Department of the Interior

U.S. Fish and Wildlife Service

DRAFT ENVIRONMENTAL ASSESSMENT

For

Ankeny Hill Nature Center

Ankeny National Wildlife Refuge

Willamette Valley National Wildlife Refuge Complex

Prepared by:

U.S. Department of the Interior
U.S. Fish and Wildlife Service
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TABLE OF CONTENTS

1. PURPOSE AND NEED FOR ACTION 6

1.1 INTRODUCTION 6
1.2 NATIONAL WILDLIFE REFUGE SYSTEM MISSION AND GOALS 6
1.3 SALEM AUDUBON SOCIETY MISSION AND GOALS 8
1.4 PURPOSE AND NEED FOR ACTION 8
1.5 DECISIONS TO BE MADE 8
1.6 PROJECT BACKGROUND AND GOALS 8
1.7 PROPOSED ACTION – ALTERNATIVE B 11
1.8 PUBLIC/AGENCY SCOPING AND INVOLVEMENT 12

2. SUMMARY OF ALTERNATIVES, INCLUDING THE PROPOSED ACTION 15

2.1 ALTERNATIVE A: NO ACTION/CURRENT MANAGEMENT 15
2.2 ACTION ALTERNATIVES 16
2.2.1. Alternative B—Proposed Action/Preferred Alternative 17
2.2.2. Alternative C – More Developed Facilities/Higher Cost/Willamette Prairie Building 23
2.2.3. Alternative D – Less Developed Facilities/Lower Cost/Modern Metal Barn 23
2.3 ALTERNATIVES CONSIDERED BUT NOT STUDIED FURTHER 24

3. AFFECTED ENVIRONMENT 36

3.1 INTRODUCTION 36
3.2 GEOLOGY AND SOILS 36
3.3 HYDROLOGY AND WATER QUALITY 37
3.4 VEGETATION 38
3.4.1. Croplands 39
3.4.2. Wetlands 40
3.4.3. Wet Prairie 40
3.4.4. Upland Prairie/Oak Savanna 41
3.4.5. Riparian 41
3.5 BIRDS 42
3.6 MAMMALS 44
3.7 FISH 44
3.8 OTHER WILDLIFE 45
3.9 THREATENED AND ENDANGERED SPECIES 45
3.10 PRIORITY PUBLIC USES 46
3.11 LAND USE 47
3.12 CULTURAL RESOURCES 48
3.13 TRANSPORTATION/ACCESS 49
3.14 SOCIOECONOMICS 50

4. ENVIRONMENTAL EFFECTS 50

4.1 NO-ACTION ALTERNATIVE 52
4.1.1. Effects to Geology and Soils 52
4.1.2. Effects to Hydrology and Water Quality 52
4.1.3. Effects to Vegetation and Fish and Wildlife 52
4.1.4. Effects to Priority Public Uses 53
4.1.5. Effects to Land Use 53
4.1.6. Effects to Cultural Resources 53
4.1.7. Effects to Transportation 53
4.1.8. Economic Effects 53
4.2 ACTION ALTERNATIVES 53
4.2.1. Effects to Geology and Soils 53
4.2.2. Effects to Hydrology and Water Quality 55
4.2.3. Effects to Vegetation, Fish, and Wildlife 56

4.2.4. Effects to Priority Public Uses 57
4.2.5. Effects to Land Use 57
4.2.6. Effects to Cultural Resources 58
4.2.7. Effects to Transportation 58
4.2.8. Socioeconomic Effects 58

5. CONDITIONS FOR ACHIEVING PROJECT GOALS AND NWR COMPATIBILITY 59

5.1 INTRODUCTION 59
5.2 GEOLOGY AND SOILS 59
5.3 WATER QUALITY AND HYDROLOGY 59
5.4 VEGETATION, FISH, AND WILDLIFE 59
5.5 PRIORITY PUBLIC USES 60
5.6 LAND USE 60
5.7 CULTURAL/HISTORIC RESOURCES 60
5.8 TRANSPORTATION 60

