United States Department of the Interior
U.S. Fish and Wildlife Service

Pahranagat National Wildlife Refuge

SNPLMA Round 16
Capital Improvement Program

Water in the Desert: Water Conservation Delivery System

Project location
N 37° 14’ 45.57”
W 115° 06’19.53”

Amount Requested $1,308,514

Project Manager: James R. Vinson
james_vinson@fws.gov
4701 North Torrey Pines Drive
Las Vegas, NV 890130
(702 775-3417 ext. 102

Nomination reviewed and approved by: /s/ April 29, 2016

Christ Smith
Project Leader
DNWR Comples

Date

THIS PAGE INTENTIONALLY BLANK

***Vision Statement**: The Pahranagat National Wildlife Refuge is managed as a sanctuary where present and future generations of people can discover a connection to the rhythms of life. Visitors from near and far find sanctuary among the crystal pools and springs as they learn about the Refuge's unique plant and animal communities. The vital, spring-fed waters of this Mojave Desert oasis attract thousands of migratory birds each year. Pahranagat NWR's seasonal marsh, wet meadows, and alkali flats provide high quality resting and foraging habitat for wintering and migrating waterfowl, shorebirds and other waterbirds along the Pacific Flyway.*

Executive Summary:

The U.S. Fish and Wildlife Service requests approval of funds to install a water delivery system that will effectively and efficiently deliver and conserve limited water resources to the wetland habitats located on Pahranagat National Wildlife Refuge in Lincoln County, Nevada, part of Desert National Wildlife Refuge Complex. The overall goal of the project is to install a water delivery system that will reduce the 90% water loss from ground infiltration and evaporation as water is moved from the Upper Lake reservoir to the refuge's wetland units. Since its inception in the early 1960s, Pahranagat National Wildlife Refuge has employed a series of water control structures to manage wetland habitats, rare in southern Nevada, for the preservation of wildlife. Today, most of these structures are more than 50 years old. With the exception of Upper Lake Dam, which underwent repairs in 2009, water control structures throughout the refuge are in need of design improvement and structural updates. Improvements will reduce water loss, allowing water to be more efficiently managed and distributed throughout the refuge.

The proposed deliverables for this nomination would create a new water delivery system approximately 21,500 feet long. Lateral lines will feed the major wetland units of the refuge, with fire-proof outlets to allow prescribed fire management, an indispensable part of marsh management, to continue. Elimination of approximately 1,500 feet of an incising ditch will improve water quality in the Pahranagat Valley, by eliminating a source of erosion.

James R. Vinson, USFWS Wildlife Refuge Manager, authorizes the nomination for SNPLMA Round 16 funding. Water in the Desert: Water Conservation Delivery System.

/S/ Christy Smith
(Signature of authorizing agent)

4/29/2016
(Date)

1 PURPOSE STATEMENT

Proposed Action: Improvements to water structures are needed throughout the refuge. Installation of an environmentally friendly plastic irrigation pipe (PIP) system to convey water from below Black Canyon to Lower Pahranagat Lake will decrease water loss for improved wetland management in Middle Marsh. The more efficient water delivery system will reduce operation and maintenance efforts by up to 85%, decreasing annual water operations costs.

1. Install and incorporate an inlet structure at head of water supply source.
2. Install approximately 21,500 ft of environmentally friendly water flow system, which can maintain water flow up to 22 cfs from Black Canyon and Upper Lake.
3. Install approximately 3 to 5 steel risers with water control valves at intervals throughout refuge's wetlands to allow for water delivery and wetland management. Outlet openings at each water delivery site will be heat-proof to allow for prescribed fire management.
4. Eliminate approximately 1,500 feet of an incising ditch below Middle Marsh Dike.

Project Outcome: Installation of an improved water delivery system on Pahranagat NWR will conserve limited water resources, decreasing water loss from an unimproved and compromised ditch system while improving wetland management for wildlife habitat, wetland function, and water quality. Once installed, these infrastructure improvements will require minimal maintenance for operation, with a project life expectancy of 25 years. Improved water conservation and distribution throughout the refuge will improve wetland habitat management and create opportunities for habitat restoration to recover the ecosystem while simultaneously enhancing habitats for wildlife and human recreational opportunities.

Improvements to the water delivery and control system on Pahranagat NWR will allow for long-term sustainability of the fresh and alkali wetlands, including riparian areas. The installation of an improved water delivery system will decrease water loss, aiding water conservation for wetland management in the face of current and growing water shortage issues facing southern Nevada. The improved system would halt erosion action in the old earthen ditch below Middle Marsh Dike, decreasing tons of annual sediment deposits, a source of water quality degradation, into Lower Pahranagat Lake. Elimination of the old earthen ditch would open an opportunity for stream restoration connecting from Middle Marsh Dike to Lower Pahranagat Lake, a future goal that is not part of this current nomination. A restored, meandering stream with a riparian corridor would enhance migratory bird habitat, but this action would only be made possible with the installation of the proposed water delivery system, which would minimize further water loss in a system with a strict water budget. An improved water delivery system would reduce current refuge operation and maintenance efforts needed for the outdated ditch system, which requires ditch debris removal and operation of 11 water control structures. The annual cost of water operations on the refuge would decrease, while habitat benefits, water conservation, and species richness would increase.

Water delivery infrastructure improvements will allow for enhanced wetland habitats in 1,240 acres that will benefit not only native wildlife, but will allow rejuvenation of natural areas for camping, hiking, fishing, photography, hunting, bird watching, and general recreation, promoting connectivity and a sense of stewardship by people that come to the refuge to enjoy nature. Improved water delivery will provide guaranteed, timely water delivery to assigned wetlands, resulting in independent water management capabilities. Dependable "wet" habitats will attract migratory and sedentary wildlife species, which will improve outdoor recreation opportunities. Improved wetland habitat will attract more visitors to the refuge from Las Vegas and other areas, allowing more people to connect to the natural environment. Wetland areas on the refuge will be connected by visitor facilities that include four parking lots, a trail system, interpretive information, and a Visitor Center.

