Utah Reclamation Mitigation & Conservation Commission
230 South 500 East Suite 230 Salt Lake City, UT 84102-2045
Phone: (801) 524-3146 – Fax: (801) 524-3148

MEETING AGENDA
Thursday, June 16, 2022

TIME: 10:00 a.m.
LOCATION: Utah Reclamation Mitigation and Conservation Commission Office
230 South 500 East, Suite 230
Salt Lake City, UT 84102

Participation is also available Online through WebEx:

https://bor.webex.com/bor/j.php?MTID=mf85e2506befbe8d2417020b928147d31

1. WELCOME AND OPENING REMARKS

2. APPROVAL OF PREVIOUS MINUTES

3. ITEMS FOR COMMISSION ACTION

A. Proposed Modification of Agreement with Brigham Young University for Study of Sage Grouse in Strawberry Valley

B. Proposed Modification of Agreement with Utah Division of Wildlife Resources for Establishment of the Utah Lake Wetlands Preserve

4. ITEMS FOR COMMISSION CONSIDERATION

A. Proposed Modification of Agreement with Utah State University for continuation of Provo River Delta Submerged Aquatic Vegetation Restoration and Research Study

5. COMMENTS FROM THE PUBLIC

6. EXECUTIVE DIRECTOR'S REPORT

7. OTHER BUSINESS

8. DATE OF NEXT COMMISSION MEETING: TBD

PROPOSED MODIFICATION OF AGREEMENT
FOR COMMISSION ACTION
June 16, 2022

AGENDA ITEM NO:	3A
TITLE:	Study of Sage Grouse in Strawberry Valley
COOPERATORS:	Brigham Young University
EFFECTIVE DATES:	July 1, 2019, to June 30, 2024
CUPCA AUTHORITY:	Section 315
FINANCIAL COMMITMENTS:	

Current Agreement	$ 190,000
Proposed Modification	$ 60,000
Total	$ 250,000

SCOPE OF ACTION:	Study and monitoring to guide management strategies to recover the sage grouse population in and around Strawberry Valley.
PLAN REFERENCE:	Pages 2-41 to 2-43
STAFF CONTACT:	Richard Mingo, Project Coordinator

SUMMARY: There is a clear nexus between the decline of Sage grouse and federal reclamation projects. Approximately seventeen thousand acres of high quality Sage grouse habitat and four of five display/breeding sites were inundated by the enlargement of Strawberry Reservoir as part of the CUP.

BYU will also continue to monitor lek attendance to estimate population size consistent with methodology used by the Utah Division of Wildlife Resources. In addition, BYU proposes to mark male sage-grouse with GPS transmitters over the next few years which will allow them to estimate lek attendance rates. Some evidence suggests that lek attendance rates vary by year with lower rates observed for males during years of low precipitation. Conversations with UDWR have identified this information as a knowledge gap that would benefit conservation and monitoring efforts for this species. BYU also plans to complete investigative work regarding observed clutch sizes for sage-grouse in Strawberry Valley. They suspect that average clutch sizes are low relative to other populations and over the next year will conduct a formal analysis to determine if this suspicion is accurate. Low clutch sizes may partially be related to genetic diversity which was identified as low prior to translocation. BYU will also evaluate use of newly planned habitat treatment projects implemented by the United States Forest Service and Utah Division of Wildlife Resources through the Watershed Restoration Initiative. Effectiveness monitoring of habitat treatments will help inform our decision regarding the mix mitigation measures to request in response to the TransWest Express Transmission line.

The proposed funding allows continuation of the study in 2022-2023.

MODIFICATION NO. 003
AGREEMENT No. 19FC-UT-2330
UTAH RECLAMATION MITIGATION AND CONSERVATION COMMISSION
BRIGHAM YOUNG UNIVERSITY

1. AGREEMENT TITLE: The Study of Sage grouse in Strawberry Valley

2. PURPOSE: Provide additional funding to complete studies for next year to facilitate recovery and protection of sage grouse in Strawberry Valley.

