

Aquatic Health Interpretive Plan

for

Malheur National Wildlife Refuge



alchemy of design[®]

Alan Ransenberg

Lead Alchemist

7556 NE Stanton St.

Portland OR

97213

503 381 2676 (new number)

alan@alchemyofdesign.com

design is the process of making dreams come true

July 3, 2014

Table of Contents

Executive Summary	1
Background.....	3
Interpretive Goals.....	4
Themes (Messages)	7
Interpretive Stories.....	10
Interpretive Network.....	12
Introduction.....	12
On-site Interpretive Network.....	15
Outreach Interpretive Network	28
Action Plan (Priority for Implementation).....	33
Appendix 1: Background Information	36
Audience Profiles	36
Parameters	40
Appendix 2: Interpretive Planning Process	46

Executive Summary

Malheur National Wildlife Refuge is the largest freshwater marsh in the West, a key component of SONEC, a system of wetlands supporting migratory birds on the Pacific Flyway, and designated by the Audubon Society as a Globally Important Bird Area. Carp, an invasive species introduced into the Harney basin in the 1920s, is destroying aquatic habitat that millions of migratory waterfowl depend on. As a result, the lake now supports less than 10% its those historic numbers in terms of producing waterfowl and supporting migratory birds, with the negative impacts of the loss in production felt all along the Pacific Flyway. Consequently, the USFWS has made aquatic health in general, and the carp issue specifically, a top priority.

In addition to ongoing research to address the issue, the USFWS has attempted a lot of solutions, such as rotenone and dynamite, but with limited or short term success. One strategy focuses on engaging the public on a local, regional and national level to increase awareness of the issue and increase participation in and support for addressing the problem. Given lack of capacity on the refuge, achieving active support from the public is crucial.

The goals for the interpretive network include increasing the number of people valuing MNWR, especially the resources endangered by carp, and motivating them to take an active role in helping address the issue, notably by joining the Friends Group and/or contributing money or time. The public is critical to achieving the goals because the refuge does not have the capacity to provide time or staff to engage in an on-going outreach effort. However, the Friends Group could provide resources to facilitate that effort, if they gain enough support from the general public. Since Malheur receives low visitation, outreach opportunities are the key thrust of the plan, although it does include several low cost strategies for ensuring that everyone visiting Malheur is aware of the scope and magnitude of the problem.

Key recommended on-site strategies include the following:

- A new Headquarters Overlook Interpretive Panel Cluster that provides an overview of the refuge and the issue with carp
- New panels outside the Headquarters building focusing on the carp issue
- New exhibits in the museum
- New panels at the Narrows Bridge pullout
- A personal presence (by the Friends group or volunteers) on the deck at headquarters disseminating information about carp, answering questions, and providing a means for people to become members of the Friends Group, volunteer and/or donate in some way.

Outreach strategies focus on supplying a steady stream of information to individuals and groups likely to be interested in providing support, personal presentations to such groups, and a traveling exhibit that can be modified to be relevant to different target audiences. The steady stream of information recommends providing regular updates to groups that can then use it in newsletters and at meetings, creating and using several Facebook sites, having an Internet presence and having a Twitter presence. To do so will require an Information Distribution Coordinator, also a position that the Friends Group may be able to assist with. Although presentations might be more effective by USFWS staff, others can be used to do such presentations if provided the correct information and props. That requires a Presenter's kit that includes a variety of PowerPoint programs designed for different target audiences, a large map

of the Pacific Flyway that emphasizes the role of SONEC, a means to facilitate donating or joining the Friends Group and other support materials. Although the traveling exhibit can stand on its own, it would also be a key tool at presentations.

At this point the highest priority is to rework the agreement with the Friends Group to provide specific direction on what needs to be done so that group can begin to work with the USFWS to implement the strategies recommended in this plan. In terms of physical strategies, the following are high priority:

- Headquarters Overlook Interpretive Panels
- Headquarters Pond Interpretive Panel
- Carp Carving Interpretive Panel
- Traveling Exhibit
- Presenters Kit

The recommended network includes other strategies, such as an Introductory Video, the museum exhibits and interpretive panels at the Narrows Bridge. Just because they are lower priority does not mean they should not be implemented given the right circumstances.

Due to the uncertainty of future funding and staffing, and of reliance on outside groups, this plan should be reviewed periodically, especially if circumstances change significantly.

Background

Malheur National Wildlife Refuge is the largest freshwater marsh in the West, a key component in SONEC (SE Oregon - NE California), the system of wetlands critical in supporting migratory birds on the Pacific Flyway, and designated by the Audubon Society as a Globally Important Bird Area. Carp, an invasive fish species introduced into the Harney basin in the 1920s, is destroying aquatic habitat that breeding and migratory waterfowl and other birds depend on. Carp are bottom feeders, uprooting vegetation in search of invertebrates and stirring up mud, which increases turbidity to a level that prevents the photosynthesis necessary for emergent aquatic plants, thus destroying habitat for water birds. In addition, the resulting lack of vegetation on the marsh allows the wind to create additional turbidity. As a result, a lake that once produced more than 100,000 ducks and geese and supported peaks of over a half million migrating waterfowl now supports less than 10% of those historic numbers, with the negative impacts of the loss in production felt all along the Pacific Flyway.

The USFWS has attempted a lot of solutions, including using rotenone and dynamite, but with limited or short term success. Although draining water bodies such as Boca Lake can eliminate carp, Malheur Lake is too large to drain. The USFWS have now made aquatic health in general, and the carp issue specifically, a top priority at Malheur NWR, continuing to attack the issue using an array of strategies, including research, temporarily draining smaller lakes, building barriers and taking other actions. They are hampered in part by lack of knowledge on how to deal with the issue because nobody has ever tried to eradicate or manage carp from a lake at this scale, which is why control strategies used elsewhere have limited - if any - success. That is also why on-going research is critical, such as the experimental commercial harvest of carp in May, 2014, and the research on potential biological treatments.

One strategy focuses on engaging the public on a local, regional and national level to increase awareness of the issue and increase participation in and support for addressing the problem. This strategy is critical to building capacity outside the USFWS to help address the problem. A key first step in implementing this strategy was to create this Aquatic Health Interpretive Plan to guide the development of interpretive opportunities, on- and off-site, necessary to achieve the desired impacts on the public.

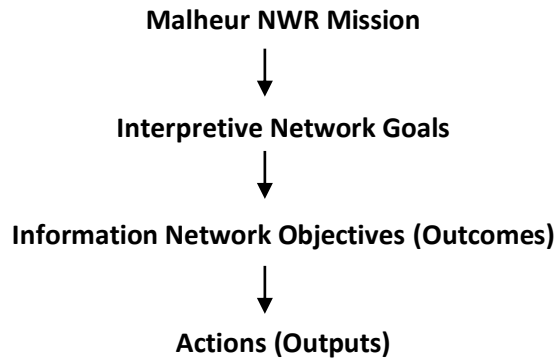
A Note on the Management Direction in the CCP

The recently completed (May, 2013) Comprehensive Conservation Plan (CCP) for Malheur NWR identified numerous interpretive and environmental education strategies that depend on capacity (staffing). Since completion of the CCP, capacity that could have been used for such efforts has been severely reduced. Notably, the USFWS is eliminating the staff position responsible for coordinating volunteers, working with visiting educational groups and engaging in a variety of other tasks that enabled the refuge to offer personal interpretive opportunities and programs. Consequently, the USFWS is not currently in a position to implement outreach efforts critical to achieving the goals established in this Interpretive Plan. However, such efforts could be implemented and managed by others, such as the Friends of Malheur. Many of the on-site strategies identified in the CCP that require coordination will also only be possible if someone other than the USFWS takes on the task of coordinating volunteers and personal interpretive services on the refuge.

Interpretive Goals

Introduction

The goal hierarchy contained in this section reflects the following structure:



The hierarchy is developed in this manner to clearly show the link between the purposes for which the refuge is managed and the recommended actions associated with developing a network of interpretive opportunities.

Management Goals

In general, the purposes of Malheur NWR focus on conserving, managing and restoring native fish, wildlife and plant resources and their habitats, with an emphasis on migratory and breeding birds. Carp are a major management issue on the refuge primarily because of their negative impacts on habitat for migratory and breeding waterfowl. The purpose of this plan is to identify and provide guidance for developing interpretive opportunities that result in the public engaging in actions that support the efforts of the USFWS to control carp at this refuge specifically, such as by joining or donating to the Friends of Malheur, which in turn enables that group to offer more support to the refuge. However, the themes and supporting stories used in this interpretive effort will also help emphasize the need to control or eliminate invasives in general, the need to manage habitat as the key to managing wildlife, and the need for a system of refuges to support migratory birds, all concepts that will support the efforts of the USFWS on other refuges.

Interpretive Program Goals

Introduction

As noted, an interpretive program can support Management Goals focused on aquatic health by motivating the public to engage in actions that support the efforts of the USFWS to control carp at this refuge specifically. The process for motivating people to take such action is likely to follow a sequence of four (4) steps:

- 1. Increase the *value* people attach to a resource threatened by carp.** If people don't care about migratory and breeding birds, native fish and/or other resources threatened by carp, they are unlikely to be motivated to take actions to protect them. The interpretive network must raise awareness of Malheur NWR and its importance in supporting breeding and migratory birds along the Pacific Flyway. This is more than just caring about Malheur NWR as a place; it is about caring about a specific type of resource, whether migratory and breeding birds, native fish or another resource that depends on the aquatic habitats at Malheur NWR. Birders and duck hunters are likely to care, whether they visit Malheur or not. Locals may care due to the influence on the local economy, but the USFWS needs a broader base of support.
- 2. Increase awareness of the *threat* to the resource they value.** This will focus on the negative impact of carp on aquatic habitat, but it has to extend to migratory and breeding birds, native fish, local or regional economy or whatever resource is threatened by carp. To understand the threat, people need to understand a few basic ecological concepts, such as "managing birds, fish and wildlife means managing habitat for those species."
- 3. Increase awareness of what the USFWS has done and is doing to combat the threat.** In general, people are more likely to take action if they feel that their help is really needed. This involves sending the message "We can't do it without your help." It also involves increasing understanding of potential solutions and solutions that will not work.
- 4. Tell people what they can do specifically that will support the efforts of the USFWS regarding this issue. (Call to Action)** The write-up on the back of the publication '*Harney Basin Wetlands*' contains a good example of this last step.

Interpretive Program Goals

The following interpretive program goals reflect this series of steps to achieve the overall goal of increasing public involvement in and support for managing carp at Malheur NWR.

Interpretive Goal 1: Foster a personal valued connection between the public and migratory and breeding birds, native fish or any other resource threatened by carp at Malheur National Wildlife Refuge.

Since this is the Aquatic Health Interpretive Plan and carp are the key issue in aquatic health, it is important for people to value a resource threatened by carp as a first step in motivating them to take action. Those resources threatened by carp include, but are not limited to, migratory and breeding birds, native fish and possibly other wildlife, local economy, and economy in other areas along the Pacific flyway. As noted previously, it is important that people value a particular resource rather than just Malheur NWR as a whole. Value is subjective, so, depending on the person, a valued connection may reflect aesthetics, economics, duck hunting, angling, bird watching, philosophical viewpoint or some other factor.