Improved water management on the refuge will preserve an important wetland ecosystem that will benefit wildlife and attract tourists to a part of rural Nevada, promoting economic opportunities for local communities. As habitats on Pahranagat NWR regenerate with water infrastructure improvements that allow improved water distribution and management, future restoration projects and recreation/trail enhancement projects would further promote ecosystem recovery for numerous species of conservation concern, enhance recreational opportunities, and promote partnership networks to further the knowledge, conservation, and appreciation of an important desert oasis.

2 Background and Project Need

Located in the Pahranagat Valley of southern Nevada, Pahranagat National Wildlife Refuge (Refuge) was established in 1963 to protect important wetlands and wet meadows for wetland dependent migratory birds and endangered species of the Pacific Flyway. Pahranagat Valley is but one link in a chain of increasingly rare open water and riparian habitats across the arid western United States and especially across Nevada. Perennial water on Pahranagat NWR sustains a variety of habitat patches, including open lake, marsh, wet meadow, alkali meadow, and riparian woodlands that provide valuable aquatic and wetland habitat for many of Nevada's native species. The refuge provides essential stopover habitat for numerous migratory birds and waterfowl traveling along the Pacific Flyway in the spring and fall. Willow groves on the refuge provide critical nesting habitat for the endangered southwestern willow flycatcher (*Empidonax traillii extimus*). Pahranagat is also home to several species of rare aquatic species, some endangered, such as the Pahranagat roundtail chub (*Gila robusta jordani*), Pahranagat speckled dace (*Rhinichthys osculus velifer*), White River desert sucker (*Catostomus clarkii intermedius*), and northern leopard frog (*Lithobates pipiens*). The Pahranagat NWR provides a welcome watering hole not only for unique and migratory wildlife species, but it attracts numerous visitors from large cities and rural areas that come to enjoy the outdoors and gain an appreciation of an important Nevada wetland.

Located at the terminus of the pluvial White River system, Pahranagat NWR receives limited water in quantities that fluctuate seasonally, depending on annual precipitation patterns and the needs of water users located on upstream ranches and populated areas. Agricultural development in the Pahranagat Valley that included diverting water through an extensive

network of ditches began as early as the 1800s. Current dikes, culverts, water control structures, and ditches on Pahranagat NWR are outdated structures that can no longer efficiently convey water. Water conservation is one of the top priorities in Pahranagat Valley, where water availability is key to cultural and environmental survivability. Due to the scarcity of water shared by upstream ranchers and the refuge, today's Pahranagat NWR managers face a challenge to maintain needed wetland habitats with a limited water supply.

As part of its goal for preserving wetland and riparian habitat for migratory birds and other wildlife, the Pahranagat NWR is currently in the process of refuge-wide wetland restoration planning. In 2012, an assessment was completed for dikes and other water control structures on the refuge, with a focus on Middle Marsh management. The assessment found many of the water control and conveyance structures to be outdated and in need of structural repairs or design improvement. Improvements of these water structures on the Pahranagat NWR will increase water efficiency by reducing water loss and allowing better control over water distribution. Better water management will allow for improved management of important wetland areas for migratory birds and species of conservation concern. Rejuvenation of a natural oasis will preserve an important conservation area for future generations of people to enjoy.

3 Project Timeframe

Water infrastructure improvements proposed in this nomination will be completed within four years, with close out documents completed by the fifth year. NEPA documentation, planning and design for pipeline layout on the refuge will occur in the first year. Construction and installation of the pipeline and associated outlet structures will take place during the following 2-4 years. The SNPLMA close out package may then be prepared in year five, or earlier if the project progresses ahead of schedule.

4 Project Location

Pahranagat NWR is located in the Pahranagat Valley of eastern Nevada, and lies along the transition zone between the Mojave and Great Basin deserts. The refuge is in Lincoln County, Nevada, approximately 90 miles north of Las Vegas, off Hwy 93. The refuge headquarters and visitor center are centrally located at 37° 16' 07" N / 115° 07' 17" W (map datum WGS84).

Figure 2. shows some of the other SNPLMA funded projects, completed or still in progress on Pahranagat NWR. These projects include hydrologic analyses, Black Canyon restoration, cultural resource inventories, campground improvements, and recreational facilities development. The current capital improvements project nomination for a water conservation delivery system on Pahranagat NWR will augment these other SNPLMA funded projects to promote the values of sustainability, connectivity, and community. For example, improved water infrastructure would allow better management of wetlands in Middle Marsh. Removal of the water delivery ditch below Middle Marsh Dike will remove a source of sediment input, improving the quality of water entering Lower Pahranagat Lake. Removal of the eroding ditch and installation of the new water delivery system will allow for future possibilities of riparian and stream habitat restoration. Better water delivery will sustain important wetland habitats

for wildlife, while enhancing the recreational experience to better connect visitors with natural and cultural areas of interest. This connection will in turn promote a sense of stewardship, allow for economic opportunities, and promote partnerships that will support the community and conservation efforts for years to come.

5 PROJECT DELIVERABLES

5.1 Primary Deliverables

Primary deliverables include all structures needed to be installed to improve the existing water delivery system through Pahranagat NWR. Primary deliverables include:

1. A construction design report to determine appropriate water conveyance layout, materials, construction sequencing, and best management practices (BMPs).
2. Publication of an Environmental Assessment (EA) report, including Section 7 and 106 Cultural Resource consultations by USFWS, for construction of pipeline, to be reviewed by the public.
3. Based on the results of the EA, USFWS will publish a Finding of No Significant Impact (FONSI) statement or Environmental Impact Statement (EIS) and Record of Decision (ROD).
4. Installation of approximately 21,500 feet of environmentally-friendly water delivery system. Lateral lines with outlet openings at each water delivery site will allow water management for each of the wetland units of the refuge.
5. Installation of 3-5 heat-proof water outlets, made from recycled materials, to allow for prescribed fire management in Middle Marsh.
6. Installation of valves at each water outlet to improve capabilities for independent wetland water management.

5.2 Anticipated Deliverables

7. Anticipated deliverables that are desirable, but not needed to achieve current nomination goals of decreased water loss and improved water delivery on the refuge, include the elimination of approximately 1,500 feet of an old and incising ditch below Middle Marsh Dike that is a source point of pollution to Lower Pahranagat Lake.

