

Final Abstract

Final Report Approved on January 29, 2025

M.L. 2020 Project Abstract

For the Period Ending June 30, 2024

Project Title: Driving Conservation Behavior For Mussels And Water Quality

Project Manager: Carol Strecker

Affiliation: Minnesota Zoological Garden

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Website: <http://mnzoo.org/>

Funding Source:

Fiscal Year:

Legal Citation: M.L. 2021, First Special Session, Chp. 6, Art. 5, Sec. 2, Subd. 05i

Appropriation Amount: \$191,000

Amount Spent: \$184,952

Amount Remaining: \$6,048

Sound bite of Project Outcomes and Results

The Minnesota Zoo launched a campaign to encourage dog owners to pick up dog waste before rain or snow to support healthy waterways and native mussels. The campaign used a proven data-driven approach called community-based social marketing (CBSM) that leverages social science to foster specific conservation behaviors.

Overall Project Outcome and Results

Native mussel populations in many of Minnesota's waterways have been significantly depleted, in part, due to behaviors many members of the general public may be unintentionally participating in. To mitigate this, the Minnesota Zoo developed and piloted a public engagement campaign to foster conservation behaviors that prevent contamination of mussel habitat. The Zoo selected a target behavior based on a survey of 1,600 single-family households randomly selected from 27 cities in four Minnesota watersheds – the St. Croix, Cedar, Cannon, and Mississippi River, a literature review and eight expert interviews. These data sources showed that properly disposing of pet waste before weather events was a behavior people were likely to engage in and would prevent runoff containing harmful bacteria from entering waterways, harming mussel habitat. The resulting "Super Scooper" campaign was piloted in fall 2023, evaluated and revised, and relaunched in spring 2024 through onsite tabling at the Zoo and via outreach events. Visitors

were asked to pledge to pick up pet waste on their property before rain or snow and given informational flyers and promotional items (e.g., poop bags). Nearly 1,400 guests were invited to take the Super Scooper Pledge with nearly 200 pledges confirmed. The campaign was highly effective for awareness building as surveys showed that engaged participants were keenly concerned about the impact of pet waste on waterways, reported a strong likelihood to pick up pet waste on a weekly schedule, and a very strong likelihood of picking up pet waste before an upcoming weather event. To ensure greater impact on protecting Minnesota's waterways and native mussels, future phases of the campaign need to support habituation of the desired behavior by broadly implementing optional text reminders or other prompts sent in advance of weather events and better associate the behavior with the trigger.

Project Results Use and Dissemination

The Zoo designed a webpage – www.mnzoo.org/superscooper – that allows guests to engage with the Super Scooper campaign and take the pledge to pick up dog waste before rain or snow in support of clean water for mussels. Materials were produced to support the campaign including pledge stickers, flyers, posters and banners used for ongoing tabling at the Zoo and at partner institutions and outreach events. For long term engagement, permanent interpretive signage was installed near the Zoo's Mussel Exhibit to educate guests about how and why to properly manage pet waste to prevent contaminated runoff and protect waterways.



Environment and Natural Resources Trust Fund

M.L. 2020 Approved Final Report

General Information

Date: January 30, 2025

ID Number: 2020-017

Staff Lead: Mike Campana

Project Title: Driving Conservation Behavior For Mussels And Water Quality

Project Budget: \$191,000

Project Manager Information

Name: Carol Strecker

Organization: Minnesota Zoological Garden

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Project Reporting

Final Report Approved: January 29, 2025

Reporting Status: Project Completed

Date of Last Action: January 29, 2025

Project Completion: June 30, 2024

Legal Information

Legal Citation: M.L. 2021, First Special Session, Chp. 6, Art. 5, Sec. 2, Subd. 05i

Appropriation Language: \$191,000 the second year is from the trust fund to the Minnesota Zoological Garden to develop research-supported strategies to engage the public in specific conservation behaviors to improve water quality and native mussel health across the state.