Interpretive Goal 2: Increase awareness that carp threaten populations of migratory and breeding birds on a continental basis due to impact on birds breeding at Malheur Lake and migrating along the Pacific Flyway.

In some cases, understanding the threat requires a basic understanding of the linkages in an ecosystem and the consequent need to manage entire ecosystems in order to manage birds, fish and wildlife. The magnitude of the threat will be a key to emphasizing the need to take immediate action, and the far reaching impact will help generate widespread support.

Interpretive Goal 3: Increase awareness of and support for the USFWS National Wildlife Refuge management philosophy and actions regarding controlling carp at Malheur NWR.

This will require an understanding of previous attempts to control the carp population and why they don't work, along with an understanding of solutions that are not feasible, such as draining Malheur Lake. It would also include increasing people's awareness of existing plans to deal with the issue.

Interpretive Goal 4: Increase the number of people supporting the Friends of Malheur National Wildlife Refuge.

A key issue in providing additional interpretive opportunities both at the refuge and off-site that would help achieve the goals is lack of capacity (staff) for coordinating programs and managing volunteers. The Friends of the Malheur National Wildlife Refuge is the entity currently in the best position to engage in actions that would specifically address this issue, such as managing information distribution, providing a volunteer coordinator, and providing volunteers during peak visitation to provide a personal presence dedicated to informing visitors about the carp issue.

Interpretive Goal 5: Enhance the quality of visitor experiences at the refuge.

Although this is a 'given,' it is important to understand that most visitors to the refuge come for a specific experience. Visitors are more likely to engage in an interpretive opportunity that integrates with and enhances that experience than one that doesn't. Consequently, interpretive opportunities focusing on carp must integrate and mesh with rather than compete with those experiences.

Interpretive Goal 6: Increase support from non-visitors.

The segments of the public with the greatest capacity to make a difference in terms of support live outside the local area, and may not be visitors to the refuge. Reaching them will require investment in outreach opportunities. Reaching more people on-site suggests maintaining / increasing interpretive efforts at times of high visitation, such as spring and fall migration and the annual John Scharff Waterfowl Festival. It also suggests choosing and locating interpretive strategies on the refuge to achieve a high probability of being used, which means in part tailoring them to the specific audiences visiting the refuge and also locating opportunities in areas frequented by target audiences.

Themes (Messages)

Introduction

Themes (messages) and topics are not the same. A topic is a subject, such as “managing wildlife” A theme is a *statement* or *message* about the subject, such as “the key to managing wildlife is to manage their habitat.” Stories and information for interpretive panels, presentations and exhibits are selected in order to communicate themes. Consequently, themes are determined before selecting and developing interpretive strategies.

The elements in the theme hierarchy include:

Themes

These are the key ideas or concepts to be communicated.

Sub-themes

These are the concepts that support a theme.

Supporting Stories

These are the stories that communicate a sub-theme or theme.

Themes are derived from goals by determining what a visitor needs to understand in order for them to respond in a way that helps achieve the Interpretive Program Goals. Since people typically only remember 1-3 overarching concepts, it is important to focus efforts on communicating a few key points. Sub-themes and supporting stories support those key points. In combination, they provide the guidance for selecting information to be presented.

Overarching Themes for Malheur NWR

This project focuses on developing interpretive strategies that will lead to the public taking actions that support and facilitate managing carp at Malheur NWR. However, any themes developed for that focus should fit within overarching themes for the interpretive network for Malheur NWR as a whole. Although those themes have not been articulated in previous documents, based on the reasons for setting aside the refuge and managing it primarily to protect and support wildlife that depend on the resources of the refuge, especially migratory and breeding waterfowl, and on the cultural history of the area and existing interpretive opportunities, the overarching theme(s) is likely to focus on the importance of the natural resources of the Blitzen Valley and the role they have played and continue to play in the life cycle of migratory and breeding waterfowl, human history of the surrounding area, and on the far reaching impact of an unhealthy aquatic ecosystem due to the importance of the refuge for birds that migrate along the Pacific Flyway.

This focus encompasses the story of the Northern Paiutes who lived here and continue to use the resources of the valley, the story of Pete French, the story of the National Wildlife Refuge and even the story of the geomorphology from the perspective that the uplift and faulting created the drainage pattern leading to the accumulation of water in the valley and basin. The current story of the battle against carp also fits with that focus in that destruction of the migratory and breeding bird populations through destruction of habitat has impact on the future not only of this area, but on a continental scale.

Themes Relating to Aquatic Health

Introduction

The themes (messages) have been crafted with the intent of motivating people to engage in behaviors that support the goals of the Aquatic Health Interpretive Plan by increasing a sense of value for the resources, raising awareness that carp threaten those resources, and providing direction on how to get involved and help.

Themes

Primary Theme 1: Malheur NWR is one of the most important wetland complexes in NA, contributing to the quality of life in the surrounding area and on a continental scale.

Sub-theme 1-1: Malheur NWR is a premier site for waterfowl and other birds, providing invaluable migratory stopover and breeding habitat along the Pacific flyway.

Examples of supporting stories

- Historically, 35% of the Pacific Flyway's canvasback duck population used Malheur Lake.
- The lake historically produced approximately 400,000 ducks, 75,000 geese and 3500 swans annually.
- The lake used to rank as one of the most productive waterfowl areas in NA.
- Malheur NWR has international acclaim among birders, listed in "Fifty Places to Go Birding Before You Die" by Chris Santella.
- More than half the world's Ross's Geese use aquatic resources at Malheur NWR.
- 20% of the world's population of white-faced ibis use aquatic resources at Malheur NWR.
- Malheur is a part of SONEC, a combination of wetlands that also includes Klamath Lake NWR and the Warner Basin. SONEC provides a key link between the northern and southern parts of the Pacific Flyway for migratory waterfowl.

Sub-theme 1-2: The migratory birds depending on Malheur are important to different recreational pursuits, and therefore quality of life, for many people along the Pacific Flyway.

Examples of supporting stories

- The experience of many birders, duck hunters, anglers and other recreationists coming to Malheur NWR depends to some extent on migratory and breeding birds that depend on Malheur.
- Visitors to Malheur, who come in part due to migratory and breeding birds threatened by carp, contribute to the local economy.
- The experience of many birders, duck hunters, wildlife photographers and others who live along the Pacific Flyway depends to some extent on migratory and breeding birds that depend on Malheur.
- Birders, duck hunters and wildlife photographers that depend in part on waterfowl and birds supported by Malheur NWR contribute to the economy in the area in which they live.

Primary Theme 2. Carp threaten the entire ecosystem in Malheur NWR, already significantly reducing native fisheries and migratory and breeding bird populations with resulting negative impacts felt all along the flyway.

Sub-Theme 2-1: Carp have significantly reduced the populations of migratory and breeding birds at Malheur by destroying necessary habitat.

Examples of supporting stories

- Carp increase turbidity, preventing photosynthesis for plants that waterfowl need for food.
- The decline in migratory and breeding bird populations corresponds an to increase in the population of carp in Malheur Lake.

Sub-Theme 2-2: Carp negatively impact native fish populations.

Examples of supporting stories

- Carp eat the same food as many species of native fish.
- Populations of native fish have declined as numbers of carp have increased.

Primary Theme 3. Managing the carp threat will require a concerted long term effort involving the USFWS and a lot of partners, including you.

Sub-Theme 3-1: Because Malheur NWR does not manage the entire watershed, cooperation is necessary to control carp off refuge lands within the watershed.

Examples of supporting stories

- The problem is not limited to Malheur Lake or the refuge, which is one reason the Harney Basin Wetland Initiative, a coalition of stakeholders, is critical to the management of this issue.

Sub-Theme 3-2: The problem is so large the USFWS cannot deal with it without help from others.

Examples of supporting stories

- Malheur Lake cannot be drained because it is in a basin and is too large to drain.
- Nobody has ever attempted to control carp in a body of water as large as Malheur Lake, so research is necessary.
- The take-out required to control the carp would be massive and expensive, plus it is likely to be a short-term solution because carp are so adaptive and resilient.

Interpretive Stories

Interpretive stories are the 'packaging' or vehicles for communicating the themes, in this case, the themes related to aquatic health. Ideally, they would fit into the larger story of Malheur. One 'big picture' story of Malheur is the significant role of the resources in the Blitzen Valley in the past, present and future of the cultural activity and history of the area and in its status and an oasis for wildlife. Water is the connection between all the cultural stories and the stories of fish and wildlife at Malheur. It also connects the geologic story in that the geomorphology created the landforms that caused water to be available in the Blitzen Valley and for Malheur Lake to be a basin, which has significant impact on the story of the issue of carp and potential solutions. Primary stories that fit within that context that are relevant to the focus on carp include the following:

The critical role of aquatic habitat in the survival of migratory and breeding birds

The reliance of a species on its habitat is a basic biological concept that people must understand in order to understand the importance and management of the aquatic resources of Malheur and other refuges along the Pacific Flyway. It is the basis for explaining why carp must be managed and the management actions of the USFWS regarding carp.

The critical role of Malheur NWR and a wildlife refuge *system* in maintaining healthy populations of migratory birds, with an emphasis on its role in SONEC.

Understanding that migratory birds need a series of habitats along their migratory route will support the concept that a refuge *system* is required. Specifically understanding the role of the refuges associated with SONEC in migration of birds along the Pacific Flyway, the current issues associated with those refuges, and the resulting impacts already being felt at other locations along the flyway will help emphasize this point, and will help communicate the importance of Malheur.

The threat of Invasives, especially carp

The issue with invasives is not new, but rather an ongoing concern that started decades ago. The USFWS has aggressive campaigns in place for eliminating invasives because if they were allowed to flourish, wildlife habitat and native ecosystems would be degraded significantly. In addition to carp, the USFWS at Malheur is also dealing with pepperweed and the potential of invasives introduced from vehicles, pets, and other sources. Understanding the importance of habitat and the impact of invasive carp on bird habitat will help emphasize the threat of invasives.

The work of the USFWS trying to deal with the carp problem

This story includes the efforts of the USFWS over the years and the limited success of those efforts, which helps people understand why carp are still an issue. It also helps people understand the significant effort the USFWS has made is continuing to make to deal with the problem and the difficulties involved. The story of Boca Lake, once supporting the densest population of carp in NA and now in the midst of being renewed, is a good supporting story. The trap at the Narrows Bridge is a visible example of USFWS efforts. The Sodhouse trap also supports the story, but issues with fish disposal make it unwise to open it to the general public.

The critical role of the public in recovering and maintaining healthy populations of breeding and migratory birds at Malheur.

This is an important part of the story, and one that can be supported by telling the story of the Harney Basin Wetlands Initiative, and by highlighting the role of the Friends of Malheur in providing funding for

the Sodhouse Dam trap, the 2014 test commercial harvest and providing people to staff an information table during the commercial harvest among other activities. It focuses on what people can do on an individual basis to help.

