

**UTAH DIVISION OF WATER QUALITY**

195 North 1950 West  
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**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: Rich Hansen

Co-Applicant Name(s) (if applicable):

Project Title: **Farmington Bay Waterfowl Management Area Artificial Islands**

Agency or Business Name (if applicable): Utah Division of Wildlife Resources

Mailing Address: 2004 N. 1400 W. City: Clinton State: UT Zip: 84015

Phone: (801) 391-1454 E-mail: richhansen@utah.gov

Individual  Non-Profit  Govt. Agency  Academic  Commercial  Other

**1. Estimated Project Costs:**

Labor	\$ <u>65,000</u>
Materials	\$ <u>80,000</u>
Equipment	\$ <u>5,000</u>
Administration	\$ <u>20,000</u>
Miscellaneous	\$ <u>80,000</u>
<b>TOTAL</b>	<b>\$<u>250,000</u></b>

Other sources of project funding:

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

Total project cost including other sources of funding: \$250,000

(please include bids for labor, equipment, rentals, etc.)

**2. Describe the purpose and need of the project:**

The purpose of this project proposal is to install artificial, floating islands in the Unit 1 pond of Farmington Bay Waterfowl Management Area (FBWMA). The floating islands ([www.floatingislandinternational.com](http://www.floatingislandinternational.com)) will provide critical nesting habitat for redhead ducks and other water bird species during the breeding season, as well as loafing areas during spring and fall migrations. In addition, the artificial islands are a natural water purification system that will reduce high nutrients loads in FBWMA. Floating islands provide many of the same ecological benefits as natural wetlands such as: improving water quality; producing large biomass of insects which are food for birds and fish; and providing habitat for birds, frogs and other species. By providing food and cover for fish and frogs, fish-eating birds will also benefit from the floating islands.

FBWMA is comprised of approximately 18,000 acres (with an indefinite west boundary into the Great Salt Lake) and is located at the base of the Jordan River delta

along the southeast bay of the Great Salt Lake in Davis and Salt Lake Counties. For management purposes, it is divided into four units; Unit 1, Unit 2, Turpin Unit, and the Crystal Unit. Private lands surround the majority of the WMA, with the Great Salt Lake bordering on the west.

Unit 1 at FBWMA, is a 2,100 acre unit. Of the 2,100 acres, about 1,500 acres is open water. This unit historically produced valuable sago pondweed, which migrating waterfowl depend upon. However, the excessive nutrients found within Unit 1 lead to the growth of extensive algal mats which precludes the growth of SAV (sub-merged aquatic vegetation; sage pondweed). With the installation of the islands, there would be valuable food in the seeds that will be produced from the emergent vegetation on the islands which will provide food for nesting waterfowl. Of the 1,500 acres of open water, about 400 acres are in the waterfowl rest area. There is no trespassing and no disturbances are allowed in the waterfowl rest area. As a result of no disturbance, there can be 30,000 to 80,000 ducks in the rest area during the hunting season until the pond freezes up and the ducks disperse to other suitable habitats. There is great species diversity amongst the ducks found in the rest area including: mallards, northern pintails, American green-winged teal, northern shoveler, American wigeon, gadwall, cinnamon teal, redhead, canvasback, Ruddy ducks, lesser and greater scaup, common goldeneye, ring-necked ducks, buffleheads and mergansers. The number of redheads found in this area can frequently exceed 4,000 birds.

Historically, the eastern shores of the Great Salt Lake have been a very important nesting area for redhead ducks because of the quality nesting habitat found here. The emergent marshes are ideal habitat for redheads because the majority of the time they nest over water. According to Frank Bellrose (Ducks, Geese and Swans of North America, 1976), "The greatest concentration of Redheads in North America occurs in the marshes adjacent to the east and north sides of Great Salt Lake. The bulk of Utah's 130,000 redheads breed there, a density of 355 birds per square mile of wetlands". Today the eastern shores of the Great Salt Lake are still very important nesting areas for redheads, however with the intrusion of *Phragmites*, a non-native, aggressive reed, there is not as much suitable nesting habitat remaining and the number of nesting redheads has decreased considerably. Ideal nesting habitat for redheads is hard stem bulrush and cattail that is located in the middle of a pond. The redheads feel a sense of security when they are nesting over the water and these islands will provide that ideal situation. The vegetation on the floating islands will be able to be manipulated and controlled until the ideal habitat for the redheads is created. The habitat characteristics and nesting birds will be monitored to identify the ideal combination of vegetation type and cover needed to encourage nesting redhead ducks.