Appropriation End Date: June 30, 2024

Narrative

Project Summary: The Minnesota Zoo will develop research-supported strategies to engage the public in specific conservation behaviors they can take in order to improve water quality and mussel health across the state.

Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.

In order to effectively conserve and preserve native mussels and improve water quality in Minnesota, we must engage the public in specific conservation actions that they can take to have a positive impact. Building upon the Minnesota Zoo's novel educational and large-scale informational campaign (Show Us Your Mussels Challenge) and research on the biology of native mussels, which have been previously funded through ENRTF, we propose to use social science to develop a research-supported public engagement campaign in order to foster conservation behaviors beneficial to Minnesota mussels and waterways. We chose to focus this project on native mussels as native mussels serve as critical ecosystem engineers, creating habitat for fish and other aquatic wildlife and helping to keep Minnesota's waterways clean. However, mussel populations in many of Minnesota's waterways have been significantly depleted, in part, due to behaviors many general public may be unintentionally participating in. Examples of these actions may include not scooping pet waste (i.e., improper pet waste disposal) or using too much road or sidewalk salt in winter.

What is your proposed solution to the problem or opportunity discussed above? Introduce us to the work you are seeking funding to do. You will be asked to expand on this proposed solution in Activities & Milestones.

Our innovative approach combines natural science research on native mussels with a public engagement campaign grounded in social science research on behavior change. This interdisciplinary approach will enable us to have broad public participation in conservation behaviors to conserve and benefit native mussels and water quality across the state. By using a social science framework for fostering conservation behavior change, we will identify the specific behaviors the public can participate in that will have the greatest impact on water quality and mussel health. We will then develop a strategy to reduce any barriers, and enhance any perceived benefits the public has with regards to participating in that specific behavior. Once we have developed the public engagement strategy, we will implement, evaluate, and refine so that we have the greatest positive impact on water quality and mussel health across Minnesota.

What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state's natural resources?

As a result of the proposed project, we will:

- Identify the specific conservation behaviors that would have the greatest benefit on native mussels and water quality in Minnesota.
- Implement strategies to encourage public participation in those conservation behaviors to benefit waterways and aquatic wildlife across Minnesota.

Project Location

What is the best scale for describing where your work will take place?

Statewide

What is the best scale to describe the area impacted by your work?

Statewide

When will the work impact occur?

During the Project

Activities and Milestones

Activity 1: Broad Public Behavior Change Strategy Research, Implementation and Refinement

Activity Budget: \$183,000

Activity Description:

Based on initial research at the Zoo, we are most interested in focusing the behavior change campaign on animal pet waste and winter road or sidewalk salt usage. These are two areas in Minnesota that have a large impact on water quality and mussel health. However, the actual behavior(s) selected will be determined from the data and initial selection in consultation with the contracted specialist. Once we have identified the behavior of interest we will then pilot strategies designed to encourage the public to change their behavior in order to positively impact water quality and native mussels. We will pilot, evaluate, and revise the strategy before a broad implementation of the strategy to the public. The Minnesota Zoo will contract an outside specialist to ensure that the public's needs are addressed and the behavior change strategy and selection is grounded in social science research.

Activity Milestones:

Description	Approximate Completion Date
Specialist contracted and research completed.	April 30, 2022
Most effective conservation behaviors identified.	December 31, 2022
Developed strategy for engaging the public in the conservation behavior(s).	December 31, 2022
Implementation, revision, and evaluation of the strategy.	May 31, 2024
Final report on effectiveness and impact of the implemented strategies.	June 30, 2024

Activity 2: Outreach to Visitors at Minnesota Zoo

Activity Budget: \$8,000

Activity Description:

Based on the results of Activity 1, we will design an interpretive display and signage that will be placed onsite at the Minnesota Zoo's Mussel Conservation Cabin, and also available digitally to our visitors not able to come to the Zoo. Onsite interpretive displays and signage, along with digital engagement, enable us to reach our more than 1.3 million annual visitors, and engage them in social-science supported actions they can take to positively affect mussels and water quality.