Interpretive Network

Introduction

The list of strategies includes some that have been suggested and recommended in previous plans but not others. Understanding the approach used to select strategies and key factors affecting the development and functioning of an effective interpretive network within the context of the current situation at Malheur may help readers understand the rationale for the recommendations in this plan. Consequently, this section begins with an explanation of the approach used to develop the suggestions for interpretive strategies, followed by a list of key factors affecting the choice of strategies. That is followed by a description of the on-site and outreach strategies that comprise the network.

Information Network Approach

In today's world people have a very limited amount of time and virtually unlimited options for spending that time, which makes it a highly valued currency. Interpretive opportunities are commodities, with the cost measured primarily in time and attention, which includes opportunity cost. To compete successfully for a visitor's attention requires offering information that the target audience considers to be worthwhile benefit for the cost involved. That is why the number of people reading interpretive panels increases with the use of visuals (higher promise of benefit at lower cost), limited text (reduces perception of and actual 'cost' in terms of time and effort), and application of a myriad of other factors that contribute to the perception of a good benefit to cost ratio.

In general, people prefer to commit small increments of time when making choices on engaging and staying engaged in interpretive opportunities (if I like the heading I will read the text; if I like this sign I will read the next one; if I like this exhibit I will look at the next one; and so on). A commitment at the beginning of an interpretive experience to stay engaged throughout, such as to read *all* the signs or view *all* the exhibits, is rare. We have all experienced this when reading books. We choose them based on an expectation that we will find a particular benefit we seek (entertainment, mental stimulation, etc.) at a particular 'cost' related to time and difficulty. If the book does not provide the desired benefit, or it is too hard to read (higher cost) we often quit.

Applying the incremental approach to interpretation results in a series of opportunities arranged in a network, beginning with ones that are highly visible, attract attention and do not require a significant amount of time and effort, and then moving to opportunities that provide more detail on different aspects of the story. A book is a good example of an information network approach. The story that the author wants people to engage in is contained in the chapters, but to motivate people to start reading the book designers use a cover to attract attention so people see and pick up the book, a back cover to entice them to open the book, excerpts and other information on flyleaves to motivate them to start reading chapter one, and so on. Books are designed this way because it matches the process people use to choose and use information.

This is the approach being used to develop the Aquatic Health Interpretive Network for Malheur NWR. For visitors, highly visible, low effort and interesting strategies, such as interpretive panels, in or adjacent to areas already frequented by visitors (so additional cost in time to access the panel is minimized) will attract attention and quickly introduce people to key concepts, hopefully piquing their interest so they are more amenable to spending time with other opportunities that provide more detail. Successive levels of information providing more detail and requiring more time and effort, such as the

exhibits, will build off the panels. Additional detail is offered primarily using outreach strategies, such as a web site.

Key Factors in Determining Strategies

The following factors had significant impact on determining what strategies would be most effective to achieve the goals established for the Aquatic Health Interpretive Network for Malheur NWR.

1. This is the Aquatic Health Interpretive Plan for Malheur National Wildlife Refuge; not an Interpretive Master Plan for the entire refuge. Consequently, it only includes and addresses interpretive strategies that focus on or support the goals related to aquatic health. This is not to suggest that strategies focusing on other aspects of cultural and natural history are not important. They are quite valuable in establishing a connection between visitors and Malheur NWR. They are simply not the focus of this planning effort.
2. The Management Direction for Interpretation in the recently completed CCP included a number of directives that depended on capacity (staff or volunteers) for implementation, such as presentations on a regular basis and the use of social media (which requires frequent inputs of time to keep them current). Since that time the USFWS has eliminated the staff position at the refuge responsible for coordinating volunteers and docents, providing presentations and directing outreach and environmental education efforts. That situation may change, which means that this plan is being created during a transition period when the level of future resources for this effort is unknown. Consequently, an assumption was made that regardless of whether additional capacity to handle such duties is added back to the staffing at the refuge in the future, the plan would focus on low maintenance non-personal strategies to the extent possible, and on building capacity in organizations (such as the Friends group) that can in turn increase the capacity for dealing with this issue.
3. Creating a broader base of support for the efforts to manage carp will require capacity, which potentially could come from the Friends of Malheur, who are already doing what they can to support the campaign against carp. However, increasing the membership in the Friends Group will require strategies that themselves require capacity, such as social media, presentations, information updates, web site that stays current, and traveling exhibits. Consequently, the initial priority in terms of implementation will be on strategies that can generate capacity at the lowest possible cost to the USFWS in terms of time.
4. Although the network of orientation, wayfinding and interpretation at the refuge could be improved, upgrading and/or adding to those opportunities for the most part is a lower priority than creating outreach opportunities due to the potential of such opportunities to reach more people and have more impact.
5. A majority of visitors to Malheur NWR come for a specific type of experience, such as angling, hunting, or birdwatching. If an interpretive opportunity is to be successful, it must mesh with and add to the desired experience rather than compete with it. For example, offering birding information to birders provides an opportunity to *add* information related to key messages the USFWS wants to communicate regarding carp because the birding information is of value. In contrast, an interpretive opportunity that appears to be solely about carp is not as likely to be

effective, especially if lengthy, because in a sense it competes with the experience in which the visitor wants to engage.

6. Malheur does not have relatively high visitation, nor does it contain numerous areas of visitor concentration. Consequently, fixed on-site opportunities, which are relatively expensive and limited in terms of the amount of information that can be conveyed, will be limited.
7. The USFWS currently has a number of interpretive panels, publications, exhibits and other materials to support on-site visitor experiences, whether birdwatching, angling, hunting, hiking or engaging in other recreational activities. As noted in the parameters, with the exception of the CD for the Auto Tour, none of the information materials contain any mention of the carp issue. At this time, revising those publications and materials to include information on carp is a low priority because they already facilitate experiences desired by visitors, which results in important personal connections between visitors and the refuge. Consequently, the plan does not contain suggestions for modifying existing publications and materials, but focuses on adding a few key interpretive opportunities to communicate the key points. However, when the time comes to reprint publications, that information should be included.

On-site Interpretive Network

Overview

The most likely achievable goals in communicating to visitors on-site are:

1. Increase awareness of the scale and magnitude of the issue, the current impacts and the potential implications if it is not dealt with.
2. Increase membership in the Friends group (through increased awareness of the issue, potential future projects for the Friends of Malheur, and facilitating joining).
3. Provide additional information for delving into a story that could be used in a different setting that doesn't interfere with the desired experience, such as at home.

To those ends, the recommendations for interpretive opportunities focus on those areas with the highest level of visitation by people who are likely to provide support and areas that are at least along the travel routes of people visiting the area.

Headquarters

Overview

Headquarters is the single most important location from an interpretive perspective on the refuge because most visitors visit headquarters at some point in their on-site experience. Consequently, it can and does function as a hub, distributing interpretive publications and materials, offering exhibits in a small museum, and providing a person to answer questions. Within the array of opportunities are several that include a focus on carp, including the exhibits in the museum and a large wooden model of a carp (pictured below) with a brief panel implying that a problem exists with carp, but requiring visitors to go inside to get more information. The original intent of the sculpture was to have people 'de-scale' the carp by buying scales on the sculpture with the money going to support carp management. At this time the scales have not been put on the carp so people are buying scales and putting them on the sculpture.



Figure 1: Carp carving and associated sign at Malheur NWR Headquarters

In creating a network of opportunities at Headquarters it is important to take into account why people are there. In the case of people seeking to hunt, fish, or engage in opportunities not available at Headquarters, it is usually to obtain information to facilitate the experience they want. The route to and from the upper parking area is therefore a critical location for any outdoor interpretive opportunities designed to reach those audiences.

Birders and photographers are more likely to wander around the site in their search for different species of birds, but sites visually accessible from both parking areas and along the access routes to the main building at Headquarters are still important locations because signs located in those areas will be seen.

In an effort to capture and hold the attention (even briefly) of all visitors to the refuge, the fixed strategies recommended at Headquarters include interpretive panels around the Visitor Center in view of people approaching the building, interpretive panels for the Headquarters Overlook near the watchtower and an array of exhibits in the museum that differs from what is there currently.

Non-fixed non-personal strategies include a brief brochure focusing on the issue of carp and how to become a member of the Friends Group that will be distributed at the headquarters building and in the museum and a brief Introductory Video as one of the exhibit opportunities in the museum. Follow-up detail will be offered using electronic media, such as a web site, that will probably be used when visitors are off-site.

Personal strategies depend on the capacity of the USFWS and on the ability of outside groups, such as the Friends of Malheur to provide capacity. At a minimum, the plan recommends a person dedicated to providing information about carp be present during time of high visitation.

Concepts for Interpretive Strategies

Note: The recommendations do not preclude other interpretive opportunities not associated with carp being located at Headquarters and various points around the refuge. Those serve an important purpose in helping to establish meaningful connections between visitors and the refuge, thus increasing the sense of value visitors have for the refuge. The following strategies specifically address the aquatic health issue.

Headquarters Overlook Interpretive Panel Cluster

Location

Headquarters Overlook. The combination of high visitation to Headquarters, easy visual and physical access to the site and view of Malheur Lake and lower Blitzen Valley make this a good place to locate interpretive panels.

Objectives

When people finish interacting with these signs, they will:

- Know that Malheur was established to protect migratory and breeding waterfowl, especially birds with plumes.
- Understand the importance of Malheur NWR as a key cog in the system of refuges sustaining migratory birds along the Pacific Flyway.

- Know that carp threaten the entire ecosystem, the birds that depend on it, and therefore, the lives of many people along the flyway.
- Feel inspired to help in some way.
- Donate to or become a member of the Friends Group when given the opportunity.

Key Themes

All key themes should be included in this set of panels.

Description and Concepts

This cluster of interpretive panels should provide an overview of the key stories at the refuge, including providing visitors with a basic understanding of why it was designated a refuge and how important it is to migratory and breeding birds. To provide a complete overview, not just one focusing on aquatic health, the cluster could also have a panel focusing on how the Blitzen Valley has attracted humans and for what purposes over the years to provide a basis for cultural history stories and a panel focusing on the geomorphology story to set the stage for other interpretive opportunities providing more detail on those two stories. However, given the limited resources both for implementing and maintaining interpretive panels and associated viewing areas and the focus on aquatic health, the initial set of interpretive panels should include the ones about establishing the refuge and its importance to migratory and breeding birds along with one about the importance of aquatic health and the threat of carp. Overview panels on cultural use and geomorphology could be located at Buena Vista Overlook to take advantage of the view of the Steens, the rimrock and the Blitzen Valley. The following are descriptions of the recommended panels at this time:

Establishing a Refuge

This panel focuses on the story of establishing the refuge in response to plume hunters wiping out egrets. One possible approach is to use an image of a ladies hat with plumes from that era, an image of the species it came from and an image of the first refuge manager as visuals to help tell the story. (This replaces the panel on the same subject located at the Narrows Bridge pullout.)

