SOCIAL SCIENCE RESEARCH
MALHEUR WILDLIFE REFUGE REPORT

Understanding stakeholder values and perspectives for management of Malheur Lake

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Prepared for

U.S. Fish and Wildlife,
Malheur National Wildlife Refuge

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Photo taken by Jackie Delie

0.0 Executive Summary

Historically, management of the Malheur National Wildlife Refuge has focused on ecological and technological approaches to address the complexity of the Refuge's aquatic health. The variable success of these activities has led to an interest in understanding the lake ecosystem as a social-ecological system, yet there is little direction on how to do so. As a first step, the manager of Malheur has requested more information regarding stakeholder values to inform long-term adaptive management.

Adaptive management has gained attention as a means to link the importance of learning from policy experiments with the integration of stakeholder values, to inform experimental frameworks and social learning. This study seeks to understand motivations for participation in collaboration and perceptions of Malheur stakeholders, initiating the integration of social science in the adaptive management of Malheur Lake in southeastern Oregon.

Semi-structured interviews were conducted with 35 stakeholders who had been impacted by or can affect decisions associated with management of Malheur Lake. The diverse identities and varying value orientations expressed by the participants fall within a superordinate identity associated with the health of Malheur Lake. Moreover, these value orientations shape their perceptions of management and how management should be carried out at Malheur Lake.

Stakeholder engagement for natural resource management enables the integration of diverse knowledge and values to make more informed and supported decisions. The continued embracing of individual identities will enable trust and collaboration for adaptive management.

IMPLICATIONS

1. Openly express that people with diverse individual and professional identities have a role in Malheur Lake Health. Ranchers, scientists, Tribal members, local business owners, and others all contribute to the collaborative adaptive management process. However, these individuals must first feel their identities to the place are respected and welcomed. *See page 10 – Identity.*

2. Recognize and embrace the diverse values that lead to supporting adaptive management of Malheur Lake. Ecological, aesthetic, intrinsic, and group-oriented values all contribute to optimism of the process. *See page 12 – Stakeholder Values.*

3. Traditionalist values are defined in psychology as being resistant to change and openness. Those who hold more traditionalist values are more likely to be pessimistic about adaptive management. Effort *should not* be placed on trying to change individuals with these values; rather try to help them feel heard. *See page 13 – Stakeholder Values.*

4. When communicating with people who are either pessimistic or agnostic to the management process, be sure that the messenger is someone who the recipient trusts and identifies with. *See page 14 – Perspective on Management*.

1.0 Introduction

Management of public lands is challenged by uncertainties around complex ecological processes. In addition, societal values have increasingly diversified and diverged; these new value shifts are influencing how we manage our public lands (Manfredo et al., 2017). To improve decision making in the face of uncertainty, the implementation of collaborative adaptive management can be effective. The adaptive management framework involves learning from implementation with the primary objective of accumulating knowledge for improving decision making (Moore et al., 2011). Critical components of this iterative and cyclical process include engagement of appropriate stakeholders, measurable and agreed-upon objectives to guide decision making, management alternatives, models that link management actions to resource consequences, and well-designed monitoring plans (William, 2011). One approach touted as critical to moving forward with adaptive management is the collaboration with diverse and sometimes adversarial interests at key points in the process. Collaboration can improve resource management by strengthening the knowledge base of decisions, diversify the pool of feasible strategies, and developing social capital necessary for implementation and monitoring of management projects.

1.1 OBJECTIVES

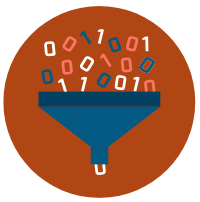
The manager of the Malheur National Wildlife Refuge has requested social science to inform long-term adaptive management of Malheur Lake. Our objective is to initiate science-based, systematic strategies to this end. As this team of social scientists is new to the context, our first step was to understand the variation of proximate stakeholders' values and perspectives. The following report summarizes data from this exploratory stage and suggests research questions and methods that could best contribute to adaptive management of Malheur Lake.

"Our objective is to initiate science-based, systematic strategies to inform adaptive management of Malheur Lake."

2.0 Methods

2.1 DATA

We interviewed 35 stakeholders who had been impacted or can affect decisions associated with management of the Malheur Wildlife Refuge Lake. These included representatives of state and federal agencies such as the U.S. Fish and Wildlife Service, non-governmental organizations such as the Audubon Society and Friends of Malheur, and the general public including local business owners, ranchers, and independent contractors. The refuge manager identified an initial list of key participants, and interviewees when asked what other perspectives we should hear from provided additional participants. Interviews were conducted until we reached data saturation (the point in the research process when no new information were received). A total of 55 stakeholders were contacted, and 35 agreed to participate.



2.2 METHODS

Semi-structured (informal) interviews were conducted by phone or face-to-face, depending on the interviewee's preference. The method balanced asking multiple participants the same questions to achieve data saturation, while allowing opportunities to follow new turns in the conversation. Interviews lasted between 20 and 90 minutes and focused on understanding:

- Individual relationships to Malheur Wildlife Refuge and surrounding areas
- Perceived values of Malheur Lake
- Opinions on carp management in Malheur Lake
- Conditions for continuing to support carp management (Appendix).

In addition to interviews, observation notes were taken during meetings and workshops in 2017-2018. Data gathered from interviews are the opinions and personal statements made by interviewees and do not represent the views or policies of their organizations.

2.3 ANALYSIS

To search for patterns in the data and explanations of patterns, interview transcripts were coded and analyzed using a combination of deductive and inductive approaches. We first created a pre-set list of ten parent codes: Place attachment, value of Malheur Refuge, habitat, management, perspectives, history of Malheur, stakeholders, support, collaboration, and community. The parent codes were derived from the main topics of the interview questions (Appendix) being asked. These codes provided direction regarding what to look for in the qualitative data.

Then, when reviewing the transcripts, we assigned meaningful segments of the conversation to the parent codes and inductively developed finer scale 'child codes' within the parent codes. As a result, child codes emerged from the data to add more specificity to the broader code groupings. This iterative process continued until no new codes were identified. Coding did not consider the indirect or inferred intention of the participant to minimize confirmation bias in research (Murchison, 2010). In some instances, a line was coded to multiple parent or child codes. A codebook was maintained for reference during the coding process.