6. LIST OF PREPARERS 61

7. CONSULTATION AND COORDINATION WITH THE PUBLIC AND OTHERS 61

8. ENVIRONMENTAL REVIEW AND CONSULTATION 61

8.1 NATIONAL ENVIRONMENTAL POLICY ACT 62
8.2 EXECUTIVE ORDER 11593: PROTECTION OF HISTORICAL, ARCHAEOLOGICAL, AND SCIENTIFIC PROPERTIES AND THE NATIONAL HISTORIC PRESERVATION ACT 62
8.3 ENDANGERED SPECIES ACT AND THE MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT 62
8.4 EXECUTIVE ORDER 11988: FLOODPLAIN MANAGEMENT. 63
8.5 EXECUTIVE ORDER 11990: PROTECTION OF WETLANDS 63
8.6 COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT AND SECRETARIAL ORDER 3127 63
8.7 COASTAL ZONE MANAGEMENT ACT 63
8.8 EXECUTIVE ORDER 12372: INTERGOVERNMENTAL REVIEW 64
8.9 EXECUTIVE ORDER 12898: FEDERAL ACTIONS TO ADDRESS ENVIRONMENTAL JUSTICE IN MINORITY AND LOW-INCOME POPULATIONS 64

9. REFERENCES 64

LIST OF FIGURES

Figure 1.1 Ankeny NWR and vicinity in Mid-Willamette Valley, OR 13
Figure 1.2 Ankeny NWR overview, trails, and existing outdoor visitor service kiosks 14
Figure 2.1 View of Ankeny NWR southwest from Ankeny Hill. 15
Figure 2.2 Site schematic of proposed Nature Center at full development 25
Figure 2.3 Floor plan of Preferred Alternative Nature Center Building 26
Figure 2.4 Elevation of Preferred Alternative Nature Center Building 27
Figure 2.5 Nature Center at Ankeny NWR Bird's Eye View Looking West. An artist's illustration provides a vision of the completed Nature Center on Ankeny Hill with views to Eagle Marsh and Peregrine Marsh in the distance. The boardwalk and outdoor classroom at Peregrine Marsh are also shown along with the trail network and the experience zone to the left of the Nature Center. 28
Figure 2.6 Elevation and floor plan for Peregrine Marsh Outdoor Classroom associated with Phase 4. 29
Figure 2.7 Site schematic for Alternative C, Willamette Prairie building. 30
Figure 2.8 Floor plan for Alternative C, Willamette Prairie building. 31

Figure 2.9 Elevation for Alternative C, Willamette Prairie building. 32
Figure 2.10 Site schematic for Alternative D, Modern Metal Farm Barn building. 33
Figure 2.11 Floor plan for Alternative D, Modern Metal Farm Barn building. 34
Figure 2.12 Elevation plan for Alternative D, Modern Metal Farm Barn building 35

LIST OF TABLES

Table 2.1 Nature Center Program and Construction Phasing 19
Table 2.2 Outdoor Classroom at Peregrine Marsh Program and Construction Phasing.....21
Table 3.1 Ankeny NWR Habitat Types 39

1.

Purpose and Need for Action

1.1 Introduction

The purpose of this Environmental Assessment (EA) is to evaluate alternatives for constructing a Nature Center at Ankeny National Wildlife Refuge (NWR, Refuge) to increase the opportunities for environmental education and interpretation in Marion County, Oregon. The desire to increase these types of activities was discussed in the Refuge's recently completed Comprehensive Conservation Plan (CCP) for the Willamette Valley National Wildlife Refuge Complex (W. L. Finley, Baskett Slough, and Ankeny NWRs) (WVNWRC) (USFWS 2011).

Mr. Mark Gehlar, a Salem businessmen and philanthropist, donated $1.35 million to the Salem Audubon Society (Salem Audubon) to enable the organization to build a Nature Center somewhere in the Salem area to connect families with nature. Salem Audubon spent a number of years exploring possible sites for the Nature Center. In September 2011, Ankeny NWR was selected for its wildlife viewing opportunities, ease of access, and tremendous partnership possibilities with the U.S. Fish and Wildlife Service (Service). In accordance with the National Environmental Policy Act of 1969, as amended (16 U.S.C. 688dd-688ee) (NEPA), this EA explores the social and environmental consequences of not building a Nature Center at Ankeny NWR (the no-action alternative) and of three design alternatives for building a new Nature Center at Ankeny NWR (the action alternatives).

