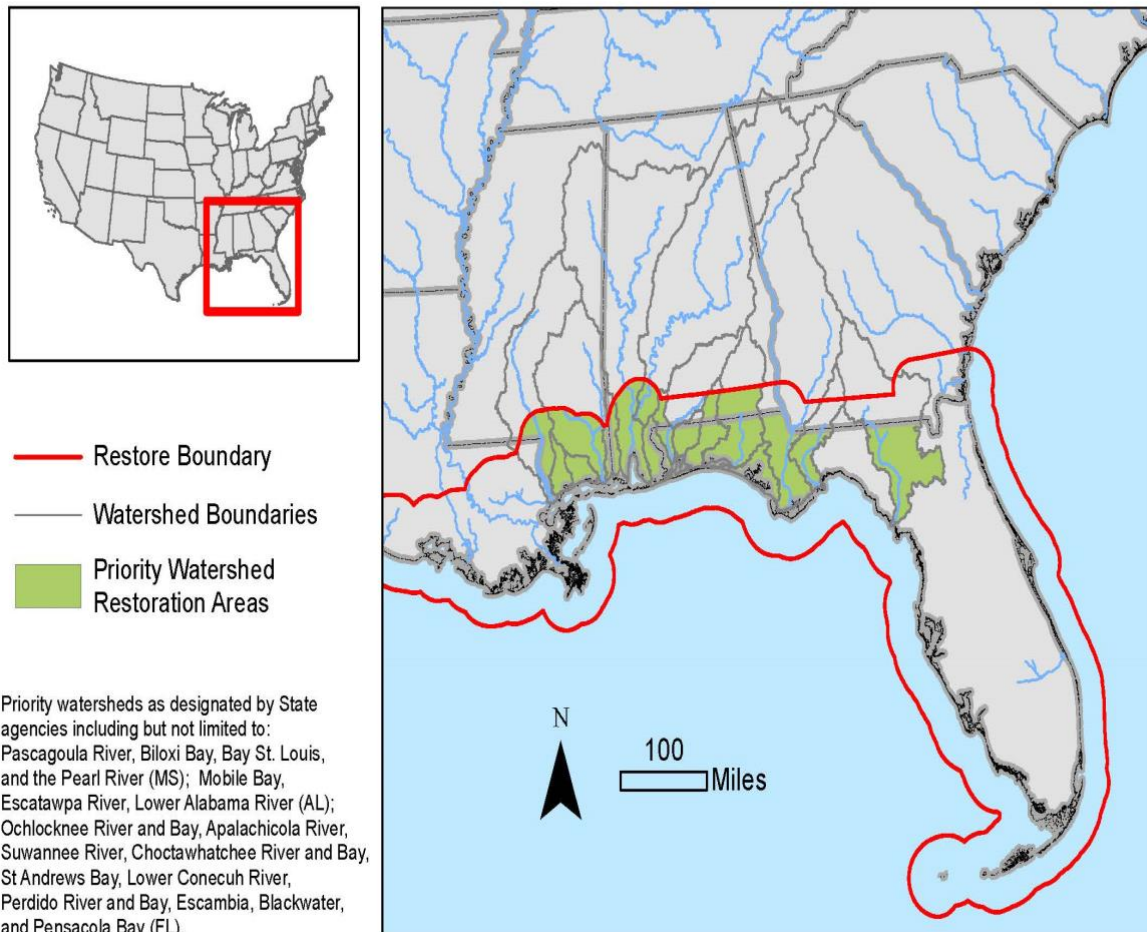


Figure 1 : Project Location

FPL 3b Internal Staff Review of Proposal Submitted 4/24/2020

Project/Program	Enhancing Gulf Waters through Forested Watershed Restoration		
Primary Reviewer	John Ettinger	Sponsor	USDA
EC Reviewer	John Ettinger	Co-Sponsor	
1. Is/Are the selected Priority Criteria supported by information in the proposal?			Yes
Notes			
2. Does the proposal meet the RESTORE Act geographic eligibility requirement?			Yes
Notes			
3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?			Yes
Notes			
4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?			Yes
Notes			
5. Does the proposal align with the applicable RESTORE Council definition of project or program?			Yes
Notes			
6. Does the budget narrative adequately describe the costs associated with the proposed activity?			No
Notes	<p>There is a discrepancy in the amount requested in at least one location. The total amount requested is listed in several places as \$30.4 million. However, the "Total FPL 3 Project/Program Budget Request" reads "\$30,000,000.00." Council staff recommend that this discrepancy be addressed. Council staff also recommend that the sponsor consider whether sufficient funding is incorporated into the request for management of the overall agreement, including any subrecipients or contractors, other general project management costs, agency overhead, and indirect costs for any subrecipients. Some of the partner agencies and organizations that may receive these funds for their programs will likely need funding for staff to carry out the work</p>		

		described. Does the sponsor consider this to be part of implementation rather than project management?	
7. Are there any recommended revisions to the selected leveraged funding categories?			No
Notes			
8. Have three external BAS reviews been completed?			More information needed
Notes	Please see the external BAS review comments, and external reviews summary attached with these review comments.		
9. Have appropriate metrics been proposed to support all primary and secondary goals?			More information needed
Notes	The sponsor has selected RESTORE Council metric "HM006 - Habitat management and stewardship - Acres under improved management"; however, use of this metric has previously been reserved for land acquisition projects (and has been discontinued due to redundancy with other acquisition metrics). Council staff recommend revising the proposal to replace metric HM006 with metric "HR004 - Habitat restoration - acres restored" as well as metric "HM005 - Agricultural BMPs - acres under contracts/agreements." In order to avoid double-counting, the same acre should never be included under both HR004 and HM005.		
10. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?			No
Notes	The sponsor provided the 2015 environmental compliance documentation used by the Council to approve the Gulf Coast Conservation Reserve Program in the Initial FPL, not the proposed Enhancing Gulf Waters through Forested Watershed Restoration program. Based on the environmental compliance discussion in the application, it appears the sponsor is proposing that the Council use a USDA CE to support funding approval of this program. Council staff agrees with such an approach. To that end, the sponsor would need to provide documentation that demonstrates compliance with the environmental laws applicable to the proposed approval of funds for the Enhancing Gulf Waters through Forested Watershed Restoration program. Specifically, USDA will need to provide (1) USDA CE documentation that fully covers the activities in the proposed program; (2) documentation from USFWS regarding compliance with the Endangered Species Act for the proposed program; and (3) ensure that NHPA has been addressed for the program (as was done for other USDA programs in the Initial FPL, this could be accomplished by referencing in the CE the programmatic approaches and commitments USDA will employ to ensure compliance with NHPA).		