Malheur NWR as a hub

This panel focuses on the role of Malheur Lake and the rest of the refuge in the Pacific Flyway as a key resting, feeding and breeding place. It should include SONEC and the impact on a continental level due to aquatic health issues at Malheur. One possible concept is to use a map of North and Central America as a backdrop for a visual indicating the Pacific Flyway with emphasis on the 3 key areas that make up SONEC. Each would have an image of the refuge when it is filled with migratory birds. If possible, a supporting bar graph would indicate the approximate percentage of migratory birds using the three refuges. Associated text would focus on the importance of these areas in maintaining the populations of waterfowl and other migratory birds along the flyway.

Killer Carp

This panel focuses on the impact of carp on the aquatic ecosystem and on the populations of migratory and breeding birds on the refuge. Focus should include impact on people along the flyway who value the migratory birds in some way, such as birders and duck hunters. One possible approach is to use side-by-side visuals of marshland without carp (with emergent vegetation) and one with carp (with no emergent vegetation). Visuals corresponding to impact on specific species of waterfowl would be associated with each marsh visual. For example, one side of the panel could use a marsh with emergent vegetation as a backdrop for images of vast numbers of waterfowl and birds

that depend on that type of habitat and the other half would show marsh without emergent vegetation and the resulting lack of populations of birds.

Comment: To increase the probability that anyone visiting the Headquarters will view the panels, a viewing area should be developed along with the panels. One possible concept is depicted in figure 2.



Figure 2: Headquarters Overlook Interpretive Panel Cluster

Headquarters Pond Interpretive Panel

Location

In front of the Visitor Center where the existing panel on Fluctuating Wetlands is now located, oriented toward Headquarters Pond. This is perhaps the best single location for a panel because most visitors to headquarters will pass this location whether the Visitor Center is open or not.

An alternate location is overlooking the pond at the edge of the parking area nearest the walkway to the main building. However, visitors parking in the lower lot are not as likely to see it, plus it is not proximate to the headquarters building where additional information can be supplied and joining the Friends Group or donating can be easily facilitated and encouraged.

Objectives

When people finish interacting with this panel, they will:

- Know that carp are a significant issue.
- Know that the USFWS has been battling the problem for a long time using a variety of different strategies, but with limited success.
- Feel motivated to support efforts to manage carp.
- Become a member of the Friends Group and/or donate funds.

Key Themes

- **Primary Theme 2.** Carp threaten the entire ecosystem in Malheur NWR, already significantly reducing native fisheries and migratory and breeding bird populations with resulting negative impacts felt all along the flyway.
- **Primary Theme 3.** Managing the carp threat will require a concerted long term effort involving the USFWS and a lot of partners, including you.

Description and Concept

This panel focuses on the losing battle against carp over the last few decades and what it will take (support from the public) to bring the problem under control. One possible approach is to use a historic photograph of the pond below headquarters filled with dead carp - the result of dynamite or rotenone - as a focal point for introducing the issue with carp. An accompanying graph could show the increasing population of carp and subsequent, decreasing populations of birds supported by and produced at Malheur.

Carp Carving Interpretive Panel

Location

Adjacent to the carp carving

Objectives

When people finish interacting with this panel, they will:

- Know that carp are a significant issue.
- Feel motivated to support efforts to manage carp.
- Become a member of the Friends Group or donate funds.

Key Themes

- **Primary Theme 2.** Carp threaten the entire ecosystem in Malheur NWR, already significantly reducing native fisheries and migratory and breeding bird populations with resulting negative impacts felt all along the flyway.
- **Primary Theme 3.** Managing the carp threat will require a concerted long term effort involving the USFWS and a lot of partners, including you.

Description and Concept

This panel also focuses on the battle against carp, but with an emphasis on what can be done, and that public support is needed. It can use the same heading (Scaling Back Carp) but it must communicate the severity of the problem and where money from buying a scale will go (research, signage, etc.). One possible approach is to use a simpler version of the exhibit in the museum that depicts a carp 'time line' indicating the rising population of carp with a corresponding drop in populations of breeding waterfowl as a visual, with supporting text focusing on what the public can do to support the efforts.

Museum Exhibits

Location

Museum at Headquarters

Objectives

When people finish interacting with the exhibits, they will:

- Understand that waterfowl that depend on emergent vegetation are particularly susceptible to the impacts of carp.
- Be able to name (or describe) at least two species who's population has decreased significantly due to the impact of carp.
- Be aware that carp are destroying the waterfowl populations at Malheur.
- Be aware of how critical Malheur is - as a key component of the SONEC - for migratory waterfowl along the Pacific Flyway.
- Be motivated to take personal action to help in the battle against carp.
- Join or contribute to the Friends of Malheur.

Key Themes

- **Primary Theme 1:** Malheur NWR is one of the most important wetland complexes in NA, contributing to the quality of life in the surrounding area and on a continental scale.
 - **Sub-theme 1-1:** Malheur NWR is a premier site for waterfowl and other birds, providing invaluable migratory stopover and breeding habitat along the Pacific flyway.
- **Primary Theme 2.** Carp threaten the entire ecosystem in Malheur NWR, already significantly reducing native fisheries and migratory and breeding bird populations with resulting negative impacts felt all along the flyway.
 - **Sub-Theme 2-1:** Carp have significantly reduced the populations of migratory and breeding birds at Malheur by destroying necessary habitat.
- **Primary Theme 3.** Managing the carp threat will require a concerted long term effort involving the USFWS and a lot of partners, including you.

Description and Concepts

Although this space has room for numerous exhibits, the amount of time a visitor is willing to spend reading about carp probably renders detailed exhibits somewhat ineffective. However, the space could be used for the following exhibits that depend more on visuals to tell the story, with limited text:

Exhibit 1: SONEC

This exhibit uses a map of the Pacific Flyway as a backdrop for highlighting the 3 areas comprising SONEC that are critical to the migratory waterfowl on the Pacific Flyway. Images depict the areas full of migratory birds. Supporting text focuses on the danger to the flyway if any of these areas are significantly compromised. This is primarily visual. The point is for people to be able to grasp very quickly that Malheur is one of three key areas providing a critical link between the northern and southern parts of the flyway.

Exhibit 2: The Destruction of Malheur Marsh

This exhibit uses a 'carp timeline' depicting the rising population of carp over the years overlain by a graph of waterfowl production to visually depict that as carp populations increase, waterfowl production drops. The timeline could include images depicting various actions that have been taken, such as using dynamite and rotenone. The graph should indicate a short-term drop in carp population followed by a recovery, indicating that the success of such actions has been short term. It could also include images depicting the flooding of the Silvies River and the subsequent increase in carp populations. Again, the point is for visitors to quickly grasp that more carp mean fewer waterfowl. As an option, a push button could activate sounds of waterfowl when the marsh is full, with corresponding text pointing out that such a sound may become extinct if carp cannot be brought under control.

Labels for Taxidermy Exhibits

These are simply tidbits of information about the impact of carp on specific species. The tidbits are associated with the specimen of that species.

Note: *The museum should also distribute the Friends version of "Refuge Waters in Peril" to help facilitate visitors joining the Friends of Malheur.*

Introductory Video

Location

This could be shown in the museum, used by presenters, be accessible on web sites (Friends Site and USFWS site) and distributed to educational institutions and others.

Objectives

When people finish viewing this video, they will:

- Know that the production of breeding and support of migratory waterfowl is well below historic levels due to the impact of carp.
- Know that the carp threaten to make the entire ecosystem collapse.
- Be inspired to support, such as by becoming a member of the Friends Group and/or donating time and money.

Key Themes

All key themes and sub-themes should be covered.

Description and concept

It would be a short overview of the key points - the importance of Malheur Lake in its own right and as a part of SONEC to migratory and breeding birds, the threat posed by carp and resulting impact all along the flyway, what is being done and what people can do. One possible approach is to use visuals to emphasize what visitors are already not seeing (in terms of numbers / species) and what else they may not be able to see in the future if the carp problem is not brought under control. A brief overview of what has been tried and current efforts - supported by many people outside the USFWS - will not only emphasize the magnitude of the problem, but may also communicate the key message that "people just like me are helping to solve this problem." Becoming aware of what they have already missed out on (if it is something they value) and what might be lost may motivate people to become involved, as will knowing that others like them are already involved. Consequently, it is important to facilitate involvement at that point, such as by making it possible for visitors to join the Friends Group or donate it some way be ensuring that an application form and/or donation box is visible and easily accessible.

"Refuge Waters in Peril" publication: Friends of Malheur version

Objectives

When people finish reading this publication, they will:

- Be a aware of the severity of the carp issue at Malheur.
- Understand that negative impacts are being felt all along the Pacific Flyway.
- Feel a sense of urgency to get the problem under control.
- Join the Friends Group or provide support in some way.

Key Themes

All key themes should be covered.

Description and Concept

The existing 'Refuge Waters in Peril' is a good publication with a lot of basic information that needs to be communicated in this information network. However, given the current need to bolster the Friends group to the point where they can offer assistance in the form of supporting social media, volunteers and in other ways, a different publication containing much of the same information is needed - one that comes from the Friends Group - with information on how the Friends group is planning to help and how to join. It should contain an application form for joining the Friends of Malheur.

Peak Visitation Carp Issue Volunteer

Objectives

When people finish interacting with this person, they will:

- Be aware of the severity of the carp issue at Malheur.
- Understand that negative impacts are being felt all along the Pacific Flyway.
- Feel a sense of urgency to get the problem under control.
- Join the Friends group or provide support in some way.

Description

During periods of peak visitation, notably in the spring, this person (or people) would be at a table on the deck near the carp sculpture where they can distribute literature, answer questions, and take membership applications to the Friends group and donations for the battle against carp. (This was employed during the last 2 weeks in May, 2014, when the refuge was conducting a test commercial harvest of carp).

Remainder of Refuge

Overview

For the rest of the refuge, on-site fixed strategies include interpretive signs at key locations where visitors already stop or can be easily induced to stop, such as at Buena Vista Overlook, the Narrows Bridge pullout, and the P-Ranch. Strategies at sites immediately adjacent to the refuge, such as Page Springs Campground, Frenchglen, and the Narrows, function as distribution points for orientation, wayfinding, interpretive and other literature and non-fixed strategies to enhance the experience different visitors are seeking.

***Note:** Although Wright's Point is a key point along the access route from Burns due to its ability to capture attention and the views it affords of the Blitzen and Silvies valleys, it is not included in this plan because it is not a high priority in terms of Aquatic Health. In an overall interpretive plan for the refuge, Wright's Point should be seriously considered for introductory panels.*

Narrows Bridge Pullout Interpretive Panels

Location

Along the edge of the wide pullout at the Narrows Bridge overlooking Malheur Lake. This is the best close-up view of the lake easily accessible to the majority of people traveling to visit the refuge, drive the Steens Loop or traveling the highway for other reasons, and the best place to view a feature associated with the battle against carp (the trap on the west side of the road). Consequently, it is a good location for interpretive panels that communicate key points.