This study was a small sample of willing participants. The implications section of this report offers recommendations for future social science projects that include a general public survey.

3.0 Findings

3.1 DEMOGRAPHIC PROFILE

A total of 35 stakeholders participated in the study. These individuals were predominately between the ages of 31 to 65 (Fig. 1), with a wide spread of years of experience working in the Malheur Lake area (Fig. 2). Participants of the study resided in cities and towns across Oregon, Washington, Montana, and Idaho. A majority of participants resided in Burns, Oregon, followed by the city of Portland (Fig. 3). The participants' professions were grouped into three broad categories based on sectors: government positions, environmental non-government, and local residents (Fig. 4). Government positions were the most common profession including federal, state, county, and tribal governments.

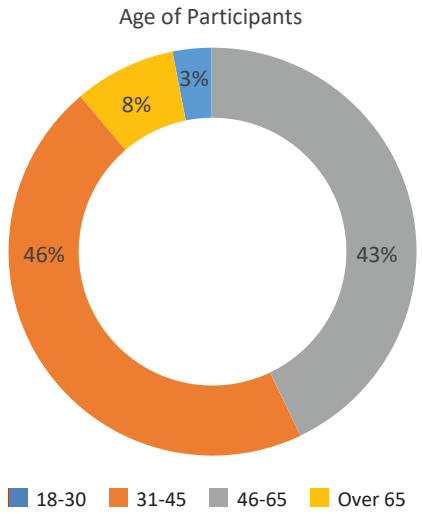


Figure 1. Age range of participants.

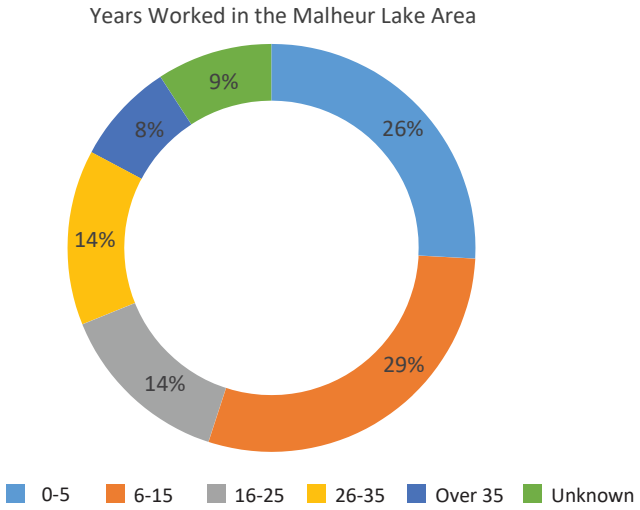


Figure 2. Range of years worked in the Malheur Lake area.

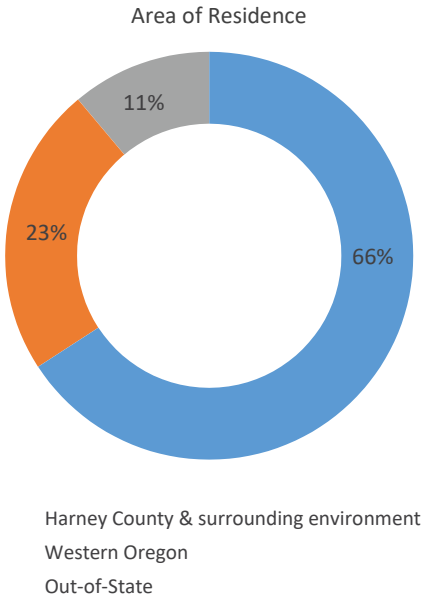


Figure 3. Areas of residence where participants currently live.

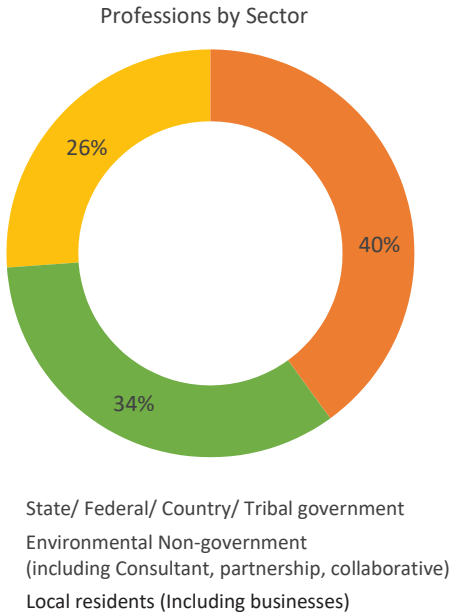


Figure 4. Professions grouped by sector.


Photo taken by Jackie Delie

3.2 RESULTS

Four broad themes, *Identity, Stakeholder Values, Perspectives on Management, and Engagement,* were synthesized from the coding process (Fig. 5) and are discussed in the paragraphs below. These four themes influence the process of adaptive management by setting its social stage.

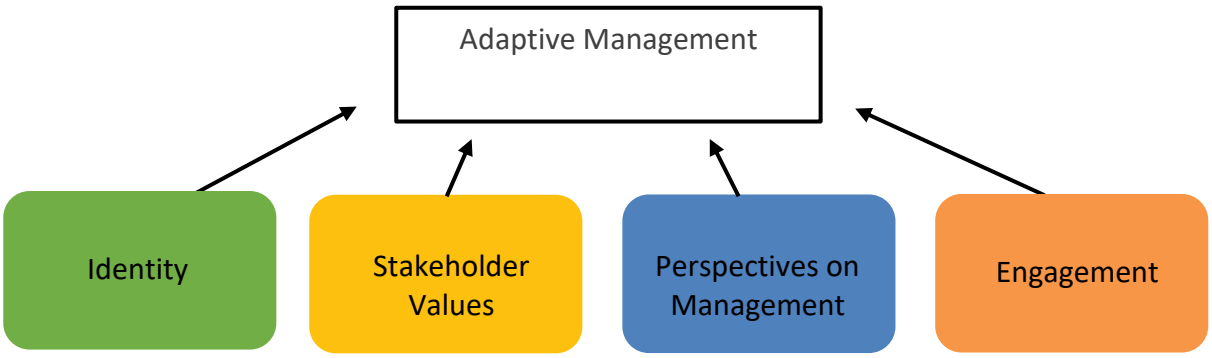


Figure 5. Broad themes identified from the coding process that go into adaptive management.