11. Geospatial Compliance: Have the appropriate geospatial files and associated metadata been submitted along with a map of the proposed project/program area?		More information needed
Notes	Council staff recommends removal of Eastern Louisiana Coastal watershed from list. The GIS project boundary submitted does not include this watershed.	

FPL 3b BAS Reviews Summary -- Enhancing Gulf Waters Through Forested Watershed Restoration

May, 2020

Overall the external Best Available Science reviews for the *Enhancing Gulf Waters Through Forested Watershed Restoration* proposal are positive. Reviewers agree that the applicant has demonstrated experience in implementing similar programs. Most reviewers agree that the proposal objectives are justified using publicly peer-reviewed and/or publicly available information, with one reviewer agreeing that the literature is accurately cited but could be expanded in particular areas. All reviewers agree that the program has identified the likely environmental benefits. Some reviewers comment that the risks and uncertainties which could affect the program outcome could be further detailed in specific cases.

Reviewers 1 and 3 agree that the proposal objectives, including methods, are justified using peer-reviewed and/or publicly available information. Reviewer 2 writes that though the importance of forests in maintaining and improving water quality and habitat is well supported by peer-reviewed publications, “many short-term and small-scale studies showed that forest restoration reduced water yield, mainly due to larger evapotranspiration in forests,” negatively impacting the water supply for human use. They would like to see more literature included on the impact of reforestation on water yield and streamflow. They also note that though the proposal discusses the successes of similar efforts, they would also like more details on the failures of similar projects.

Reviewer 2 would like more information on how targets were selected. They note that “historical and current data of water quality, habitat use, and private landowners’ involvement in the proposed watersheds are not described, therefore the restoration goals lack context.” They also note that no targets were selected for nutrient reduction. Reviewer 3 comments that metrics could include how many treated acres are contained within and contributing to the health of delineated state source water protection areas.

All reviewers believe that the methods proposed are clearly described and some of the tools selected are well justified. Reviewer 2 adds that there should be more detail given for how the different methods proposed integrate to achieve cost-effectiveness. They would also like more detail on how spatial variability is taken into account for method selection, for models predicting wildlife habitat, and how to quantify the prediction uncertainties from the Soil Water Assessment Tool (SWAT). They suggest that “the project partners consider to prioritize the more critical forest locations (for example, adjacent to urban areas, adjacent to riparian zones that provide most benefits for water quality based on the decision support tool).” Reviewer 3 has similar thoughts, writing that the applicants “could take a more targeted approach toward outreach to specific landowners in key watersheds tied to water supply within the 3 state area.”

Reviewers 1 and 3 believe the proposal adequately evaluates uncertainties and risks which may affect the program’s ability to meet its objectives over time. Reviewer 2 notes that numerous

uncertainties and risks which could impact the performance of the program have been evaluated, but would like to see more detail on “the impact of forest restoration on streamflow and hydrological cycle, and the risks related to the use of non-native trees in forest restoration require attention.” They further note that there is no mitigation for short-term risks. In discussing risks they also comment that “information on water quality and private landowners’ involvement is largely lacking in the proposal.” Reviewer 3 notes that some areas of the project may be threatened by sea level rise. They comment that since sea level rise is predictable, the applicant could better detail the long-term risks and possible mitigation strategies.

Reviewers 1 and 3 also agree that the proposal is based on science that maximizes the quality, objectivity, and integrity of information. Reviewer 2 comments that though collaboration is appreciated, more information could be given on how activities will be integrated, and how the SWAT will be used to facilitate adaptive management and help involve private landowners requires more details. Reviewer 2 also notes, “The competitive RFP described in the proposal is a great idea to improve innovation and maximize project outcomes.”

Reviewers 1 and 3 think that the program has identified a monitoring and data management strategy that will support the program’s measures of success. Reviewer 2 requests additional details regarding monitoring and data management, in particular how data will be stored and made accessible, but it should be noted that detailed monitoring and data management plans are not required at the FPL 3 proposal stage. Reviewer 2 also states, “I believe the implementation of SWAT based on the monitoring data, and SWAT scenario analysis will be combined to inform adaptive management. This needs to be more clear in the proposal. Monitoring is part of [the] budget, however the proportion seems very low considering its importance. In order to increase [the] monitoring network, citizen science may be considered.”

Reviewer 1 leaves us with these summary comments: “Much will depend on how much cooperation they will get from the private landowners who own the majority of land in these threatened watersheds. By providing education and financial incentives to restore and manage forests with BMP’s, this work can have a major impact. Maintaining and managing healthy forests in threatened watershed is key to keeping downstream estuaries clean. This landscape-scale project is the only way to accomplish this.”

RESTORE Council FPL 3b Best Available Science Review

Enhancing Gulf Waters Through Forested Watershed Restoration

USDA was pleased to receive the feedback from the Best Available Science review of the Enhancing Gulf Waters Through Forested Watershed Restoration project proposal. This process will serve to provide the public with greater transparency relative to how the program will be administered and how the proposed outcomes will be achieved. The comments and USDA's response to the comments provide additional information as suggested by reviewers. The proposal seeks to build upon similar and synergistic Gulf restoration activities to address water quality. The following responses to BAS Review comments are provided to address information gaps identified by the reviewers as it relates to the Enhancing Gulf Waters Through Forested Watershed Restoration proposal.

Comment: Reviewer 2 writes that “many short-term and small-scale studies showed that forest restoration reduced water yield, mainly due to larger evapotranspiration in forests,” negatively impacting the water supply for human use. They would like to see more literature included on the impact of reforestation on water yield and streamflow. They also note that though the proposal discusses the successes of similar efforts, they would also like more details on the failures of similar projects.

Response:

- Decades of paired watershed forest manipulation experiments have shown that removal of forest in a watershed results in a short-term increase in water yield, and that the magnitude of water yield response is proportional to the percentage of the watershed cut or forest basal area removed (Bosch and Hewlett, 1982; Andréassian, 2004). Water yield increases usually decline over time as the forest regrows (Swank et al., 1988). Conversely, afforestation has generally been shown to reduce watershed water yield (Andréassian, 2004; Farley et al., 2005; Filoso et al., 2017). As the reviewer points out, the mechanism for these reductions in water yield in forest restoration experiments relates to generally higher forest evapotranspiration rates relative to other land cover types due to higher leaf area (resulting in greater transpiration and rainfall interception) and extensive root systems that may provide more access to soil moisture. However, there are cases where other land cover types can have equal or greater evapotranspiration than forests. For example, a paired watershed experiment in the southern Appalachian region showed that highly productive fertilized pasture could use as much water as a mature deciduous forest (Elliott et al., 2017).