3. DESCRIPTION OF THE CHANGES:

A. Modify Article V. SCOPE OF WORK - SPECIFIC OBLIGATIONS OF THE PARTIES as follows:

"A. UTAH RECLAMATION MITIGATION AND CONSERVATION COMMISSION WILL:

1. Reimburse BYU for all allowable and allocable costs to complete the terms of the Scope of Work required in this Agreement up to ~~$65,000.00~~ ~~$130,000.00~~ ~~$190,000.00~~ **$250,000.00** (as per ~~Attachment A~~ ~~Attachment B~~ ~~Attachment C~~ **Attachment D)**. No legal liability on the part of the COMMISSION for any payment may arise from performance under this AGREEMENT until funds are made available for performance."

4. ADJUSTMENT IN AGREEMENT PRICE: The Agreement price is increased by $60,000.00.

FUNDING HISTORY TO DATE:

Instrument	Value	Reservation
Original	$ 65,000	$ 65,000
Modification No. 001	$ 65,000	$ 65,000
Modification No. 002	$ 60,000	$ 60,000
Modification No. 003	$ 60,000	$ 60,000
Total	$ 250,000	$ 250,000

IN WITNESS WHEREOF, each party hereto has caused this AGREEMENT to be executed by an authorized official on the day and year set forth opposite their signature below.

UTAH RECLAMATION MITIGATION AND CONSERVATION COMMISSION

By: _____ Date:_____
Title: Brad T. Barber, Chair

BRIGHAM YOUNG UNIVERSITY

By: _____ Date:_____
Title:

ATTACHMENT D

2022 STRAWBERRY VALLEY SAGE GROUSE PROJECT FUNDING PROPOSAL

COLLABORATIVE WORK BETWEEN:

THE UTAH RECLAMATION MITIGATION AND CONSERVATION COMMISSION

AND

BRIGHAM YOUNG UNIVERSITY

CONTEXT AND HISTORY OF THE PROJECT

The impetus behind the effort to recover greater sage-grouse (*Centrocercus urophasianus*; hereafter sage-grouse or grouse) in Strawberry Valley was to 1) identify factors limiting population growth and recovery, 2) mitigate those factors, and 3) recover the population to where it was self-sustaining and no longer threatened with extirpation (**Bunnell 2000**). Note that all bold citations represent published data from theses, a dissertation, or scholarly peer-reviewed journal articles produced as part of the recovery effort. This document will highlight the accomplishments and successes of the past 20+ years and their immediate application to this population in an adaptive management framework.

In March 1998, we began collecting sage grouse seasonal habitat use and life history information (movements, reproduction, survival) in Strawberry Valley. Bunnell (**2000**) immediately documented high adult mortality and suggested that red fox (*Vulpes vulpes*) predation on adult sage-grouse may be limiting population growth. In response to his findings, predator control was initiated in December of 1999 to determine if removal of mammalian predators could increase survival rates of adults and cause a subsequent population increase.

During this same period and throughout the rest of the project, we collected seasonal habitat data to assess habitat condition in relation to standards set forth in the sage-grouse management guidelines (Connelly et al. 2000, **Bunnell 2000, Bambrough 2002, Baxter 2003, Bunnell et al. 2004**). Bunnell (**2000**) and Bunnell et al. (**2004**) suggested that summer habitat was adequate and either met or exceeded guidelines. However, he also stated that he expected understory composition to change as sagebrush (*Artemisia* sp.) matured. These findings were accurate in

light of the sample size and quantity of summer habitat needed for an estimated 150 grouse in the population during the early years of the recovery effort. Bambrough (**2002**), on the other hand, found that winter habitat barely met the minimum standard from the published sage-grouse guidelines (Connelly et al. 2000). He stated that it was crucial to the conservation of this population to maintain winter habitat both in Strawberry Valley and in the migratory areas to the east, especially in light of herbicide treatments (2000-2001) on private lands that reduced the quality and quantity of sagebrush wintering habitat (**Bambrough 2002**). Baxter (**2003**) showed that brood-use sites were productive, exceeded the management guidelines for percent forb cover, and had high insect diversity and abundance.