The Jordan River is the main water source for FBWMA and it has been documented to have poor water quality. There have been numerous water quality studies conducted at FBWMA and all of them have identified several water quality issues (Miller and Hoven 2007; Hoven 2009; Hoven and Miller 2009; Hoven 2010a, b; Hoven et al. 2011; Johnson et al. 2011; Miller et al. 2011). One of the main water quality issues is excessive nutrients (specifically nitrogen and phosphorus), which may explain large algal blooms that occur every year as well as other issues such as toxic metals that have accumulated in the sediment and toxic sediment sulfides. The algal blooms are so extensive that they cover the water surface with a dense mat of algae, which is not a food

source for waterfowl. Heavy metals and / or sulfide toxicity are believed to play a role in premature die-off of sago pondweed (Hoven et al 2011) an important food source for waterfowl. Lack of sustained growth of sago pondweed, or submerged aquatic vegetation (SAV), in the open water area of Unit 1 leads to reduced water clarity and purity that vegetation from floating islands can provide.

Floating islands and their associated microbial bio-films offer a natural, cost-effective means for converting deleterious nutrients into beneficial biomass, by shifting them from the water into the food web. Nitrogen and phosphorus can be progressively transitioned into the food chain, from bacteria and algae, to zooplankton, to insects, to fish and birds. As nutrients are assimilated, the majority of them remain sequestered from the waterway. The creation of artificial floating islands at FBWMA is anticipated to provide multiple benefits to waterbirds (waterfowl, shorebirds, wading birds) including providing secure nesting habitat, providing secure roosting habitat and providing additional food sources. Another benefit from island creation is the anticipated water quality improvements which will remove the excess nutrients and allow the growth of important SAV food for waterfowl.

This project will greatly enhance waterfowl habitats on FBWMA and will provide some measure of compensatory mitigation for the Chevron diesel spill impacts.

**3. Estimated time frame of the project with significant milestones (Note:Project must be completed with final reports filed by November 10, 2014):**

The Utah Division of Wildlife Resources will work with Mr. Laddie Flock of Floating Islands West, to plan, design and engineer floating islands of appropriate size for Unit 1. This phase will be completed by June 1, 2015. The construction will begin in May of 2016 and is anticipated to be completed by September 1, 2016.

**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:**

This project would be located in Township 2N Range 1W and occur in Sections 23 and 24. The project will take place in the rest area of Unit 1 at FBWMA. Please see the attached map. This is a 400 acre area that provides a loafing and feeding area for waterfowl that is off-limits to human trespass year round, but this off-limit area is especially important during hunting season.

The total area that will be enhanced by the project will around 86 acres. As far as water quality enhancement, the islands can treat 375 square feet of water per square foot of island and for \$250,000, we should be able to get 5,000 square feet of island.

**5. Describe how the project will specifically enhance and protect waterways affected by the Red Butte releases and improve the conditions of one or more of the following: wildlife, habitat, natural vegetation, water quality or emergency response:**

Beneficial uses of the Jordan River, which include warm water fish, water birds, and aquatic organisms in their food chains, are protected by a variety of water quality standards, but every segment of the Jordan River has been found to be impaired for one or more beneficial uses due to exceeding one or more water quality standards. Segments of the lower Jordan River are currently impaired due to low levels of dissolved oxygen, organic enrichment, total dissolved solids, high water temperatures, and *E. coli*. The Jordan River receives pollutants from many sources, including Utah Lake, wastewater treatment facilities, tributaries, storm water, and diffuse runoff. While the quality of

Jordan River water is not ideal for supporting the uses by fish and wildlife, it nevertheless serves as the life-blood of a series of ponds and wetlands at the lower end of the Jordan River and Farmington Bay. Management of the Jordan River is crucial to protecting the existing beneficial uses and potentially improving the condition of this waterway and wetland habitat that is supported by it.

