**1. Executive Summary**

**Applicant:** Fountara, LLC

**Project:** Orange Springs, Seminole Spring, and Orange Creek System Restoration & Preservation

**Location:** From Seminole Spring head and Orange Spring head (Marion County), following Orange Creek East through Putnam County into Rodman Reservoir and West to Orange Lake and Lochloosa Lake (Alachua County).

**Historic Resource:** James W. Townsend House (National Register Ref. #98001343)

**Purpose**

Preserve, restore, and protect one of North Florida’s most interconnected freshwater and cultural systems.

This initiative integrates Seminole Spring, Orange Springs, and the Orange Creek–Orange Lake–Lochloosa Lake corridor, addressing ecological, hydrological, and historic-preservation priorities under a unified multi-county plan.

**The project will:**

* Safeguard and document both Seminole Spring and Orange Springs headwaters.
* Remove invasive vegetation, fallen trees, and accumulated muck to restore natural flow and oxygenation.
* Stabilize eroding banks and re-establish native vegetation across riparian zones.
* Conduct a front-loaded archaeological and burial-site assessment before disturbance to protect cultural or ancestral resources.
* Restore and preserve the James W. Townsend House, a key heritage landmark representing Florida’s early settlement and frontier architecture.

**Scope of Work**

**Phase 1** – Archaeological and Burial-Site Survey:

 Conduct a state-licensed Phase IA/IB survey covering Seminole Spring, Orange Springs, and the Orange Creek corridor.

 Identify and protect any cultural or burial sites per Florida Statute §872.05 and coordinate with tribal representatives.

**Phase 2** – Creek and Spring Restoration (Multi-County Corridor):

 Remove muck, debris, and invasives from Seminole Spring and Orange Springs downstream to Rodman Reservoir, Orange Lake, and Lochloosa Lake.

 Restore hydrology and improve oxygen levels while minimizing mechanical disturbance.

**Phase 3** – Vegetation and Shoreline Stabilization:

 Replant native wetland and upland species; use bio-engineering methods (coir logs, root matting, live staking, native sod stabilization).

**Phase 4** – Historic and Cultural Preservation:

 Stabilize and restore the James W. Townsend House using the Secretary of the Interior’s Standards.

 Produce as-built documentation and interpretive materials for public education.

**Phase 5** – Conservation Buffer and Monitoring Network:

 Establish a vegetated buffer linking Seminole Spring, Orange Springs, and Orange Creek.

 Implement quarterly monitoring for vegetation, erosion, and water quality, with annual DEP and DHR reporting.

**Expected Outcomes**

* Full hydrologic reconnection between Seminole and Orange Springs and the Orange Creek–Orange Lake–Lochloosa Lake system.
* ≥90 % invasive biomass removal and ≥75 % native cover within 12 months.
* Reduced erosion and improved shoreline stability.
* Verified archaeological compliance and burial-site protection.
* Preserved integrity of the James W. Townsend House.
* Creation of a regional conservation and education corridor.

**Sustainability and Monitoring**

* Annual water-quality and vegetation surveys reported to DEP and DHR.
* Volunteer-led invasive-control and shoreline watch programs.
* Five-year follow-up evaluations for plant survivorship and hydrologic stability.
* Coordinated multi-county stewardship coalition for long-term maintenance.

**Performance Indicators**

Metric Target

Linear miles restored (Seminole → Orange → Lochloosa) ≥ 15 miles continuous flow

Invasive biomass removal ≥ 90 % reduction

Native vegetation coverage ≥ 75 % within 12 months

Shoreline stability gain ≥ 60 % erosion reduction

Archaeological compliance 100 % DHR-approved

Townsend House preservation Full stabilization

Volunteer engagement ≥ 500 hours per year

**Future Phases and Site Integration**

After ecological and preservation objectives are complete, Fountara, LLC and partners plan adaptive-reuse projects to enhance public safety, sustainability, and economic value.

Planned future components include:

* Repurposing the existing spray field into a solar-assisted recharge and pollinator meadow, reducing nutrient runoff and supporting native species.
* Constructing multi-purpose emergency shelters and water facilities built as monolithic domes engineered for Category-5 hurricane resilience. These domes will serve dual roles as community shelters and secure operations hubs during storms and disasters.
* Establishing a renewable-powered water canning and storage center within the domes to provide long-term emergency potable-water supply for regional response efforts. Deploying a portable water bagging line to package emergency drinking water for rapid distribution during disasters. This line will produce sealed bags of potable water alongside the canning operation, ensuring flexible and scalable relief during crisis events.
* These elements are not included in the current funding request but represent the next phase of sustainable development after restoration benchmarks and regulatory clearances are met. All future construction will undergo independent environmental and cultural review to maintain full DEP, SJRWMD, and DHR compliance.

**2. Background and Need**

**Site Context:**

The Orange Springs–Seminole Spring–Orange Creek system forms one of Florida’s most ecologically and historically significant freshwater corridors. Originating from two primary spring heads—Seminole Spring and Orange Springs—the system flows northwest through Putnam County, feeding Orange Lake and Lochloosa Lake in Alachua County, and northeast entering the Rodman Reservior.

The region’s water quality is unusually high for a natural spring-fed system, yet its stability is threatened by invasive vegetation, debris buildup, and bank erosion caused by decades of unmanaged flow obstructions, aging infrastructure, and changing land use. Without intervention, these pressures risk degrading a corridor that supports critical habitats, historic resources, and rural water resilience.

**Historical Significance**

At the cultural heart of the project lies the James W. Townsend House, constructed in the late 1800s and listed on the National Register of Historic Places (Ref. #98001343). The structure embodies Florida’s frontier craftsmanship, serving as one of the few intact examples of early domestic architecture associated with Orange Springs’ settlement era.

The area surrounding the Townsend House also contains potential archaeological resources from pre-Columbian habitation, early Seminole and Creek cultural activity, and 19th-century community development tied to the spa-resort economy that once defined Orange Springs. This makes the location a unique intersection of natural, cultural, and archaeological heritage.

The Florida Division of Historical Resources identifies Orange Springs as a sensitive archaeological zone, with historical references to burial mounds and early trading activity. Accordingly, the project’s inclusion of a Phase IA/IB archaeological survey—conducted prior to any physical restoration—ensures legal compliance and the highest level of cultural respect.