Photo taken by Jackie Delie

3.2.1 IDENTITY

Overall, 74% of the interviewee respondents described their relationship to Harney County and the Malheur area as rooted in their relationship to place. Place identity involves the dimensions of the self that define individuals' personal identity in relation to their environment (Proshansky, 1978). For example, as one rancher noted, **"My grandfather lived here his whole life, and I was born here."** And a manager of a non-profit organization stated, **"I grew up in Harney County, I am a part of that landscape. I used to drive through the refuge on my way to high school back in the day."** Of the participants, 8.6% openly explained how they have had many generations of ranchers in their family, and one participant described the ranching lifestyle as his connection to place: **"Forty years here in Harney County, own property here in Harney, raise cattle, hay – I like the lifestyle of ranching."** A local business owner said that moving from the Willamette Valley to Harney County 42 years ago actually changed her identity: **"I am a different person because of this environment."** With those words, the participant described how living in the environment of Harney County shaped who she is. This concept of identity is central to understanding people's sense of place; place affects identity formation.

In addition to the general importance of place for identity formation, people's professions also informed their identities. All participants referenced distinct professional identities, such as resident, rancher, business owner, contractor, researcher, and resource manager. 20% of the participants explicitly referred to their connection to Harney County, and specifically Malheur Refuge, as a professional relationship or an attachment that developed over time through their profession.

> "Forty years here in Harney County, own property here in Harney, raise cattle, hay – I like the lifestyle of ranching."
> *– Rancher*

17.1% of participants were initially attracted to Malheur by their appreciation for natural wetlands and wildlife, but thereafter, further developed their relationship with Malheur Refuge through their professional identity. For example, a biologist described his connection to Malheur as, **"A visitor first as a recreational naturalist … and now a scientist engaged in assisting the refuge."** One resource manager stated, **"I am an employee of the federal refuge system... I always wanted to come to Malheur because my background is in wetland and waterfowl management."** The biologists, 42.9% of interviewees who identified with this profession, have a strong identity to their occupation and their connection to Harney County is through their appreciation for the Malheur ecosystem.

These personal identities, whether formed through an association with place (e.g., Harney County) or profession (e.g., scientist), are strong drivers for values, beliefs, and behavioral tendencies relevant to a specific environment. Unfortunately, people often perceive identities that are different from their own as having fundamentally different, and therefore threatening, beliefs. This can lead to inability to trust people of different identities (Stern, 2018). It is not uncommon to see shifts in beliefs, but these shifts typically stay within the same identity group in order to maintain group cohesion. However, there is such a thing as a **"superordinate identity,"** which can bring diverse people together, reduce the size of the out-group, and enable people to keep their preferred personal identities. Superordinate identity is a metaphorical state that derives from people feeling a sense of belonging to or an identification with a higher social identification and can lead people to act in congruence with the group's goals, values, beliefs, and behaviors (Argote and Kane, 2009; Stern, 2018). In Harney County, this superordinate identity is based on place rather than profession, and it can facilitate connections between people from different in-groups (Fig. 6). One can be a rancher or a bird conservationist and still identify as someone connected to the overall health of Malheur Lake.

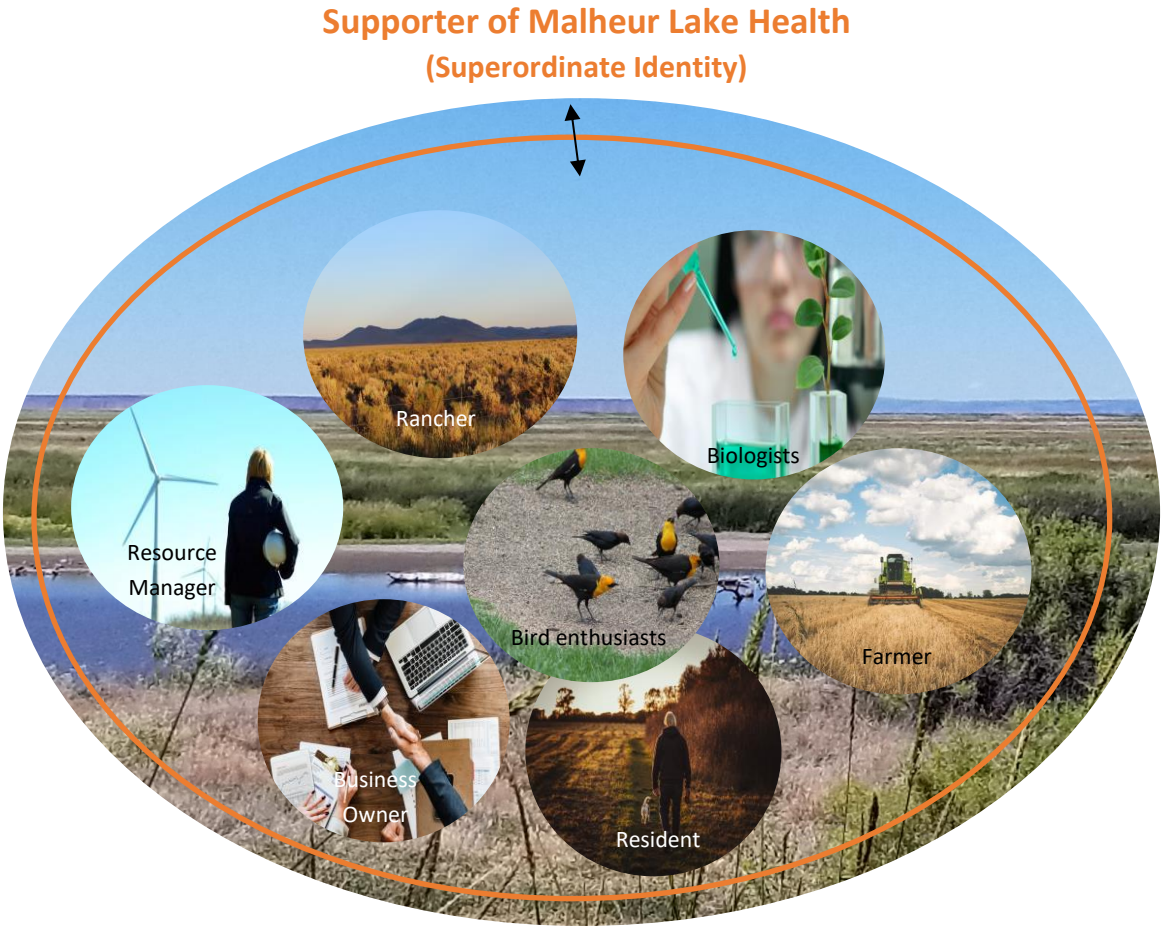


Figure 6. Different identities within a superordinate identity, supporter of Malheur Lake health.