Objectives

When people finish interacting with these panels, they will:

- Know that carp have been destroying the waterfowl habitat on Malheur Lake.
- Know that the USFWS has been battling the problem for some time, with limited success, but is continuing to try to find a solution.
- Feel concerned about the future of waterfowl populations at the refuge.
- Understand the importance of Malheur Lake to the waterfowl using the Pacific Flyway.

Key Themes

- **Primary Theme 1:** Malheur NWR is one of the most important wetland complexes in NA, contributing to the quality of life in the surrounding area and on a continental scale.
 - **Sub-theme 1-1:** Malheur NWR is a premier site for waterfowl and other birds, providing invaluable migratory stopover and breeding habitat along the Pacific flyway.
 - **Sub-theme 1-2:** The migratory birds depending on Malheur are important to different recreational pursuits, and therefore quality of life, for many people along the Pacific Flyway.
- **Primary Theme 2.** Carp threaten the entire ecosystem in Malheur NWR, already significantly reducing native fisheries and migratory and breeding bird populations with resulting negative impacts felt all along the flyway.
 - **Sub-Theme 2-1:** Carp have significantly reduced the populations of migratory and breeding birds at Malheur by destroying necessary habitat.
- **Primary Theme 3.** Managing the carp threat will require a concerted long term effort involving the USFWS and a lot of partners, including you.

Description and Concepts

The following panels focus specifically on the carp issue rather than providing an overview of the cultural and natural history of the refuge. Panels on those topics are recommended for other locations. Specifically, the existing (or a new) panel on the Northern Paiutes is suggested for the Buena Vista Overlook and a panel focusing in part on plume hunters being a catalyst for establishing the refuge is now recommended for the Headquarters Overlook.

Panel 1: The Swan Song of the Swans

The panel focuses on the significant decline in production of waterfowl and use by migratory waterfowl due to the impact of carp. One possible approach is to compare how many swans Malheur Lake supported historically and how many it now supports because of destruction of habitat by carp. The header should relate to birds (or not seeing birds) because that is the likely reason most people stop at that pullout. For example, the image could be of a wetland full of swans with the heading as noted. The visuals must dominate and the text must be minimal.

Panel 2: It's Everyone's Problem

This panel focuses on the need to control carp outside the refuge because the USFWS does not control the entire watershed and because the aquatic health of Malheur affects everyone in the local area in some way. One possible approach is to use images of anglers, ranchers and duck hunters to highlight impact on local residents, and to highlight the Harney Basin Wetlands Initiative as evidence of the widespread support for controlling carp.

Panel 3: Confining the Carp

This panel uses the carp control structure to introduce what is being done and needs to be done to control the carp. It should include the importance of research due to the unprecedented magnitude and scope of the project. One approach is to use a series of images depicting other strategies, such

as the use of rotenone, the use of dynamite and the experiment with commercial harvest. The latter is important because it is recent, indicating that the USFWS is actively continuing to try to find ways to control the carp.

Note: A sign simply saying "Carp Control Structure" with an arrow would help raise awareness, at least at a basic level, that an issue exists. Even an increase in awareness can be a positive impact as it increases the likelihood that someone will pay attention to information about the carp in the future.

Buena Vista Overlook Interpretive Panel Cluster

Location

Buena Vista Overlook (replaces existing panels)

Objectives

When people finish interacting with these panels, they will:

- Understand the importance of the Blitzen Valley to Native Americans and later arriving settlers and others.
- Understand that the Blitzen Valley is also important for breeding and migratory waterfowl - not just Malheur Lake - and that it too needs to be protected from carp.
- Be motivated to help in some way.

Key Themes

- **Primary Theme 1:** Malheur NWR is one of the most important wetland complexes in NA, contributing to the quality of life in the surrounding area and on a continental scale.

Additional themes for these panels would be derived from an overall Master Interpretive Plan for Malheur, but should focus on how the resources of the Blitzen Valley dictated cultural activity and history in this area, and how faulting was a major force in creating the landscape a visitor sees today.

Description and Concepts

Because everyone who arrives at this point will have traveled through a semi-arid environment, one story supported by the visuals at this site is the elevated importance of water, and therefore the Blitzen Valley, to all living organisms in a semi-arid region. The visual landscape also includes the Steens (as the source of water) and clues to geomorphologic events that shaped the area. The Buena Vista Overlook is also an elevated vantage point, providing an opportunity to compare features on a large scale. Consequently, the panels suggested to replace those now located there use those visuals as the focal points for interpretive stories.

Panel 1: Blitzen Valley as an Oasis

This panel focuses on the elevated importance of water to living organisms in a semi-arid environment, and that the water of the Blitzen Valley is key to the cultural and natural history of this area. It supports the vegetation and offers habitat to migratory and breeding birds and other wildlife that were important resources for the people who inhabited or used the area - from the Northern Paiutes, to the plume hunters, to Pete French and other early ranchers, present day ranchers and farmers (who desire the water) and others. Increasing understanding of the importance of water helps people understand the importance of aquatic health. This low-angled panel would be oriented

directly out over Buena Vista Marsh. One possible approach is to show a series of vignettes depicting how successive groups of people have used and continue to use the resources of this area over time.

Panel 2: The First Inhabitants

This panel focuses on the Northern Paiutes and their use of and dependence on resources of the Blitzen Valley, including Malheur Lake. If Rattlesnake Butte is visible from this location the panel should be oriented in that direction because that feature is important in their culture. One possible approach is to use images depicting how they used different resources of the valley.

Panel 3: Shaping the landscape to funnel the water

This panel uses visual clues in the landscape to briefly show how this landscape was formed by geomorphologic events, leading to the formation of the Blitzen Valley today. One possible approach is to show how the area looked at different points in geologic history to highlight the faulting that formed the Steens and other features, and dictated the route of the Blitzen River. This panel would be oriented so the rimrock to the south and the Steens were in the visual field and designed using those features to help tell the story.

Panel 4: It's not just Malheur Lake

This panel focuses on the importance of the Blitzen Valley to breeding and migratory waterfowl to ensure that visitors do not believe that Malheur Lake is the only resource important to such species. One possibility is to use the scene as a backdrop for a series of enlarged visuals depicting different species of breeding and migratory waterfowl that use different parts of the area below.

P-Ranch Interpretive Panels

Location

P-Ranch parking area

Objectives

When people finish interacting with these panels, they will:

- Understand the importance of water in dictating EuroAmerican cultural activity in the area - past, present and future.
- Understand the role of Pete French and cattle ranching in shaping the upper Blitzen Valley.

Key Themes

The themes for these panels would be derived from an overall Master Interpretive Plan for Malheur, but should focus on how the resources of the Blitzen Valley dictated cultural activity and history in this area.

Description and Concepts

This area already contains interpretive panels focusing on EuroAmerican history and on the role of Malheur on the Pacific flyway. Because the landscape is dominated by cultural artifacts it is the best place to tell the story of Pete French and other EuroAmerican settlers in the area. When it comes time to replace the panels, they should still focus on the cultural story, but should include one about present day culture and how it still depends on water from the Steens and resources from the Blitzen Valley.

Note: *Including a panel about the role of Malheur in SONEC and the Pacific Flyway is an option, but the landscape is telling a cultural story, so that is likely to be a visitor's focus. Also, most people who visit the P Ranch are likely to visit one of the sites with panels that focus on the natural history of the area.*

Note: *The new panels could include the story of the pig issue as a vehicle for highlighting the problems with invasives, which would help communicate the key concept that invasives disrupt natural ecosystems, which ties to the carp story and to efforts by the USFWS to eradicate pepperweed and other invasives.*

Adjacent Sites

Although fixed interpretive opportunities are not recommended for off-site locations adjacent to the refuge, such as Page Springs Campground, those locations can still play a key role in the interpretive network as places for distributing interpretive materials, such as auto tour information and the visitor map/brochure. Those places at which people spend the night, such as the campground and Frenchglen Hotel, also represent locations for the presenting programs in the evening focused on the carp issue at Malheur. Finally, the Traveling Exhibit described in the next section could be located at the hotel periodically.

Outreach Interpretive Network

Introduction

Due to the importance of generating widespread public support and the relatively small level of visitation at the refuge, the outreach interpretive network will be critical for achieving the goals and desired outcomes. To get the most return on investment, the outreach network should take advantage of existing communication channels to reach audiences who are already interested in the type of resource endangered by the carp and therefore have a higher probability of joining or donating to the Friends of Malheur, who in turn can help support activities focused on managing carp. This includes members of the Audubon Society and other birders, members of the Izaak Walton League, members of Ducks Unlimited and other waterfowl hunters, the Sierra Club and similar organizations. Such organizations typically have mechanisms already in place, such as newsletters (paper and/or electronic) that could be used to provide updates and news on the efforts to manage carp and what members can do to help. Such organizations also typically have meetings and events where traveling exhibits could be displayed and presentations made regarding the issue. In addition, the USFWS already has a few conduits for communication, such as the Friends of Malheur and other USFWS refuges. Refuges along the Pacific Flyway that are affected by the carp situation at Malheur NWR represent key opportunities to communicate information to people who are already affected by what is happening at Malheur Lake.

Overview

Although the outreach network does depend in part on physical and digital components, such as a Presenter's Kit, a Traveling Exhibit and an Internet presence, the key for success is capacity. Someone's time will be required to keep the Internet presence up to date and to use Facebook sites and Twitter effectively. Time will also be required to schedule and oversee shipment of the Traveling Exhibit and to provide a steady stream of information to organizations and individuals. The purpose and value of supplying a information on a regular basis is to keep a spotlight on the issue.

Concepts for Strategies

Traveling Exhibits (with accompanying literature)

Traveling Exhibits would require an initial investment of time and resources, but could then be used with minimal demands on staff time. If the Friends group managed the schedule and shipping of the exhibit, the demands on USFWS time would be even less.

Objectives

The specific objectives will depend on the content of the exhibit, which will be adjusted for the target audience. However, at a minimum, people interacting with this exhibit will:

- Understand the severity of the carp issue at Malheur.
- Understand that people all along the Pacific Flyway are being affected by the carp.
- Know that people from all walks of life are concerned about the problem and getting involved.
- Know that the aquatic health of Malheur affects their quality of life.
- Have literature providing additional detail.
- Have the information necessary to join the Friends group or provide support in some other way.

Key Themes

- **Primary Theme 1:** Malheur NWR is one of the most important wetland complexes in NA, contributing to the quality of life in the surrounding area and on a continental scale.
- **Primary Theme 2.** Carp threaten the entire ecosystem in Malheur NWR, already significantly reducing native fisheries and migratory and breeding bird populations with resulting negative impacts felt all along the flyway.
- **Primary Theme 3.** Managing the carp threat will require a concerted long term effort involving the USFWS and a lot of partners, including you.

Specific sub-themes and supporting stories depend on the audience being targeted. For example, if the exhibit were being presented at a meeting of anglers, Sub-theme 2-2 (Carp negatively impact native fish populations) would be a focal point. For presentations at refuges in Alaska, Sub-theme 1-2 (The migratory birds depending on Malheur are important to different recreational pursuits, and therefore quality of life, for many people along the Pacific Flyway) could be a focus.