**Environmental Conditions**

Field and aerial observations confirm several key environmental issues across the Seminole–Orange Creek–Orange Lake–Lochloosa corridor:

* Flow Impediments: Fallen trees, sedimentation, and dense mats of invasive aquatic vegetation restrict water movement and oxygen circulation.
* Bank Erosion: Shoreline collapse has increased turbidity and nutrient loading downstream.
* Invasive Dominance: Hydrilla, torpedo grass, and Chinese tallow outcompete native vegetation and diminish habitat quality.
* Hydrologic Fragmentation: Disconnected sections of the creek impede natural drainage and wildlife passage.
* Infrastructure Legacy Impacts: The former spray field and drainage features from older agricultural and wastewater systems contribute to unnatural runoff and silt loading.

Despite these challenges, the system remains highly recoverable because of intact spring flow, moderate nutrient levels, and accessible public-private ownership enabling multi-jurisdictional cooperation.

**Regional Importance**

The project lies within the St. Johns River Water Management District’s priority watershed and supports DEP Springs Protection goals under the Florida Springs and Aquifer Protection Act (FSAPA). Restoration of this corridor strengthens:

* Groundwater recharge capacity feeding the Floridan Aquifer.
* Surface-water connectivity critical for flood resilience and drought mitigation.
* Habitat corridors for fish, amphibians, and migratory birds dependent on spring-fed flow.
* Economic and cultural value through tourism, education, and heritage interpretation centered on Orange Springs.

By restoring continuous flow from Seminole and Orange Springs through Orange Lake and Lochloosa Lake, the project enhances hydrologic and ecological stability across Marion, Putnam, and Alachua Counties, benefitting both natural ecosystems and human communities.

**Need for Immediate Action**

Without restoration, the system faces escalating decline:

* Invasive biomass and organic sediment will continue reducing dissolved oxygen and aquatic habitat quality.
* Bank erosion and nutrient release will increase downstream loading into the St. Johns River Basin.
* Potential archaeological and burial resources risk unintentional disturbance from unmanaged erosion.
* The James W. Townsend House faces gradual deterioration from moisture, foundation instability, and deferred maintenance.
* Regional communities will lose opportunities for resilient water infrastructure, ecological tourism, and cultural education.

Immediate intervention will prevent irreversible degradation and position the Orange Springs corridor as a state model for integrated spring restoration and heritage preservation.

**Public and Interagency Alignment**

This project aligns with multiple state and regional objectives:

* Florida Department of Environmental Protection (DEP): Watershed restoration and nutrient reduction under the Florida Springs Restoration Initiative.
* St. Johns River Water Management District (SJRWMD): Restoration of basin hydrology and flood resilience.
* Florida Division of Historical Resources (DHR/SHPO): Protection of listed historic structures and cultural sites.
* Florida Fish and Wildlife Conservation Commission (FWC): Habitat restoration for aquatic and riparian species.
* Putnam and Alachua Counties: Inter-county water-quality enhancement, eco-tourism development, and emergency-water resilience.
* The cross-county scope ensures that environmental restoration, cultural preservation, and public safety objectives are achieved within a single coordinated framework.

**Summary of Need**

The Orange Springs and Orange Creek Restoration & Preservation Project is not a discretionary improvement—it is a necessary intervention to prevent the loss of irreplaceable natural and historic assets.

* It secures the headwaters of two significant springs.
* It restores a multi-county freshwater corridor that feeds two major lakes and the St. Johns River system.
* It preserves one of Marion County’s most important historic structures.
* It lays the foundation for future emergency water infrastructure and community resilience, all while maintaining strict environmental and archaeological compliance.

**3. Goals and Objectives**

**Primary Goal**

To protect and restore the full Seminole Spring–Orange Springs–Orange Creek–Orange Lake–Lochloosa Lake system while preserving the James W. Townsend House and associated cultural resources, ensuring the corridor’s long-term ecological integrity, historical continuity, and community resilience.

**Supporting Objectives**

**Objective 1** – Preserve and Enhance Water Quality

* Maintain and document existing high-quality water at Seminole Spring and Orange Springs through continuous monitoring of turbidity, pH, nitrate, phosphate, and dissolved oxygen.
* Remove nutrient-trapping muck and accumulated organic matter that currently reduce oxygen and flow.
* Reduce runoff contributions from adjacent agricultural and spray-field lands using vegetative filtration and buffer zones.
* Coordinate with DEP and SJRWMD to align water-quality testing with the Florida Springs Restoration Initiative’s monitoring protocols.

Measurable Outcome:

Water-quality parameters remain within or exceed DEP Class III standards after restoration; measurable 25–40% reduction in nutrient concentration downstream to Orange Lake.

**Objective 2** – Restore Hydrologic Flow and Habitat Connectivity

* Remove fallen trees, sediment buildup, and invasive aquatic vegetation from Orange Creek’s full length, reestablishing natural flow between Seminole Spring, Orange Springs, Orange Lake, and Lochloosa Lake.
* Reconnect fragmented wetland zones and eliminate artificial blockages created by decades of unmanaged debris.
* Design low-impact flow corridors that retain floodplain function while reducing stagnation.
* Rehabilitate feeder channels to improve water movement during dry and high-rainfall seasons.

Measurable Outcome:

Reconnected, continuous hydrologic pathway across 15 linear miles with 90% flow restoration compared to baseline; improved dissolved oxygen by >30%.

**Objective 3** – Remove Invasive Species and Re-establish Native Vegetation

* Target removal of hydrilla, torpedo grass, Chinese tallow, and other high-proliferation invasives through mechanical and manual methods.
* Replant native riparian and upland species (pickerelweed, bald cypress, maidencane, sand cordgrass, etc.) to improve shoreline stability and biodiversity.
* Integrate bioengineering erosion controls (coir logs, root matting, live staking) to reinforce streambanks and wetlands.
* Establish a multi-county seed and plant propagation plan in coordination with FWC and local nurseries for sustainable native replanting.

Measurable Outcome:

≥90% invasive biomass removed; ≥75% native vegetative cover achieved within 12 months post-restoration.

**Objective 4** – Conduct Archaeological and Burial-Site Protection Measures

* Execute a Phase IA/IB archaeological survey before ground disturbance, coordinated with the Florida Division of Historical Resources (DHR).
* Identify, map, and record any cultural or burial sites along the project corridor.
* Follow Florida Statute §872.05 for unmarked burial protection: immediate work stoppage, DHR notification, and preservation in place or respectful reinterment under state supervision.
* Maintain full NHPA Section 106 and tribal consultation compliance with Seminole and Miccosukee Tribal Historic Preservation Officers (THPOs).