5.3 Standard Deliverables

Standard deliverables for this project would include:

8. Contract management by Fish and Wildlife Service (USFWS) agency personnel, including but not limited to, developing scopes of work, writing bid requests, reviewing proposals/bids, and providing technical representation for the Contracting Officer throughout the project's duration.
9. Environmental permitting by USFWS agency personnel when applicable, such as required by the National Environmental Policy Act (NEPA), Section 106 of the National Historic Preservation Act, Section 7 of the Endangered Species Act, etc.
10. Project management by a refuge employee on the project to:
    a. oversee project activities and deliverables;

b. conduct appropriate reviews throughout different stages of deliverables;
c. coordinate with other agency personnel or contractors; and
d. ensure sufficient progress throughout the duration of the project.

6 RELEVANT PERFORMANCE MEASURES AND SNPLMA STRATEGIC PLAN:

Strategic Goal 1, Objective 1.1 – Increase or improve the resource base (e.g. habitat) with a focus on landscape-level habitat restoration

- Output (Primary Deliverable): Water delivery system to lower refuge wetlands, restoring and improving hydrology of the wetland management units of Lower Lake, Middle Marsh, and Whin Marsh.

Strategic Goal 1, Objective 1.2 – Protect threatened, endangered, and sensitive species and their habitats.

- Output Anticipated Deliverable): approximately 1,940 acres of wetlands on Pahranagat will have a direct positive impact from the water savings from the installation of this project.
- Output (Anticipated Deliverable): Approximately 9 acres of southwestern willow flycatcher nesting habitat will be positively impacted as a result of water savings of the project.
- Approximately one acre of Pahranagat round-tailed chub refugium will have positive impacts as a result of increased water table of adjoining wetland.

Strategic Goal 1, Objective 1.4 – Promote the value of science and research in increasing the effectiveness of conserving and restoring natural resources, and promoting resources sustainability.

- Output (Anticipated Deliverable): installing approximately 21,500 feet of underground water delivery system and reducing 90% of water loss of 7,200 acre feet.
- Output (Anticipated Deliverable): Water savings will last approximately 25 years by estimated life expectancy of the project.

Strategic Goal 1, Objective 3.2 – Create habitat connectivity across local and regional landscapes.

- Output (Primary Deliverable): install approximately 21,500 feet of water conveyance system to improve water conservation practices on Pahranagat NWR. This bridges an existing USFWS Partners project on private farm ground adjoining the northern refuge boundary.

Strategic Goal 1, Objective 5.1 – Use federal, local, state, and regional government lands as learning laboratories to help develop the next generation of environmental understanding and advocacy.

- Output (Anticipated Deliverable): Increased habitat and wildlife richness to approximately 1,940 acres, allowing additional opportunities for Visitor Services to provide on-site outreach to underserved constituents.

Strategic Goal 2, Objective 1.1 – Protect or improve the integrity of environmental, cultural, historical, educational, community, recreational, and open space resources to enhance the quality of the human experience.

- Output (Primary): Provide stable water management system for 1,240 acres of marsh habitat for increased and improved outdoor recreation on Pahranagat NWR, thus inviting additional outdoor recreation opportunities for hunting and wildlife viewing.

Strategic Goal 2, Objective 1.4 – Promote projects that are representative of the environment.

- Output (Primary Deliverable): Approximately 21,500 ft, depending on designs and development, of underground pipeline, will be out of sight, and have no negative impacts to the installed area. Disturbed areas will be restored to native vegetation by close of the project from natural plant recruitment or seeding.
- Output (Anticipated Deliverable): Improved wetland management to approximately 1,240 acres of marsh.
- Output (Anticipated Deliverable): Improved water quality to approximately 700 acres of marsh through elimination of head cutting of approximately 1,500 feet of ditch.

Strategic Goal 2, Objective 2.1 - Use federal, local, state, and regional government lands as learning laboratories to help develop the next generation of environmental understanding and advocacy.

- Output (Anticipated Deliverable): Increased habitat and wildlife richness to approximately 1,240 acres, allowing additional opportunities for Visitor Services to provide on-site outreach to underserved constituents.

Strategic Goal 2, Objective 4.1 – Promote projects that encourage renewable energy construction methods.

- Output (Primary Deliverable): New conveyance system to improve water conservation and reduce water loss from evaporation and ground filtration in upwards of 75% of 7,200 acre feet.

7 Project Implementation Process

The project implementation process would generally follow the Project Timeframe and Deliverables noted above. Initial coordination would occur between the Refuge Manager and Contracting Officer to develop scopes of work, write bid requests, and review proposals/bids for selection of a contractor or cooperator to complete the deliverables. The Refuge Manager would then coordinate with the selected contractor or cooperator on final planning, permitting and design. Once those steps are completed, implementation would begin until the final inspection. The Contracting Officer and other agency personnel would be engaged as needed throughout the duration of the project. Project will be complete once the water delivery

system can directly and independently deliver water to at least three of the major wetland management units (Lower Lake, Middle Marsh, and Whin Marsh) on Pahranagat National Wildlife Refuge. Once the project is completed, final documentation and a closeout package would be prepared and submitted for approval.

Table 1. Deliverables and implementation schedule.