Activity Milestones:

Description	Approximate Completion Date
Content and design of display/signage completed.	February 28, 2024
Installation of display/signage.	June 30, 2024

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Conservation, Interpretive, Life Support, Education, and Aquariums staff	Minnesota Zoo and beyond	Zoo Conservation, Interpretive, Life Support, Education, and Aquariums staff will provide expertise for this project. Depending upon the behaviors and strategies identified in Activity 1, we may identify and seek a variety of partners to assist in implementing the public engagement behavior change strategy.	No

Dissemination

Describe your plans for dissemination, presentation, documentation, or sharing of data, results, samples, physical collections, and other products and how they will follow ENRTF Acknowledgement Requirements and Guidelines.

As a part of Activity 1 we will be developing a strategy for engaging the public in selected conservation behaviors. This strategy will include disseminating the information to the public in the research-supported most effective manner (e.g. social media, website, trainings, decals, etc). We will also share updates on the Minnesota Zoo’s website (mnzoo.org) as relevant. We will update staff on the status of the project via internal newsletters and staff meeting presentations, as appropriate.

As a result of activity 2, we will be designing and installing an interpretive display and signage that will be placed onsite at the Minnesota Zoo. The lifespan of the sign is anticipated to be at least 10 years, allowing us to reach our more than 1.3 million annual visitors to engage them with this project.

As applicable, the project manager, Carol Strecker, or other Zoo staff, will present on the findings of this project at relevant meetings (such as the annual Association of Zoos and Aquariums conference) in order to share best practices with the broader field.

The Minnesota Environment and Natural Resources Trust Fund (ENRTF) will be acknowledged through use of the trust fund logo or attribution language on project print and electronic media, publications, signage, and other communications per the ENRTF Acknowledgement Guidelines.

Long-Term Implementation and Funding

Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this work be funded?

This project is part of an effort to restore imperiled mussel populations in the Upper Midwest to historic levels and improve water quality. This project focuses on actions the general public can take to support mussels and water quality across the state. We anticipate Zoo staff will maintain the strategy implementation after the granting period for this project is complete. Depending upon the strategy identified, there may be additional costs for supplies in order to continue to implement across the state. In this case, we will look for alternate, non-ENRTF sources/partners to offset any costs for continued long-term implementation.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount	\$ Amount Spent	\$ Amount Remaining
Personnel										
C. Strecker, Education, Events, and Experiences Manager		Project Manager			33%	0.27	X	\$38,550	-	-
M. Mallinger, Conservation Engagement Specialist		Assist in conservation messaging and strategy development			33%	0.12	X	\$11,450	-	-
K. Quam, Graphic Designer		Assist in graphic design and brand standards for messaging			14%	0.02	X	\$2,000	-	-
							Sub Total	\$52,000	\$51,974	\$26
Contracts and Services										
Action Research	Professional or Technical Service Contract	Contract(s) with Community Based Social Marketing specialists (averaging \$37,000 / year x 3 years). 1-2 consultants selected through a competitive application process.				1.35		\$111,000	\$111,000	-
							Sub Total	\$111,000	\$111,000	-
Equipment, Tools, and Supplies										
	Tools and Supplies	Supplies for strategy implementation (e.g. decals, stickers, signs, etc)	Used in public engagement strategy implementation					\$20,000	\$18,246	\$1,754
	Tools and Supplies	Interpretive display/signage at Minnesota Zoo	Educate Minnesota Zoo guests about actions they can take to improve native mussel habitat and water quality					\$8,000	\$3,732	\$4,268
							Sub Total	\$28,000	\$21,978	\$6,022
Capital Expenditures										