Measurable Outcome:

100% archaeological compliance verified by DHR review; no unpermitted disturbance or loss of cultural materials.

**Objective 5** – Preserve and Stabilize the James W. Townsend House

* Perform structural stabilization and weatherproofing of the James W. Townsend House using historically appropriate materials.
* Address foundation settling, roof integrity, and moisture infiltration under supervision of preservation specialists.
* Record all work with as-built drawings and photographs following Secretary of the Interior’s Standards for Rehabilitation.
* Incorporate interpretive signage and educational displays highlighting the site’s contribution to Florida’s frontier history.

Measurable Outcome:

Historic structure stabilized to state preservation standards with full documentation filed to DHR; public interpretive materials installed.

**Objective 6** – Create a Conservation Buffer and Long-Term Monitoring Framework

* Establish a protected vegetative buffer surrounding Seminole Spring, Orange Springs, and key segments of Orange Creek.
* Conduct quarterly monitoring of vegetation, erosion, water quality, and wildlife activity.
* Develop an open-access environmental data portal for community science engagement.
* Publish annual progress reports to DEP, SJRWMD, DHR, and county partners.

Measurable Outcome:

Fully vegetated buffer zone within 18 months; quarterly data reports verifying improved ecosystem metrics and shoreline stability.

**Objective 7** – Foster Multi-County Partnerships and Community Stewardship

* Formalize cooperative agreements with Marion, Putnam, and Alachua County governments for joint maintenance and data-sharing.
* Integrate regional partners including Forest Gold Water Inc., Sleepy Creek Lands LLC, Gateway Girl Scout Council, and Stephen McDonald Grassing Inc. for technical and volunteer support.
* Engage local schools, veteran organizations, and citizen groups for environmental education, shoreline restoration, and invasive removal programs.
* Encourage eco-tourism and heritage events centered around the restored Townsend House and the Orange Springs system.

Measurable Outcome:

Annual volunteer hours ≥500; formal MOUs signed with at least three counties and five private partners; educational outreach to ≥300 students and residents per year.

**Objective 8** – Prepare for Long-Term Resilience and Future Infrastructure Integration

* Reserve land and design plans for future monolithic dome shelters and emergency water canning and storage facilities once restoration objectives are met.
* Repurpose existing spray-field areas into ecological recharge zones and solar-assisted pollinator meadows.
* Ensure all future development undergoes DEP, SJRWMD, and DHR review to preserve restored conditions.

Measurable Outcome:

Feasibility and siting assessments for post-restoration domes completed within 24 months; full environmental compliance maintained for future infrastructure integration.

**Summary**

These objectives together establish a complete ecosystem and heritage protection framework—balancing environmental restoration, archaeological integrity, and community preparedness. Each objective includes quantifiable outcomes, ensuring DEP, DHR, and SJRWMD can monitor measurable results aligned with state and federal grant standards.

**4. Methods and Implementation Plan**

This section defines the technical sequence, professional standards, and operational framework through which Fountara, LLC and its partners will execute the Orange Springs–Seminole Spring–Orange Creek System Restoration & Preservation Project.

Each method follows state and federal regulatory guidance to ensure compliance, efficiency, and preservation integrity.

**Phase 1** – Archaeological and Burial-Site Assessment

**Objective:** Identify, document, and protect all cultural, archaeological, and potential burial sites before any soil disturbance or mechanical activity.

**Regulatory Framework:**

* Conduct a Phase IA/IB Cultural Resource Assessment Survey (CRAS) in accordance with 36 CFR Part 800 and the Florida Division of Historical Resources (DHR) Compliance and Review Standards.
* Notify and coordinate with the State Historic Preservation Officer (SHPO) and Tribal Historic Preservation Officers (THPOs) of the Seminole and Miccosukee Tribes prior to survey initiation.

**Field Survey Methods:**

* Perform a systematic pedestrian and subsurface shovel-test survey on a 30–50 m grid interval, adjusted for topography and hydrology.
* Excavate test units to sterile subsoil, screening all material through ¼-inch mesh to recover cultural artifacts.
* Record GPS coordinates, soil profiles, and artifact context for GIS integration.
* Documentation and Reporting:
* Compile detailed site forms and photographic logs per Florida Master Site File requirements.
* Prepare a CRAS report and submit to DHR for official review and clearance prior to restoration work.

**Burial-Site Protocol:**

If human remains or burial features are discovered:

* Immediately stop all work within a 50-meter radius.
* Notify DHR and the local law enforcement agency within 48 hours per F.S. §872.05.
* Protect the area from disturbance until state or tribal authorities determine disposition.

**Deliverables**

* DHR-approved CRAS report and clearance letter.
* GIS database of mapped cultural resources.
* Updated site management plan reflecting avoidance zones and protective buffers.

**Phase 2** – Creek and Spring Restoration (Hydrologic Renewal)

**Objective:** Re-establish natural hydrology and water quality along the interconnected Seminole Spring–Orange Springs–Orange Creek corridor, restoring continuous flow to Orange Lake and Lochloosa Lake.

**Assessment and Planning:**

* Map debris accumulation, sediment loads, and invasive clusters using drone-based LiDAR and multispectral imaging.
* Prioritize areas restricting flow or causing stagnation.
* Debris and Muck Removal:
* Use low-impact amphibious excavators and hand crews for selective removal of blockages.
* Remove organic muck and sediment to restore stream depth and flow gradient, while leaving natural substrate intact where stable.
* Stage and dewater dredged material in containment berms for reuse in shoreline reinforcement.
* Flow and Oxygen Restoration:
* Restore cross-sectional profiles at critical constrictions to pre-disturbance geometry using historic elevation data.
* Re-establish channel meanders where straightening has occurred to slow flow and promote sediment settling.
* Deploy temporary aeration diffusers powered by portable solar systems at stagnant reaches until vegetation establishes.

**Permitting and Oversight:**

* Confirm SJRWMD Environmental Resource Permit (ERP) exemption or obtain general permit for low-impact activities.
* Monitor turbidity daily during removal and file weekly water-quality logs with DEP.
* Deliverables
* Flow-restoration map and channel-profile data.
* Volume and tonnage log of debris/muck removed.
* Verified hydrologic continuity between Seminole Spring and Lochloosa Lake.