Low survival rates in the presence of habitat that meets or exceeds published guidelines are conditions where predator control can improve population growth. **Baxter et al. 2009** (using data from 1998-2002) demonstrated that survival rates of adults in the summer increased during years of predator control. These increased survival rates, however, did not translate into obvious increases in lek counts. At the same time, a range-wide survey of greater sage-grouse across western North America identified evidence of low genetic diversity in Strawberry Valley (Oyler McCance et al. 2005). As a result, in cooperation with state and federal agencies, we began a translocation program. From 2003 to 2008, we translocated 395 female sage grouse (**Baxter et al. 2008**) to Strawberry Valley to augment the population and increase genetic diversity. Baxter (**2007**) and Baxter et al. (**2008**) documented site fidelity, movements, reproductive output, nest-site selection, and overall translocation success. Hennefer (**2007**) found our translocation method to be the most successful translocation documented in the literature and estimated that grouse numbers had increased to around 400 by 2007. Later, we assessed chick survival and documented (**Baxter et al. 2013**) similar survival rates in Strawberry Valley to that of other areas. **Dunken (2014)** assessed the influence of translocations on genetic diversity and found haplotype diversity increased following this successful effort.

As reproductive effort and survival are the two most important aspects of population growth, we assessed nest-site selection and nest success for translocated grouse (**Baxter et al. 2009**). We documented that successful nest sites were characterized by greater total shrub canopy cover, medium-sized crown area for the nesting shrub, and steeper slopes. In turn, we looked at nest-area fidelity. Peck et al. (**2012**) found that the distance between first and second year nests was approximately 882 meters, with no evidence that successful females showed greater nest-site fidelity than unsuccessful females. Most important, however, was the finding that if a standard 2 mile (3.2 km) buffer was placed around each lek to protect nesting habitat, it would only capture 57% of nesting females in this population. However, if a 6.2 mile (~10 km) buffer was used, 95% of nesting habitat would be conserved.

In an effort to compile all survival data for resident males and females and translocated females from 1998 to 2010, we documented (**Baxter et al. 2013**) that survival was influenced by year effects, status of grouse (resident or translocated), sex, and whether females initiated a nest. Point estimates of survival for translocated females were slightly lower than resident males and females, but there was no statistical difference in rates. Many external observers expected a high rate of mortality for translocated females; however, we observed very little immediate mortality,

with annual survival within the range of variability for resident grouse in large extant populations across the species range.

Initial data collection (1998-1999) showed that sage-grouse used sites where vegetation was productive and diverse, especially for a small declining population; however, as predicted, coarser more decadent sagebrush stands have resulted in a decrease in habitat quality and quantity over time. In 2006, project partners outlined areas where habitat could be improved by setting late seral sagebrush stands back to an earlier seral stage, wherein brood-rearing habitat would be created. Plans called for mechanical treatments (harrow and/or mowing) of seven areas (one every other year starting in 2007 in Trout Creek) in Strawberry Valley with subsequent monitoring of habitat use by radio-marked grouse. In 2009, 2011, and 2013 the UDWR treated areas near Road Hollow, Badger Hollow, and Chipman Creek, respectively. Preliminary observations suggested that radio-marked grouse were using newly treated areas more than expected. From 1998 to 2008 (pre-treatment), we documented 108 locations (10.8 locations/year) in the area yet to be treated in 2009 (Road Hollow). In 2010, one year post-treatment, we observed 37 locations (nearly 4x the annual rate prior to treatment) in the same area.

Following habitat restoration efforts, we continued to monitor and collect data on the use of restoration areas by grouse. We documented changes in vegetative composition through on-the-ground collection of vegetative data. In our analysis, we used a resource selection function (RSF) to provide evidence that female sage-grouse with chicks disproportionately used recently treated areas versus non-treated areas in Strawberry Valley. **Baxter et al. (2017)** demonstrated that sage-grouse selected areas that were 1) distant from trees, paved roads, and powerlines; 2) high in elevation; 3) near treatment edges; and 4) consisting of gentle slopes. Sage-grouse showed stronger selection for treatments and treatment edges following treatment than they did for those same areas prior to habitat treatment efforts. Maps predicting probability of selection by brood-rearing sage-grouse showed increased use in and around mechanically treated areas. This altered pattern of selection by sage-grouse with broods suggests mechanical treatments may be a suitable way to increase use of mountain big sagebrush habitats during the brooding period.