							Sub Total	-	-	-
Acquisitions and Stewardship										
							Sub Total	-	-	-
Travel In Minnesota										
							Sub Total	-	-	-
Travel Outside Minnesota										
							Sub Total	-	-	-
Printing and Publication										
							Sub Total	-	-	-
Other Expenses										
							Sub Total	-	-	-
							Grand Total	\$191,000	\$184,952	\$6,048

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
<p>Personnel - C. Strecker, Education, Events, and Experiences Manager</p>		<p>Project Manager</p>	<p>Classified : This staff person has the necessary expertise required to successfully coordinate project activities and oversee the contractor duties and community engagement elements. ENRTF funding will make it possible for this individual to work on the project for the percentage of time reflected in the budget. Without this funding, they would be unable to support the project with their time. Responsibilities for classified staff will be reprioritized and reallocated as necessary to support the project.</p>
<p>Personnel - M. Mallinger, Conservation Engagement Specialist</p>		<p>Assist in conservation messaging and strategy development</p>	<p>Classified : The ENRTF funding will make it possible for this staff person to work on this project for the percentage of time indicated in the budget. Without this funding they would not be able to support this project with their time. Further, the nature of the success of this project necessitates some level of expertise coming from the Zoo, which this staff will be instrumental in providing in order to have successful completion of the project. Responsibilities for the classified staff will be reprioritized and reallocated as necessary to support this project.</p>
<p>Personnel - K. Quam, Graphic Designer</p>		<p>Assist in graphic design and brand standards for messaging</p>	<p>Classified : The ENRTF funding will make it possible for this staff person to work on this project for the percentage of time indicated in the budget. Without this funding they would not be able to support this project with their time. Further, the nature of the success of this project requires a level of expertise of the Zoo's design and brand standards, which this staff possesses. Responsibilities for the classified staff will be reprioritized and reallocated as necessary to support this project.</p>

Non ENRTF Funds

Category	Specific Source	Use	Status	\$ Amount	\$ Amount Spent	\$ Amount Remaining
State						
			State Sub Total	-	-	-
Non-State						
Cash	General operating budget of the Minnesota Zoo to support approximately 15% of the indirect costs for the proposal.	Used to cover indirect costs for the proposal, estimated at 15% of the total proposal cost.	Pending	\$28,587	\$28,587	-
			Non State Sub Total	\$28,587	\$28,587	-
			Funds Total	\$28,587	\$28,587	-

Attachments

Required Attachments

Visual Component

File: [05afd83e-3a2.pdf](#)

Alternate Text for Visual Component

Five circles-arrows between, and text: select behaviors, uncover barriers & benefits, develop strategy, pilot strategy, implement broadly & evaluate. Four other circles-text goals plus pictures of healthy mussels, clean water....

Supplemental Attachments

Capital Project Questionnaire, Budget Supplements, Support Letter, Photos, Media, Other

Title	File
Background Check Certification	a49dc62e-be8.pdf
Driving Conservation Behavior for Mussels and Water Quality Final 1-Page Visual	9a04a329-a36.pdf
Action Research Behavior Survey to Inform Strategy	0e026694-6e3.docx
Action Research Behavior Survey Results	c230fb97-f42.pdf
Action Research Campaign Development Creative Brief	00032652-434.docx
Action Research Campaign Development Strategy Table	6b8686cd-44c.docx
Action Research Campaign Implementation Tabling Protocol	cc997974-073.docx
Action Research Campaign Final Report	e4ef87b7-c43.docx
Action Research Post First Pilot Strategy Refinement	db13a215-0ec.docx
Action Research Post Second Pilot Results	804f4bbc-df4.pptx
Image - Campaign in Action	7bff079b-012.jpe
Image - Campaign Pledge Board	29054abe-40b.jpe
Image - Guest Taking Pet Waste Survey	15d462fd-432.jpe
Image - MN Zoo Onsite Interpretive Signage Near Mussel Cabin	63a4fef6-c2f.jpe
MN Zoo Campaign Onsite Interpretive Signage File 1	3ec98ec7-583.pdf
MN Zoo Campaign Onsite Interpretive Signage File 2	27a46f6a-a88.pdf
MN Zoo Campaign Tabling Pop Up Banner	c5432421-ff4.pdf
MN Zoo Campaign Tabling Resources	c015f854-685.pdf
Super Scooper Campaign Commitment Board File	b9d24935-902.pdf
Super Scooper Campaign Flyer	80616826-56b.pdf
Super Scooper Campaign Pledge Sticker	0feb9e4a-fa6.pdf
Super Scooper Campaign Reminder Text Screenshot	e4848adc-dae.jpe
Super Scooper Campaign Sticker Take Home	441ca27f-93c.pdf