3.2.2 STAKEHOLDER VALUES

Participants discussed ecological, social, cultural, economic, aesthetic, and intrinsic values they saw as relating to Malheur Lake and the surrounding area. Values are the basic cognitions that form the foundation of our attitudes, beliefs, preferences and behaviors (Fulton and Manfredo, 1996; Vaske et al., 2011). They are slow to change and, at the societal level, tend to only change with large cultural shifts (Manfredo et al., 2017). In the context of this study, a number of value orientations exist.

There was a strong consensus that from an ecological perspective there is immense value in managing water resources in the Harney Basin and preserving wildlife habitat, specifically that of waterfowl. However, there was a clear distinction between participants who agreed that the lake was historically productive in the role it played for migratory birds and those who found no value in its current state but recognized its potential. For example, one resource manager stated, **"There is limited value of the lake in its current form unless you are carp."** Others acknowledged the intrinsic value of the lake by referencing the foundational values of the public land system in the United States. In this regard, one resource manager stated, **"Public lands are relevant to people in country and in the West, and residents of Harney County."**

> "Public lands are relevant to people in country and in the West, and residents of Harney County."
> *– Resource Manager*

Several other participants touched on the potential indirect and direct benefits of Malheur Lake. Members of the community rely on the ranching and livestock industries, which sometimes are perceived as contrary to the goals of the Lake conservation. For example, one rancher stated, **"To relook at full grazing and haying as a management tool both for the ecological health of the refuge and for economic benefit to Harney County."** Another rancher provided a recommendation of working with farmers to plant grain to support waterfowl populations, **"[and] this would help the farmers who want to earn some money to sublease their land."** 37% of interview participants specifically elaborated on the value of recreational tourism and the potential for tourism growth at the refuge. Either the growth of tourism could result in economic income for local businesses in Burns (a material value) or, as a local government employee stated, **"It becomes a family, emotional experience that sticks with people"** (a non-material value).

> "I think there is value on any piece of land. But there are other values we are not looking at."
> *– Rancher*

22.9% of the participants mentioned the cultural relevance of Malheur Lake to the Paiute tribe and the inherent value of land itself. For example, one rancher pointed out, **"I think there is value on any piece of land. But there are other values we are not looking at."** The participant elaborated on these "other values" by also mentioning the value of the refuge system as a management tool for both ecological health and the economic benefit of haying production, which is a thriving industry in Harney County. This value was shared by another local business owner who spoke about the value of wildlife and domestic animals living together on the refuge: **"I remember we could sit on the front porch and see cattle. I know the value of farm animals and wildlife. They coexist. I don't care what any environmental groups says. It's the truth."** This comment exemplifies how some values, which are mostly advocated by the environmental movement, are often in conflict with the values of rural landowners. These findings highlight stakeholders' varying foundational beliefs and value orientations, which can either directly or indirectly influence support or opposition for management programs.

International research has identified two broad categories of value orientations under which many other foundational values exist: mutualism (or openness to change) and traditionalism (or conservation of 'way of life') (Fig. 7). The number of mutualists is increasing in Oregon and most of the U.S. (Manfredo et al., 2017), and they are more likely to look favorably on management approaches, such as collaboratives, that are funded and designed to represent all interests. Traditionalists, on the other hand, do not value working collaboratively and perceive those who disagree with them as "outsiders". Mutualists can acknowledge all values, but Traditionalists are less likely to. Traditionalists will not change their orientation unless a big life event or a powerful individual from their own identity group triggers such a change. At the Harney County Way Collaborative Summit 2018, a summit for collaborative members of the High Desert Partnership (HDP), one participant stated, **"But what if we don't want to change?"** The change was not a reference to behaviors but to values and beliefs, and working with people from outside the region.

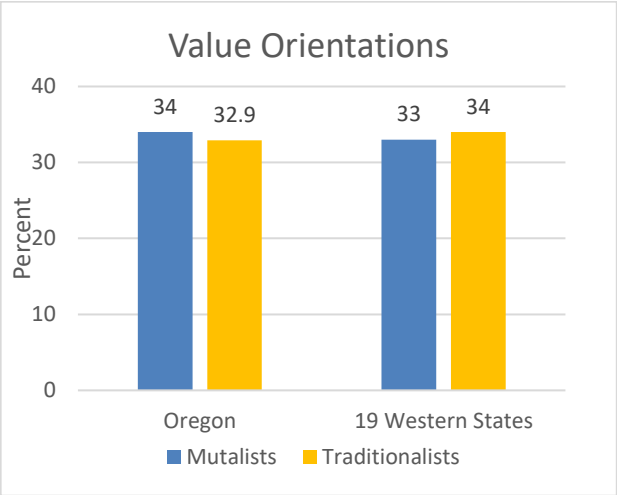


Figure 7. Value orientations presented in Manfredo et al. (2017).

The findings of this study suggest many people hold several types of values that on the surface may seem conflicting, but that there is potential for recognizing the overlap of, for example, economic and aesthetic values. The primary concern for the future management of Malheur Lake and the surrounding area is how to promote superordinate levels of value interactions that can potentially appease even the Traditionalists who don't want to see collaboration or change. In our interviews, however, there were very few people who demonstrated Traditionalist tendencies. That may be due to our sampling method and people's willingness to be interviewed.