The project will specifically enhance the water in Unit 1 of FBWMA. Constructed of post-consumer polymer fibers and vegetated with native plants, Floating Treatment Wetlands mimic the ability of natural wetlands to clean water by bringing a “concentrated wetland effect” to any water body. Oil, diesel and other organic materials can be removed from water through the same natural processes. Reduction of nutrients, metals and organics and filtration of sediment particulates from the water column by the vegetation on the floating islands will enhance water quality conditions.

Native vegetation that is preferred as nesting habitat for redheads will be planted on the islands which will also provide a great natural vegetation habitat for many species of birds. Some of the preferred nesting habitat species include hard stem bulrush, Olney’s three square, alkali bulrush, native cattail, and salt grass. Following island installation, UDWR will monitor the islands to document bird usage. UDWR also anticipates working with water quality researchers to document any water quality improvements associated with island creation. Hopefully, there would be an increased number of nesting and migratory redheads at FBWMA due to these islands.

The other advantage to these islands would be during the fall, when there are 30,000-80,000 ducks in this area. The islands would provide a much needed loafing and rest area in the middle of the pond.

**6. Describe project’s connectivity to other natural areas or projects that further enhance wildlife, habitat, natural vegetation, water quality or emergency response:**

The GSL is of hemispheric importance to migratory waterbirds (waterfowl, shorebirds and wading birds), and many species use the GSL as nesting, feeding and staging areas. At times, millions of birds may be found on the GSL and the surrounding wetland/upland habitat complexes. Since the GSL is a dynamic system with the lake elevation changing seasonally and annually, the abundance and location of salt, brackish and freshwater habitats continually change over time. These changes create a continual diversity and continuity of available habitats, such that wildlife, especially waterfowl and shorebirds, will move around the GSL to find those habitats that supply their needs. It is because of these habitats that the GSL has become so critically important to wildlife, with the Lake sometimes supporting over 50% of the worldwide populations of some avian species.

Since the floating islands will assimilate much of the excess nutrients during the growing season, it is likely that the water quality will improve enough to prevent or reduce algae blooms adjacent to the islands. By preventing an algae bloom, the SAV production should be excellent in these areas. With good sago pondweed production, there will be more food available and more waterfowl should be attracted to the area. Also, the project area is immediately adjacent to the Great Salt Lake (GSL) and thus should enhance water flowing into the GSL.

**7. Describe any additional social benefits of implementing this project:**

Some social benefits of implementing this project will be from birdwatchers and photographers, but hunters will also benefit from the increased numbers of redheads and

other ducks using the rest area and adjacent hunting units. The islands will attract migrating birds and provide a quality loafing area. As the fall progresses and the ducks and water birds migrate out of the area, bald eagles are anticipated to also utilize the islands as loafing areas.

The success of the islands will be evaluated both for bird usage and water quality, and if it is determined that they are successful, the project could be expanded in the future and more islands added to FBWMA.

**8. Project plans and details, including rights to work on specified piece of land:**

The FBWMA is owned and managed by the Utah Division of Wildlife Resources (UDWR). An RFP will be released requesting bids for this project.

The project would be designed by consulting with an engineer from Floating Islands West. The idea is to design several small islands that will provide wildlife habitat and enhance water quality at FBWMA. The islands have an indefinite lifespan and the engineered islands will be designed to handle environmental factors such as: wave action; ice build-up; water drawdown; wave action; and flooding events.

Based on initial review of optimal redhead duck habitat, 5,000 square feet of BioHaven floating islands will be proposed to be placed in an archipelago configuration within the rest area portion of Unit 1 of FBWMA. Several different naturalized island shapes, with island square footage ranging from 64 to 250 square feet of top surface, would be tethered and anchored together. The islands will be designed to maximize edge effect, with island perimeters tapering into the water. The islands will be eight inches thick, with an average freeboard of four inches. This is a standard BioHaven design which has proven extremely durable and winter hardy. Minimal island maintenance is required. When fully vegetated with desirable native wetland and terrestrial plants, which normally takes a single growing season, abundant suspended nesting sites, preferred by redheads, will be available. The projected costs for the island component of this project are \$250,000. UDWR also anticipates working with water quality researchers to document water quality improvements and food production associated with island creation.