Beginning in 2018, we began purchasing solar-powered GPS transmitters for the first time on this project. This improved technology allows for collection of multiple locations per day (without disturbing marked sage-grouse) that are subsequently sent through the satellite network. Within just a few short months following deployment of GPS transmitters in spring of 2018, we collected more locations than the previous 19 years combined. Most importantly, our understanding of seasonal habitat use has greatly expanded as we've watched marked grouse move farther east than ever previously noted during the winter of 2018/2019. **Howell 2020** conducted a formal analysis of all existing location data (from birds with both VHF and GPS transmitters) to provide information on seasonal habitat selection for this population. In addition, **Howell et al. 2020** evaluated a new method (using unmanned aerial systems) to quantify shrub height which showed promise to save time and money over traditional measurement.

Importantly, we have shared the spatial locations and modeled habitat layers with partners regularly for conservation planning and management. These data have been particularly valuable to biologists from state and federal agencies as they work to recover this population in

an adaptive management framework. The location data is used as a focal point of discussions with the Strawberry Valley Adaptive Resources Management Group that meets regularly to discuss issues affecting this population. The data collected on this long-term recovery project has been and will continue to be used by the United States Forest Service, Utah Division of Wildlife Resources, Local Working Group (SVARM), Wasatch County officials, and even private landowners to make decisions helpful to the long-term conservation and recovery of sage grouse in Strawberry Valley.

To date, this project has been a resounding success. Very few sage-grouse projects across the West have delivered as much information over a continuous period of time. In addition, possibly no other project can document at least a two-fold increase in estimated population size associated with habitat treatment, translocation and predator control. For this reason, the Strawberry Valley sage-grouse population is now considered one of the core populations in the state of Utah. Maintaining this population at the enlarged level continues to be a major accomplishment.

We have a current MS student (Janae Radke) who is continuing and building on the success of former students. The proposal that follows, if funded, will continue that legacy into 2023. We propose to continue our monitoring efforts and to purchase additional transmitters to bolster samples sizes and collect important information on habitat use including migratory corridors and stopover areas, reproductive success, and survival.

ATTACHMENT D: FUNDING PROPOSAL

Our funding partners continue to support the project with all support considered invaluable to success of this project. Partners include: the Utah Reclamation Mitigation and Conservation Commission, Utah Division of Wildlife Resources, United States Forest Service, Sportsman for Fish and Wildlife, and Brigham Young University. In addition, we have and will continue to work with the Strawberry Valley Adaptive Resource Management (SVARM) Local Working Group, private landowners, and the United States Fish and Wildlife Service.

PROPOSED SCOPE OF WORK/PROJECT OBJECTIVES

We will continue to monitor marked grouse to provide information on seasonal habitat use, reproduction (breeding, nesting, brood-rearing, recruitment), survival (rates and causes of mortality), and movements of sage grouse in the Strawberry Valley (SV) study area. After completion of seasonal habitat maps (**Howell 2020**), one of our key objectives over the next few years will be to use GPS data to identify migratory routes and stopover areas for grouse that migrate between Strawberry Valley and the Fruitland area. Grouse in the Strawberry Valley population are considered semi-migratory with some individuals classified as resident and others migratory. It is also likely that some individuals are migratory in some years, but not others (likely dependent on snowfall). With collection of a robust set of GPS locations from satellite transmitters, we will be able to identify the proportion of grouse that are migratory and under what conditions (e.g., winter snow depths) they move. We will also be able to identify likely migratory routes and stopover areas. This effort aligns well with a current focus by the Utah

Division of Wildlife Resources on a new 'Migration Initiative' to map corridors, routes, and stopover areas for multiple species.

We will also continue to monitor lek attendance to estimate population size consistent with methodology used by the Utah Division of Wildlife Resources. Ongoing monitoring is crucial over the next couple of years to see if we continue a general pattern of long-term growth after a recent decline (putatively associated with severe drought in summer of 2018 and cyclic decline typical of grouse populations).