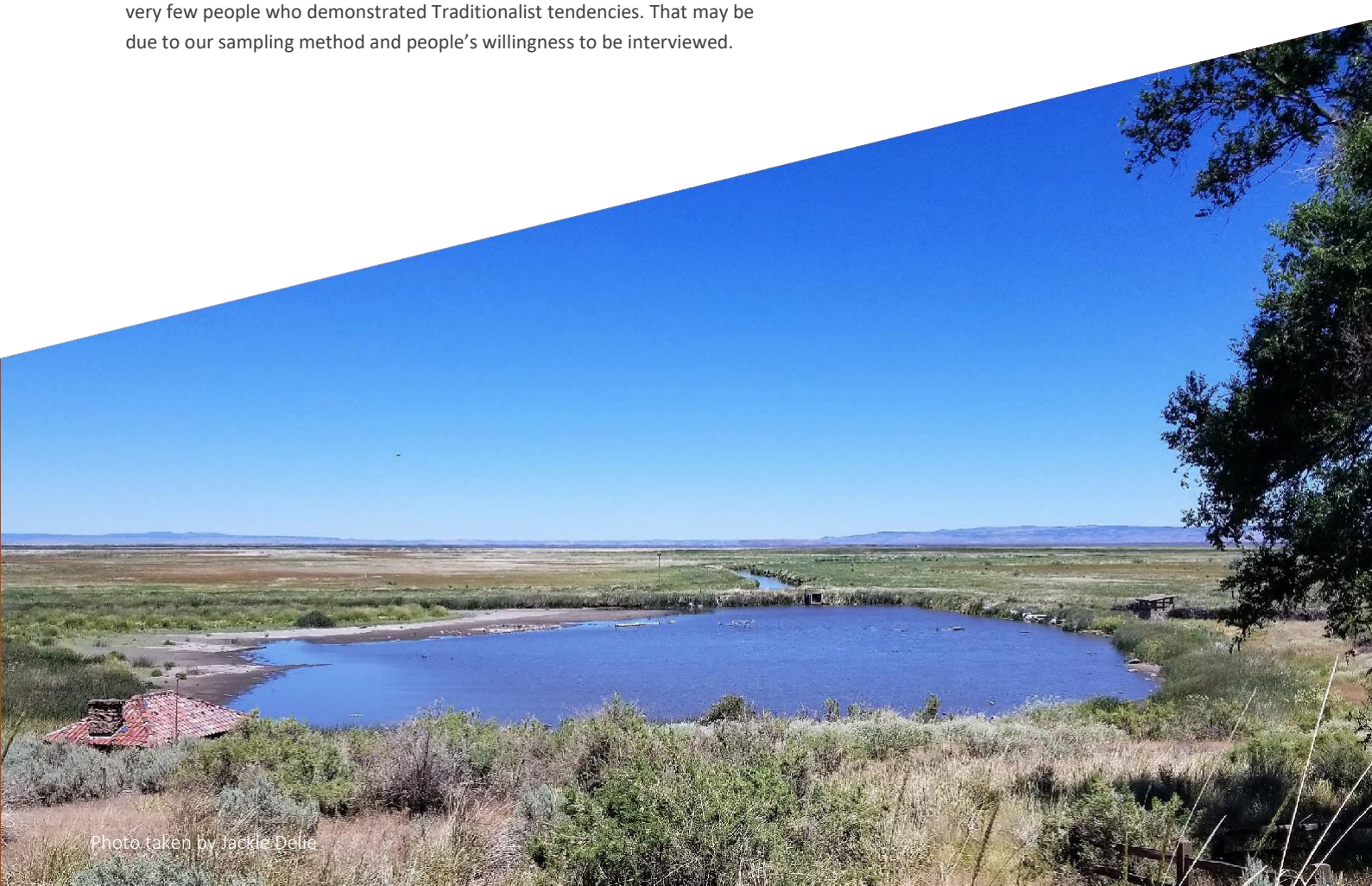


Photo taken by Jackie Delie

3.2.3 PERSPECTIVES ON MANAGEMENT

The responses of the interviewees reveal that Malheur Lake and the surrounding area are shaped by a complex interaction of perspectives about social and ecological conditions. Those perceptions are shaped by people's value orientations. In this regard, the interviewees had polarizing opinions about management and how management should be carried out at Malheur Refuge and Malheur Lake. The findings demonstrate a continuum of three perspectives toward management: optimistic, pessimistic, and agnostic (Fig. 8). The way people talk about the management of natural resources is important for understanding how they perceive challenges to management and what success may look like.

Optimism

Participants: 71%

Values:

- Ecological
- Aesthetic
- Intrinsic
- Group achievement

Reasons behind their view: Progress is being made and processes are place to address ecological, social, and economic issues.

Perspectives: A need for a broader, holistic approach to management.

Wanted actions: More research, innovative thinking, collaboration, comprehensive strategy

Pessimistic

Participants: 14%

Values:

- Economic
- Tradition
- Security

Reasons behind their view: Large government agencies are not protecting natural resources and the public lacks ownership over resources.

Perspectives: Environmental policies have a large influence on management practices and these policies are not aligned with local values or wants.

Wanted actions: To be good neighbors, cooperation, decision making to occur at the local level

Agnostic

Participants: 14%

Values:

- Independent
- Self-direction
- Security

Reasons behind their view: Disconnected from the entire process, lack information, or don't care about the resource issue, i.e. carp.

Perspectives: Not aware of the management practices or processes in place to comment.

Wanted actions: More communication, stop investing in carp, no opinions on management

Figure 8. Perspectives on management of Malheur Refuge and Malheur Lake.