While the potential of forest restoration to reduce water yield may have some impact on human water supply, there are benefits to forest restoration-driven changes to the water cycle, including regulation of high flows and reduced freshwater pulses that negatively affect estuary oyster populations (Parker et al., 2013) that far outweigh the risks, especially in high rainfall areas such as the southern US. In addition, baseflows are much more stable from forests, meaning that while overall annual flow may be lower in forests, forested watersheds are more likely to provide continuous streamflow even during low precipitation years (Vose et al. 2016).

The magnitude and direction of change in water yield resulting from the forest restoration techniques implemented in this program will depend on prior land use (e.g., unmanaged forest, pasture, irrigated cultivated crops, etc.), proportion of the watershed restored, and forest restoration technique applied. For example, conversion of abandoned agricultural land to a loblolly pine plantation may be expected to reduce water yield; however, reducing forest density with thinning or prescribed fire (McLaughlin et al., 2013) or managing forest species composition (e.g., eliminating invasive species or favoring low water demanding species such as longleaf pine) could increase water yield (Brantley et al. 2018; Caldwell et al., 2018).

Furthermore, while flows from highly urbanized and agricultural watersheds may be higher in some cases, drinking water facilities (and reservoirs that support them) may have a limited capacity to utilize the extra flow (Gorelick et al. 2020). In addition to examining potential responses in water quality, the proposed spatially explicit SWAT modeling approach will enable us to evaluate the potential change in water yield and streamflow regime in light of multiple watershed characteristics and restoration techniques applied as part of the decision support system.

Andréassian V. Waters and forests: From historical controversy to scientific debate. *J Hydrol (Amst)*. 2004; 291(1–2): 1–27.

Bosch, J.M., Hewlett, J.D., 1982. A review of catchment experiments to determine the effect of vegetation changes on water yield and evapotranspiration. *Journal of Hydrology* 55, 3–23.

Brantley, S.T., Vose, J.M., Wear, D.N., and Band, L. 2018. In: Kirkman, L. Katherine; Jack, Steven B., eds. *Ecological restoration and management of longleaf pine forests*. Boca Raton, FL: CRC Press: 291-309. Pages 291-309.

Caldwell, P.V.; Jackson, C.R.; Miniati, C.F.; Younger, S.E.; Vining, J.A.; McDonnell, J.J.; Aubrey, D.P. 2018. Woody bioenergy crop selection can have large effects on water yield: A southeastern United States case study. *Biomass and Bioenergy*. 117: 180-189.

Elliott, Katherine J.; Caldwell, Peter V.; Brantley, Steven T.; Miniati, Chelcy F.; Vose, James M.; Swank, Wayne T. 2017. Water yield following forest-grass-forest transitions. *Hydrology and Earth System Sciences*, Vol. 21(2): 17 pages.: 981-997.

Farley KA, Jobbágy EG, Jackson RB. Effects of afforestation on water yield: A global synthesis with implications for policy. *Glob Chang Biol*. 2005; 11(10): 1565–76.

Filoso S., M.O. Bezerra, K.C.B. Weiss, and M.A. Palmer 2017. Impacts of forest restoration on water yield: A systematic review. *Plos One*, 12.

Gorelick, D. E., Lin, L., Zeff, H. B., Kim, Y., Vose, J. M., Coulston, J. W., et al. (2020). Accounting for adaptive water supply management when quantifying climate and land cover change vulnerability. *Water Resources Research*, 56, e2019WR025614.

McLaughlin, D.L., Kaplan, D.A., and Cohen, M.J. 2013. Managing Forests for Increased Regional Water Yield in the Southeastern U.S. Coastal Plain. *Journal of the American Water Resources Association*, 49(4):953-965.

Parker, M.L., Arnold, W.S., Geiger, S.P. Gorman, P., Leone, E.H. 2013. Impacts of Freshwater Management Activities on Eastern Oyster (*Crassostrea virginica*) Density and Recruitment: Recovery and Long-Term Stability in Seven Florida Estuaries. *Journal of Shellfish Research* 32(3):695-708.

Swank, W.T., Swift, L.W. Jr, and Douglass, J. E.: Streamflow Changes Associated with Forest Cutting, Species Conversions, and Natural Disturbances, in: *Forest Hydrology and Ecology at Coweeta*, Ecological Studies, 66, edited by: Swank, W. T., and Crossley, D. A. Jr., Springer-Verlag, New York, 35–55, 1988.

Vose, J.M., K.L. Martin, P.K. Barten. 2016. Applications of Forest Hydrological Science to Watershed Management in the 21st Century. In *Forest Hydrology: Processes, Management 240 and Assessment* (eds D.M. Amatya, T.M. Williams, L. Bren and C. de Jong)

Comment: Reviewer 2 would like more information on how targets were selected. They note that “historical and current data of water quality, habitat use, and private landowners’ involvement in the proposed watersheds are not described, therefore the restoration goals lack context.” They also note that no targets were selected for nutrient reduction.

Response:

- The target for sediment reduction (2700 tons over the life of the project) was estimated to be up to 90 lb/yr of sediment per acre of land reforested or kept in forest land use with 20% of the total 20,000 restored acres accrued each year over 5 years). The 90.0 lb/ac/yr loading estimate was calculated as the difference in loading between forest and agricultural land uses in the RESTORE restoration areas, based on the US Geological Survey Spatially Referenced Regression On Watershed attributes (SPARROW) estimated 2012 total suspended sediment load delivered from catchments (~600 acres) in the priority watersheds to their respective stream not accounting for in-stream losses (Roland and Hoos, 2019).

Roland, V.L. II, and A.B. Hoos. 2019. SPARROW model inputs and simulated streamflow, nutrient and suspended-sediment loads in streams of the Southeastern United States, 2012 base year: U.S. Geological Survey data release, <https://doi.org/10.5066/P9A682GW>.

- Targets are based on the estimated per acre cost of restoration when applying a suite of forest treatments that is typical for the region(i.e., prescribed fire, timber stand improvement, etc.). Treatments are based on the standards established in the NRCS Technical Guide and costs were corroborated with NRCS’s payment schedule.
- Landowner participation is a derivative of the estimated total acres treated and the average size (30 acres) of a family forest in the South. State Forestry Agencies, NRCS, and Program partners have a successful record of coordinating private landowner assistance programs, both cost-

share and technical guidance-based, within and beyond the Program's priority watersheds. In many cases, these assistance programs have been developed, funded, advertised/marketed, implemented, and monitored directly by each of the Program's participating State Forestry Agencies or in collaboration with Program partners. Combined prior experience with private landowner programs across the Program's implementing agencies and partners has proven landowner interest in assistance programs, particularly cost-shares, remains high. For example, yearly applications from landowners for a NFWF-funded and state-administered cost-share to re-establish and restore longleaf pine forests in northern Florida consistently outpace available funding by 50-80%.