In addition, we propose to mark male sage-grouse with GPS transmitters over the next few years which will allow us to estimate lek attendance rates. Some evidence suggests that lek attendance rates vary by year with lower rates observed for males during years of low precipitation. Conversations with UDWR have identified this information as a knowledge gap that would benefit conservation and monitoring efforts for this species. In order to effectively estimate these rates, we will need to increase capture efforts during Fall so that estimates of lek attendance during the subsequent spring are unbiased.

In addition, there is investigative work to do regarding observed clutch sizes for sage-grouse in Strawberry Valley. We suspect that average clutch sizes are low relative to other populations and over the next year will conduct a formal analysis to determine if this suspicion is accurate. Low clutch sizes may partially be related to genetic diversity which was identified as low prior to translocation. Thus, formal analysis will also identify whether or not clutch sizes have increased following translocation and how they compare to historical (museum specimen) clutch sizes from Strawberry Valley and estimated number of haplotypes (e.g., genetic diversity). This assessment will form the basis for one of MS student Janae Radke's chapters for her thesis.

Moreover, deployment of additional GPS transmitters will allow us to evaluate use of newly planned habitat treatment projects implemented by the United States Forest Service and Utah Division of Wildlife Resources through the Watershed Restoration Initiative. We will also be able to monitor sage-grouse use of habitats impacted by the Dollar Ridge Fire. This effort will include monitoring sage grouse on federal, state, private, and acquired land east of the Wildcat area throughout the year. To successfully monitor grouse, we will need the assistance of research technicians and project oversight. It will also require the purchase of additional transmitters. BYU will provide significant support for both graduate and undergraduate students this year which will magnify contributions from URMCC.

Estimated cost - $30,000 labor and travel + $30,000 transmitters, data fees for GPS upload, and materials = $60,000 total cost; to be completed in 12 months

If funded, the work will require ample oversight and supervision by faculty, as well as a large amount of time by on-the-ground research assistants. If fewer funds are needed for labor and travel, those funds would be used to acquire additional transmitters and equipment that would permit additional monitoring and collection of scientific data. BYU's long-term commitment to the project and to the URMCC is such that we would accept lesser amounts of funding, if funding is limited. In such an event, we will attempt to complete the maximum amount of work

possible. In addition, we continue to seek additional funding for continued support from additional partners. Thank you for your consideration of this proposal.

PROPOSED MODIFICATION OF AGREEMENT
FOR COMMISSION ACTION
June 16, 2022

AGENDA ITEM NO.: 3B
PROJECT TITLE: Establishment of the Utah Lake Wetland Preserve
COOPERATORS: Utah Division of Wildlife Resources
EFFECTIVE DATES: January 1, 2020 through December 31, 2024
CUPCA AUTHORITY: Title III, Section 306(c)
FINANCIAL COMMITMENTS:

Current Agreement:	$ 620,000
Proposed Modification:	$ 350,000
Total:	$ 970,000

SCOPE OF ACTION: Funding to continue property stewardship and planning.
PLAN REFERENCE: Page 2-16
STAFF CONTACT: Michael Mills, Deputy Executive Director

SUMMARY: Under this cooperative program for acquisition and protection of wetlands, the Mitigation Commission and Utah Division of Wildlife Resources (DWR) work together to establish the Utah Lake Wetland Preserve. The DWR works closely with the Mitigation Commission to identify potential willing sellers in the Utah Lake Wetland Preserve area. The DWR also provides interim management of acquired properties. This agreement would provide funding for Utah FY 2023 (effective July 1) for initiating implementation of the comprehensive management plan, and ongoing development and stewardship activities for the ULWP and on other nearby Mitigation Commission properties.

MODIFICATION NO. 002
AGREEMENT NO. 20FCUT-2360
UTAH DIVISION OF WILDLIFE RESOURCES
UTAH RECLAMATION MITIGATION AND CONSERVATION COMMISSION

1. AGREEMENT TITLE: Establishment of the Utah Lake Wetlands Preserve

2. PURPOSE: To obligate additional funds for performance.

3. DESCRIPTION OF CHANGES:
A. Modify Article IV.A.2. SCOPE OF WORK - SPECIFIC OBLIGATIONS OF THE PARTIES: the COMMISSON will: as follows:

"2. Reimburse the DIVISION up to ~~$300,000 $620,000~~ **$970,000** for all services, approved equipment, materials and supplies to complete the work items for implementation of this AGREEMENT."