**Phase 3** – Vegetation and Shoreline Stabilization

**Objective:** Prevent erosion, enhance habitat diversity, and re-establish native vegetation along streambanks, wetlands, and upland buffers.

**Erosion-Control Engineering:**

* Install coir-fiber logs, erosion blankets, and root-matting along critical bends and slopes (>3:1 grade).
* Construct vegetative terraces at high-energy banks to dissipate flow velocity.
* Native Replanting Program:
* Select region-specific species such as pickerelweed, duck potato, bald cypress, red maple, sand cordgrass, muhly grass, and saw palmetto.
* Plant in staggered, zoned patterns—emergent, transitional, and upland—to maximize storm resilience and water filtration.
* Use wetland plug trays for rapid establishment and shoreline coverage.

**Invasive Control Measures:**

* Perform manual and mechanical removal of torpedo grass, hydrilla, Chinese tallow, and other aggressive species.
* Apply targeted, aquatic-approved herbicides only where mechanical removal is impractical, under FWC Aquatic Plant Management Permit.
* Wildlife Integration:
* Install floating habitat platforms and woody debris structures to promote fish and amphibian refuge.
* Monitor avian and aquatic biodiversity quarterly to gauge ecological response.

**Deliverables**

* Stabilized shoreline transects (baseline + 12-month comparison).
* Native planting inventory and survival-rate data.
* Quarterly invasive-removal progress reports.

**Phase 4** – Historic and Cultural Preservation (James W. Townsend House)

**Objective:** Preserve the James W. Townsend House as a centerpiece of regional cultural heritage and ensure compliance with federal preservation standards.

**Condition Assessment:**

* Engage a licensed preservation architect and structural engineer to assess the foundation, roof, framing, and cladding.
* Conduct moisture-content readings and photographic documentation of all affected materials.
* Stabilization and Restoration:
* Stabilize foundation using historically compatible concrete piers or timber replacements.
* Replace deteriorated wood members in-kind using cypress or pine of matching profile.
* Repair roofing with historically accurate shingles or metal sheeting.
* Treat all wood surfaces with borate-based preservative and repaint with vapor-permeable coatings.
* Documentation and Compliance:
* Follow the Secretary of the Interior’s Standards for Rehabilitation.
* Record work via annotated photo log and “as-built” report submitted to DHR for project closeout.
* Install interpretive signage detailing the house’s historical and architectural significance.

**Deliverables**

* DHR-approved preservation report.
* Structural stabilization certification.
* Completed interpretive exhibit for public education.

**Phase 5** – Conservation Buffer, Monitoring, and Maintenance

**Objective:** Ensure long-term ecological stability, compliance verification, and public involvement in the preservation of restored lands.

**Conservation Buffer Installation:**

* Establish 50–100 ft vegetated buffers at spring heads and riparian zones.
* Use native canopy trees (cypress, sweetbay magnolia, red maple) and understory vegetation to reduce nutrient inflow.
* Monitoring Framework:
* Quarterly field inspections: vegetation survival, erosion rate, and water-quality sampling.
* Annual cultural and historic integrity check of the Townsend House and archaeological protection zones.
* Maintain a GIS-based dashboard tracking environmental data, accessible to DEP and county partners.
* Community and Volunteer Engagement:
* Coordinate “Restoration Days” with Gateway Girl Scout Council, local schools, and veteran organizations.
* Host annual stewardship training workshops for invasive removal and citizen science monitoring.
* Reporting and Adaptive Management:
* Submit quarterly progress summaries and annual cumulative reports to DEP, SJRWMD, DHR, and participating counties.
* Adjust planting and maintenance methods based on data trends and agency feedback.

**Deliverables**

* Fully vegetated, self-sustaining buffer system.
* Annual DEP/DHR compliance reports.
* Active volunteer network supporting maintenance for ≥5 years post-completion.

**Phase 6** – Integration for Future Infrastructure (Post-Restoration Planning)

**Objective:** Lay the groundwork for future development of monolithic dome shelters and emergency water storage/canning facilities, ensuring that design and siting align with restored environmental conditions.

* Conduct feasibility and hydrologic-impact analyses to determine optimal dome locations on non-sensitive, elevated ground.
* Design domes to Category 5 hurricane resistance, using steel-reinforced shotcrete shells and insulated closed-cell spray foam.
* Power all future facilities via on-site solar arrays and battery banks, maintaining net-zero environmental impact.
* Integrate systems with existing monitoring and conservation infrastructure for seamless emergency deployment.

**Deliverables**

* Feasibility study and conceptual site plan for monolithic domes.
* Environmental compliance review packages for DEP/SJRWMD/DHR approval.
* Concept design documentation for future grant or capital funding phases.

**Summary**

These six implementation phases form a linear, compliance-first sequence:

**Survey → Restoration → Stabilization → Preservation → Monitoring → Future Integration.**

Each step includes measurable deliverables and regulatory checkpoints to ensure that Fountara, LLC, its partners, and participating agencies achieve complete transparency, ecological integrity, and cultural protection throughout the project lifecycle.

**5. Timeline**

The Orange Springs – Seminole Spring – Orange Creek System Restoration & Preservation Project will run for 24 months, followed by a five-year monitoring and maintenance cycle.

The schedule ensures that no ecological or construction work begins before cultural clearance is secured, and that every phase delivers measurable outputs to DEP, DHR, and SJRWMD standards.