Deliverable	Year 1	Year 2	Year 3	Year 4	Year 5
(1) Development of a construction design report to determine appropriate water conveyance layout, materials, construction sequencing, and best management practices (BMPs).	Planning and Design				Final Documentation and Closeout
(2) Publication of an Environmental Assessment (EA) report, including Section 7 and 106 Cultural Resource consultations by USFWS, for construction of pipeline, to be reviewed by the public.	Planning and Design	Planning and Design Construction and Installation			Final Documentation and Closeout
(3) Based on the results of the EA, USFWS will publish a Finding of No Significant Impact (FONSI) statement or Environmental Impact Statement (EIS) and Record of Decision (ROD).	Planning and Design	Planning and Design Construction and Installation			Final Documentation and Closeout
(4) Installation of approximately 21,500 feet of environmentally friendly water delivery system. Lateral lines and outlet openings at each water delivery site.		Construction and Installation	Construction and Installation	Construction and Installation	Final Documentation and Closeout
(5) In all Wetland Units south of Black Canyon, the design report will determine optimal locations to place heat-proof water outlets made from recycled materials to allow for prescribed fire management in Middle Marsh.	Planning and Design	Planning and Design	Construction and Installation	Construction and Installation	Final Documentation and Closeout
(6) Installation of valves at each water outlet to improve capabilities for independent wetland	Planning and Design	Planning and Design	Construction and Installation	Construction and Installation	Final Documentation and Closeout

Deliverable	Year 1	Year 2	Year 3	Year 4	Year 5
water management.					
(7) Elimination of approximately 1,500 feet of erosion from an old water delivery ditch below Middle Marsh Dike.	Planning and Design	Planning and Design	Construction and Installation	Construction and Installation	Final Documentation and Closeout
(8) Contract management by Fish and Wildlife Service (USFWS) agency personnel, including but not limited to, developing scopes of work, writing bid requests, reviewing proposals/bids, and providing technical representation for the Contracting Officer throughout the project's duration.	Throughout Project Duration				
(9) Environmental permitting by USFWS agency personnel when applicable, such as required by the National Environmental Policy Act (NEPA), Section 106 of the National Historic Preservation Act, Section 7 of the Endangered Species Act, etc.	Planning and Design	Planning and Design			Final Documentation and Closeout
(10) Project management by a refuge employee on the project	Throughout Project Duration				

8 Level of Readiness for Project Implementation

The U.S. Fish and Wildlife Service at Pahranagat National Wildlife Refuge will be ready to initiate implementation of the nominated project within one year of notification of funds availability. Over past years, Fish and Wildlife Service has managed existing projects and completed SNPLMA projects at Pahranagat National Wildlife Refuge well before project deadlines. The refuge continues to make excellent progress on existing SNPLMA projects.

Design work and construction will be contracted out, to insure a timely execution of the project. This will ensure that the infrastructure will be operational by fall/winter of the year construction starts and ensure wetland management goals are achieved. Pahranagat NWR staff and contractors will complete necessary permitting for this project.

9 Relationship to Previous Phases and Anticipated Future Phases

This nomination is for a stand-alone capital improvement project with no previous or anticipated future phases of work.

10 PROPOSED PROJECT BUDGET

$1,300,285. See attached estimated necessary expense summary and detailed cost estimates.

An estimated $335,159 in contributed funds is projected at this time. Fish and Wildlife Service personnel (Refuge Manager and/or Equipment Operator) charging to base agency funding will contribute time and therefore salary each year to the project. The Refuge Manager and/or Equipment Operator would mostly be involved in the planning and design phase (coordination, review, and permitting), with some involvement during construction and implementation (coordination). The Refuge Manager would also supervise the Project Manager, if necessary.

11 CAPITAL IMPROVEMENT RANKING CRITERIA

11.1 Sustainability

The project promotes sustainability by conserving resources to ensure availability to future generations, or restores or maintains natural processes. The project will remain relevant and continue to provide a benefit in the face of changing demographic and/or environmental conditions. The project minimizes the human impact on the environment. Factors (A or B) + C + D = total points (23 maximum).

This project will promote ecological, and hence recreational sustainability because the new underground water delivery system will conserve water on the Pahranagat NWR, reducing a current 90% water loss of 7,200 acre-feet by 75%. Reduction of water loss as it passes through refuge water management units will allow managers to provide for more stable water supply to needed habitats, which in turn will provide important habitat for multiple federally endangered and non-listed wildlife species. With better water conservation, refuge managers can focus on landscape-level habitat restoration to recover a rare wetland ecosystem that provides critical habitat for many species of conservation priority, such as migratory birds. Water conservation is one of the top priorities in the Pahranagat Valley, and in southern Nevada, water availability is key to cultural and environmental survivability.

Factor A: *Conserves the quality of the outdoor environment and mitigates future potential negative impacts by conserving, preserving, or protecting the natural and/or cultural resources of the project area.*

> This project will conserve water, a limited, but valued resource in the vast, arid desert landscape of southern Nevada. On the Pahranagat NWR, water limitations restrict optimal management and acreage of wetland habitats for migratory birds and other species dependent on these rare, desert wetland systems. Increased water conservation within the refuge's water delivery system will allow for improved or increased wetland habitat on approximately 1,240 acres. The elimination of approximately 1,500 feet of an incised, eroding ditch will improve the quality of water entering Lower Pahranagat Lake.

***Factor B**: Enhances or restores the quality of the outdoor environment by reducing or eliminating existing impacts to the natural and/or cultural resources of the project area (10 points).*

N/A.

***Factor C:** Project will enhance stewardship and shared support for the operations and maintenance over the life of the project.* (*Show financial support and/or in-kind support*).

U.S. Fish and Wildlife Service and Pahranagat NWR staff would maintain and operate the new underground water delivery system to promote increased acreage and improved wetland habitat to sustain wildlife biodiversity and to enhance human recreational opportunities in the Pahranagat Valley. Although Pahranagat NWR is already a popular spot for camping, hunting, fishing, and birding, wetland ecological recovery will attract more visitation, conservation studies, and enhance a general sense of stewardship for this valued wetland area by groups in the local area and extending to larger urban centers like Las Vegas and Reno.

An estimated $227,952 in contributed funds is projected at this time. A USFWS Refuge Manager (GS-12) and/or Equipment Operator (WG-10) charging to base agency funding will contribute time and therefore salary each year to the project. The Refuge Manager and/or Equipment Operator would mostly be involved in the operation of the water delivery system. The estimated figure is based on 8 hours per month of intensive management during a calendar year, with an estimated project life of 25 years. Given a time of 96 hours, a GS-12 employee salaried at $110,000 per year with fringe benefits, or about $53 per hour with fringe benefits, would contribute $5,088 per year, or $127,200 total over 25 years. A WG-10 employee working for 96 hours per year and salaried at $69,857 per year with fringe benefits, or about $41.98 per hour with fringe benefits would contribute $4,030.08 per year, or $100,752 total over 25 years. This gives a total contribution of $227,952 over a 25-year period.