- Initially, nutrient targets were included. Based on advice from Council Staff, the number of targets were reduced. The nutrient targets were eliminated as they seemed redundant with the sediment target.

Comment: Reviewer 3 comments that metrics could include how many treated acres are contained within and contributing to the health of delineated state source water protection areas.

Response:

- There doesn't appear to be a metric that would allow for tracking acres restored that are within a "delineated state source water protection areas". However, the applicant intends to monitor restoration progress and will use adaptive management to determine how restoration of such areas can be improved.

Comment: Reviewer 2 adds that there should be more detail given for how the different methods proposed integrate to achieve cost-effectiveness.

Response:

- In a cost-share program structure, cost-effectiveness is driven by 1) a landowner's interest in achieving the best result at the least cost, and 2) a field forester's professional opinion as to what would be most effective treatment. It is not unusual to apply a step-wise approach to address a resource need and minimize costs. For example, using prescribed fire to control invasive species with a follow-up spot application of herbicides, thus reducing the cost associated with chemical control.

Comment: Reviewer 2 would also like more detail on how spatial variability is taken into account for method selection, for models predicting wildlife habitat, and how to quantify the prediction uncertainties from the Soil Water Assessment Tool (SWAT).

- The SWAT modeling will be performed at a spatial resolution within and across watersheds to evaluate forest restoration alternatives in different locations (e.g., headwaters, uplands, riparian zones, urban areas). Each watershed will be subdivided into smaller sub-watersheds that are further divided into Hydrological Response Units (HRUs), with each HRU having similar land use, soils, topography within (Arnold et al., 2012). In this way spatial variability within each

watershed will be accounted for, and the water quantity and quality effects of forest restoration implemented in various locations within the watershed will be quantified.

Prediction uncertainties of the SWAT model will be quantified during the model calibration and validation process (Arnold et al., 2012). During calibration, the model parameters that govern within-watershed hydrologic processes will be adjusted, within recommended bounds, to achieve the best match between model predictions and publicly available observed streamflow and water quality measurements in the place and at the time the measurements were taken. Prediction uncertainty will be quantified by comparing model predictions to measurements during a different time period and/or in different locations within the watersheds

Arnold, J.G., D.N. Moriasi, P.W. Gassman, K.C. Abbaspour, M.J. White, R. Srinivasan, C. Santhi, R.D. Harmel, A. van Griensven, M.W. Van Liew, N. Kannan, and M.K. Jha. 2012. SWAT: Model use, calibration, and validation. Transactions of the ASABE 55(4):1491-1508.

- NFWF investments are guided by 10-year Business Plans that set species specific goals which have to factor spatial variability into account. As NFWF sets up any competitive RFP process, those business plan goals will be factored. Example business plan.. <https://www.nfwf.org/sites/default/files/2019-12/longleaf-forests-rivers-business-plan.pdf>
- Further, NFWF recently partnered with NRCS and is in the process of granting to Florida A&M University out of Tallahassee, FL in support of their Center for Spatial Ecology and Restoration. The support will backstop our work in the Gulf around GIS mapping and capacity. The Center will help us model and assess wildlife habitat spatial variability and it will be used to inform management options over the life of this RESTORE proposal.

Comment: Reviewer 2 suggested that “the project partners consider to prioritize the more critical forest locations (for example, adjacent to urban areas, adjacent to riparian zones that provide most benefits for water quality based on the decision support tool).” Reviewer 3 has similar thoughts, writing that the applicants “could take a more targeted approach toward outreach to specific landowners in key watersheds tied to water supply within the 3-state area.”

Response:

- The level and extent of targeting will be part of the adaptive management process. We will use SWAT modeling and monitor landowner participation, progress toward achieving targets, on-the-ground feedback from landowners and private-sector forestry professionals; and other variables (such as the aforementioned FAMU grant) to determine how more focused targeting would be beneficial and how such targeting could be most effectively achieved.

Comment: Reviewer 2 notes that numerous uncertainties and risks which could impact the performance of the program have been evaluated, but would like to see more detail on “the impact of forest restoration on streamflow and hydrological cycle, and the risks related to the use of non-native trees in forest restoration require attention.” They further note that there is no mitigation for short-term risks.

In discussing risks, they also comment that “information on water quality and private landowners’ involvement is largely lacking in the proposal.”

Response:

- Impact of forest restoration on streamflow and hydrologic cycle – Please see previous response.
- Risks related to use of non-native trees in forest restoration? – State policy requires using native species.
- Mitigation for short-term risks – The applicant will apply adaptive management strategies to address Program implementation challenges. By adjusting the type and schedule of forest treatments for the conditions, short-term delays can be ameliorated. For example, tree planting delayed by excessive rain can be rescheduled for the next planting season, while other treatments, such as timber stand improvements, can be accelerated. In addition, the landscape scale of the Program provides the flexibility needed to address short-term risks by shifting resources to unaffected areas.
- Water quality and private landowner involvement – Please see previous response.

Comment: Reviewer 3 notes that some areas of the project may be threatened by sea level rise. They comment that since sea level rise is predictable, the applicant could better detail the long-term risks and possible mitigation strategies.

Response:

- Most of the Program activities will be performed in areas away from the coast and are not likely to be impacted by sea level rise. That said, sea level rise and additional impacts of climate change have been anticipated and are addressed in each State’s Forest Action Plan. Mitigation strategies (i.e., selecting the correct tree species that can thrive in future conditions) have been developed and will be refined as States employ adaptive management.

Comment: Reviewer 2 comments that though collaboration is appreciated, more information could be given on how activities will be integrated, and how the SWAT will be used to facilitate adaptive management and help involve private landowners requires more details.

Response:

- State Forestry Agencies and their partners have successfully integrated and coordinated numerous programs, initiatives, and activities over many decades. The integration and coordination of activities for this effort will build off of those experiences and relationships and be accomplished through active management of the Program. With State Forester leadership, dedicated staff, effective data reporting and monitoring, and collaboration with key partners (USDA Forest Service and NRCS, AFF, NFWF, U.S. Endowment, TNC), the Program will be delivered seamlessly just as the USDA Forest Service’s State and Private Forestry program or the NRCS’s Environmental Quality Incentives Program are today.

- In addition, NFWF intends to develop its annual RFP with input from a steering committee made up of the States. This will ensure that year to year the RFP will be adaptive and integrated.
- Yes, the SWAT model is one element in a feedback system that will inform the adaptive management of the Program. Additional elements include landowner participation and feedback, private sector forestry professionals, progress toward achieving metric goals, and numerous other data and statistics that State Forestry Agencies routinely track.

Comment: Reviewer 2 requests additional details regarding monitoring and data management, in particular how data will be stored and made accessible, but it should be noted that detailed monitoring and data management plans are not required at the FPL 3 proposal stage.