OPTIMISTS

First, 71% of participants expressed optimism and were encouraged by the strategies implemented by management – for example, commenting on the progress of scientific research and collaboration. In one conversation, a manager stated, **"It is encouraging that it is being managed, heading in the right direction with all the efforts to remove carp or reduce levels where they are not affecting the water resource."** Another participant with a non-profit organization stated, **"If we look at the context of where we started, the lake was not the focus; everything else was the focus. We brought innovative thinking and have a lot more information than what we had."** Participants also acknowledged what they saw as two major challenges: limited resources and a limited ability to address ecological issues: **"They are doing the best they can with what they have in terms of infrastructure and capacity. For example, the Silvies doesn't have dams and diversion infrastructure so can't do much there."**

Woven into the narrative of optimism toward current management strategies is support for the implementation of a larger approach that would manage the entire system. Optimistic participants shared the view that Malheur Lake is a unique environment that should be a part of a more comprehensive strategy: **"The lake, wetlands, flood irrigation fields, they are interconnected. If one is gone it can affect the others,"** as one policy coordinator stated. Moreover, a business owner commented on the importance of Malheur Lake **"not being managed as a single body of water, but more of holistic approach. The entire basin."** This need for a broader, holistic approach to management was recognized among 29% of participants as a long-term strategy that could address a large number of the ecological challenges mentioned to managing Malheur Lake: carp infestation, wind turbidity, depletion of native vegetation, fluctuating water levels, poor water clarity, fragmented freshwater system, reduced water levels, and climate change.

Of the optimist's respondents, 31% stated that the high number of carp is one of the primary ecological issues facing the health of Malheur Lake. Of the optimistic respondents with an identified background in ecology, 26% believe that direct investment and further research into the dynamics of the carp population and the effects of carp on the whole ecological system is necessary before additional management strategies should be applied, such as the use of rotenone. One scientist shared an outlook that management needs to work methodically to conduct sound research before direct action is taken: **"I think there is a struggle to maintain, always a desire to find a quick fix to satisfy the demands of stakeholders in terms. You know it's a problem, do something about it."** Other participants, 17%, mentioned limited water and lack of vegetation as primary ecological issues facing the health of Malheur Lake. As one biologist stated, **"it will be difficult in the next years to make decisions about water allocations."**

> "The lake, wetlands, flood irrigation fields, they are interconnected. If one is gone it can affect the others."
> *– Policy coordinator*

PESSIMISTS

In contrast to those optimistic opinions, 14% of interview participants had a generally negative outlook on the potential of management strategies, referencing past management and an overall dissatisfaction with government agencies managing the nation's resources. For example, one rancher stated, **"We all want to protect our resources, but Oregon is not protecting their resources naturally. Agencies are getting bigger, and more federal money is going into federal jobs and federal land management."** This rhetoric of a growing government was explicitly stated by 9% of participants with one rancher mentioning how more than one-third of Harney County jobs are federal government jobs. The rancher elaborated saying, **"they [government] spend money on a project without considering the social aspects of where the money can be better spent."** The participant provided the example of the project done by the U.S. Army Corps of Engineers where they built a rock and sand island to lure birds to Malheur. Similarly, a business owner stated how environmental policies have increased regulation of public lands and have made acres off limits to traditional activities such as cattle grazing. This view was shared by another rancher and business owner who expressed positive views of management thirty years ago that has succumbed to the negative influence of environmental groups: **"Don't want to get convoluted, but when John was there it was better. Then after him they hired a hitman to do the dirty work to put pressure. Environmental groups won't let them manage like how it should."** "How it should" referred to when cattle grazing was allowed on the refuge. Another rancher shared, **"When they lost cattle grazing that was a big mistake. It was a political move. I don't see wildlife like I used to. The refuge was a big economic base for those who had permits."** The comment of "don't see it like it used to" was in reference to the diversity and abundance of bird species on the refuge, and the participant mentioned how birders are asking for access to private lands for bird viewing.

Those who shared such discouragement, however, were still concerned about the natural resources in and around the refuge. For example, one rancher stated, **"The refuge is the heart and soul of Harney County and would like to see it used in a different way than it currently is being used"**. This individual goes on to explain how they would like a symbiotic relationship between ranchers and the refuge with haying production to occur on the refuge again.

Interviewees with pessimistic opinions regarding management practices emphasized a need to cooperate with management to find agreeable solutions that do not negate traditional ranching activities or other cultural traditions, such as the Paiute Tribe's cultural traditions. In this regard, one rancher mentioned, **"They [the federal government] need to be good neighbors. If they are doing something that is affecting pocket book, they need to help out."** The participant continued by sharing the view that the hierarchy of the federal political system restricts managers' ability to make decisions that are good for all local interest groups: **"Management decisions need to be based on local decisions."** This sense of decision making not occurring at the local level coexisted with the perception of some participants that the refuge's management practices do not take neighboring properties into account. The reality of such a diverse society and the differing values of stakeholders – that is, the traditional values of "Old West" resource use and "New West" environmental values – pose challenges to managing public lands (Manfredo et al., 2017)).

AGNOSTICS

In addition to the interviewees who held strong opinions regarding Malheur Lake, 14% of participants were disconnected either from the information or from the entire process. In response to the question regarding the perceptions of management and management of carp, one business owner commented, **"Really haven't heard too much. Haven't gone out to the ponds to see them swirling or digging."** The interviewee continued to share his detachment from the HDP collaborative process, although he said that he would like to be a part of the process and increase communication with various land managers, such as the Bureau of Land Management and the Malheur refuge staff. Another government employee stated, **"Carp is a huge challenge. I am not aware of what they are trying to do, I wish them luck.**" These conversations were based on the limited communication of the participants with the management at Malheur, and they did not know enough about the process to comment. Furthermore, one local resident openly did not care about invasive species such as the carp and found it "funny" that the land management had been investing their time and money in studying the fish. Such mindsets are grounded in the varying value orientations among stakeholders and relate to the concern of several interviewees – how do you get people to care? We know that if people don't care now, it's likely they will not care much in the future unless they somehow become more connected to the place (i.e. Malheur Lake) (Altman and Low, 1992).

Photo taken by Jackie Delie

3.2.4 ENGAGEMENT

In the context of natural resource management, stakeholder engagement refers to the participation of stakeholders in decision making efforts as a means to integrate their values and knowledge. In the dialogue with the interviewees, stakeholder engagement emerged as a fundamental tool that could be actively applied to foster support for the long-term management of Malheur Refuge and Malheur Lake. This likely is due to their successful experiences of stakeholder engagement occurring in the variety of HDP collaboratives. The Harney County Way Collaborative Summit enabled individuals to recognize the core group of individuals who are continuing the process by investing their time in relationship building. As one participant of the Harney County Way Collaborative Summit mentioned, **"Collaboration is investing more up front and less later on; other methods have less investment early but more at the end."** Along with this shared view of investing in the process of collaboration, the interviewees considered building trust to be the key to fostering those relationships. Another participant of the Harney County Way Collaborative Summit stated, **"Progress will move forward at the speed of trust."** Trust and relationships are being developed within the HDP collaborative.