***Factor D:** Project employs sustainable or "green construction" practices using recycled or renewable materials, improves energy efficiency or utilizes low-maintenance products in construction. Conserves resources during the manufacture and life-cycle of the project (8 points).*

Construction of the water delivery system would include environmentally friendly PIP and recycled metal for the outlet riser/valve units. Because the water system will likely be a pipeline, the system will be buried underground; most of the water delivery infrastructure will be out of sight and have no negative impacts to the installed area. Areas of construction disturbance will be restored to native vegetation by the close of the project from the process of natural vegetation recruitment or through active seeding efforts. Additionally, the installation of the pipeline will reduce current water losses on the refuge. The expected lifespan of this system is 25 years and the pipeline

will require less maintenance than the current ditch system, reducing refuge operation costs over the long-term.

11.2 Connectivity

The project provides recreational opportunities that link population centers, recreation facilities and natural landscapes. It encourages people to meaningfully connect with their natural environment, thus helping them appreciate and care for the environment..

This underground water delivery system will connect water conservation practices that our Partners Program has been implementing on private property to the north. The Pahranagat Valley is a largely agricultural community, thus water conservation is a priority one focus area. By having water conveyed in an underground pipeline system, water loss from ground filtration and evaporation through this planned system will be eliminated, as water is delivered from the Upper Pahranagat Lake storage location to other wetland systems throughout the refuge. The water delivery system will allow refuge managers to improve water distribution and management of Middle Marsh, thereby enhancing the natural landscape and recreational opportunities.

Factor A: *Project provides access and/or amenities to previously undeveloped recreation areas and/or new recreation opportunities to enjoy the public lands (10 points).*

The improved water delivery system will provide greater water efficiency and time savings for management of the major wetland systems on Pahranagat NWR. This will in turn provide the marshes with a more "guaranteed" water supply, resulting in achieving optimal foraging water levels for fall and spring migrating birds, as well as wintering migratory birds over the life span of the pipeline (estimated 25 years). With improved habitat management capabilities, wetland wildlife species will benefit, resulting in increased and improved outdoor experiences from local and non-local stakeholders. As more visitors visit the refuge for outdoor recreation such as hunting, hiking, wildlife viewing, wildlife photography, and camping, the local economy and community serving Alamo, NV will benefit from these visitors visiting local restaurants, gas stations, food markets, motels, and auto services.

The project will allow improved, efficient water delivery to three wetland systems composing of 1,240 acres. Improved water delivery will provide guaranteed timely water delivery to the assigned wetlands, resulting in independent water management capabilities. This will allow dependable habitat to attract migratory and sedentary wildlife species, which will improve outdoor recreation from hunting and wildlife viewing. Being only 90 miles from Las Vegas, the largest population center in Nevada, this new, guaranteed wetland habitat will attract new visitors and users to the refuge, allowing more people from urban Las Vegas to connect to their natural environment, further developing an appreciation for the natural world.

Factor B: *Project improves access to previously developed recreation areas and sites on the public lands and/or upgrades site amenities (5 points).*

With the current water delivery system, earthen ditches are used in over half of the project area. Because of the magnitude of elevation change, these ditches have developed major erosion as a result of normal wetland management water delivery. Incising ditches have become a major impact on the refuge landscape, and will have to be dealt with by restoration efforts. By switching to an underground line system, the erosion from these ditches will be eliminated, and tons of sediment deposits in our natural wetlands will be saved annually. The restoration of the ditch below Middle Marsh Dike will require the existing ditch to be filled in and a new meandering stream be constructed to slow down the water to eliminate the incision process. This stream can then be reforested to create a riparian zone to further protect and stabilize the stream. This action cannot be accomplished without the previous installation of the proposed water conservation delivery system due to conflicts with existing water management delivery and timing needs.

With an improved water delivery system, operation and maintenance efforts will be reduced up to 85%. The more efficient system will eliminate the need to operate 11 water control structures, monthly ditch debris removal, and yearly ditch maintenance from sediment. Annual cost of water operations on the refuge would decrease, while habitat benefits, water conservation, and species richness would increase as a result of the project.

Factor C*: Project contains an outreach and education component to improve public awareness and engage the public in the conversation and protection of the surrounding natural environment through the use of resource interpretation (information signage, kiosks, educational programs, etc.).*

Four parking lots throughout Pahranagat NWR wetland complex will provide wetland and wildlife interpretive information for visitors to read and learn about. With new and improved ecological integrity the wetland oasis in the Mojave Desert, our new users will be able to understand the importance of wetlands in desert environments, and the importance of keeping our desert wetland in pristine condition.

The new water delivery system will promote the value of science and research by increasing the effectiveness of conserving and restoring natural resources, and promoting resource sustainability. Pahranagat NWR is open to the public, providing recreational and educational outdoor experiences to develop the next generation of environmental understanding and advocacy. Increased habitat and wildlife richness on approximately 1,940 acres will allow additional opportunities for Visitor Services to provide on-site outreach.

11.3 Community

This project provides outdoor recreation opportunities to improve the quality of life, especially for underserved communities. It conserves or restores the functionality, resiliency, and integrity of biological communities. The project encourages partnerships, which in turn also builds community.).

The project will allow improved, efficient water delivery to marsh wetland composing of 1,240 acres. Improved water delivery will provide guaranteed timely water to assigned wetlands, resulting in independent water management capabilities. This will allow dependable habitat to attract migratory and resident wildlife species, thus improving outdoor recreation such as hunting and wildlife viewing. The water delivery system will connect water conservation practices that our Partners Program has been implementing on private property to the north. This multi-partner project was implemented through the USFWS Ecological Service Office, Partners Program. The design was of the project was to remove sediment from the existing Irrigation District supply ditch that is fed from Ash and Crystal Springs. This project was focused on water conservation throughout the Pahranagat Valley, in a time when western states were experiencing a shortage in water quantity. By continuing this project, the refuge will be serving the mission of the refuge, USFWS, and local partners in conservation of a vital resource in the Pahranagat Valley. These types of water conservation practices can also serve as a flagship project to other agencies, NGO's, and private individuals with water budget requirements.