Media Links

Title	Link
MN Zoo Super Scooper Campaign Landing Page	https://mnzoo.org/superscooper/

Difference between Proposal and Work Plan

Describe changes from Proposal to Work Plan Stage

Changed end date to reflect current appropriation cycle. Adjusted budget slightly to reflect costs associated with COVID staffing changes and increases in hard costs for deliverables.

Additional Acknowledgements and Conditions:

The following are acknowledgements and conditions beyond those already included in the above workplan:

Do you understand and acknowledge the ENRTF repayment requirements if the use of capital equipment changes?

N/A

Do you understand that travel expenses are only approved if they follow the "Commissioner's Plan" promulgated by the Commissioner of Management of Budget or, for University of Minnesota projects, the University of Minnesota plan?

N/A

Does your project have potential for royalties, copyrights, patents, sale of products and assets, or revenue generation?

No

Do you understand and acknowledge IP and revenue-return and sharing requirements in 116P.10?

N/A

Do you wish to request reinvestment of any revenues into your project instead of returning revenue to the ENRTF?

N/A

Does your project include original, hypothesis-driven research?

Yes

Does the organization have a fiscal agent for this project?

No

Work Plan Amendments

Amendment ID	Request Type	Changes made on the following pages	Explanation & justification for Amendment Request (word limit 75)	Date Submitted	Approved	Date of LCCMR Action
1	Amendment Request	<ul style="list-style-type: none"> • Budget - Professional / Technical Contracts 	Request to change the Entity under Professional/Technical Contracts in the Budget from TBD to Action Research to reflect the selected social marketing vendor as a result of a competitive bid process.	October 19, 2022	Yes	October 20, 2022

Status Update Reporting

Final Status Update August 14, 2024

Date Submitted: August 14, 2024

Date Approved: November 27, 2024

Overall Update

During the final phase of the project, Action Research compiled and analyzed all data and completed a final report summarizing our behavior change campaign efforts (reported uploaded to Attachments). The Zoo and Action Research also debriefed what elements of the campaign were most critical to success, but also identified the implementation tactics that, while critical, presented challenges to the Zoo to implement properly, due to our unique staffing and engagement practices. These learnings informed a set of recommendations for future campaign initiatives both onsite at the Zoo and at local partner organizations such as pet shelters/rescues, pet stores, and animal hospitals. The Zoo will utilize the campaign materials toolkit to launch annual Super Scooper campaigns every spring to engage dog owners in proper pet waste disposal to protect Minnesota's waterways and freshwater mussels. The Zoo also designed, fabricated, and installed permanent signage featuring the key campaign messages adjacent to the Zoo's Mussel Conservation Cabin on the Main Lake walkway, visited by up to 1.5 million guests every year.