**Phase Schedule Table**

| **Phase** | **Duration** | **Major Activities** | **Deliverables** |
| --- | --- | --- | --- |
| 1 – Archaeological & Burial-Site Assessment | Months 1 – 3 | Cultural resource survey; shovel testing; mapping; DHR/SHPO and tribal consultation. | Approved Cultural Resource Assessment Survey (CRAS) report and DHR clearance letter. |
| 2 – Creek & Spring Restoration | Months 3 – 9 | Selective removal of muck, fallen trees, and invasives from Seminole Spring through Orange Creek to Orange and Lochloosa Lakes; hydrologic profiling and oxygen re-establishment. | Flow-restoration map; volume log of debris/muck removed; turbidity and DO data sheets. |
| 3 – Vegetation & Shoreline Stabilization | Months 9 – 15 | Erosion-control installation; native planting; bioengineering structures; invasive-species follow-up. | ≥75% native cover achieved; stabilized transects documented by GPS and photolog. |
| 4 – Historic Preservation (James W. Townsend House) | Months 10 – 16 (overlaps Phase 3) | Foundation and roof stabilization; moisture control; period-appropriate repairs; interpretive signage. | DHR-approved preservation report; stabilized structure; as-built documentation. |
| 5 – Conservation Buffer & Monitoring Setup | Months 16 – 20 | Vegetated buffer installation at spring heads and riparian zones; sensor placement; public safety signage; launch of monitoring program. | Buffer map; monitoring protocol manual; DEP validation of installed system. |
| 6 – Future Infrastructure Planning | Months 20 – 24 | Feasibility and site analysis for hurricane-resistant monolithic domes and emergency water facilities; concept design and environmental review. | Feasibility study; preliminary engineering drawings; DEP/DHR review submittal. |
| Post-Restoration Monitoring | Years 3 – 7 | Quarterly water and vegetation surveys; annual DEP/DHR reports; adaptive management reviews. | Annual performance reports and five-year independent audit summary. |

**Key Milestones Table**

| **Month** | **Milestone** | **Deliverable / Result** |
| --- | --- | --- |
| 1 | Project mobilization and agency coordination meeting | Signed inter-agency work plan and baseline data collection complete. |
| 3 | Archaeological fieldwork complete | CRAS report submitted and DHR clearance received. |
| 6 | Hydrologic restoration mid-point | Flow restored through 75% of target reach; DEP Interim Report #1 filed. |
| 9 | Debris and invasive removal finished | Documented debris log and oxygen improvement metrics. |
| 12 | Vegetation establishment review | ≥50% plant survival and bank stability verified. |
| 14 | Townsend House restoration complete | Final inspection and DHR sign-off issued. |
| 18 | Buffer and monitoring network live | All monitoring stations operational and data streaming to DEP dashboard. |
| 20 | Agency compliance review | DEP and SJRWMD approve restoration performance. |
| 22 | Monolithic dome feasibility phase | Concept design package submitted for next-phase funding. |
| 24 | Project close-out | Comprehensive final report and financial certification submitted. |

**Long-Term Monitoring (Years 3 – 7)**

| **Frequency** | **Activity** | **Deliverable/Result** |
| --- | --- | --- |
| Quarterly | Water-quality sampling, vegetation surveys, erosion transect checks | Data for annual and five-year reports |
| Annually | DEP/DHR combined report and public summary release | Annual evaluation and public transparency |
| Year 5 | Independent performance audit with recommendations for adaptive management | Audit summary and recommendations |
| Year 7 | Transition to maintenance-only mode under county agreements with Fountara oversight | Maintenance phase begins |

**Management Chain of Responsibility**

| **Function** | **Entity / Responsible Party** |
| --- | --- |
| Project Director | Fountara LLC |
| Project Manager | William B. Greene Jr., Fountara LLC |
| Archaeology Lead | State-Certified Archaeologist (DHR-registered) |
| Hydrology & Restoration Engineer | SJRWMD Liaison Engineer |
| Vegetation / Ecological Specialist | Fountara Environmental Division with FWC Habitat Team |
| Historic Preservation Architect | Licensed Preservation Architect (DHR-approved) |
| County Coordination | Marion, Putnam & Alachua County Environmental Services |
| Monitoring & Public Engagement | Fountara LLC |
| Prospective Private and Community Partners | Fountara LLC, LTD Unlimited, Forest Gold Water Inc., Island Grove LLC, Stephen McDonald Grassing Inc., Gateway Girl Scout Council, Church Street Distributors, TruPurge Inc., Kim S. Williams, Jack Williams Company, Natalie S. Powers III, Sleepy Creek Lands LLC, Carolyn O. Marlowe |

**6. Budget and Cost Breakdown**

**Funding Strategy Overview**

Fountara LLC requests 100 percent grant funding for both environmental and historic-preservation components.

* All partner participation will be recorded as non-cash in-kind support once quantified.
* A formal match-waiver and hardship statement will accompany the application.
* Quarterly expenditure and performance reporting to DEP and DHR.
* Independent annual audit verifying allowable-cost compliance.
* Separate project account under Fountara LLC for all grant transactions.
* Procurement governed by 2 CFR 200 and Florida Administrative Code 60A-1.
* Contingency use exceeding $10,000 requires written agency approval.

**A. Environmental Restoration Budget**

| **Category** | **Description** | **Estimated Cost (USD)** | **Funding Source** |
| --- | --- | --- | --- |
| Project Management & Compliance | Oversight, reporting, field supervision | $185,000 | DEP Springs Restoration Grant |
| Archaeological & Cultural Assessment | Phase IA/IB survey, mapping, tribal consultation | $120,000 | DEP (Environmental Compliance) |
| Creek & Spring Restoration | Debris, muck, and invasive removal; flow and oxygen restoration | $410,000 | DEP / SJRWMD Joint Grant |
| Vegetation & Shoreline Stabilization | Native replanting, bio-engineering erosion control | $260,000 | DEP / FWC Habitat Restoration |
| Monitoring & Data Systems | Sensors, GIS dashboards, field test kits | $85,000 | DEP Springs Protection Program |
| Conservation Buffer & Signage | Buffer plantings, interpretive and safety signage | $60,000 | DEP Education & Outreach |
| Equipment & Supplies | Field tools, safety gear, portable pumps | $40,000 | DEP Environmental Restoration |
| Contracted Specialists | Hydrologist, FWC ecologist, ERP permit liaison | $90,000 | SJRWMD Cost-Share |
| Contingency (10%) | Inflation and field variance allowance | $125,000 | DEP Authorized Contingency |
| **Total Environmental Budget** |  | **$1,375,000** | **100% Grant Funded** |

**B. Historic Preservation Budget**

| **Category** | **Description** | **Estimated Cost (USD)** | **Funding Source** |
| --- | --- | --- | --- |
| Administration & Documentation | Grant management and reporting | $60,000 | DHR Preservation Grant |
| Architectural & Engineering Services | Preservation architect and structural engineer | $140,000 | DHR / NPS Technical Services |
| Structural Stabilization & Envelope Work | Foundation, roof, framing, moisture control | $500,000 | NPS Save America’s Treasures |
| Interior Restoration & Finishes | Windows, doors, plaster, painting, fixtures | $300,000 | DHR Capital Projects |
| Interpretive Exhibit & Public Access Improvements | ADA access, signage, walkways | $50,000 | DHR Education Subgrant |
| Contingency (10%) | Inflation and material variance | $100,000 | DHR Allowance |
| **Total Historic Preservation Budget** |  | **$1,150,000** | **100% Grant Funded** |

**Combined Project Total**

Environmental Component $1,375,000

Historic Preservation Component $1,150,000

**Grand Total Project Value $2,525,000 (fully grant funded)**

**In-Kind and Community Support**

Partner / Entity Contribution Type Estimated Value (USD) Documentation Method

Fountara LLC

Forest Gold Water Inc.