Factor A: *Project provides new or enhances existing recreation opportunities for under-served or under-represented communities that cannot be addressed or met with current funding. (Must be sustainable).*

SNPLMA funding will allow Pahranagat NWR managers to implement a plan for improved water delivery to wetland habitats that support migratory birds and a diverse array of wetland-dependent species. This project cannot be implemented with current funding reserves. Without SNPLMA funding, water operations on the refuge will remain dependent on an outdated ditch delivery system that contains deteriorating components, and requires relatively high maintenance to function properly. Water loss will continue at the existing rate of 90% and managers will continue to struggle to manage suitable wetland acreage for wildlife and recreational enjoyment.

With the new water delivery system, increased wetland acreage and recovery will be possible, attracting wildlife and greater visitation. As more visitors visit the refuge for hunting, hiking, wildlife viewing, photography, and camping, the local community serving Alamo, NV, a rural community, will benefit as visitors also visit local restaurants, gas stations, food markets, motels, and auto services. Within small remote towns, tourism is the major lifeblood of local businesses. According to the 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Activities (USFWS, 2011), expenditures for wildlife-related recreation in Nevada was 1.2 billion dollars. Improved wetland ecological integrity supporting abundant wildlife will bring increased visitation

from outdoor-loving people and the resulting increased visitation will have a positive effect on the local, rural economy.

Factor B: *Project has identified committed non-SNPLMA sources of funding or in-kind contribution for the development of the project.*

Please refer to Section 10 Proposed Project Budget for a cost breakdown of in-kind contributions for this project. Project development tasks that will be provided by USFWS funds and staff will include:

An estimated $335,159 in contributed funds is projected at this time. A USFWS Refuge Manager (GS-12) and/or Equipment Operator (WG-10) charging to base agency funding will contribute time and therefore salary each year to the project. The Refuge Manager and/or Equipment Operator would mostly be involved in the planning and design phase (coordination, review, and permitting), with some involvement during construction and implementation (coordination). They would also supervise the Project Manager, if necessary. Estimated figure is based on ¼ time (~940 hours) of GS-12 at $110,000 salary per year with fringe benefits or about $53 per hour with fringe benefits = $49,820 per year or $249,100 total over five years. The Equipment Operator Estimated Figure is based on ¼ time (~410 hours) of WG-10 at $87,318.40 salary per year with fringe benefits or about $41.98 per hour with fringe benefits = $17,211 per year or $86,059 total over five years. Total estimated USFWS contribution for the development and construction of the project is $335,150.

Factor C*: Project has identified committed non-SNPLMNA sources of funding or in-kind contribution for the implementation of the project. (Project engages the public in the conservation and protection of the surrounding natural environment through use of volunteer/stewardship resources).*

By increasing water conservation and habitat availability, the refuge will have increased possibilities of environmental education, and additional habitat for outdoor interpretation. Refuge volunteers and Visitor Services personnel will be able to conduct additional outreach events with a focus on resource conservation. Through additional eagle watch and birding days, approximately five new events will be added to existing refuge outdoor events that will encourage public participation, with a focus on attracting Las Vegas residents. These events will require 40 additional hours from our volunteers.

The standard rate currently being used by the USFWS is $23.00 per hour for volunteer time. It is estimated that two volunteers will likely be required to assist with planning and event implementation. The total USFWS volunteer contribution of the project would be $184.00 per day, or $920.00 per event. For 5 events, the total yearly contribution per two volunteers would be $9,200. The estimated life of the proposed

project is 25 years, so the total contribution of an estimated two volunteers over the life of the project would be $230,000.

11.4 Maintenance and Operation Costs

***Factor A**: Operations and Maintenance costs will be reduced (6 points for short-term up to 10 points for long-term reduction to operations and maintenance cost).*

With an improved water delivery system, operation and maintenance efforts will be reduced up to 85%. The more efficient system will eliminate the operation of 11 water control structures, monthly ditch debris removal, and yearly ditch maintenance from sediment. The annual cost of water operation on the refuge would decrease for the expected 25-year lifespan of this project.

---- REMAINDER OF THIS PAGE IS BLANK----

Capital Improvement Project Proposal
Estimated Necessary Expenses

Project Name:	Water Delivery System for Water Conservation on Pahranagat	Date:	4/11/2016
Agency:	U.S. Fish and Wildlife Service		
Project #:		Priority #	
Prepared by:	James Vinson		
Phone #	(775) 725-3417 x102		%

1	**Planning, Environmental Compliance & Preconstruction Engineering and Design** ***(Not to exceed 27% of total project costs)****	$71,600	5.5%
	(pre-design sketches and conceptual drawings; environmental assessment and permitting, specialist surveys/reports for archaeology, wildlife, biology, etc.; architectural and engineering analysis, design survey & field investigations; construction drawing, specifications, cost estimates, and engineering technical reports.)		
2	**Construction Contract Costs**	$1,125,000	86.0%
	(including labor, supplies & materials, construction management, etc.; sampling/testing; site restoration; and government furnished supplies and materials.		
3	**Project Equipment**	$0	
	(pg. 89 of the Implementation Agreement) SNPLMA funds can only be used for "project related necessary expenses" and SNPLMA can reimburse only for those equipment costs directly associated with completion of the approved project. Does not include office furnishings or equipment necessary for operations or maintenance of the project).		
4	**Travel**	$3,000	0.2%
	(including per diem where official travel status is required to carry out the project, such as to serve as COR, experts to review reports, etc.)		
5	**Official Vehicle Use**	$7,500	0.6%
	(pro rata cost for use of Official Vehicles when required to carry out the project)		
6	**Other Direct and Contracted Labor**	$52,150	4.0%
	Agency payroll for the Contracting Officer to do project procurements, COR Project Inspector, Section 106 Consultation, NEPA Lead, Project Manager, Project Supervisor, and subject experts to review contracted surveys, design/drawings, plans, reports, etc.; Also covered is the cost to contract for a Project Manager and/or Project Supervisor if contracted separately from other project costs.		
7	**FWS Consultation - Endangered Species Act**	$0	
8	**Federal Direct Labor** *(direct angency labor for construction, PI, CO, and COR work)*	$49,264	3.8%
9	**Other Necessary Expenses** (See IA Appendix B-3)	$0	
	Total Requested/Estimated Budget	**$1,308,514**	**100.00%**
10	**Total Estimated contributed funds**	$335,159	
	Total Estimated Project Value (*Requested funding plus contributed funds)*	**$1,643,673**	

1	Estimated project start date:	6/1/2017
2	Planning, NEPA, and design phase complete	2/1/2019
3	Construction and build-out complete	9/30/2021
4	Project close-out (allow 120 days to process)	9/30/2022

General Comments:
Planning and Design will take place years 1-2; construction and installation will incorporate years 3-4; the close out package and final documentation will be completed in year 5. See nomination narrative for more detailed information.