Within the HDP, there are various levels of stakeholder engagement, with some individuals having been engaged for a long time. Thus, stakeholders in the collaborative wondered how burnout should be prevented or alleviated. This concern was followed by dialogue centered on the claim that not enough people within the collaborative know what is happening with the process. A number of individuals questioned the best way to transfer individual experience to collaborative learning. One manager commented, **"We have to have a mechanism that stores data and transfers that knowledge effectively through time. We need baseline data to make informed decisions."** The members of the collaborative shared this desire to develop a comprehensive process that meets the needs of the group while working to fulfill the goals of each individual initiative, including robust social, ecological, and economic data collection methodologies. There was further discussion on how alternative forms of communication are necessary to reach a diverse audience (i.e., individuals or organizations who are outside the collaborative) with ecological and social information. One Harney County Way Collaborative Summit participant commented **"We hold ourselves accountable; how we expand our circle with ranchers."** Other interviewees mentioned gaining stakeholder participation from landowners, ranchers, Paiute tribal members, local Harney County residents, local government, and the broader national public.

> "Collaboration is investing more up front and less later on; other methods have less investment early but more at the end."
>
> *– Harney County Way Collaborative Summit participant*

Two interviewees who described their reasons for not being involved in the process illuminated a lack of diverse participation. For example, one business owner stated, **"I live with it. I would like to see it made better, but they are not going to listen to me."** Later, the business owner stated, **"I don't see much change unless we get an attitude change."** The participant expressed varying attitude differences between themselves and those making decisions. A non-profit manager also elaborated that geographic distance between people, those in Harney County and those living outside Harney County, manifests in differing attitudes. This was expounded further by a collaborative member at the Harney County Way Collaborative Summit: **"Five to 15% of people are disenfranchised from the process. How to give them a seat at the table and feel that they are being listened to."** However, as one participant of HDP mentioned, **"Collaboration does not necessarily work if people have their ideas coming in,"** meaning that those who want to participate and be heard have to be open to having their minds changed**.** The findings of these interviews suggest that this lack of participation outside the collaborative is what a majority of HDP collaborative members want to address.

While broader engagement is an interest, a number of participants mentioned the significant time investment required to be a part of the HDP collaborative: **"One thing though, people just don't understand is that local ranchers are working. They can communicate what they want, they are just busy people. People don't get it for some reason that they work seven days a week."** Indeed, 14% participants acknowledged time limitations as preventing people from participating in meetings or events.

The lack of involvement of these identified groups in the collaborative process is interpreted among HDP collaborative members as due to miscommunication or to limited local outreach efforts (i.e., in Harney County). As a non-profit manager stated, **"We need to be there, share information, be open, gain community trust, and external support."** Moreover, some suggested elevating the profile of the refuge by sending out quarterly newsletters or updates about what is going on. The "what is going on" was in reference to the research, restoration, preservation, and management strategies that are occurring at Malheur. Similarly, others suggested making the HDP collaborative an even more open and inviting space for decision-making processes through social learning. Caution is warranted, however, because research shows that education or information exchange alone does not change attitudes, intentions, knowledge, or behavior (McCleery, 2009). While information sharing within an in-group can sometimes influence beliefs, the same cannot be said of an out-group. When an 'outsider' shares knowledge with the goal of changing the perspective of another person, the latter is likely to become even more deeply entrenched in his or her existing belief. One identified biologists recognized that local people may not want to be engaged: **"I don't know if they want or need to be engaged. . . . as long as what you're doing isn't harming [them]."** This individual was suggesting that efforts should perhaps be focused on coexisting without harming each other and that additional involvement may be unrealistic because it is difficult to get participation from the public when decisions do not directly impact them. A few other HDP collaborative members touched on this during the Harney County Way Collaborative Summit, mentioning how continuing to add people to the process could add complication and constitute a **"reckless expansion of capacity."** This was supported by another HDP local participant who stated, **"Everybody's perspectives but not everybody. All interests represented but not an open invitation to everyone as it can create difficulty."**

The engagement of multiple stakeholders is a multifaceted process, particularly when joined with differing dynamics of identity and varying value orientations. In the local context of adaptive decision making, values should not be understood as static but as dynamic. Social processes, such as modernization and urbanization, are influencing the way people think about natural resources and will continue to modify decision-making processes at the local level (Manfredo et al., 2017).


Photo taken by Jackie Delie

4.0 Implications

We learned from this exploratory phase that there are diverse identities and varying value orientations for stakeholders related to Malheur Lake management. Engagement requires allowing individual identities to coexist under a superordinate identity. Given that our study was based on a limited sample of the population, we recommend two projects to further explore social dynamics associated with the management of Malheur Lake: 1) a randomly-sampled public survey to dive into public values, identities, and preferences for management and 2) a social network analysis to characterize and identify pathways for communication within the collaborative networks.

4.1 GENERAL PUBLIC SURVEY

A randomly distributed public survey would identify general population frequencies of identity, value orientations, and support for Malheur restoration alternatives. A general public survey could assess the potential public benefits of the Harney Basin Wetlands Initiative results chain and provide guidance on public preferences for selected management strategies. A survey could also communicate current Malheur National Wildlife Refuge (MNWR) science and policy in accessible terms to the general public. A survey of randomly-selected households in western states will measure knowledge of and attitudes toward potential management outcomes for the MNWR. It will also quantitatively measure value households place on Malheur restoration alternatives. A survey, for the first time, would provide insights into general population opinions and values associated with MNWR. The potential restoration alternatives could be based on those discussed at the Malheur Lake Restoration Alternatives Summit. The next project ideas could aim to address the following questions:

Q1 What is the current state of knowledge in the general population regarding MNWR?

Q2 What value does the average household place on selected potential MNWR restoration outcomes?

Q3 What individual motivations are associated with support for restoration alternatives?

Q4 Is there significant diversity in household values for MNWR restoration?