LTD Unlimited

Island Grove LLC

Stephen McDonald Grassing Inc.

Gateway Girl Scout Council

Church Street Distributors

TruPurge Inc.

Sleepy Creek Lands LLC

Kim S. Williams

Jack Williams Company

Natalie S. Powers III

Carolyn O. Marlowe

**Funding Sustainability**

Post-grant maintenance will rely on county stewardship agreements, volunteer conservation programs, and additional competitive grants (DEP Springs Restoration, DHR Capital Improvements, FEMA BRIC) for the dome-construction and emergency-water-storage phase.

**7. Evaluation and Success Metrics**

This section defines how Fountara LLC and agency partners will measure the effectiveness of restoration, preservation, and community outcomes for the Orange Springs – Seminole Spring – Orange Creek System Restoration & Preservation Project.

All metrics follow DEP, SJRWMD, and DHR reporting standards, ensuring transparency, quantifiable performance, and long-term verification.

**Evaluation Framework**

The evaluation plan integrates quantitative (measurable scientific data) and qualitative (observational and community) indicators across five major result areas:

* Water Quality & Hydrologic Flow
* Habitat & Vegetation Recovery
* Cultural & Archaeological Protection
* Historic Structure Preservation
* Community & Educational Engagement

Each area includes baseline measurements, periodic reporting intervals, and end-of-project performance thresholds.

**Key Performance Indicators (KPIs) Table**

| **Category** | **Metric** | **Measurement Method** | **Baseline / Target** | **Reporting Frequency** | **Responsible Party** |
| --- | --- | --- | --- | --- | --- |
| Water Quality | Dissolved Oxygen (DO) | DEP-approved field meters | Baseline 4–5 mg/L → Target ≥ 6 mg/L | Quarterly | Fountara Environmental / DEP |
| Water Quality | Nutrient Levels (Nitrate/Nitrite, Phosphate) | Laboratory analysis per DEP SOP | 25–40% reduction from baseline | Semi-annual | DEP / SJRWMD |
| Water Quality | Turbidity | Nephelometric method | ≤ 29 NTU | Quarterly | Fountara Environmental |
| Water Quality | Flow Continuity (Hydrologic Connectivity) | GPS and flow gauge readings | Continuous flow Seminole → Lochloosa | Annual | SJRWMD |
| Vegetation & Habitat | Invasive Biomass Reduction | Transect field survey | ≥ 90% reduction | Semi-annual | Fountara LLC / FWC |
| Vegetation & Habitat | Native Vegetation Cover | Quadrat sampling | ≥ 75% coverage after 12 months | Semi-annual | Fountara Environmental |
| Vegetation & Habitat | Shoreline Stability | Erosion cross-section comparison | ≥ 60% stability improvement | Annual | SJRWMD / County |
| Vegetation & Habitat | Wildlife Presence Index | Visual and acoustic counts | +20% increase in indicator species | Annual | FWC |
| Archaeological & Cultural | CRAS Completion & Clearance | DHR approval letter | 100% clearance prior to ground work | Once (Pre-restoration) | Certified Archaeologist / DHR |
| Archaeological & Cultural | Burial-Site Protection Compliance | Site inspection log | 0 incidents of disturbance | Ongoing | Archaeology Lead / DHR |
| Historic Preservation | Structural Stabilization | Engineer inspection report | 100% load-bearing stabilization | Mid-project | Preservation Architect / DHR |
| Historic Preservation | Roof & Envelope Integrity | Moisture meter readings | ≤ 15% moisture content | Post-restoration | DHR Inspector |
| Historic Preservation | Interior Finish Restoration | Visual inspection checklist | 100% completion of designated rooms | End of project | Fountara Preservation Team |
| Historic Preservation | Interpretive Exhibit Installation | Photo verification | Exhibit installed and open | End of project | Fountara LLC |
| Community & Education | Volunteer Participation | Sign-in sheets / digital logs | ≥ 500 hours annually | Annual | Fountara LLC |
| Community & Education | Public Outreach | Events, school programs | ≥ 3 events per year | Annual | Fountara LLC |
| Community & Education | County / Partner Collaboration | MOUs executed | ≥ 3 active interlocal agreements | Once | Fountara LLC |

**Baseline Data Collection**

**During the first 60 days**:

* Water samples collected at fixed points (Seminole Spring head, Orange Springs head, Orange Creek midpoint, Orange Lake inflow, Lochloosa outflow).
* Topographic and LiDAR mapping of creek channel profiles.
* Vegetation baseline survey using 10 m² quadrats for invasive/native ratio documentation.
* Historic building condition assessment including structural, roof, and moisture readings.
* Archaeological survey completed and filed with DHR prior to field mobilization.
* All baseline data sets will be entered into the Fountara GIS Environmental Management System (F-GEMS) for consistent reference during monitoring.

**Evaluation Methodology**

Quantitative Monitoring:

* DEP and SJRWMD-approved instruments used for all water and soil tests.
* DHR-approved inspection protocols for cultural and structural elements.
* Statistical trend analysis to confirm improvements exceed confidence thresholds (95 % confidence level).

**Third-Party Verification:**

* Independent review by DEP or contracted auditors once per year.
* Annual photo documentation for each key site.

**Adaptive Management:**

* Quarterly review meetings with DEP, DHR, and County staff.
* Adjust planting strategies or erosion-control designs if metrics fall below 80 % of target values.

**Data Transparency:**

* Monitoring results published via public-access online dashboard (maintained by Fountara LLC).
* All GIS layers and reports shared with participating agencies.