Response:

- State Forestry Agencies must comply with State Records Management requirements. They collect and digitize large amounts of data in the general course of doing business and report their activities to various funders and stakeholders (e.g., State leadership and federal agencies). The amount of data and level of detail could easily exceed the RESTORE Council's expectations and need. Additional information and a data management plan can be provided in the future.

Comment: Reviewer 2 also states, "I believe the implementation of SWAT based on the monitoring data, and SWAT scenario analysis will be combined to inform adaptive management. This needs to be more clear in the proposal. Monitoring is part of [the] budget, however the proportion seems very low considering its importance. In order to increase [the] monitoring network, citizen science may be considered."

Response:

- SWAT will serve as a decision support tool for resources managers as they evaluate locations and alternative restoration and management approaches within and across watersheds. For example, if several stands are being considering for restoration within a watershed, SWAT projections can provide information on expected water resources benefits to inform decisions on priority locations and management actions (e.g., riparian forests vs. upland forest; thinning vs. not thinning).

Monitoring will be an important part of the SWAT modeling and overall assessment of restoration success. It has three components. First, we will leverage ongoing monitoring data from publicly available sampling platforms, such as the US Geological Survey water quality and streamflow gauging network to calibrate SWAT (see response regarding prediction uncertainty above). The calibration ensures that the SWAT model is accurately estimating water quality and quantity under current conditions, as well as providing a baseline for evaluating change. Second, SWAT will be used as a decision support tool to help managers make decisions (i.e., identify priority locations and best management practices) based on expected water quality and quantity outcomes from restoration and management activities. Third, SWAT model outputs will be used to document and monitor short and long-term restoration benefits. Once restoration and management activities have been initiated, SWAT will be applied to restored watersheds to project short (1-5 yrs.) and long-term (5+ yrs.) water resource benefits. This approach is necessary because benefits are likely to continue to accrue well past the project

period. Site specific water quality monitoring and cross-checking with data from available sampling platforms will also be initiated on a subset of restored watersheds to validate model performance and quantify uncertainty. By using a proven process-based hydrologic model (SWAT) that is calibrated and validated using available monitoring data, the effectiveness of restoration efforts can be evaluated within the specified budget.

Response to Internal Review Comments

Comment: The total budget is listed in several places as \$30.4 million. The Total FPL 3 Project/Program Budget Request reads \$30,000,000.00

Response: The Total Project/Program Budget Request should read \$30,400,000.00

Comment: Council staff also recommend that the sponsor consider whether sufficient funding is incorporated into the request for management of the overall agreement, including any subrecipients or contractors, other general project management costs, agency overhead, and indirect costs for any subrecipients. Some of the partner agencies and organizations that may receive these funds for their programs will likely need funding for staff to carry out the work described. Does the sponsor consider this to be part of implementation rather than project management?

Response: Yes, this was considered part of implementation rather than project management.

Comment: Council staff recommend revising the proposal to replace metric HM006 with metric "HR004 - Habitat restoration - acres restored" as well as metric "HM005 - Agricultural BMPs - acres under contracts/agreements." In order to avoid double-counting, the same acre should never be included under both HR004 and HM005.

Response:

- The applicant has given considerable thought to the metrics selected for the Enhancing Gulf Waters Through Forested Watershed Restoration Program and, based on the descriptions in the guidance, strongly believes that HM006 is appropriate. HM006 focuses on habitat management and stewardship which are the main goals of the Program. It is consistent with the existing business practices of State Forestry Agencies and will not require a significant investment in a new program delivery and accounting process. As defined, HM006 is required for projects that acquire property, however it is not limited to acquisition.
- HR004 (acres of disturbed areas restored) emphasizes restoring disturbed areas (such as well plugging/wellhead protection) and infrastructure removal, both of which are not a consideration for the Program. Linking the Program to this metric would not be representative of the Program's goals and could confuse the public.
- HM005 emphasizes Agricultural BMPs and contracts/agreements. This metric emphasizes conservation treatments on agricultural land and appears to be more in line with the business

practices of agricultural agencies. State Forestry Agencies do not use similar agricultural BMPs or business methods. If States are required to count acres under contract/agreement, they will need to develop an entirely new business process – greatly increasing the cost of administration, slowing implementation, and the raising the potential for error.

- For the reasons stated above, the Applicant respectfully requests the use of the HM006 metric for tracking Program progress.

Comment: USDA CE documentation the full covers the activities is needed as is USFWS documentation regarding compliance with Endangered Species Act.

Response:

The planned activities associated with the Enhancing Gulf Waters through Forested Watershed Restoration Program are covered by Restore Council and USDA Categorical Exclusions (CEs). CEs for the planned activities are consistent with Section 4(d)(4) of the Council's National Environmental Policy Act (NEPA) Procedures, which enables the Council to use member CEs, where appropriate. Potential extraordinary circumstances, including potential negative effects to threatened and endangered species, essential fish habitat, Tribal interests, and historic properties have been considered and determined that no such circumstances apply. In using these CEs, USDA will employ the mitigation measures included in the CE documentation pertaining to aquatic resources, protected species, and cultural and archaeological resources.

Forestry practices will be implemented according to NRCS conservation practices standards and specifications (covered by the aforementioned CEs). State Agencies will complete on-site environmental evaluations (EE) and performance monitoring to identify practices that are not installed to standards. The EE will be documented on Form NRCS-CPA52, "Environmental Evaluation Worksheet." State Forestry Agencies will then work with landowners to address deficiencies and offer adaptive management options to ensure that all practices are functioning as planned and contributing to positive environmental outcomes. Based on the EE, avoidance and minimization measures will be outlined to address potential environmental concerns. At a minimum, 10 percent of the EEs will be submitted to the Council.

Comment: Council staff recommends removal of Eastern Louisiana Coastal watershed from list. The GIS project boundary submitted does not include this watershed.

Response: The Eastern Louisiana Coastal watershed will be removed.

Gulf Coast Ecosystem Restoration Council

FPL 3b Internal Best Available Science Review Panel Summary

July 2020

Introduction

On Tuesday, June 30, and Wednesday July 1, 2020 the RESTORE Council convened the Funded Priorities List (FPL) 3b Internal Best Available Science (BAS) Review Panel. The purpose of this internal panel was to use Council member-agency expertise to address external BAS review comments provided for FPL 3b submitted project/program proposals, and potentially identify project/program synergies not identified prior to proposal submission. The ultimate goal of the panel was to provide Council members with substantive best available science content to inform their decision-making.

