

UTAH DIVISION OF WATER QUALITY
 195 North 1950 West
 PO Box 144870
 Salt Lake City, Utah 84114-4870

Willard Bay Project Proposal Form

NOTE: Proposal must be no longer than 6 pages. Supplemental documents such as letters of support, information to demonstrate previous project implementation and other relative supportive documents may be submitted in addition to this form.

Applicant Name: Blair Stringham/Utah Division of Wildlife Resources
Co-Applicant Name(s) (if applicable):
Project Title: Harold S. Crane Wildlife Management Area Culvert and Dike Reconstruction
Agency or Business Name (if applicable): Utah Division of Wildlife Resources
Mailing Address: 1594 West North Temple, Salt Lake City, Utah 84114-6301
Phone: (801)-538-4781 **E-mail:**blairstringham@utah.gov

Individual Non-Profit Govt. Agency Academic Commercial Other

1. Estimated Project Costs:

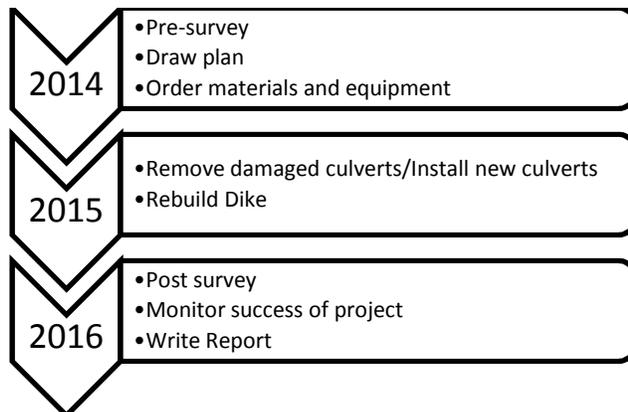
Labor	<u>\$8,023</u>
Materials	<u>\$23,912</u>
Equipment	<u>\$30,867</u>
Administration	<u>\$1,480</u>
Miscellaneous	<u>\$1,000</u>
TOTAL	<u>\$65,282</u>

Other sources of project funding:

_____	\$ _____	_____	\$ _____
Source	Amount	Source	Amount
_____	\$ _____	_____	\$ _____
Source	Amount	Source	Amount
_____	\$ _____	_____	\$ _____
Source	Amount	Source	Amount
_____	\$ _____	_____	\$ _____
Source	Amount	Source	Amount

Total project cost including other sources of funding: \$
(Please include bids for labor, equipment, rentals, etc.)

2. Describe the purpose and need of this project.
 - a. The intention of this project is to rebuild a dike and replace several culverts in the Harold S. Crane Wildlife Management Area (HCWMA) that have corroded over time and no longer function effectively. This project is necessary for managing the water quality, level and flow velocity throughout the area in order to create ideal habitat for numerous species of plants, amphibians, invertebrates, and birds, including waterfowl.
3. Estimated time frame of the project with significant milestones.
 - a.



4. Describe the location of the project with attached location map, including details on the total area that will be directly enhanced by the project.
 - a. The HCWMA (41°20'48.5"N, 112°10'21.0"W) is located west of Willard Bay and Willard Bay Upland WMA in Weber and Box Elder Counties (Fig. 1). It lies in the northeast portion of Bear River Bay, just south of the Willard Spur. From I-15, take Exit 354. Go west to SR-126, then continue west on 4000 North to the Willard Bay Upland Game WMA entrance. Continue west on the dirt road adjacent to the Willard Bay dike for 2 ½ miles to the main gate. This area contains approximately 12,500 acres of wetlands typically associated with the eastern shore of the Great Sale Lake. Most of the HCWMA is made up of emergent bulrush marshes, mud flats and open water. The location of the culverts and dike for this project are shown in Figure 3.
5. Describe how the project will specifically enhance and protect waterways affected by the Willard Bay diesel release and improve the conditions of one or more of the following: wildlife, habitat, natural vegetation, water quality or emergency response.
 - a. Wildlife: The HCWMA is partially fed by the Willard Bay Reservoir. This area, along with surrounding bodies of water, is considered one of the largest wetland complexes in the world and is a key staging area for waterfowl, shorebirds, and other waterbirds. It is also important habitat for invertebrates, amphibians and