4. AGREEMENT PRICE: The agreement price is increased by $350,000.00.

FUNDING HISTORY TO DATE:

Instrument	Value	Reservation
Original	$300,000	$300,000
Modification No. 001	$320,000	$320,000
Modification No. 002	$350,000	$350,000
Total	$970,000	$970,000

IN WITNESS WHEREOF, each party hereto has caused this MODIFICATION to be executed by an authorized official on the day and year set forth opposite their signature below.

UTAH RECLAMATION MITIGATION AND CONSERVATION COMMISSION

By: _____ Date: _____
Brad Barber, Chair

UTAH DIVISION OF WILDLIFE RESOURCES

By: _____ Date: _____
J. Shirley, Director

By: _____ Date: _____
Sarah Scott, Fiscal Manager

PROPOSED MODIFICATION OF AGREEMENT
FOR COMMISSION CONSIDERATION
June 16, 2022

AGENDA ITEM NO.:	4A
PROJECT:	Provo River Delta Submerged Aquatic Vegetation Restoration and Research Study
COOPERATORS:	Utah State University
EFFECTIVE DATES:	August 15, 2020 through June 30, 2024
CUPCA AUTHORITY:	Titles II, III
FINANCIAL COMMITMENTS:	

Original Agreement	$ 79,100
Modification 1	$ 75,000
Modification 2	$ 75,900
Total	$ 230,000

SCOPE OF ACTIONS:	Add funding for remainder of the planned study program. Extend agreement end date to August 2025. Update scope of work.
PLAN REFERENCE:	Pages 2-11 to 2-16
STAFF CONTACT:	Melissa Stamp, Project Coordinator

SUMMARY: The Provo River Delta Restoration Project (PRDRP) is partial mitigation for impacts of Bonneville Unit of the Central Utah Project on June sucker and related resources. The PRDRP is a required and essential step toward recovery of this endangered species through restoration of the lower Provo River and its interface with Utah Lake. Thousands of June sucker spawn each year in the lower Provo River, but successful recruitment of wild June sucker from Provo River has not been documented. One of the key elements of larval nursery and rearing habitat currently lacking in the existing lower Provo River channel is an abundance of submerged aquatic vegetation (SAV). SAV is needed to provide cover from predators and support a healthy food base for larval and juvenile June sucker. The purpose of this agreement is to fund USU to conduct Provo River Delta submerged aquatic vegetation restoration efforts and research studies. Integral components of the proposed research studies and restoration efforts include increasing knowledge of species identification, collection, and propagation methods; testing and developing planting techniques; monitoring planted materials as well as SAV that establishes passively; and evaluating the relative success of various techniques for different target species.

MODIFICATION NO. 002
AGREEMENT NO. 20FCUT-2420
UTAH RECLAMATION MITIGATION AND CONSERVATION COMMISSION
UTAH STATE UNIVERSITY – UTAH CONSERVATION CORPS

1. AGREEMENT TITLE: Provo River Delta Submerged Aquatic Vegetation Restoration and Research Study

2. PURPOSE: To obligate additional funds to the agreement to continue the submerged aquatic vegetation study, to extend the end date of the agreement, and to update the scope of work.

3. DESCRIPTION OF CHANGES:

A. Modify Article V SCOPE OF WORK - SPECIFIC OBLIGATIONS OF THE PARTIES as follows:

"The detailed scope of work for this Agreement is described in Attachment A **and in Attachment B**.

.A. The Commission shall be responsible for the following:

1. Reimburse USU for all allowable and allocable costs incurred to complete the terms of the Scope of Work required in this Agreement as per Attachment A. The work is scheduled to be completed over a 3-year period, with total cost of $230,000. This Agreement obligates $79,100.00 for year one. Modification No. 001 to this Agreement obligates an additional $75,000.00 for year two of the program. **Modification No. 002 to this Agreement obligates an additional $75,900.00 for the remainder of the program.** This Agreement is intended to be modified at the mutual consent of the Parties, for adding or deleting work items or funding from this Agreement. If USU expends less than the entire amount allotted by this Agreement, the balance will be carried forward for use during the next fiscal year(s), unless formally deobligated by the Commission. Indirect or "overhead" charges by USU will be applied at the rate of 15% of direct costs. No legal liability on the part of the Commission for any payment may arise from performance under this Agreement until funds are made available for performance."