Description and Concept

Ideally, the traveling exhibits would be the type that are easy to modify so a variety of different exhibits can be put together using the same structure, but with different text, images and other visuals. The structure should also have the capacity to mount a brochure holder, or distributing the "Refuge Waters in Peril" (Friends version) and other literature. Figure 2 depicts one type of traveling exhibit. Specific exhibit layouts could be designed and all the necessary information packaged together so the exhibit could be shipped to the next location and easily set up by anyone. These exhibits could be used at meetings of different potentially interested groups, events, and at Visitor Centers associated with other refuges, especially ones along the flyway, and similar locations. The small brochure about the carp issue with information on how to join or donate to the Friends group would be a part of the package.

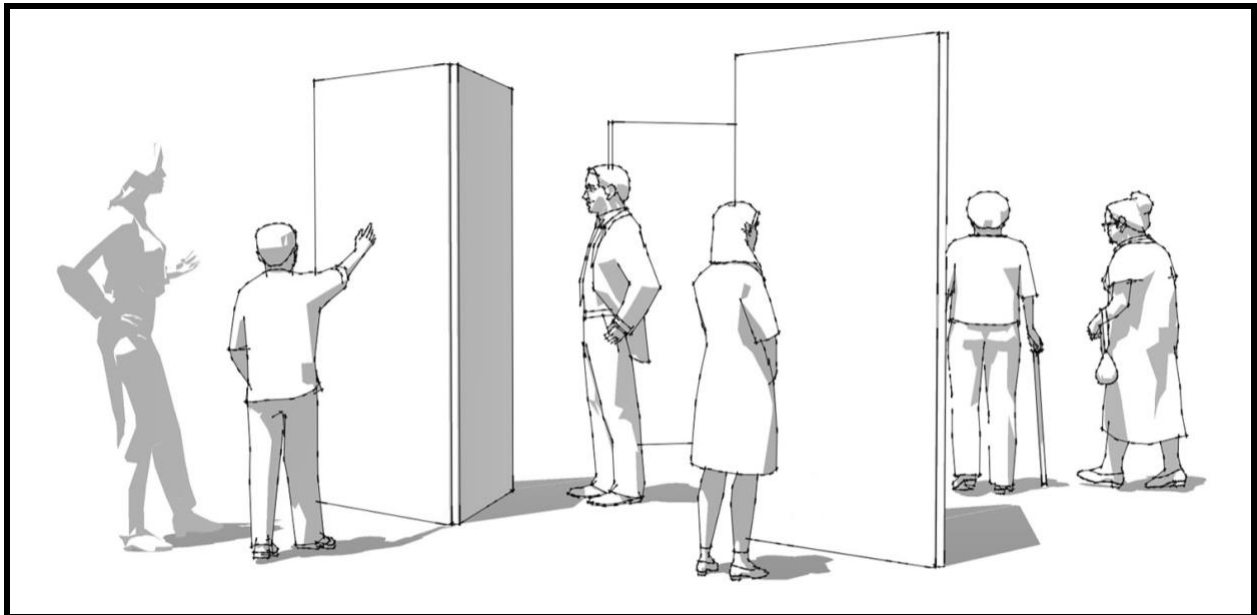


Figure 3: Example of a Traveling Exhibit

Presenter's Kit (and presentations)

Objectives

The primary objective is to facilitate effective presentations by providing an array of tools.

Description

Presentations would be given by USFWS personnel when possible, or credible sources, such as scientists at Universities studying aspects of this issue. USFWS personnel giving the presentations would be a time intensive strategy, but could yield the most progress toward goals because of the opportunity to tailor the presentation very specifically to the group, to answer questions and to facilitate involvement. It may be possible to provide materials and information to members of the Friends of Malheur to give such presentations. However, using USFWS personnel sends the message that "this issue is so important that we are committing personal time to try to address it," which can be valuable in enlisting support.

To facilitate such presentations, a Presenter's Kit should be developed that includes the following:

- Traveling exhibit structure with setup instructions and all necessary components (photos, maps, text blocks, other visuals, brochure holders, etc.)
- Several PowerPoint programs with scripts, each focused on a specific type of audience
- Introductory Video
- Map of Pacific Flyway with SONEC highlighted
- Refuge Waters in Peril publication (Friends version)
- A smaller version of the 'Scaling Back Carp' display at Headquarters. This provides attendees the opportunity to donate by purchasing a 'scale,' a tangible reminder of the issue.

Information Distribution Coordinator

Description

This is simply a person to handle distribution of information by performing the following tasks:

- Keep the Friends website updated regarding the carp issue
- Maintain a presence on Twitter
- Create and keep Facebook pages up to date
- Supply groups such as Audubon, Ducks Unlimited, the Izaak Walton League and others, with information - electronically - on a regular periodic basis. Those groups can put the information into newsletters, present it as brief updates at meetings or use it in other ways.

The Information Distribution Coordinator could be a USFWS person, but given the lack of capacity at the refuge, it is more likely the position would be filled by someone brought on for that purpose by the Friends group or a volunteer.

Social Media (Facebook and Twitter)

Description

Although capacity at the USFWS, and especially at the refuge, may not allow for investment of the time necessary to make full use of social media, utilizing such avenues of communication - if done properly - can significantly increase the effectiveness of the network by keeping people informed on a relatively constant basis and leveraging people to reach more people. They are also preferred avenues of communication for a significant segment of the public. Therefore, the plan includes such strategies under the assumption that an organization such as Friends of Malheur - if supported sufficiently by the public - could invest the time necessary to create and use these channels of communication, and that the USFWS would do everything possible to support that effort.

Facebook

The key to using Facebook is to first develop pages that appeal to specific groups of the target audience and then provide a continual supply of information they want to reach the point where they are regular users. You then have the opportunity to add information on the carp issue, preferably tied to their area of interest. Consequently, different Facebook pages need to be developed for different groups. At a minimum, a Facebook page for birders should be developed, but one for duck hunters and possibly anglers could yield enough use and generate enough support to be worth the investment.

- **Facebook page for birders:** The flow of information would primarily focus on birds - what is arriving; what rare birds have shown up; what the prospects are for a good birding year, etc. But within that flow of information the sender can periodically include updates on the battle against carp. Birders will send it to other birders, whether ones likely to visit or people from further away, thus increasing the dissemination of the message.
- **Facebook page for duck hunters:** Essentially the same concept, only using information likely to be of interest to duck hunters.
- **Facebook page for anglers:** Essentially the same concept, only using information likely to be of interest to anglers, such as fishing conditions.

Twitter

Twitter works best when it is used for a "news flash" that includes a link to another on-line source of information, such as a web site, where a person can get more information. Again, the 'news' must be geared toward the user using appropriate hashtags.

Friends of Malheur Website

Note: This site already exists. This simply contains suggestions for tweaking the site to help meet the goals and objectives of the plan.

Objectives

Ideally, when people finish interacting with the information about carp on this website, they will:

- Understand the severity of the carp issue at Malheur.

- Understand that people all along the Pacific Flyway are being affected by the carp due to impact on breeding and migratory birds.
- Have literature (by downloading it) providing additional detail.
- Know what SONEC is and why it is important.
- Have the information necessary to join the Friends group or provide support in some other way.
- Be motivated to join the Friends group and/or provide support in other ways.
- Be aware of upcoming projects in which they could be involved.
- Know that the website is a source of up-to-date information on the battle against carp at Malheur.

Description

One key to generating and maintaining interest in the carp issue is to make information regarding the issue prominent and up-to-date. Both send the message that the issue is important. If the information is hard to find or not kept updated, people will get the impression that it's not that much of an issue. In a world with so many projects and issues clamoring for the public's attention and support it is important to move this issue to a high priority on their list and keep it there. In this case it means highlighting the issue on the home page, highlighting the Friends ongoing participation in addressing the problem (helping fund the Sodhouse Dam trap and the 2014 test commercial harvest, and staffing an information table during the commercial harvest), and highlighting current and upcoming opportunities to get involved. Although the carp story was prominent in the spring, 2014 newsletter, currently, it is hard to get a sense of the magnitude of the threat of carp from browsing the website.

Action Plan (Priority for Implementation)

Introduction

The current combination of parameters (circumstances) associated with addressing the carp issue through interpretation creates difficulty in providing a clear blueprint for actions over the long term. Since the on-site staff is not likely to have the capacity to provide personal services necessary to provide a steady stream of information using social media, websites and presentations - all key strategies for building awareness and support - the refuge must depend on regional staff or others, notably, the Friends of Malheur. At this point predicting how much staff time and money can be devoted to this issue at the regional level is an unknown. That leaves the Friends group as a key player in the attempt to generate support. They have already provided a great deal of support through helping to fund the Sodhouse Dam trap and the 2014 text commercial harvest, providing people to staff an information desk during the commercial harvest, and engaging in other activities. However, at this point, they also do not have the capacity to provide the necessary level of support to maintain an up-to-date social media and internet presence at the level recommended in this plan, while also providing personal services at the refuge for creating a higher level of awareness among visitors, and while also providing capacity for presenting the issue at meetings of special interest groups likely to be amenable to supporting the control of carp, such as Audubon and Ducks Unlimited. All are roles they could take on if they had enough support. In short, no one group can be counted on at this time to provide the capacity necessary to implement elements of this plan requiring capacity, nor the time to build the necessary capacity. With that in mind, the following recommended course of action should be reviewed on a regular basis at a minimum, and especially if the situation changes significantly in terms of potential funding or sources of volunteers.

The highest priority is to go over this plan with the Friends of Malheur and discuss the role of the USFWS and potential role of the Friends in specific project, notably, recruiting and coordinating volunteers to provide a personal presence during high visitation times at the refuge, modifying their website to indicate the priority of addressing the carp issue and begin the process of developing the Friends version of the "Refuge Waters in Peril" publication among other actions. Those discussions should lead to a re-working of the agreement between the USFWS and the Friends group so it clearly identifies the agency's greatest needs in the short term.

Phase 1

On-site Strategies

Although those *not* visiting Malheur are a critical audience because of their significantly larger capacity to provide needed support, those visiting Malheur should not be ignored as a critical audience. They are the easiest audience to reach in terms of raising awareness of the issue because they are already on-site, and most already value Malheur and its bird life, so they are likely to provide support in some way. At the time this plan was written (2014), it was possible to spend 3-4 days birding at Malheur, or engaging in other activities, and not be aware of the magnitude or severity of the carp issue. Implementing the recommended on-site strategies will increase the likelihood that most visitors to Malheur will come away with a higher degree of awareness of the scale, magnitude and serious nature of the issue, with a commensurate increase in support for the Friends group and for actions by the

USFWS to deal with the issue. Those visitors then reach more people as they become spokespeople for the carp problem and need for support. The following are the strategies most likely to generate the desired results:

Headquarters Overlook Panel

Headquarters Pond Panel

Carp Carving Panel (along with putting scales on the carp so it can be 'de-scaled' so visitors who donate leave with a memento reminding them of the issue)

Recruit and coordinate volunteers to provide a presence at Malheur NWR Headquarters during high visitation months as they did during the 2014 test commercial carp harvest (this may be a project that can only be taken on by the Friends Group given the shortage of capacity at the refuge)

Off-site strategies

Given the uncertainty regarding capacity for presenting programs, the initial focus is on strategies that can stand alone, and on preparing the tools that will facilitate presentations. These include:

Traveling Exhibit. As with the panels, this requires an initial investment of resources, but then it can work to help build support without requiring significant staff time and expense, especially if distribution is managed by the Friends group.