**9. Describe your experience in implementing projects of similar scope and magnitude:**

This project would be different from any other projects that have been implemented at FBWMA, however we have created dirt islands within our wetlands. We have a great understanding of wetlands and their functions, and can implement this project without a problem. With over 4,500 floating islands in place around the world, demonstrating significant nutrient removal when required, floating islands are one of the best solutions available.”

Floating Islands West (FIW) has built two of the largest BioHaven habitat islands launched to date, a 22,000 square foot Caspian Tern floating rookery in Duchy Lake, Oregon, and a 39,800 square foot island in Sheepy Lake, California. In addition to setting an efficacy record relative to usage by the Terns at Sheepy Lake, compared to over ten land based Caspian Tern island projects, both island projects also have proven extremely effective at minimization of ground based animal predation. Currently a 51,000 square foot island is launching in New Zealand. Mr. Laddie Flock of FIW was the project coordinator on both the Sheepy Lake and Duchy Lake launches and is prepared to work closely with project managers on the FBWMA launch. This primary

purpose of the current proposal is to address eutrophication issues which are also a critical factor at FBWMA.

**10. Describe how ongoing maintenance of the project will be funded and carried out:** There will be minimal maintenance associated with the project. If maintenance is required on the island, volunteers can be utilized to assist with the project. A small amount of money will be requested in the FBWMA annual budget to cover annual maintenance costs.

**11. List consultants or agency partners that have participated in project development:**

Please see the attached letter of support.

The following organizations also support this project. Please see the attached letters of support

- Utah Airboat Association
- Delta Waterfowl
- Utah Mud Motor Association
- Utah Waterfowl Association

Signature \_\_\_\_\_

*Richard O. Hansen*

Date 5/5/14

Applicant

## References

- Hoven, H.M. 2009. SAV assessment method metrics development for impounded wetlands of Great Salt Lake. The Institute for Watershed Sciences, Kamas, Utah. 38 pp.
- Hoven, H.M. 2010a. Submerged Aquatic Vegetation of Impounded Wetlands of Farmington Bay, Great Salt Lake: Final Report to DWQ for the 2007 EPA Wetland Program Development Grant. 71 pp.
- Hoven, H.M. 2010b. The 2009 Report on SAV Condition in Farmington Bay and other Impounded wetlands of Great Salt Lake. The Institute for Watershed Sciences, Kamas, Utah. 39 pp.
- Hoven, H.M. & T.G. Miller. 2009b. Developing vegetation metrics for the assessment of beneficial uses of impounded wetlands surrounding Great Salt Lake, Utah, U.S.A. In: Saline lakes around the world: unique systems with unique values. Oren, A., Naftz, D.L., and Wurtsbaugh, W.A. (eds.); The S.J. and Jessie E. Quinney Natural Resources Research Library, published in conjunction with the Utah State University College of Natural Resources.
- Hoven, H.M., D.Richards, W.P. Johnson, G.T. Carling. 2011. Plant Metric Refinement for Condition Assessment of Great Salt Lake Impounded Wetlands, Final Report: June 7, 2011. The Institute for Watershed Sciences, Kamas, Utah.
- Miller, T.G. and H. M. Hoven. 2007. Ecological and Beneficial Use Assessment of Farmington Bay Wetlands: Assessment Methods Development Progress Report to EPA, Region VIII and Final Report for Grant: CD988706-03. Draft, April 10, 2007.
- Miller, T.G., D. Richards, H.M. Hoven, W.P. Johnson, M. Hogset & G.T. Carling. 2011. Macroinvertebrate communities in Great Salt Lake Impounded Wetlands, Their Relationship to Water and Sediment Chemistry and to Plant Communities and Proposed Modifications to the MMI, Draft Report to Jordan River/Farmington Bay Water Quality Council.



# UTAH WATERFOWL ASSOCIATION



May 2, 2014

To whom it may concern:

The Utah Waterfowl Association (“UWA”) is a non-profit organization that represents the interests of the roughly 15,000 waterfowl hunters in the state of Utah, a majority of which represent the Farmington Bay Waterfowl Management Area (“FBWMA”). I write this letter in support of the Division of Wildlife Resources’ (“DWR”) grant proposal to fund the specific projects listed below.