many native wetland plant species. The addition of highly functioning culverts will allow for control of water level and flow velocity throughout this wetland complex. This is an important aspect of wetland adaptive management because it allows the manager to maintain a seasonal flood regime with higher waters in the spring, followed by receding waters in the summer. As the water recedes, critical mudflat habitat will be exposed allowing shorebirds to utilize this area for feeding on macroinvertebrates and nesting. Previous research on HCWMA indicates that certain species of waterfowl prefer nesting in areas of tall grasses, while others prefer playas (Aldrich and Paul 2002). Consequently, maintaining the dike that divides each pond will allow managers to control each pond separately, thus increasing the habitat diversity and likely increasing the diversity of waterfowl and other wetland species. Another benefit of managing water level and flow is being able to reduce the risk of a potential avian botulism outbreak. Avian botulism has been a major problem in the marshes of the Great Salt Lake and warm, stagnant, and anoxic habitats provide suitable conditions for botulism. Several peer-reviewed articles advocate that having the ability to manipulate water levels may be a key component of reducing the risk of an outbreak. The studies often suggest decreasing the size of each “unit” or body of water in order to facilitate water-level management; therefore, enhancing the ineffective dike between the two largest ponds at HCWMA will allow wetland managers to treat each pond as a separate pond, making rapid water-level manipulation possible. Macroinvertebrates are also sensitive to different chemical and physical conditions. For example, if there is poor catchment management the turbidity of the water may be increased. In very turbid water, the light penetration is reduced which affects the photosynthesis of plants and also increases the temperature of the water. The suspended solids may clog the respirator surfaces or hinder the feeding appendages of macroinvertebrates.

- b. Vegetation and habitat: Calculated modifications of depth and flow can maintain a desirable mix of plant species or inhibit the establishment of others. For example, during high river flows or heavy precipitation events, water can be managed so that some areas receive a couple inches of surface water and some do not. This will give managers the ability to create areas of both vegetated and barren mudflats allowing for maximum diversity of vegetation for the different preferences of wildlife species, including macroinvertebrates (shredders, collectors, scrapers, predators), amphibians, and waterfowl (i.e., foraging, nesting, and loafing). The addition of highly functioning culverts will allow managers to try and reduce or slow down the spread of invasive *Phragmites* with different treatment methods. Maintaining specific water levels is critical for discouraging *Phragmites* and cattail germination. When the water level is high it is possible to spray *Phragmites* with herbicide from airboats. The unit can also be drained and allowed to dry, then cattle can graze the *Phragmites* or it can be burned.
- c. Water quality: One of the most important functions of a wetland is water quality improvement. Wetlands can remove or convert large quantities of pollutants from point sources and nonpoint sources (mining, agricultural, and urban runoff) by natural filtration, sedimentation, and other processes. There are also chemical

reactions that occur along with biological decomposition that help break down complex compounds into simpler materials. Wetland plants are able to remove nutrients for biomass production through absorption and assimilation. When the plants are growing, they produce oxygen, which in turn increases the dissolved oxygen content of the water and soil. This allows for maximum decomposition of pollutants. It has been shown that wetlands are most productive when they undergo flooding and drying events, so having the ability to manage the water level and flow velocity in HCWMA will ensure that it remains a healthy wetland with an advantageous mix of plant species. Another important factor for improving water quality at HCWMA is rebuilding the dike. Dike erosion increases sedimentation and turbidity of the water; which hinders the production of pond weed, an important food for waterfowl. Therefore, restoring this dike with the proper slope and vegetation is vital for maintaining healthy waters.

- d. Emergency Response: HCWMA provides the only access roads to otherwise inaccessible portions of Box Elder and Weber counties. Annually, wildfire personnel are provided tours in order to understand accessibility and are given keys in case of emergency. It is not uncommon for hunters and other recreationists to call in after getting stranded or lost in HCWMA. Rebuilding the dike and culverts will maintain access for such emergencies.
6. Describe the project's connectivity to other natural areas or projects that further enhance wildlife, habitat, natural vegetation, water quality or emergency response.
- a. Connectivity to other natural areas: The HCWMA is a part of a wetland complex known as Willard Spur, which includes the Bear River Migratory Bird Refuge, Willard Bay Reservoir, and the evaporation ponds of GSL Minerals (Fig. 2).
 - i. Wildlife: Many colonial nesting species, such as white-faced ibis, Franklin's gulls, egrets, and herons, utilize emergent marsh habitats located just north of the HCWMA. These birds could benefit from calculated water releases from HCWMA. Targeted, continual flow of water through a colonial nesting area will inhibit land-based predators from entering a colony. If water releases are diverted elsewhere due to clogged or broken culverts, the colony may lose its water source during the summer drying period and become more accessible by predators from land. A continual flow of water into these areas will also provide more habitats for numerous macroinvertebrate and amphibian species which are a crucial part of the HCWMA ecosystem.
 - ii. Habitat and Natural vegetation: The outfalls of HCWMA are known to be an extremely important source of nutrients for Willard Spur and can significantly affect vegetation productivity. These nutrients help support a diverse group of wetland types: submerged aquatic vegetation, emergent marshes dominated by herbaceous plants, hemi-marsh composed of both emergent and submerged wetland types, and playas. Having a great diversity of vegetation allows for high biodiversity of other wetland species which helps the area function as a healthy wetland.
 - iii. Water quality: The nutrients provided by the HCWMA outfalls into Willard Spur allow for maximum growth of plants. These plants help