Basic Presenter's Kit. This includes a PowerPoint with script, map and other visuals focusing on the impact of carp, the role of Malheur in SONEC and other materials for distribution. The Introductory Video should be a part of the kit, but production can be delayed until Phase 2 if funding is not available.

Coordinate with the Friends of Malheur. As noted, the Friends group is in the best position and the most likely group of people to increase capacity at the refuge through donation of time and financial resources. They need to be made aware of the role they can play, and provided with some direction on how to go about realizing that role. High priority actions for this group include the following:

- Revise the website to feature the carp issue as a high priority
- Create the Friends version of the *Refuge Waters in Peril* publication
- Recruit and coordinate volunteers to provide a personal presence at Headquarters during high visitation times as they did during the testing of the commercial carp harvest in 2014.

Phase 2

Ideally, when developing the interpretive network can move to Phase 2, the Friends of Malheur would have built up enough support to provide the capacity for an aggressive presence on social media and the Internet as well as providing regular information to people and groups through news releases about progress and research relating to controlling carp, opportunities for volunteers and opportunities for volunteer science related to the carp issue. This depends in part on what happens in Phase 1. At a minimum, the goal is to schedule and begin to give presentations to special interest groups along the Pacific Flyway, such as Ducks Unlimited, the Izaak Walton League, Sierra Club and Audubon, and to

schedule a traveling exhibit to be set up for a period of time at fish and wildlife refuges, nature centers and similar facilities along the flyway. The majority of resources should go to this effort rather than creating new on-site opportunities, although the on-site network should continue to expand to the extent possible. The outreach effort should include adding to the Presenter's Kit and creating multiple sets of materials so presentations can be made in more than one location at a time. They should also include developing and managing the recommended Facebook pages. In summary, the recommended strategies for this phase include:

Introductory Video. This is an excellent stand-alone strategy that can be disseminated and used in a variety of locations physically and digitally.

Facebook pages. The highest priority for pages are the ones for birders and duck hunters.

Narrows Bridge Pullout Interpretive Panels. The Narrows is the next best place other than Headquarters for visual accessibility to people traveling to or adjacent to Malheur. Buena Vista Overlook is also a good location, but the panels at the Narrows Bridge appear to need replacing sooner than the ones at the Overlook.

Future Phases

At this point the entire plan should be reassessed in light of new research, changes in information delivery technology, progress on controlling the carp, and impact of strategies implemented to date.

Appendix 1: Background Information

Audience Profiles

Introduction

Information - including interpretation - is a commodity; people have to buy it with their time and attention, highly valued personal resources. Since different people "buy" different communication experiences, it is important to identify and then profile the specific target audience(s) you want to reach. Ideally, the audiences you want to reach are ones that will help achieve your goals. Consequently, the target audiences for this interpretive network extend beyond visitors to include anyone who will contribute personal resources, such as time and money, to supporting Malheur NWR in general, and the battle against carp specifically. Non-visitors are particularly critical in this case because they have the greatest capacity to effect change due to their numbers.

Key Target Audiences

Target audiences were identified based on potential interest in the health of the refuge and potential avenues for communication. Using those criteria, the target audiences can broadly be grouped into the following:

Residents

Residents have a vested interest in the health of the refuge for a number of reasons. Visitors to the refuge, especially birders, support the local economy through purchase of lodging, fuel, food and supplies. Grazing and haying programs of local ranchers and farmers are affected by the health of refuge waters, which is one of the reasons for the broad support of the Harney Basin Wetlands Initiative.

Residents, in general, are aware of the problem and supportive of measures to manage the carp as evidenced by support for the Harney Basin Wetlands Initiative. Avenues of communication with this group are already established. Although residents may engage in interpretive opportunities, it is doubtful that such opportunities will cause any additional significant impact.

Visitors to the refuge

This group typically already values the refuge for some reason. They can be sub-divided into the following target audiences based on their interests:

- Birders, including both independent travelers and organized groups (commercial and non-profit)
- Hunters
- Anglers
- Casual visitors
- Anyone staying at the field station, such as university students taking an offered course and student and other organized groups staying at the field station

These audiences can be reached by information delivery strategies at the refuge, although the strategies have to be tailored to specific interests. Organized groups can also be reached more easily than

independent travelers through personal strategies because of the ability to contact the coordinators and arrange for presentations, tours, etc.

Non-visitors

This is an important group for generating support because of the limited number of people who actually visit the refuge. Non-visitors can be divided into the following:

- **Those who already value a particular resource that is endangered by the carp.** This includes duck hunters (especially ones along the Pacific Flyway), birders, anglers, and people who support natural resource conservation in general, such as members of conservation groups. These particular target audiences are likely to value Malheur NWR by nature of their interests and beliefs. This is possibly the easiest group of people from whom to generate support, not only because of their interests, but because they typically belong to organizations such as Ducks Unlimited, Trout Unlimited and the Audubon Society through which the USFWS can channel information. People in these audiences are not limited to residing in Oregon or the United States.
- **Oregonians.** Although the carp issue is continental in scale due to the importance of Malheur to the Pacific Flyway, Oregonians might value it simply because it is in Oregon and therefore, appeals to their pride in the place they live. This particular group may not belong to any organizations, but could value Malheur NWR because it is in Oregon and enjoys national, if not international stature among specific groups of people. Avenues for reaching this group include traveling exhibits, presentations, television coverage, newspaper articles and similar strategies that reach the general public.

General Audience Characteristics

Regardless of the target audience, it must be assumed that all preferred learning styles and all physical disabilities will be represented. It also must be assumed that children will be a part of any audience. Consequently the following characteristics must be considered.

Preferred Learning Styles

The suggested number of different learning styles depends on the model. The most common model has 3 - visual, auditory and kinesthetic; others have more. Since the audiences are voluntary, offering information in the preferred learning style of the participant is more likely to be successful; if they are uncomfortable it is likely they will choose not to participate. Since all learning styles are likely to be represented in any one group, optional learning environments should be created to accommodate each group. For example:

Hands-on. Set up an environment where visitors can work ideas and concepts out for themselves.

Observation: Set up an environment where visitors can collect, analyze and reflect on information to come up with a concept. That information can be presented in a myriad of forms, such as images,

sounds, text, scents, and textures. It can also be presented in person, although interaction should not be forced.

Social: Most people visit in groups within which social interaction in relation to the information being presented will occur. Create opportunities for groups to discuss ideas. This is especially important for families. Also, if possible, create an environment with the option of asking someone questions.

Those with disabilities

The intent of ADA provisions is to promote equal access to the built environment, and to information, for those with impairments. Braille and audio supposedly address the needs of those with visual impairments; grade and surface of trails and other modifications to the physical environment address the needs of those with mobility impairments; and visuals and text address the needs of those with auditory impairments.

Using a Universal Design Approach, which focuses on creating experiences that can be enjoyed by all parts of the target audience, including those with impairments, involves integration of multiple delivery strategies that include all senses. The result is an overall experience with opportunities that meet the needs of the few while enhancing the experience of everyone.

A Universal Design Approach also benefits our aging population because it is physical limitations, such as deteriorating eyesight, hearing and physical capabilities that are the core of the issues that seniors have with interpretive and recreational experiences, not their age.

Children

Children are a challenge because they have limitations regarding learning in the same way as adults. Whereas adults can learn by processing incoming verbal information based on past experience and existing knowledge, children up to around the age of 8 do not have a vast storehouse of existing experiences and knowledge. Consequently they are primarily focused on acquiring information firsthand. Since they have not completely mastered the symbol system we call "language," they use a human's primary information-gathering tools – their senses – to explore their environment. Therefore, opportunities to touch, smell, taste, see and hear are critical to an effective experience for children. This is an important point because we often focus on the need for activities to be interactive, and believe we have accomplished our goal if they can push buttons. Although the opportunity to interact in such a way increases the attraction power of an opportunity, if it is not an opportunity to discover information using senses, it is not nearly as effective for children in terms of gathering and processing information.

All Visitors

Key Characteristics

- All visitors will expect anyone associated with the refuge to answer basic questions regarding basic cultural and natural history of the refuge.
- Most visitors will expect to have good opportunities to see wildlife (although ease of viewing wildlife depends on seasons and water levels).
- Visitors from every audience will expect orientation information to interpretive and recreational opportunities in the surrounding area (what is there to do around here?), especially opportunities with a similar focus as the refuge (where else can I see wildlife?).
- A significant percentage of visitors can be reached using social media such as Twitter, Blogs and Facebook.
- A significant percentage of visitors are comfortable with and prefer using new technologies such as vodcasts, podcasts and GPS-based tour programs.
- Many travelers plan part of their trip, including general itinerary, prior to arriving. Many will use the INTERNET to access information in order to plan.
- People tend to visit in groups, typically family or friends. Families and other similar groups have a variety of educational levels within the group.
- Families tend to visit more often in summer months, when most schoolchildren are on summer vacation. Older visitors are better represented in the shoulder seasons.

Implications

The following are key implications of these characteristics:

- All on-site staff must be able to answer basic questions and direct visitors to on-site locations where they can obtain additional information.
- New media should be used as part of the information delivery network when appropriate to the audience and situation.
- Orientation and wayfinding information is a priority.
- Interpretive opportunities such as signs and exhibits should be designed to accommodate at least small groups.
- The interpretive program should provide opportunities that allow all members of a family or group to be involved at the same time and place, despite having different educational or experiential backgrounds. This can be accomplished by providing several opportunities in one location, each catering to a different educational level, or a single strategy that is designed in such a way that everyone in the group has an intellectual entry point into that exhibit.

Parts of the interpretive network should be able to be easily changed to take advantage of seasonal changes in audiences.

Activity-Oriented Visitors

Activity-oriented visitors are those engaged in activities that occupy most, if not all, of their attention on a relatively constant basis, such as angling, bird watching, nature study and photography.

Key Characteristics

The following is a list of characteristics shared by many visitors who fall into this category that have impact on identifying and designing effective interpretive opportunities.

- Activity-oriented users often desire orientation information focused on their activity, such as a map of trails or photo points.
- Activity-oriented visitors typically have time available during periods when they cannot or are not likely to engage in their primary activity, and do not need to prepare for their activity, such as in the evenings.
- These users may have others in their group who are not engaged in the activity and are looking for other activities to occupy their time.