To address these questions, the survey could include a choice experiment (CE). A CE is the state-of-the-art approach to measuring public preferences for potential future natural area restoration projects (Fig. 9). The CE will allow for money-metric estimates of average household willingness-to-pay (WTP) for MNWR restoration outcomes. WTP estimates may be used in conventional benefit-cost analysis. Survey results can also be used to develop targeted communication strategies, monitor awareness and preferences for restoration alternatives, and select preferred management strategies. Note also that survey results will provide new information on public attitudes toward, and quantitative measures of value for, aspects of MNWR recovery. For example, a likely result will be household average WTP for increased migratory bird populations in the MNWR. This evidence may be used to support efforts to secure funding for related HBWI activities, or future work that update/expand on this project. Recommend to apply current best practices to develop the survey, including: MNWR stakeholder consultation during survey development, focus group testing, and a pilot survey.

9. **Choice Set 1:**
Given **no other options**, please **select one** out of the three situations that you most prefer and check the appropriate box.

Description	Forest Improvement	Stream Improvement	No Change
Amount of Improvement	 120 Feet	 15 miles	100 feet streamside forest No Increase in stream miles
Cost to you for 10 years	**$750 per year**	**$10 per year**	**$0 per year**
Which option go you most prefer? (Please choose one)	☐ Option 1	☐ Option 2	☐ No change

Figure 9. Example of a component of a choice experiment survey adapted from Robinson, K. 2019. Salmon, Saws, and Sense of Place: Using a Discrete Choice Experiment to Examine Place Relationships and Preferences for Stream Restoration on the Quinault Indian Reservation. *Oregon State University Scholars Archive*.

4.2 NETWORK ANALYSIS

The second social science method idea is a social network analysis. This type of project could help understand the qualities and structure of the collaborative and its ability to implement the Harney Basin Wetlands results chain. A network analysis will identify pathways of communication, pathways of trust, inclusion of trust of different groups, dependence on individuals or groups, or other pieces of information pertaining to the identified social structure. The recommended network analysis can address key questions about how the HDP collaborative functions now and how it could change in the future in response to changes in organizations, people, and information. These could include questions such as:

Q1 What people, organizations, or other resources do people in the collective trust or gain information from?

Q2 What sectors are not currently well represented? Or what sectors are weakly connected?

Q3 Where is the resilience of the HBWI group structure at risk (e.g. potential effects of changes in group membership, pathways of communication, etc.)?

Q4 What dependence is there on individuals or sectors for the continued support for restoration alternatives?

A network analysis would be done through short interviews with each person in the network. To implement the project would require working to define the sampling population – members of HDP, stakeholders in Harney Basin Wetland Initiative, all members of adaptive management including outreach. The results of the analysis are statistical pathways (Fig. 10) that informs the resilience of the social system, potential pathways for communication and leadership development, and assess how the social structure changes over time. The information can be weighted to understand the value or volume of flow from one relationship to the next. This analysis can be updated, added to, and reevaluated as a social science monitoring method. In short, analysis of social networks can provide key insights into the long-term capacity of the collective to meet restoration needs specified in the Focused Investment Partnership results chain.

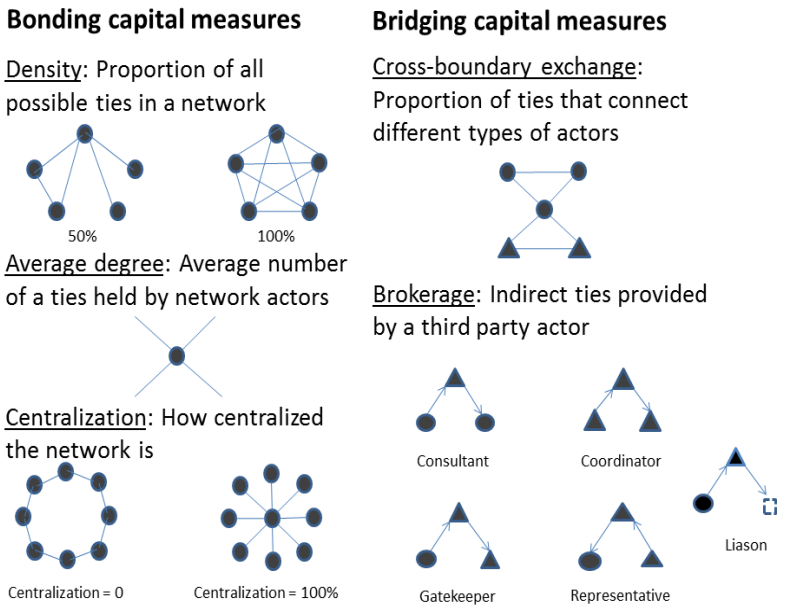


Figure 10. Example of a network analysis indicating measure of bonding and bridging capital. Bonding capital (left side) can be described as statistical pathways among actors in social networks (e.g., scientists, managers, collaborative members). Bridging capital (right side) can be described by how those social networks interact and the direction of the interaction. Figure from Fischer AP, Vance-Borland K, Burnett KM, Hummel S, Creighton JH, Johnson SL, and Jasny L. 2014. Does the social capital in networks of "fish and fire" scientists and managers suggest learning? Soc Nat Res; doi:10.1080/08941920.2014.901463.

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APPENDIX

-- APPENDIX A: QUESTIONNAIRE

Understanding Stakeholder Values in Malheur Lake Management

Semi-Structured Interview Protocol

Thank you for agreeing to speak with me. I have a few open-ended questions for you about your relationship to the Malheur Wildlife Refuge. This should take about 20-30 minutes. You are welcome to skip any question or terminate the interview at any time without

1. What is your relationship to the Malheur Wildlife Refuge and surrounding areas?
2. What do you see as the value of Malheur Lake?
3. What is your opinion of how carp is currently managed?
4. In what ways can you imagine providing support or participating in the long term management of carp within Malheur?
5. Under what conditions would this interest you?
6. Who else do you perceive to be stakeholders in this context? (groups and individuals)

Demographics:

1. What is your profession?
2. What is your age?
   18-30
   31-45
   46-65
   Over 65
3. Are you a member of a Tribe? If so, which one?
4. How long have you worked in the Malheur Lake area?
5. What is your city/town of residence
6. Interviewer to record Sex

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