improve water quality by absorbing nutrients and increasing the dissolved oxygen content of the soil and water. The oxygen rich water allows for maximum decomposition of pollutants. Macroinvertebrates are sensitive to pollutants in the water system. Their communities could be affected by decreased reproduction, impaired behavioral responses, disease or eventually death. In general, the presence of pollutants tends to reduce the overall diversity of macroinvertebrates. Having the ability to control the input of nutrients (from flow) into Willard Spur will allow managers to control the vegetation in the area, likely increasing diversity and productivity of the entire area and resulting in cleaner water.

- iv. Emergency Response: HCWMA provides the only access roads to otherwise inaccessible portions of Box Elder and Weber counties. Annually, wildfire personnel are provided tours in order to understand accessibility and are given keys in case of emergency. It is not uncommon for hunters and other recreationists to call in after getting stranded or lost in HCWMA. Rebuilding the dike and culverts will maintain access for such emergencies.
7. Describe any additional social benefits of implementing this project:
 - a. Private upstream landowners are concerned about the importance of water function at HCWMA. A long-term agreement has been established to hold water levels at a specific height (4,205.2 feet above sea level) to prevent upstream flooding. Culvert replacement and dike repair allow for this agreement to be met by letting water out when needed and allowing access to culverts to make water adjustments. Willard Spur, including HCWMA, can be used as a tool to show the effectiveness of adaptive management in an ecological setting. Research, education and monitoring programs within Willard Spur help build an ecological understanding of wetlands around the Great Salt Lake and help promote an appreciation for Utah's wildlife through hunters, anglers, bird-watchers, photographers, and outdoor enthusiasts alike.
 8. Project plans and details, including the rights to work on specified piece of land:
 - a. A total of seven culverts will be replaced in the HCWMA. The dike will be enhanced with a concrete core. The slope will also be reshaped and the top will be leveled. After that, a layer of topsoil followed by a layer of gravel will be added in order to make the dike traversable and strong. The HCWMA is owned by the State of Utah and managed by the Utah Division of Wildlife Resources (UDWR) who has the rights to implement the work for this project. The project would be executed by the UDWR construction personnel and overseen by WMA managers and wildlife biologists.
 9. Describe your experience in implementing projects of similar scope and magnitude:
 - a. The UDWR manages 243 head-gates and culverts, approximately 64 miles of dikes, and 31,430 acres at Harold Crane and Ogden Bay WMAs. Currently, we are working cooperatively with Weber County on an over \$4 million Natural Resources Conservation Service grant to elevate dikes and repair or replace over 20 large water control structures at Ogden Bay WMA. The current WMA manager also has 40 years of experience maintaining and operating WMAs in Utah. He has also restored over 20,000 acres of wetlands at Harold Crane, Ogden

Bay, and Howard Slough WMAs since the receding of Great Salt Lake floodwaters in the early 90s.

10. Describe how ongoing maintenance of the project will be funded and carried out:
 - a. Acquisition and development of Harold Crane WMA began in 1965. Continued maintenance for this project has been and will be implemented by the UDWR through its current Cooperative Federal Aid Project funding and its annual operational budget.
11. List consultants or agency partners that have participated in project development (below):
 - a. This project will be implemented by the statewide, waterfowl maintenance crew of the UDWR or through contractual services, if needed.

SUPPLEMENTAL DOCUMENTS

Harold S. Crane WMA



Figure 1. Map of the Harold S. Crane Wildlife Management Area. The total wetland area is highlighted in brown (approx. 12,500 acres). The two ponds are shown at the top in green stripes.