Activity 1

During the final phase of this activity, Action Research compiled and analyzed all remaining data, sent out a follow-up survey to participants that had agreed to receive one, and provided recommendations to the Zoo for broad ongoing implementation. As a result of the social science research and the two campaign pilots, Action Research and the Zoo collaboratively identified the most successful elements of the campaign to be considered a toolkit of sorts for future broad implementation. Activity 1 is complete and respective campaign materials have been uploaded to Attachments. *(This activity marked as complete as of this status update)*

Activity 2

The onsite interpretive display highlighting this project is complete and installed adjacent to the Minnesota Zoo's Mussel Conservation Cabin on the bridge walkway over the Zoo's Main Lake (see images uploaded to Attachments). This display will be viewed by nearly 1.5 million guests per year. The Zoo's Interpretive Program Developer utilized the research findings from the original work done by Action Research, as well as the results of the campaign strategy implementation pilots, to craft messaging that would be most effective in encouraging dog owners to consider properly disposing of pet waste specifically before precipitation events as a means of protecting Minnesota's waterways and native mussels. The messaging also answers common questions our staff received during the campaign in regards to why dog waste impacts freshwater health negatively while native animal waste does not, and also features how the Zoo ensures the waste produced by its own non-native animals is properly composted without posing a threat to the watershed. Furthermore, the Zoo's Super Scooper campaign website - mnzoo.org/superscooper/ - will be maintained and featured during future active campaign implementations. Activity 2 is complete. *(This activity marked as complete as of this status update)*

Dissemination

In addition to the 1.5 million annual visitors to the Minnesota Zoo who will interact with the project's campaign signage adjacent to the Mussel Conservation Cabin, the Zoo's Conservation and Learning & Engagement departments have established this project as one of its primary rotating conservation engagement initiatives. The campaign will be activated regularly, inviting thousands of pet owners to take the pledge to pick up dog waste before rain or snow in support of clean water for mussels. We are also working with local pet shelters, pet stores, and animal hospitals to use our toolkit to engage existing and new dog owners in taking the pledge. One campaign element that we intend to improve upon during this next phase is using text message prompts. Mass texts will be triggered by impending weather

events as a tactic to help pet owners associate oncoming precipitation with the need to properly dispose of pet waste, preventing harmful bacteria from contaminating the watershed. Finally, we will be sharing the results of this project as well as the toolkit with other zoos and like-minded organizations at upcoming conferences and symposia, including the Advancing Conservation through Empathy (ACE) for Wildlife Summit in February 2025.

Status Update Reporting

Status Update April 1, 2024

Date Submitted: April 1, 2024

Date Approved: November 27, 2024

Overall Update

This reporting period saw the successful launch and implementation of the behavior change campaign to encourage dog owners to pick up their pet waste before rain or snow in support of clean water for mussels and other wildlife. The Zoo engaged guests in campaign activities during onsite events such as our fall Jack-o-Lantern Spectacular and our winter Zoo After Hours events as well part of general Zoo daytime public programming. As we learned what worked and didn't work well to solicit pledges, our social science partner, Action Research, continuously revised the materials and protocols and we decided to expand the pilot to include spring Zoo After Hours events as well. We have launched a supporting website – www.mnzoo.org/superscooper and have begun concept development for an onsite interpretive display, showcasing the campaign and encouraging guests to participate. Our final phase will be to develop a toolkit to make available to like-minded partners and organizations for broader dissemination of the campaign message.

Activity 1

This reporting period was the primary period during which we implemented our behavior change campaign. Eleven 'Super Scooper' tabling sessions took place at the Zoo's Jack-O-Lantern Spectacular series from October 6th, 2023, through November 18th, 2023. A total of 505 table visitors were recorded, with 50 flyers and 169 poop bags distributed, and 150 commitments signed and displayed. Pet waste surveys were completed by 42 visitors, with findings consistent with the statewide survey results. Once the first pilot was complete, the Zoo gathered feedback and met with Action Research to discuss strengths and weaknesses of campaign elements and determine adjustments to make in the next pilot iteration. After the campaign components were updated, a second iteration of the pilot was conducted at the Zoo's monthly after-hours events in 2024 on January 20th, February 17th, and March 16th, with the final session taking place on April 20th. Milestone 4 is on track for completion by the target date of May 31st, 2024.

Activity 2

Given the delayed implementation of the behavior change campaign, we are waiting for the final event of data collection on April 20th to inform content development of the display and to complete Milestone 1. This will not affect our ability to complete Milestone 2 and Activity 2 by the end of the grant period. Concept development is in progress.