The internal panel was convened via webinar with representatives from each of the Council's eleven member agencies present. Each BAS Panel member was provided the following:

- 1) Full FPL 3b proposals
- 2) 3 external BAS reviews for each proposal
- 3) Summary of external BAS reviews for each proposal
- 4) Proposal Sponsor's response to the BAS reviews summary
- 5) Any proposed revisions to the proposal

Proposal sponsors provided a brief synopsis of their proposal to the panel, a summary of comments made in external reviews, and discussed their proposed response to the external reviews. Council staff then solicited feedback from the panel on the proposal sponsor's presentation of comments and responses to those comments, and any additional BAS concerns. Council staff also solicited feedback on any existing or future synergies with other Gulf restoration activities. The proceedings of the meeting for this proposal are summarized below.

Sponsor: USDA

Enhancing Gulf Waters Through Forested Watershed Restoration

Feedback from the panel on the proposal sponsor's presentation of comments and responses to those comments, and any additional BAS concerns:

Metric targets: Additional information is requested on how targets were selected.

- The BAS Panel agrees that USDA has appropriately addressed this comment.

Efficiencies: Additional details are requested on how the different proposed methods would be integrated to achieve cost-effectiveness.

- The BAS Panel agrees that USDA has appropriately addressed this comment.

Methodological details: Clarification is requested on how spatial variability is taken into account for method selection.

- The BAS Panel agrees that USDA has appropriately addressed this comment.

Justification: Expanded discussion is requested on the impact of forest restoration on streamflow and hydrologic cycle.

- The BAS Panel agrees that USDA has appropriately addressed this comment.

Adaptive management and outreach: Describe how the SWAT will be used to facilitate adaptive management and help involve private landowners.

- The BAS Panel agrees that USDA has appropriately addressed this comment.

Panel comments on existing or future synergies with proposed activity:

The proposed program would be able to leverage previous RESTORE investments by using data from the FPL1 Baseline Flow project to calibrate the SWAT model.



SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Enhancing Gulf Waters through Forested Watershed Restoration
Location (If Applicable): Gulf-wide
Council Member Bureau or Agency: U.S. Department of Agriculture
Type of Funding Requested: Planning / Implementation

Reviewed by: Reviewer 1
Date of Review: MAY 6, 2020

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	
Clearly stated and referenced	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
There is information that is basic and may not directly pertain to the proposal but it pertains to the region in general	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
Very good and extensive literature review	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	
They adequately cover the uncertainties and risks and give several examples	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science*, the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
Science -based methodology is cited and shown repeatedly in the proposal	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
Same as above as well as reference to statistical analysis	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Yes
Comments:	
Clearly, this has been shown in the proposal	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	
This is a multi-agency / State collaborative proposal with the partners having extensive experience doing such landscape-scale projects	

Question B	
Does the project/program have clearly defined goals objectives?	Yes
Comments:	
The goals and objectives are very clear and scalable	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes
Comments:	
The proposal states the methods clearly, justifies their appropriateness and backs the choices up with references.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
This was professionally done and justified. Stressors were identified and their effects clearly stated. This proposal complements and supports regional plans	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes
Comments:	
Metrics for success were clearly stated and fit with the goals and objectives of the Comprehensive Plan. The proposal is compliant with the RESTORE ACT.	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
The proposal clearly states the possibility of long-term environmental risks affecting the work and success of the project and, the proposal captures risk measures as defined by the RESTORE ACT.	

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
Such risks may cause short or long term delays and this is recognized in the proposal. Also, adaptive management is suggested as part of the solution and restructuring the program to account for such events if necessary. I think they did a good job dealing with this and basing choices on best available science as described under the RESTORE ACT	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes
Comments:	
To the extent as to when the proposal was written. I'm sure the authors did not anticipate the pandemic we are in right now, even though they mentioned "a pandemic disease) in the proposal on page 11! They discussed fully the other risk factors that were known or anticipated at the time	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Yes
Comments:	
I did not see any mention of "failures", if there are any. I'm sure there are some. The proposal concentrated on the highly-likely success of the proposal and the strong support by the participating States and other organizations. The authors view this project as having a high likelihood of success based on the ongoing work these organizations are doing. This proposal is an extension and improvement of the work they are already doing. If this proposal is funded, their work will just expand and happen more quickly.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement as defined by the RESTORE Act)	Yes
Comments:	
They have demonstrated that the best available science and methodology will be used in this project including the potential use of adaptive management if necessary. My impression is that they are planning for the expected and, worst case scenarios and have plans to deal with each. The proposal captures the statistical information requirement as defined by the RESTOR ACT.	



Please summarize any additional information needed below:
I think this is an excellent proposal. Much will depend on how much cooperation they will get from the private landowners who own the majority of land in these threatened watersheds. By providing education and financial incentives to restore and manage forests with BMP's, this work can have a major impact. Maintaining and managing healthy forests in threatened watershed is key to keeping downstream estuaries clean. This landscape-scale project is the only way to accomplish this. I hope this project gets funded. It is a good investment.s



SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Enhancing Gulf Waters through Forested Watershed Restoration
Location (If Applicable): Gulf-wide
Council Member Bureau or Agency: U.S. Department of Agriculture
Type of Funding Requested: Planning / Implementation

Reviewed by: Reviewer 2
Date of Review: May 8, 2020

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Need more information
Comments:	
The importance of forests in maintaining/improving water quality and habitat is well supported by peer-reviewed publications. In fact, enhancing water provision service is a common target in forest restoration projects (Filoso et al. 2017). Therefore, the proposed methods support the proposal objectives in general. However, many short-term and small-scale studies showed that forest restoration reduced water yield, mainly due to larger evapotranspiration in forests (Filoso et al. 2017). This would negatively impact water supply for human use. Longer-term and larger-scale studies are limited but did show the potential positive outcomes on hydrological cycles such as increased soil infiltration, reduced peak flow and flood frequency, and possibly increased precipitation, especially when native trees were implemented in forest restoration.	

This shows the importance of long-term monitoring on water quality and quantity after forest restoration. As restoring water quantity is an important goal of this proposal, some literature reviews on the uncertainties of the impact of forest reforestation on water yield are needed. The potential risks related to the negative impact of forest restoration on streamflow, at least in short term, should be described.

Question 2.

If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?

Yes

Comments:

The proposal focuses on forest restoration in improving water quality and quantity, and wildlife habitats in coastal watersheds draining into the northern Gulf of Mexico.

Question 3.

Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?

Yes

Comments:

The literatures used to support the proposal are appropriately cited. They are most from the peer-reviewed publications and presented fairly. As in my comments to Question 1, literatures on the impact of forest restoration on water yield is needed.

Question 4.

Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)

Need more information

Comments:

Short-, mid-, and long-term risks were evaluated, including the potential delays due to catastrophic events such as wildfire and hurricanes, weather extremes such as drought, and lack of incentives by private owners, in addition to the unexpected consequences due to climate change. However, the uncertainties of the impact of forest restoration on streamflow and hydrological cycle, and the risks related to the use of non-native trees in forest restoration require attention. Overall, the active forest management proposed will likely reduce risks of climate change to forests, habitat, and water quality.

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science*, the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Need more information
Comments:	
The proposal is based on sound science and forest restoration is a common approach to improve water quality and habitat conditions. However, the impact of forest restoration on water yield is highly disputed and requires recognition by the applicant. In addition, historical and current data of water quality, habitat use, and private landowners' involvement in the proposed watersheds are not described, therefore the restoration goals lack context.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Need more information
Comments:	
The cross-boundary collaboration among different organizations is highly appreciated. However, it requires more information on how different activities proposed will be integrated to maximize the quality and objectives. How Soil Water Assessment Tool (SWAT) will be used to facilitate adaptive management and help involve private landowners requires more details. Some relevant scenario analysis of the SWAT will be much needed before the project implementation. Spatial variability and location prioritization across and within watersheds should be accounted for. For example, if the response of water quality to forest land cover shows a threshold behavior, understanding the threshold in each watershed will help set the spatially variant goals for forest restoration. The competitive RFP described in the proposal is a great idea to improve innovation and maximize project outcomes.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Need more information
Comments:	
Forest restoration and its benefits in improving water quality and habitat conditions, and the potential impact of climate change on forests are well supported by the scientific literatures. However, the proposal did not provide the information on the impact of forest recovery on water yield that can be negative.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	
Based on the leveraging funds that have been received and proposed, the project partners show they have previous projects and experiences that are relevant to the project proposed here.	

Question B	
Does the project/program have clearly defined goals objectives?	Yes

Comments:	
The project clearly defined the goals and objective related to water quality, quantity, and habitat.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Need more information
Comments:	
The proposal provided a clear description of the methods and justified the selection of some tools like SWAT. However, there is no description how these different methods are integrated to achieve cost-effectiveness. Spatial variability needs to be accounted for. As the status of land cover/land use and water quality differs by watershed, some watershed may require significant increase of forest cover (urbanization-intensive watershed), some watershed may require forest conservation, and some watershed may require the combination of changing agriculture practice and forest restoration to improve water quality and quantity. The spatially variant methods should be considered but are currently missing. In addition, more information is required for the models that predict the benefits on wildlife habitat. How to quantifying the prediction uncertainties from the SWAT should also be addressed.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
The proposal identified quantifiable environmental benefits: increases of forest cover and wildlife habitat, improvement in the magnitude and distribution of stream flows, and reductions in the nutrients and sediment. The impact of forest restoration on stream flows is uncertain though. The proposal addresses the need of educating private landowners to increase their understanding of the benefits of forest management and its importance to Gulf waters to prevent forest land conversion.	

Question E

Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Need more information
Comments:	
<p>The proposal provided four metrics that are relevant to the primary goals and objectives: private landowners that will be involved (660), general public that will be involved (23,000), sediment reduction (2700 lb), and acres under improved management (20,000 acres, not acres of forest expansion). However, it is not clear how the targets were determined, and there are no historical or current data presented so the targets lack context. Is the sediment reduction of 2700 lb a significant reduction? Is this equivalent to 27.6 lb reduction per watershed per year (considering there are 14 watersheds and 7 years for the proposed project)? Is 20,000 acres a significant forest recover considering there are 12.2 million acres of forest land in the priority watershed restoration areas? How many private landowners have been contacted in the previous projects? In addition, there is no target set for nutrient reduction. These targets did not consider spatial variability either. As in my previous comments, spatial variability needs to be accounted for to maximize cost-effectiveness.</p>	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information
Comments:	
<p>The risks related to climate change has been described. Overall, the active forest management proposed will likely reduce risks of climate change to forests, habitat, and water quality. However, the uncertainties of the impact of forest restoration on streamflow and hydrological cycle, and the risks related to the use of non-native trees in forest restoration in the long term require discussion.</p>	

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information
Comments:	
Short- and mid-term risks were evaluated, including the potential delays due to catastrophic events such as wildfire and hurricanes (short-term), weather extremes such as drought (short-term), and lack of incentive by private owners (mid-term). There is a brief mitigation plan to address the lack of incentives by private owners but does not seem to have a mitigation plan to address the short-term risks.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Need more information
Comments:	
The proposal described possible scenarios relevant to the short-, mid- and long-term risks. The information on water quality and private landowners' involvement is largely lacking in the proposal.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Need more information
Comments:	
The proposal described some possible scenarios due to catastrophic events and weather extremes but it is not clear whether these are lessons from the project partners' previous efforts. In generally the past failures of similar efforts are lacking. The past successes of similar efforts mainly exist in the literatures cited in the proposal.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Need more information
Comments:	
<p>Due to the scope of the project, a much stronger data management will be required, including what type of (monitoring and modeling) data will be stored, how security and integrity will be maintained, how the data will be shared and accessed within and beyond the project partners, when the data will be disseminated broadly, and how the data will be maintained in the long-term, what database management system will be used, and standards for metadata. This will largely facilitate the large-scale implementation of the SWAT that helps adaptive management. I believe the implementation of SWAT based on the monitoring data, and SWAT scenario analysis will be combined to inform adaptive management. This needs to be more clear in the proposal. Monitoring is part of budget, however the proportion seems very low considering its importance. In order to increase monitoring network, citizen science may be considered.</p>	

Please summarize any additional information needed below:
<p>The proposal is based on well-supported scientific understanding of the importance of forest ecosystems in maintaining and improving water quality and wildlife habitats. It addresses the challenges of maintaining private forests by increasing private landowners' incentives to conserve. Overall I think the proposed project has large potentials for success. It is based on sound science, there are leveraging funds, and there may be a competitive RFP to improve innovation. However more information and thoughts are required to maximize the quality and cost-effectiveness of the proposed project. The main problems are: 1) no spatial variability is explicitly accounted for, 2) the risks related to water yield are not assessed, 3) the target metrics are hard to evaluate due to the lack of historical and current data and there is no target for nutrient reduction, 4) there is a lack of integration of different activities to maximize the project outcomes, and 5) data management plan needs to be largely strengthened. In addition, use of native species in forest restoration needs to be emphasized. This is important to consider especially when economic values of planting non-native species are large. Budget justification is very coarse, but maybe it is meant that way. Monitoring and adaptive management seem too small a proportion of the budget, considering monitoring is very important to calibrate and validate SWAT. The project partners may think of citizen science to increase monitoring network.</p> <p>I will detail my comments from the following three aspects as required.</p> <p>Maximized the quality, objective and integrity of information:</p>

The integration of different activities is currently missing and it will surely improve the quality and contribute to objectives of the proposed project. Overall I think the data management needs to be improved. Without a good data management plan, it is difficult to integrate the pieces in a large-scale project. One important component spatial variability is not considered in the proposal. The location of forest is important as well as the acres of forest, and I suggest the project partners consider to prioritize the more critical forest locations (for example, adjacent to urban areas, adjacent to riparian zones that provide most benefits for water quality based on the decision support tool). The possible competitive RFP addresses the prioritization issue.