Implications

The following are key implications of these characteristics:

- Interpretive information coupled with activity-specific orientation information to reach specific users may be effective in capturing interest.
- Interpretive opportunities fitting the 'free' time of such visitors are likely to be more effective.

Parameters

Introduction

Parameters are those conditions under which an interpretive program must be developed, such as monetary constraints, and under which it must function, such as climate. Identifying parameters ensures selection and development of interpretive and wayfinding strategies and infrastructure that are effective and realistic, not idealistic. The following section contains key parameters that could affect the interpretive program at Malheur National Wildlife Refuge. In reviewing the parameters, it is important to remember that they represent what is, not what should be or what is desired.

Key Parameters

Budget

B-1: Budget for implementing and maintaining interpretive opportunities is minimal. The USFWS has made the decision to shift funding for Visitor Services and Interpretation to refuges with higher visitation than Malheur. Consequently, interpretive opportunities must be low-maintenance.

Staffing

S-1: Staffing is minimal. Contact with visitors will primarily be with volunteers staffing the Visitor Center. The interpretive network should be based on non-personal strategies so it will function even when people are not available. Also, interpretive opportunities should be low maintenance to the degree possible.

S-2: A Friends of Malheur NWR exists. This group has a newsletter (Malheur Musings) an Internet presence (webpage) and Facebook page, and is aware of the issue of carp. This is a potential source of volunteers.

S-3: Volunteers. Volunteers are already used on a regular basis to engage in a variety of activities on the refuge, including visitor services.

Vandalism and Theft

V-1: Vandalism and theft are potential issues. Outdoor signage, kiosks, brochure racks and other structures should be constructed of vandal-resistant materials.

Environmental Conditions

E-1: Weather can be harsh. Outdoor signs and structures must be constructed of materials resistant to the weather conditions.

Physical Infrastructure and Layout

PI-1: Routes within and immediately adjacent to the refuge, and stops of visitors to the refuge are predictable. This helps identify key locations for reaching visitors with interpretive opportunities. The following table contains key routes and stops:

Primary Routes		
Route	Stops	Comments
Highway 205 from Burns to Narrows	Wright's Point Narrows bridge The Narrows	Major access route for birders. Stopping at the Narrows bridge depends on water levels, which fluctuate.
Access road between 205 and headquarters	Headquarters Headquarters overlook	
Lower Central Patrol Road	Benson Pond P-Ranch	
Highway 205 between Narrows and Frenchglen	Buena Vista overlook Frenchglen	
Access road between Frenchglen and Page Springs	Page Springs P-Ranch (side trip)	Route to go over the Steens in summer

Secondary Routes		
Route	Stops	Comments
Upper Central Patrol Road	Buena Vista Overlook	
Krumbo Reservoir Road	Krumbo Reservoir Pond	Krumbo reservoir is frequented by anglers. Birders also frequent the reservoir and several sites along the way, including Otter Pond and Krumbo Swamp. The road will be open year round.
Tertiary Routes		
Route	Stops	Comments
Boat Landing Road	Terminus	This is possibly the best place for getting a close up look at the Malheur Marsh (the view from, the Narrows is typically open water or mud). Water should be present year round.
Rue Red Road		Depending on water levels, this can be another good place to see Malheur Marsh, but it has no natural stopping place.
Road to Double O Ranch	Various along the route	The Double O Ranch is currently closed to the public and has no facilities.

PI-2: The headquarters complex has a small museum. Indoor space is available for exhibits. Note that it already has extensive exhibit on the carp issue.

PI-3: The headquarters has a small visitor area / gift store in the main building. This is also where the literature is distributed and the primary point of personal contact with most visitors.

PI-4: The headquarters has a short trail to a blind overlooking Headquarters Lake.

PI-5: Pullouts along Highway 205 at the narrows are limited and the traffic is fast. The narrows has a long pullout on the east side of 205 and a short one lane road that passes over the carp control structure on the west side.

PI-6: The BLM has an interpretive pullout with kiosk at the intersection of the Diamond Loop Road. This might be a place to put information about the carp issue.

Location and Access

LA-1: Most visitors will arrive by way of Highway 205 from the north. That would require people to drive over Wright's Point, which already has a flat cleared area that would be good for introducing the Blitzen Valley, Malheur and the geomorphology story.

LA-2: Most visitors will go across the narrows bridge. This puts them in close proximity to the carp control structure.

LA-3: Most visitors will arrive by car or RV. Interpretive strategies effective while traveling in a car, such as an auto tour, could be effective. Note that the refuge already has an auto tour on CD and by brochure, but it doesn't include Malheur Lake - a primary focus of the efforts to manage carp.

LA-4: The refuge is remote and isolated. The refuge is not on a main highway. People traveling Highway 205 are likely to be residents, visitors to the refuge, or - in the summer - people visiting Steens Mountain. It is unlikely that interpretive opportunities will draw additional visitors. Consequently, outreach strategies will be crucial for reaching more people.

Policy and Legal Issues

PL-1: All operations must comply with ADA rules and regulations. All information presented within the interpretive network will be accessible in some way for those with disabilities.

Existing Information and Interpretive Opportunities

To the extent possible, the interpretive network should incorporate and complement existing interpretive opportunities. The following are either existing opportunities or potential avenues for reaching people with information:

EI-1: The refuge has a number of publications to facilitate recreational visits to the refuge. However, with the exception of the CD for the auto tour, none of the major publications used by visitors, such as the refuge map, bird list, Blitzen River Auto Tour, Guide to Hunting and others, mention the problem with carp. These publications are already in demand and being used, so they would be a good avenue for raising awareness of the issue.

EI-2: The museum building current has a major exhibit focusing on carp.

EI-3: The deck at headquarters has a large wooden carving of a carp with a small interpretive panel with the title "Scaling back Carp." It is adjacent to the entrance to the visitor center. However, a visitor currently has to go inside to get additional information.

EI-4: The following sites have interpretive panels:

- **Buena Vista Overlook:** Focus on the marsh and its inhabitants, with messaging pertaining to the importance of managing marshes.
- **P-Ranch:** Signs chronicling the Pete French story and the story of the P-Ranch and one on neotropical migrants.

- **Narrows Bridge:** Panels focusing on the harvest of feathers for ladies hats as the impetus for the area becoming protected, a panel on the lake, which includes information on the issues with carp, and one on the Northern Paiute band who lived on the shores of the lake.
- **Boat Landing Road:** A panel on the Caspian Tern Nesting Island.
- **Headquarters:** A panel providing orientation and a bit of information oriented toward Malheur Lake.

EI-5: A Blitzen River Valley Auto Tour contains interpretive information on both the cultural and natural history of the area. It comes as both a publication and a CD. The CD contains information about carp, but not the publication.

EI-6: The refuge has a web site. The site includes a section on aquatic health.

EI-7: The publication *Refuge Waters in Peril* focuses specifically on the issue of carp. It is currently distributed at headquarters.

EI-8: The Oregon Wildlife Webpage has a site on Malheur in Special Projects where people can donate to a Restore Malheur Fund.

EI-9: You can access a Restore Malheur Page on Facebook.

EI-10: A High Desert Partnership exists that appears to be focused on implementing the Harney Basin Wetlands Initiative.

EI-11: The Sodhouse Ranch is open for tours in the fall.

EI-12: The Refuge has a Friends Group that distributes a newsletter (Malheur Musings). Motivating people to just sign up to get the newsletter would create a channel for reaching the public.

Other

O-1: Cell phone reception is limited and not available in some parts of the refuge. Opportunities requiring cell phone technology, such as an Application for an auto tour, are not feasible at this time.

O-2: The refuge is experimenting with a commercial carp harvest in May, 2014. Although the operation will not be visible to most visitors, it will be an opportunity to obtain film and photographic evidence of the numbers and size of carp in the lake.

O-3: Historic images exist of the layer of carp on headquarters pond after it was dynamited. This and similar images would help convey the magnitude of the issue to visitors.

O-4: Lodging in the area is limited. Visitors can stay at the campground at Page Springs, trailers at the Steens Mountain Resort, rooms at the Frenchglen Hotel, the RV park at the Narrows, and a few rooms at the Diamond Inn. Groups often stay at the Field Station during the spring. These are all potential locations for reaching visitors.

O-5: The Frenchglen Hotel is a State Park. This could facilitate setting up evening presentations and/or the Traveling Exhibit at this location.

O-6: The Burns - Hines area contains a BLM office, USFS ranger station and Chamber of Commerce. These are all locations where visitors and locals can and do obtain information on a variety of subjects. Consequently, they are potential locations for publications and visuals related to the campaign against carp.

Appendix 2: Interpretive Planning Process

Identifying effective interpretive opportunities depends on understanding the goals and desired outcomes of those opportunities, the key themes (messages) to be communicated that will achieve those outcomes, the target audiences to be reached, the parameters (constraints) affecting development and functioning of the interpretive network, and the features, specimens, artifacts and landscapes and other tools available for telling stories that communicate the key themes. That information is used to determine the appropriate array of media, the stories to tell, and the interpretive opportunities to develop. The following is a brief overview of the planning process used to develop the Malheur NWR Aquatic Health Interpretive Plan.

Step 1: On-Site Meeting

The planning process began with a 2-day on-site meeting between the planning team and staff. On day one the staff briefed the planning team on the issues, background information and other relevant information. Day two was spent touring key sites on the refuge.

Step 2: Submittal 1: Preliminary Context Report and Themes (Feb. 26)

Following the meeting, information gathered during the meeting and from relevant publications supplied by the refuge or obtained on-line was reviewed to relevant background information - goals and desired outcomes from the interpretive program, target audiences, parameters and key opportunities for interpretation. It was also used to begin work on identifying key themes (messages) to communicate. That information is contained in this submittal.

Step 3: USFWS Comment (3-13)

The USFWS reviewed the submittal prior to the work session with the Interpretive Planner on 3-27.

Step 4: On-site work session with Interpretive Planner (3-27)

This was a day-long work session between the interpretive planner and staff to clarify and fill in gaps in the information base, fine-tune goals, identify and develop themes and supporting stories, and discuss a potential network of interpretive opportunities. That information was used to modify and complete the background information and develop the themes and concept for the interpretive network.

Step 5: Submittal 2: Interpretive Network Concept (4-25)

This submittal contained the draft themes and supporting stories and outlines all the information delivery strategies recommended for the interpretive network.

Step 6: USFWS Comment (5-12)

The USFWS reviewed the submittal and provide feedback prior to the next on-site meeting with the Interpretive Planner.

Step 7: On-site meeting with Interpretive Planner (May 29)

The purpose of this meeting was to discuss the proposed concept for the interpretive network. Feedback was used to fine-tune the concept and prepare the Action Plan.

Step 8: Submittal 3: Draft Interpretive Plan (7-3)

This submittal contained all components of the final plan, including revised background information as necessary, full descriptions for all interpretive strategies, and a draft Acton Plan (Priority for Implementation).

Step 9: USFWS Comment (7-14)

Feedback was supplied by the USFWS.

Step 10: Submittal 4: Final Interpretive Plan (7-29)