Detailed estimated costs work sheets:

1 Estimated costs for Planning, Conceptual Design, Environmental Compliance and Field Work/Surveys, NEPA & Pre-construction Architectural and Engineering Design Services

	Description	Units	Unit of measure	Unit Cost	Est. Cost
Professional Contracts and Services	Contract for environmental assessment and FONSI	1	Job	$50,000	**$50,000**
					$0
					$0
					$0
A&E Services	Construction design development	1	Job	$21,600	**$21,600**
					$0
					$0
				Estimated total	**$71,600**

2 Estimated Costs for Construction Contracts (Agency costs)

	Description	Units	Unit of measure	Unit Cost	Est. Cost
Construction Management Contract Services	Contract for construction	1	job	$1,125,000	**$1,125,000**
					$0
					$0
					$0
					$0
					$0
				Estimated total	**$1,125,000.00**

4. Estimated travel (not associated with construction contract administration)

Identify by title/position and purpose of travel

	Description	Units	Unit of measure	Unit Cost	Est. Cost
Government Travel	Contracting Officer - Initiate Contracts and final walk through	2	Trips	$1,500	**$3,000**
					$0
					$0
					$0
				Estimated total	**$3,000**

5 Estimated costs for use of Government vehicles and equipment (FOR or hourly rate)

	Description	Units	Unit of measure	Unit Cost	Est. Cost
Heavy Equipment and government vehicles	GSA Vehicles	3	years	$2,500	**$7,500**
					$0
					$0
					$0
					$0
				Estimated total	**$7,500**

6 Labor costs for developing, managing and implementing contracts to complete the project.

This is an estimate of the total hours. Identify by Specialist title and role. Recommend use of Reimbursable Project Log to monitor and track agency labor charged to the project

	Description	Units	Units of measure	Unit Cost	Est. Cost
Federal and contract personnel involved with developing and executing contracts	Contract Project Manager & Budget Tracking	340	Hrs	$112	**$37,961**
	A&E Contractors and Subcontractors	80	Hrs	$95	**$7,592**
	Contract Engineer	50	Hrs	$132	**$6,597**
					$0
					$0
					$0
					$0
				Estimated total	**$52,150**

8	Federal Direct Labor for project construction

Note: Identify by title/position and role. Recommend use of Reimbursible Project Log to track actual labor hours charged to the project.

	Description	Units	Units of measure	Unit Cost	Est. Cost
Federal personnel performing construction of the project	Wildlife Refuge Manager - Planning, permitting, and onsite coordination	800	Hrs	$51	**$40,864**
	Equipment Operator - Onsite coordination	200	Hrs	$42	**$8,400**
					$0
					$0
					$0
				Estimated total	**$49,264**

10	Contributed funding to complete construction

Does not include any agency or partner costs incurred prior to authorization to expend SNPLMA project funds or funding from other SNPLMA funded projects. Contributed funds, in-kind services and/or materials for the construction of the project.

	Description	Units	Unit of measure	Unit Cost	Est. Cost
Description of in-kind services, labor, or materials to complete construction	Agency cost of labor for planning and design (5 yrs GS-12)	4700	hrs	$53	**$249,100**
	Agency cost of labor for planning and design (5 yrs GS-10)	2050	hrs	$42	**$86,059**
					$0
					$0
					$0
					$0
					$0
				Estimated total	**$335,159**