Dissemination

As part of the behavior change campaign implementation, the Zoo designed a webpage to support dissemination and the partner strategy – www.mnzoo.org/superscooper. This website allows remote guests to engage with the campaign and take the pledge to pick up dog waste before rain or snow in support of clean water for mussels. To enable expansion and broader dissemination of the campaign, the Zoo will apply the results of the project to the development of a toolkit that will be made available to partners such as pet stores, shelters, and veterinary clinics as well as other institutions interested in promoting clean water for wildlife. In addition, the project manager, Carol Strecker, is preparing a proposal to share the results of the campaign at the Association of Zoos and Aquariums annual conference in September 2024.

Status Update Reporting

Status Update October 1, 2023

Date Submitted: October 1, 2023

Date Approved: December 15, 2023

Overall Update

Due to conflicting internal resources needed to support the behavior change campaign, it was decided to postpone the launch from early summer to early fall. Launch of the campaign is currently set for October 6th, 2023. All assets and materials are designed and in production to support this launch. Our social science partner, Action Research, revised the implementation plan to support our new timeline and will be monitoring the activities of the campaign and assisting with data collection and evaluation. Ironically with so little rain this past summer, the campaign, which hinges on inspiring dog waste pick up prior to rain events, would have been a challenging message. We are confident the message will remain relevant to audiences even into winter. Despite the delay, Activity 1 is still on target for completion as planned. Work on Activity 2 will begin early winter as planned.

Activity 1

This most recent reporting period was intended to be dominated by the launch of our behavior change campaign, however, due to conflicting resource needs to support the campaign internally, it was decided to postpone the launch to the fall. The implementation plan was revised and finalized. Assets, including commitment boards, commitment stickers, posters, flyers, and a supporting webpage have been designed and are currently in production. The campaign will launch on October 6th with a tabling station during the Zoo's popular Jack-O-Lantern Spectacular Event, which attracts up to 5000 people per night. Guests will be invited to participate in a survey about their dog-waste pick up habits and to pledge to join our campaign to be conscientious about removing pet waste from their property before precipitation events (either rain or snow). An additional outreach strategy will be launched in October to engage new pet owners via animal shelters, veterinary clinics, and pet stores. Although delayed, Milestone 4 is still on target for completion by May 31st, 2024.

Activity 2

Not yet started.

Dissemination

Not yet started.

Status Update Reporting

Status Update April 1, 2023

Date Submitted: April 3, 2023

Date Approved: April 27, 2023

Overall Update

We are currently preparing to launch the implementation plan to pilot the behavior change campaign that was identified and refined in the third Milestone of Activity 1. Based on the initial research and barriers and benefits audience surveys conducted by our social science partner, Action Research, we have specified the routine pick up and proper disposal of dog waste in private outdoor spaces, particularly before weather events like rain or snow as the target behavior most suitable for our public engagement campaign. Based on the key survey results and consideration of other factors unique to the zoo (e.g., the Zoo's sphere of influence), we decided that fertilizer and salt use were not the best targets for this campaign and should be addressed through future efforts. Further research provided insight into the intervention strategies with the most potential for successfully achieving greater adoption of proper pet waste reduction practices, with the goal of reducing runoff from pet waste into local waterways and improving water quality and mussel health. Assets to support the implementation plan are currently being developed with the goal of launching the pilot campaign in May, 2023.