**Reporting Schedule Table**

| **Report Type** | **Frequency** | **Recipients** | **Contents** |
| --- | --- | --- | --- |
| Quarterly Technical Report | Every 3 months | DEP, DHR, SJRWMD | Progress summary, water-quality and vegetation data, compliance updates |
| Semi-Annual Performance Report | Twice per year | DEP, DHR | Data comparison to baseline, narrative of accomplishments |
| Annual Evaluation Report | Annually (Years 1–7) | DEP, DHR, Counties | KPI table updates, long-term stability and maintenance results |
| Final Project Report | Month 24 | DEP, DHR, SJRWMD | Comprehensive dataset, financials, photographs, and recommendations |
| Five-Year Audit Report | Year 5 | DEP, DHR | Independent review, post-restoration status, long-term performance |

**Success Determination Criteria**

A project will be deemed successful when the following are achieved:

* All DEP/SJRWMD environmental targets meet or exceed thresholds in water quality, hydrology, and vegetation.
* All DHR cultural and preservation milestones completed and certified.
* No violations or adverse findings related to archaeological or burial-site protection.
* The James W. Townsend House is stabilized, preserved, and operational for public interpretation.
* Long-term monitoring and volunteer programs remain active beyond grant closure.

**8. Long-Term Sustainability and Maintenance**

This section outlines how Fountara LLC and its partners will preserve the environmental, cultural, and community outcomes of the Orange Springs – Seminole Spring – Orange Creek System Restoration & Preservation Project after completion and through the next several decades. It establishes a maintenance framework, defines responsible parties, and details funding and governance strategies that keep the site self-sufficient.

**Long-Term Stewardship Framework Table**

| **Component** | **Custodian / Responsible Entity** | **Ongoing Tasks** |
| --- | --- | --- |
| Waterways & Hydrology | Fountara LLC / SJRWMD / County Environmental Depts. | Quarterly flow inspections, sediment clearing, debris control, turbidity and oxygen monitoring |
| Vegetation & Habitat | Fountara Environmental Division / FWC | Annual invasive-species audits, seasonal replanting, habitat surveys |
| Archaeological & Cultural Sites | Florida Division of Historical Resources (DHR) / Fountara Cultural Liaison | Maintain protective buffers, update site records, enforce burial-site protections |
| Historic Structure (James W. Townsend House) | Fountara LLC / DHR Historic Sites Program | Biennial structural inspection, preventive maintenance, roof and foundation checks |
| Monitoring Network & Public Access | Fountara LLC / County Parks Divisions | Maintain sensors, signage, and educational displays; data upload to public dashboard |
| Emergency Facilities (Future Domes) | Fountara LLC / County Emergency Management Offices | Maintain readiness, inspect solar-power systems, verify potable-water storage integrity |

**Post-Grant Funding Plan**

**County Maintenance Agreements**

* Memoranda of Understanding (MOUs) with Marion, Putnam, and Alachua Counties will allocate small annual budgets from county environmental and public-works funds for basic upkeep. Counties receive public-use credit for parkland and storm-water improvements, creating mutual incentive.
* Revenue-Neutral Stewardship Fund. Fountara will establish a dedicated Stewardship Account seeded by environmental service contracts and private donations. Earnings cover annual inspections, insurance, and vegetation maintenance.
* Grant-Rotation Strategy. Ongoing eligibility under:

DEP Springs Restoration Mini-Grants (maintenance and monitoring)

DHR Historic Preservation Small Matching Grants (Townsend House upkeep)

FEMA BRIC and HMGP (future dome construction)

EPA 319 Program Maintenance Grants (nonpoint-source prevention)

* Public-Private Support Mechanisms. Partnerships with Forest Gold Water Inc., Island Grove LLC, and others to sponsor native-plant replacement and community events.

Naming-rights or heritage-sponsorship options for interpretive installations.

* Tax Credit and Deduction Eligibility. The James W. Townsend House qualifies for the Federal Historic Preservation Tax Incentive Program, enabling long-term reinvestment in continued rehabilitation.

**Volunteer and Community Engagement**

* Annual Restoration Days: community clean-ups, native-planting drives, and educational workshops led by Fountara LLC.
* Citizen-Science Program: volunteers record turbidity and vegetation data via the Fountara GEMS mobile app.
* Youth Education: coordination with the Gateway Girl Scout Council and local schools for ecology merit programs.
* Public Interpretation: guided tours through the Townsend House and nearby conservation buffer to reinforce local stewardship.

**Maintenance Schedule Table (Years 3–15)**

| **Year(s)** | **Focus** | **Primary Actions** |
| --- | --- | --- |
| 3–5 | Vegetation Establishment & Data Refinement | Replace failed plantings, recalibrate sensors, confirm hydrologic targets |
| 6–7 | Stability Verification | Third-party review; certify erosion control and bank stability |
| 8–10 | Preventive Maintenance Cycle 1 | Re-apply protective coatings on Townsend House; minor shoreline grading |
| 11–12 | Monitoring System Upgrade | Replace solar sensors and data hardware |
| 13–15 | Preventive Maintenance Cycle 2 | Inspect and reseal building envelope; replace signage; community workshop refresh |
| After 15 | Heritage-Park Status | Joint management by Fountara LLC and county authorities |

After Year 15, the site transitions to heritage-park status jointly managed by Fountara LLC and county authorities, ensuring continuous preservation under local ordinances.

**Risk Management & Contingency Table**

| **Potential Risk** | **Mitigation Action** |
| --- | --- |
| Invasive Re-establishment | Annual mechanical removal, rapid-response herbicide permit with FWC |
| Storm Damage / Flooding | Reinforced banks, emergency response protocol, dome shelter readiness |
| Funding Delays | Maintain 12-month operating reserve in Stewardship Account |
| Vandalism / Unauthorized Access | Surveillance signage, county ranger patrol coordination |
| Structural Deterioration (Townsend House) | Biennial engineering inspection; insurance coverage for replacement-cost repairs |

**Sustainability Benchmarks**

* Ecological: system self-stabilizes without supplemental planting by Year 5.
* Cultural: no unmitigated disturbance to recorded archaeological sites.
* Structural: Townsend House moisture content maintained ≤ 15 %.
* Financial: annual maintenance funded 100 % from self-generated or grant-renewal sources.
* Community: ≥ 500 volunteer hours per year after Year 3.

**Long-Term Vision**

The Orange Springs corridor will serve as a permanent demonstration site for integrated waterway restoration and cultural preservation in Florida.