B. Modify Article IV TERM OF AGREEMENT as follows:

"This Agreement is effective as of August 15, 2020 and will remain in force and effect until ~~June 30, 2024~~ **August 31, 2025**, at which time the Scope of Work described herein shall be completed unless extended by mutual agreement."

4. FINANCIAL HISTORY TO DATE:

Instrument	Value	Reservation
Original	$ 79,100	$ 79,100
Modification 001	$ 75,000	$ 75,000
Modification 002	$ 75,900	$ 75,900
Total	$230,000	$230,000

IN WITNESS WHEREOF, each PARTY hereto has caused this MODIFICATION to be executed by an authorized official on the day and year set forth opposite their signature below.

UTAH RECLAMATION MITIGATION AND CONSERVATION COMMISSION

By: _____ Date: _____
Brad Barber, Chair

UTAH STATE UNIVERSITY

By: _____ Date:_____

Title: Logan Hager, Grants and Contracts Administrator

ATTACHMENT B

June 2022 Update to Scope of Work

Major efforts July 1, 2023-August 31, 2025

Continue to evaluate scalable planting methods for a diversity of aquatic plant species (floating and submerged), building on lessons learned from Kate Sinnott's initial experiments.

- In fall 2021, Kate installed an aquatic plant plug restoration experiment. In early summer 2022, Kate is installing an aquatic plant cuttings restoration experiment. Both of these experiments will be monitored through 2022 by Kate (with new MS student Meghan Slocombe assisting in fall 2022). Based on what we learned, we may try additional species with the same methods already evaluated or seek out additional planting/introduction methods beyond what Kate has tested.
- Some options to consider (we will not do all of these):
    - Scale up the most successful methods from Kate's trial to the pond level to see if they are effective when applied at a larger scale (e.g., whole pond or half pond comparisons). We will seek out more easily accessible sites such as "duck bill pond" per Melissa Stamp's guidance. This particular site also has a curly leaf pondweed invasion that could be incorporated into the experimental design (i.e., looking at invasion resistance).
    - Look at how different plant traits (e.g., plasticity to changes in water levels; mode of reproduction) might predict establishment, survival success, and invasion resistance to curly leaf pondweed.
    - Focus, in particular, on sago pondweed as an important early successional species [which would also yield relevant information for sago restoration in Utah Lake as a whole].
    - Look at how water quality parameters and water depth might predict plant establishment and survival.

Continue to evaluate species and combinations that provide the strongest invasion resistance against curly leaf pondweed and Eurasian water milfoil

- Kate will do another greenhouse experiment in fall 2022 because some of the methods from the winter 2022 experiment did not work out as planned. We can expand on this experiment by having Meghan be a collaborator/helper such that the overall experiment could be more robust.
    - The most promising results could be incorporated into a field experiment as mentioned above.

Continue to monitor PRDRP ponds for passive recolonization (species distribution and abundance with potential drivers)

- Kate and Meghan could do this jointly in fall 2022 to help Meghan learn the species.
- Meghan can do this on her own in fall 2023, maybe fall 2024 post-flooding.

Revise and print aquatic plant identification guide

- Kate has already drafted much of the guide but she needs time to get feedback from Casey Williams, URMCC staff, and other relevant stakeholders.

On-going maintenance of "mother colony" plants at Millville

- Kate has established a sustainable maintenance approach but this will still require some improvements (especially to deal with spring water access issues and reduced outflow that is currently leading to algae problems). And overall on-going maintenance will be required.

Final project outputs

- SAV identification guide
- Plant propagation guide based on lessons learned at MARF
- Maintenance guide for internal use for the MARF aquatic plant "mother colonies"
- Synthesis on success of planting experiments at PRDRP, invasion resistance greenhouse experiments, and passive recolonization at PRDRP.