Activity 1

During this phase of the project, our contracted partner administered a survey to a representative sample of Minnesota residents to learn more about their attitudes, behaviors, and perceptions of road salt use, fertilizer application, and pet waste management on their property. The survey also explored the perceived barriers and benefits related to shifting current behaviors. Picking up and properly disposing of pet waste before weather events was identified as the best fit for the Zoo's public behavior change campaign efforts. The primary target audience for this outreach is residents of Minnesota who own at least one dog, live in proximity to waterways important to native freshwater mussels, and are responsible for picking up dog waste on their property. Action Research prepared a Creative Brief that outlined potential intervention strategies and assets to form the basis of the campaign. A detailed implementation plan and list of assets for production are currently being finalized. The campaign features research-based community-based social marketing tools including prompts, social norming, modeling, and public commitments as well as messaging strategies proven to increase the likelihood of impact including appealing to values, identity, and convenience. Milestone 3 is complete and Milestone 4 is on target.

Activity 2

Not yet started.

Dissemination

Not yet started.

Status Update Reporting

Status Update October 1, 2022

Date Submitted: October 19, 2022

Date Approved: October 20, 2022

Overall Update

During this reporting period, the Zoo worked with its contracted social science partner, Action Research, to complete the first two Milestones in Activity 1. These two milestones involved completing initial research to assess how water quality is affected by consumer choices and behaviors, and to assess all choices and behaviors in order to identify the most effective conservation behaviors and audiences to target for a conservation behavior change campaign. Work is underway on the third Milestone, which involves fine tuning the targeted behaviors and informing the intervention strategies by identifying the barriers and benefits to the desired behaviors through an audience research survey. All activities are on target for completion within the intended timeline.

Activity 1

Action Research conducted a review of Minnesota Zoo's existing data on native mussel rearing and reintroduction. This data provided insights into the threats facing native mussel species and water quality. Threats that warranted additional research included road salt, pet waste, fertilizers, pesticides, and invasive zebra mussels. To answer outstanding research questions from the data review, an in-depth literature review was completed. Subsequently, a comprehensive list was developed to assess several factors connected to each threat, including evidence for impact, severity, target audience, need for intervention, fit with existing Zoo messaging, and if a CBSM intervention is feasible. From this list, it was determined that fertilizers, road salt, and pet waste are all threats that have been directly linked to declines in water quality and native mussel populations. A preliminary list of behaviors tied to these pollutants was compiled and reviewed by eight mussel and water quality experts identified by Minnesota Zoo staff. It was decided that residential behaviors connected to the use of road salt, fertilizers, and picking up pet waste should be promoted to the audience research step. Milestones 1 and 2 are complete. Milestone 3 is on target for completion by the target date of 12/31/22.

Activity 2

Not yet started.

Dissemination

Not yet started.

Status Update Reporting

Status Update April 1, 2022

Date Submitted: May 17, 2022

Date Approved: May 19, 2022

Overall Update

Despite COVID-related capacity and timing challenges that prolonged our start, we are excited to report that we are moving full speed on this project. We have secured a contractor to provide expertise and leadership in behavioral science to help research and identify the specific conservation behaviors that will have the greatest benefit on native mussels and water quality in Minnesota. Action Research is a team of internationally recognized experts in community-based social marketing (CBSM) and the integration of behavioral science into conservation behavior change programs, with more than 15 years applying this model to address behaviors impacting water quality. They are leading the effort to review existing data and assess and prioritize potential target behaviors and are expected to complete this phase of the project by October 1st, well within our project timeline. The implementation phase of the project, our second outcome, will follow as behaviors are further studied to inform the development of effective intervention strategies.

Activity 1

Action Research, our contractor, is beginning work to review existing data regarding impacts of consumer choices and behaviors on water quality in the Upper Midwest. The review will involve identifying pollutants of concern for water quality and mussel populations and an analysis of whether these pollutants can be effectively addressed with a behavior change program. This first milestone is targeted for completion by August 1, 2022, which is past the initial date of April 30, however this will not impact the overall timeline or future milestones. Milestone 2 was initially targeted for completion by December 31, 2022 and Action Research's project timeline has identified October 1 as a completion date, getting us back on track, with Milestone 3 remaining on track with a targeted completion of December 31, 2022. Milestones 4 and 5 will come into play later in FY23 and FY24.

Activity 2

Not yet started

Dissemination

Not yet started