1. Installation of artificial islands in the rest area of Unit 1.
2. Repairing an existing dike referred to as the “J Dike.”

We believe that each of these projects has a unique benefit to both waterfowl and waterfowl hunters and should be funded. The DWR has a long track record of successfully using both private and public funding to accomplish these types of projects. For example, the Doug Miller Unit at the FBWMA was a large project that was successfully completed utilizing funding from a number of sources including private funds which had significant benefits to Utah waterfowl and waterfowl hunters.

Thank you for consideration and should you have any questions please do not hesitate to call me at (801) 589-9267.

Sincerely,

R. Jeff Richards  
President



April 25, 2014

To whom it may concern,

As president of the Utah Airboat Association, I have had numerous opportunities to work with Rich Hansen and his staff at Farmington Bay Waterfowl Management Area and although his crew is not large, I am amazed at projects they are able to take on and efficiently complete. Rich is organized. He knows how to set goals and get things done.

We support Farmington Bay WMA in their efforts to battle the insidious phragmites. This will be an ongoing endeavor which Rich and his staff have faced head-on. He has pioneered the effort to put range cattle in some areas during the summer to graze on the phragmites. It has proven to be quite effective.

Their efforts to develop and improve the water control structures, including the establishment of the Doug Miller Unit, have certainly enhanced the usable habitat for waterfowl and the other residents of the WMA.

We support Rich in his future plans to build islands in the rest area portion of Unit 1, as well as his plans to reconstruct the J- dike which was destroyed during the floods of the 1980's. The J-dike area is completely choked with phragmites at the present time and is of no value to waterfowl or hunters.

Repairing this dike would mean reopening a large area of productive habitat.

We appreciate Farmington Bay WMA and recognize it as one of the treasures of our Great Salt Lake. We pledge our continued support to the work that is done to improve and maintain this valuable resource.

Kerry McCloud – President  
Utah Airboat Association

## Willard Peak Chapter of Delta Waterfowl Foundation

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To Whom It May Concern,

This letter is to serve as my support and recommendation for a project Rich Hansen, the manager of Farmington Bay WMA of the Utah Department of Wildlife Resources has submitted.

We at Delta Waterfowl feel confident that the money you are considering awarding Rich will be well spent in rebuilding and restoring the J Dike within the Farmington Bay WMA. This marsh is an important asset to hunters relying on public land, so this restoration would be a blessing to hunters and the waterfowl that utilize it here in Utah. I have seen Rich's work in the development and improvement of the marshes, impoundments and the continuing fight with invasive species such as phragmites. I have also had the privilege of working with Rich and other volunteers on multiple projects over the last 4 years, in conjunction with many other organizations. I have worked with him on nesting & habitat projects as well as youth projects.

We hope you will strongly consider this request and look forward to helping on the project in any way we can.

Sincerely,

Jeff Adams  
Chairman, Willard Peak Chapter  
Delta Waterfowl  
Brigham City, UT.



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Utah Bowfishing Association  
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[www.utahbowfishing.com](http://www.utahbowfishing.com)

April 28, 2014

To whom it may concern:

As the active President of the Utah Mud Motor Association and the Utah Bowfishing Association, I'm writing on behalf of Rich Hansen and the staff of Farmington Bay Waterfowl Management Area. Over the course of the past eleven years, I've personally witnessed the positive transformation of Farmington Bay WMA while Rich and his staff have been in power. Some of these great projects include: dyke reconstruction, phragmites removal, construction of new units (in cooperation with other waterfowl conservation groups), and many other positive projects that make Farmington Bay what it is today. These projects benefit both an unsurpassable amount of wildlife and provides sportsmen, and outdoor enthusiasts a place to escape, while working hard to preserve and protect the very land that provides such resources. Rich's motivation, follow through, and management practices have undoubtedly made Farmington Bay WMA a resource worth fighting for.

Sincerely,

Josh Noble

Utah Bowfishing Association President  
Utah Mud Motor Association President

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