----REMAINDER OF THIS PAGE IS BLANK----

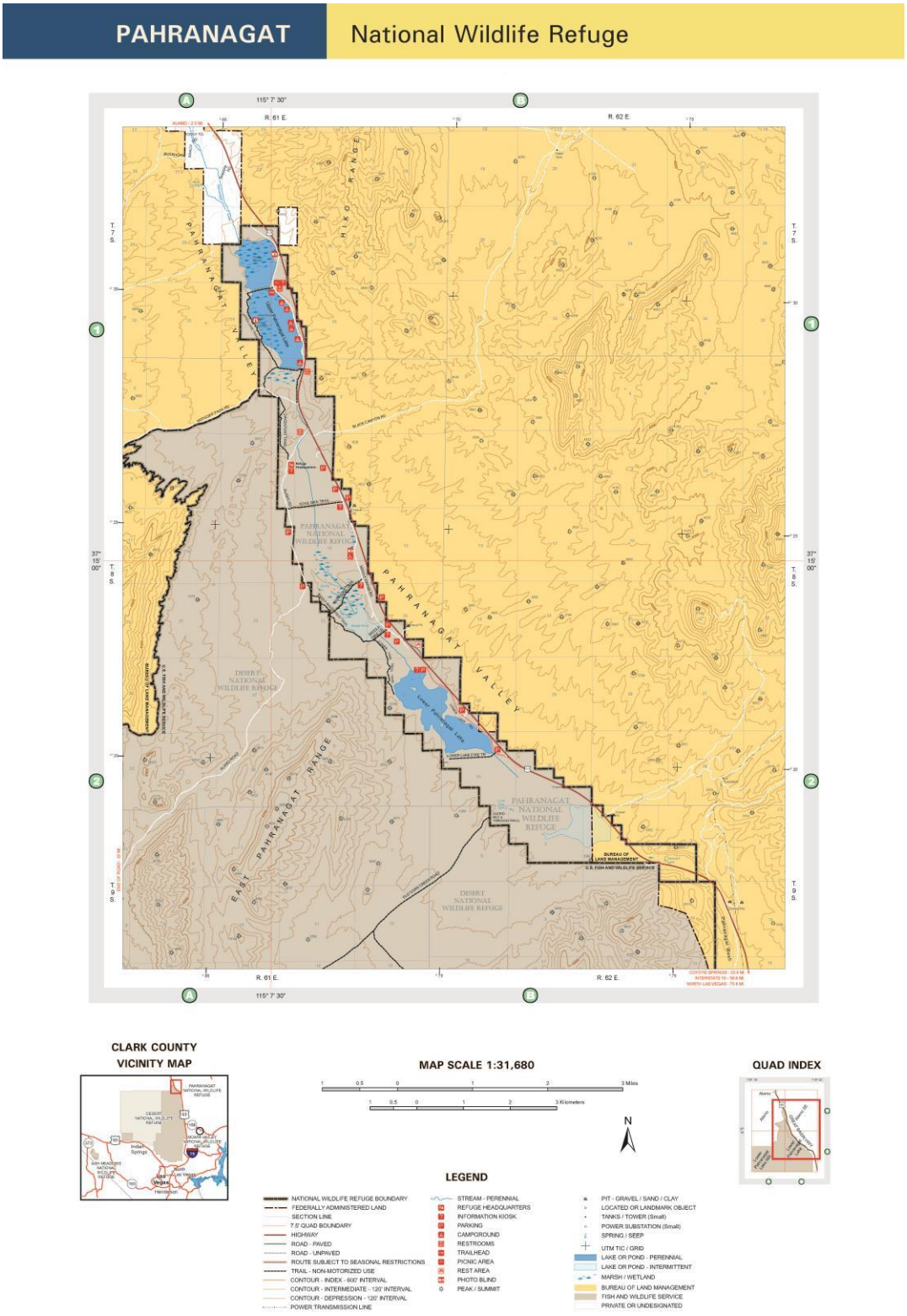

Figure 1 Project location map of the Pahranagat national Wildlife Refuge.

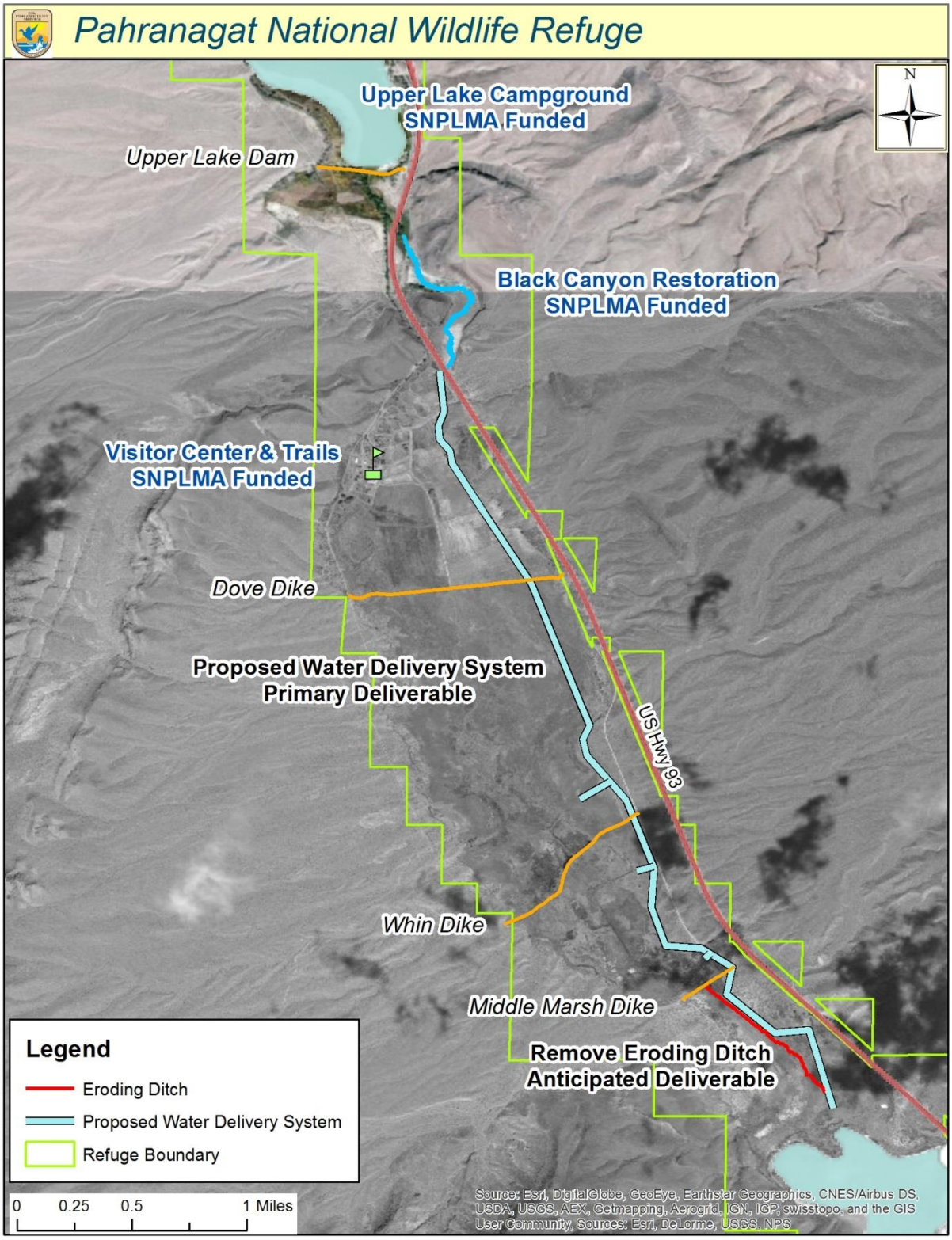

Figure 2. Proposed water delivery system from below Black Canyon to Lower Pahranagat Lake.

Figure 3 Existing water deliver head cutting

Figure 4 Existing water delivery lower ditch.

Figure 5 Existing water delivery system middle marsh

Figure 6 Existing water delivery ditch

Figure 7 Existing water delivery structure

Figure 8 Existing water delivery

Figure 9 Water delivery ditch dirt section