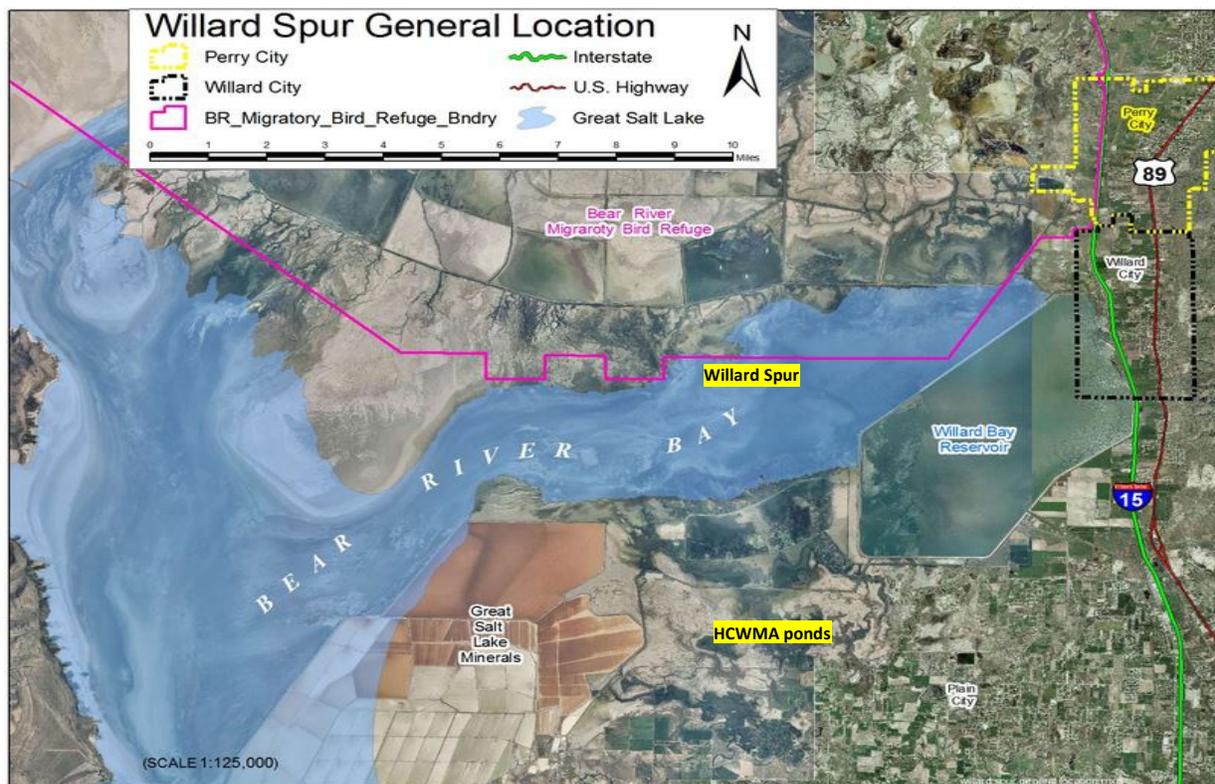


Figure 2. Map of Willard Spur including the Harold S. Crane Wildlife Management Area (HCWMA) ponds, Willard Bay Reservoir, Bear River Bay, Bear River Migratory Bird Refuge, and the ponds of Great Salt Lake Minerals. The area of HCWMA is about 12500 acres.,