By Year 10, Fountara LLC anticipates completing the monolithic dome emergency shelters and renewable-powered water-storage facilities, transforming the site into a self-sustaining regional resilience hub that links environmental protection, heritage tourism, and public-safety infrastructure.

**9. Appendices and Supporting Documentation**

This section compiles all reference materials, datasets, and supplemental records that substantiate the technical, cultural, and financial claims made in the Orange Springs – Seminole Spring – Orange Creek System Restoration & Preservation Project proposal.

Each appendix aligns with specific DEP, SJRWMD, and DHR submission requirements for a complete and auditable application package.

**Appendix A — Maps and Geographic Data**

* Regional Context Map Shows the full hydrologic network: Seminole Spring head → Orange Springs → Orange Creek → Orange Lake → Lochloosa Lake → St. Johns River Basin. Boundaries include Marion, Putnam, and Alachua Counties. Prepared using SJRWMD GIS data layers (2025 revision).
* Restoration Corridor Map Highlights work areas for debris removal, invasive management, and native-plant zones. Denotes buffer perimeters, access points, and staging areas.
* Archaeological Sensitivity Map Prepared by the project archaeologist under confidentiality per Chapter 267, F.S. Displays cultural survey grid (not for public release).
* James W. Townsend House Site Map Footprint, topography, setback, and existing utilities.
* Marked photo stations for progress documentation.
* Future Infrastructure Concept Plan Proposed siting of monolithic dome shelters and water canning/storage buildings on elevated non-sensitive land.

**Appendix B — Species and Planting Tables**

Approved Native Species List (by Zone)

* Aquatic/Edge: Pickerelweed (Pontederia cordata), Duck potato (Sagittaria lancifolia), Softstem bulrush (Schoenoplectus tabernaemontani).
* Riparian: Bald cypress (Taxodium distichum), Buttonbush (Cephalanthus occidentalis), Red maple (Acer rubrum).
* Upland Buffer: Muhly grass (Muhlenbergia capillaris), Sand cordgrass (Spartina bakeri), Saw palmetto (Serenoa repens).
* Each species chosen for high survivorship, nutrient absorption, and storm resilience.
* Invasive Species Removal List
* Torpedo grass (Panicum repens), Chinese tallow (Triadica sebifera), Hydrilla (Hydrilla verticillata), Cogon grass (Imperata cylindrica).

Includes removal method (manual/mechanical/herbicide), responsible party, and replanting schedule.

Wildlife Habitat Index

* Expected return of native amphibians, fish, and wading birds (great blue heron, limpkin, wood stork).
* Habitat success monitored through FWC wildlife presence index.

**Appendix C — Agency and Partner Letters of Support**

To be attached upon submission:

* Florida Department of Environmental Protection (DEP) – Springs Protection Program endorsement.
* St. Johns River Water Management District (SJRWMD) – Watershed Restoration Partnership confirmation.
* Florida Division of Historical Resources (DHR) – Preliminary project review acknowledgment.
* Florida Fish and Wildlife Conservation Commission (FWC) – Coordination statement.
* County letters from Marion, Putnam, and Alachua Environmental Departments.
* Partner commitment letters from:
* Forest Gold Water Inc.
* LTD Unlimited
* Island Grove LLC
* Stephen McDonald Grassing Inc.
* Gateway Girl Scout Council
* Church Street Distributors
* TruPurge Inc.
* Sleepy Creek Lands LLC
* Kim S. Williams
* Natalie S. Powers III
* Carolyn O. Marlowe
* Jack Williams Company

All letters will specify each entity’s role, expected deliverables, and non-cash contribution.

**Appendix D — Compliance Documentation**

* DEP & SJRWMD Coordination Forms
* Pre-application meeting minutes.
* Environmental Resource Permit (ERP) exemption confirmation.
* DHR & SHPO Compliance Materials
* Completed Project Review Form (HR 0304).
* Phase IA/IB Cultural Resource Assessment Survey (CRAS) executive summary.
* DHR clearance letter confirming archaeological review completion.
* Federal Compliance Certifications
* NEPA categorical exclusion determination (if applicable).
* NHPA Section 106 consultation record (Seminole & Miccosukee THPO correspondence).
* Clean Water Act Section 401/404 verification (ACOE).
* Insurance & Safety

Fountara LLC general liability, environmental liability, and worker safety coverage documents.

**Appendix E — Data Collection Templates**

Form ID Purpose Frequency Custodian

F-GEMS-01 Water Quality Log (DO, pH, nutrients) Quarterly Fountara Environmental

F-GEMS-02 Vegetation Survival & Invasive Record Semi-annual Fountara LLC

F-GEMS-03 Erosion & Shoreline Survey Form Annual SJRWMD

F-GEMS-04 Archaeological Buffer Verification Checklist Pre/Post Construction Archaeology Lead

F-GEMS-05 Townsend House Structural Inspection Report Biennial Preservation Architect

F-GEMS-06 Volunteer & Education Record Log Annual Fountara LLC

**Appendix F — Visual Documentation**

* Pre-Project Aerial Imagery (drone and satellite orthomosaics).
* Photo Index: numbered before-and-after photographs for all restoration reaches.
* James W. Townsend House Documentation: baseline, mid-point, and completion photo sets with captions.
* Public Interpretation Concepts: draft renderings of educational signage and exhibits.

**Appendix G — Financial and Audit Forms**

* DEP and DHR grant budget worksheets (Form DEP-4714, DHR-202).
* Fountara LLC internal cost ledger template.
* Annual third-party audit engagement letter.
* Match-waiver justification and hardship affidavit.
* Fiscal control statement referencing 2 CFR 200 compliance.
* Appendix H — Maintenance and Stewardship Agreements

**To be executed prior to closeout:**

* Interlocal stewardship MOUs with Marion, Putnam, and Alachua Counties.
* Long-term maintenance agreement between Fountara LLC and DEP.
* Volunteer stewardship charter (Fountara Citizen Science Program).

**Appendix I — Future Phase Planning Documents**

* Preliminary engineering concept sheets for monolithic dome emergency shelters and water canning/storage facilities.
* Conceptual renewable energy integration plan (solar and battery backup).
* Environmental assessment checklist for dome siting (DEP/DHR pre-review draft).

Prepared and compiled by:

Fountara, LLC – Project Management Division

William B. Greene Jr., Project Manager

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_