Use peer-reviewed and publically available data:

The proposal is based on peer-reviewed publications. However the use of publically available data is limited, and the data is limited to forest land cover. There is no description of historical and current data of water quality and private landowners' involvement so did not provide a context for the target metrics. In addition, the review on the impact of forest restoration on water quantity is missing.

Clearly documents risks and uncertainties in the scientific basis for such projects:

The short-, mid-, and long-term risks and uncertainties are evaluated. Overall, the active forest management proposed will likely reduce risks of climate change to forests, habitat, and water quality. Some of these uncertainties may provide an opportunity to improve understanding the role of forest restoration in mitigating climate impact and increasing climate resilience, for example, what weather extremes and climate change mean for water quality, and how restoration practices (how much and where) can be adjusted to mitigate the impact can be predicted using the SWAT.

Reference

Filoso, S., Bezerra, M. O., Weiss, K. C. B., & Palmer, M. A. (2017). Impacts of forest restoration on water yield: A systematic review. PLoS ONE, 12(8), 1–26. <https://doi.org/10.1371/journal.pone.0183210>.



SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Enhancing Gulf Waters through Forested Watershed Restoration
Location (If Applicable): Gulf-wide
Council Member Bureau or Agency: U.S. Department of Agriculture
Type of Funding Requested: Planning / Implementation

Reviewed by: Reviewer 3
Date of Review: May 15, 2020

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	
Yes, the proposal contains a clear connection between water quality and forests which is supported by peer-reviewed literature.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
Yes, many of the studies cited in the proposal are specific to the Southeast Region and are applicable to the lands contained within the RESTORE program boundary. Other sources not specific to the Southeast are adaptable to the proposed project area.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
Yes, the proposal uses scientific literature appropriately to describe the problems facing the Southeast region's water supply and uses literature to support the solutions proposed involving forest stewardship.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	
Yes, the proposal attempts to fairly depict the potential risks and uncertainties associated with undertaking the project. The proposal team concludes that there is minimal risk associated with the project activities and suggests there may even be more risk from taking no action to change long term forest stewardship throughout the Gulf region. Risk within the project is mitigated in part due to the large project area, large number of landowners involved and long timeframe for the project (7 years).	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science*, the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer-reviewed and publicly available data?	Yes
Comments:	
Yes, the proposal includes several references to peer-reviewed literature to explain the relationship between forests and water quality.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
Yes, several of the proposal objectives and metrics are justified using scientific literature. For example, the finding that 1% increased forest cover reduces turbidity for water supply by 3% is based on studies of 37 mixed-use watersheds across the country.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Yes
Comments:	
Yes, the proposal cites literature which describes potential changes to Southeast forests from climate change, altered fire regimes, development, invasive species, etc. and attempts to explain how these factors may affect or not affect the project area and proposed outcomes in the short and long term.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	
Yes, the project team, composed on professionals from state forest agencies have experience managing programs involving the proposed forest stewardship practices and outreach to private forest landowners across their states.	

Question B	
Does the project/program have clearly defined goals objectives?	Yes
Comments:	
Yes, the proposal has goals for private, community and public forest restoration and metrics for landowner and community engagement, nonpoint source pollution reduction in sediment and acres of forest management practices for improved water quality but also improvements in habitat condition.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes
Comments:	
Yes, the proposal clearly describes the methods the team plans to employ. All of the methods have been field tested before in other locations within forests of the Southeast and specifically in each of the 3 applicant states.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
Yes, the proposal describes environmental benefits to water quality/quantity as well as wildlife habitat and ecosystem recovery. For context the proposal references assessments of the potential for forest loss across the southeast region through 2060.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes
Comments:	
Yes, the proposal includes metrics for outreach/education and technical assistance which align with goals for restoration of water quality/quantity and habitat but also with the goal to promote natural resource stewardship and environmental education. Other metrics are more directly tied to Habitat Management including pounds of sediment reduction and acres of improved forest management.	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information
Comments:	
Yes, the proposal describes long term projections for forest loss in the Southeast primarily from land conversion. It also mentions potential climate change impacts on future forest composition. However, because some of the project area appears to include coastline of the Gulf and sea level rise (SLR) is predictable, the proposal could do a better job of describing long term risks from SLR to parts of the project area and explain how they plan to mitigate.	

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
Yes, the proposal explains that projects of this nature are well-known to the state forest agencies along with the risks and potential delays associated with delivering such projects. Uncertainties include outreach to private landowners, the status of the economy and by extension the timber market at the time of that outreach. In all cases, the risks are described as minimal. The project is large enough and flexible enough in scope and timeframe to accommodate adjustments that may be needed to deliver project outcomes.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes
Comments:	
Yes, the proposal cites studies assessing the future of forests and watersheds in the Southeast based on projected population growth, land use and changing climate including potential changes to water supply, forest composition and productivity. The project team is aware that the recent covid 19 pandemic may affect the economy and private landowner decisions in the short-term.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Yes
Comments:	
Yes, all of the proposed restoration and stewardship techniques have been tried before in the region and with success. The techniques (e.g. prescribed fire, invsives removal) have also been tested over time to improve their application. There are analogous programs at the federal (NRCS and US Forest Service) and state level which support similar landowner outreach and technical assistance to achieve restoration and stewardship goals. While the scale and timing of this effort is larger than many individual projects there is nothing to suggest that the proposed methods cannot be scaled up.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes
Comments:	
Yes, the proposal mentions using several models that can align with an adaptive management framework including the Soil and Water Assessment Tool (SWAT), EPA's BASINS model for tracking progress toward Total Maximum Daily Load (TMDL) reductions and also mentions using a Customer Relations Management System to track all interactions with private forest landowners in the project area to evaluate their success and modify outreach strategies.	



Please summarize any additional information needed below:
<p>The proposal describes an ambitious seven year program to restore forests across 20,000 acres of Gulf Coast forested ecosystems at a cost of approximately \$1,500 per acre. To best align the benefits of this work with the primary goal of restoring or maintaining water quality the proposal could take a more targeted approach toward outreach to specific landowners in key watersheds tied to water supply within the 3 state area. Metrics could include how many treated acres are contained within and contributing to the health of delineated state source water protection areas.</p>