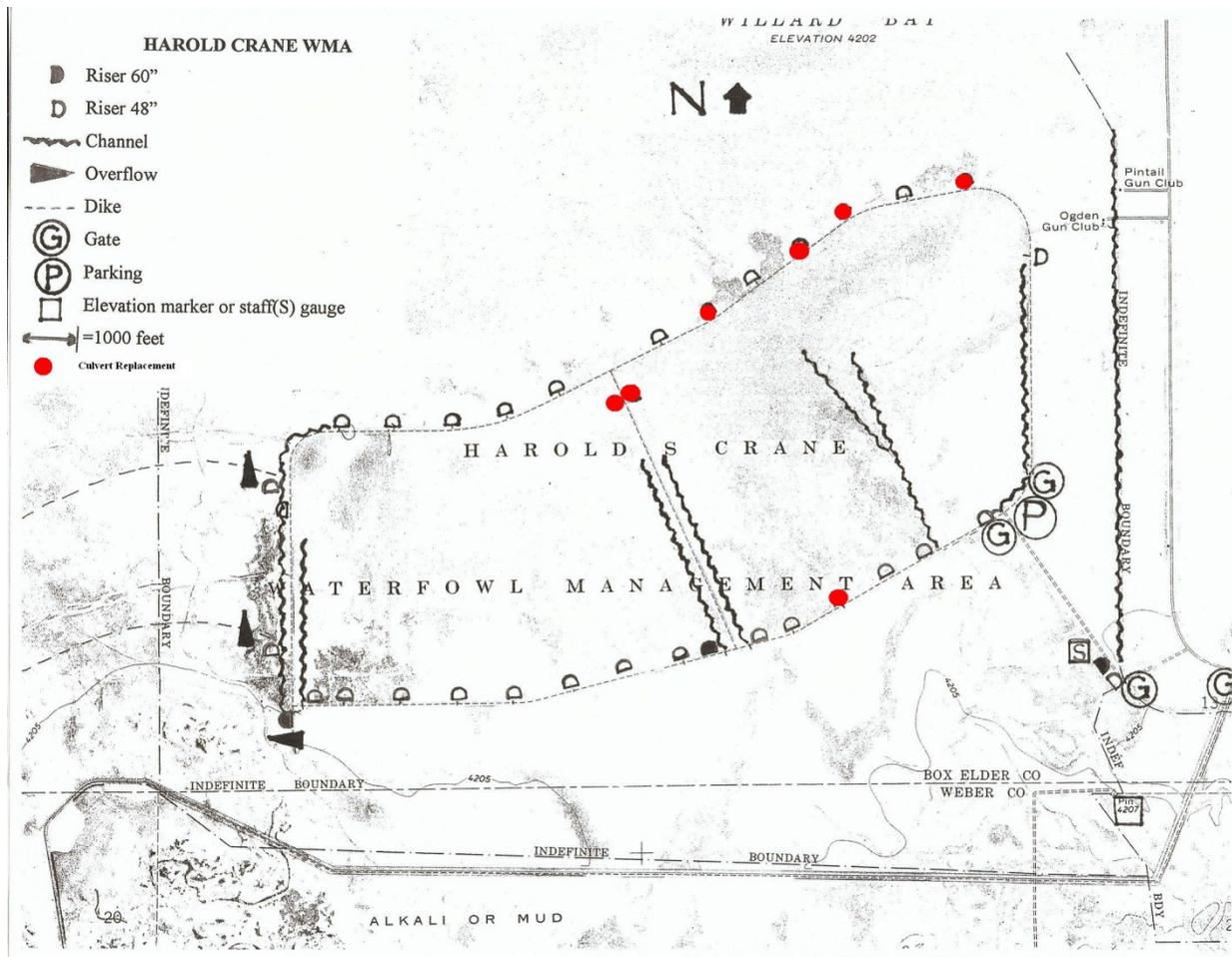


Figure 3. Headgate map of HCWMA. The red dots represent the location of the seven culverts that need to be replaced and the dashed line in the middle represents the dike.



April 24, 2014

TO: Utah Department of Environmental Quality: Division of Water Quality

SUBJECT: Utah Division of Wildlife Resources Harold Crane Waterfowl Management Area Wetland Enhancement Project

FOWL MINDED is a Utah based organization committed to the conservation, preservation, and improvement of Utah's waterfowl and upland game habitat. FOWL MINDED would like to express its support of the Utah Division of Wildlife Resources (UDWR) project to enhance the wetlands of Harold Crane Waterfowl Management Area (HCWMA) by rebuilding a dike and replace several culverts that have corroded over time and no longer function effectively. This project is necessary for managing the water quality, level and flow velocity throughout the area in order to create ideal habitat for numerous species of plants, amphibians, invertebrates, and birds, including waterfowl. HCWMA is an important component of the Great Salt Lake (GSL) ecosystem, which is one of the most important areas for migratory waterfowl in North America. HCWMA provides critical migration and breeding habitat for numerous waterfowl, shorebirds, and waterbirds. Any effort to conserve this valuable resource is a worthy activity that FOWL MINDED fully supports.

FOWL MINDED has a history of partnership and collaboration with UDWR on wetland enhancement projects. FOWL MINDED has worked closely with UDWR on multiple wildlife conservation and habitat projects throughout Utah. This project will deliver long-term protection, restoration, and enhancement of wetlands and wetland-associated upland habitat.

FOWL MINDED is pleased to support the UDWR on their efforts to enhance wetland habitats on Harold Crane.

Thank you for your consideration of this important project.

Sincerely,

Shawn McLachlan
President of FOWL MINDED

FOWL MINDED
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801-598-6026