This chapter presents the purpose of and need for the proposed action, an overview of the policies, regulations, and biological objectives that guide management of the Refuge, and the decisions to be made. Ankeny NWR is managed by the Service as part of the National Wildlife Refuge System (Refuge System). If constructed, the Nature Center would be a joint partnership between the Service, Salem Audubon, and Friends of the Willamette Valley National Wildlife Complex (Friends), a volunteer organization that supports the WVNWRC.

1.2 National Wildlife Refuge System Mission and Goals

On October 9, 1997, President William Clinton signed into law the National Wildlife Refuge System Improvement Act of 1997 (Improvement Act) (16 U.S.C. 668dd-668ee), which amended the National Wildlife Refuge System Administration Act of 1996. Among the key provisions of the Improvement Act are

- Establishment of a strong and singular mission statement for the Refuge System.
- Recognition of the needs of wildlife, which are to be given the highest priority in planning and management.
- Recognition of six priority wildlife-dependent public uses: hunting, fishing, wildlife observation, photography, environmental education, and interpretation.
- Establishment of compatibility standards and procedures to determine the compatibility of public uses.
- Requirements for development of CCPs for each unit of the Refuge System.

The Improvement Act consolidated and clarified many existing Refuge System laws and articulated the following System-wide mission statement, which is focused on protecting wildlife as a first priority:

> *The mission of the System is to administer a network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.*

The Improvement Act allows for public uses on refuges as long as they are determined to be compatible, which means the uses do not interfere with or detract from the mission of the Refuge System or purposes of the individual refuge. Visitation associated with four of these six priority public uses—wildlife observation, photography, environmental education, and interpretation—is proposed for the Nature Center under all of the action alternatives. Only hunting and fishing would not be allowed. All six priority uses were evaluated for the WVNWRC in the CCP in 2011. There are currently no facilities dedicated to providing environmental education to the public at the WVNWRC.

Willamette Valley National Wildlife Refuge Complex

During the 1960s, the Migratory Bird Commission approved the establishment of what became Ankeny, Baskett Slough, and William L. Finley NWRs in the Willamette Valley to provide sanctuaries for migratory birds. Ankeny NWR was approved in 1964 when the Service acquired 2,796 acres in the Ankeny Bottoms, situated at the confluence of the Santiam and Willamette Rivers in Marion County. The property was primarily agricultural land in the floodplain of the two rivers with a high proportion of wetland soils. Concerns over loss of historic waterfowl habitat in the Willamette Valley and excessive hunting pressure on geese, especially dusky Canada geese, guided management of the Refuge and led to a Cooperative Farming Program for providing forage for wintering geese and extensive wetland restoration.

WVNWRC adopted and implemented a CCP in 2011 to guide management of the Refuges for 15 years, or until revised. The CCP identified the following goals:

- Maintain areas to contribute to healthy, viable wintering Canada and cackling goose populations (especially dusky Canada goose) in the valley while reducing crop depredation on private agricultural lands.
- Enhance and restore native habitats representative of the historic valley (including wet prairies, wetlands, upland prairies, oak savannas, oak woodlands, mixed forests, and riparian and riverine habitats) and provide for the plants and wildlife that utilize these habitats.
- Contribute to the protection and recovery of federally threatened and endangered species and their habitats within the valley.
- Provide compatible, wildlife-dependent recreation opportunities for visitors, fostering an appreciation and understanding of the Refuges' fish, wildlife, plants, and their habitats.
- Protect and interpret the cultural heritage and resources of the Refuges.
- Collect scientific information (inventories, monitoring, research, and scientific assessments) necessary to support adaptive management decisions.
- Actively engage in off-Refuge conservation efforts in the valley.

1.3 Salem Audubon Society Mission and Goals

Salem Audubon Society is a local chapter of the National Audubon Society and supports its programs and goals. The service area for Salem Audubon is roughly Marion and Polk Counties, which includes Salem, one of the largest cities in Oregon, and several smaller municipalities.

The mission of Salem Audubon is to connect people with nature and to advocate for birds and wildlife habitat. Connection with nature may be achieved through educational, scientific, and advisory pursuits. Salem Audubon's near term goals are

- Strengthen Salem Audubon leadership, increase membership, and expand the diversity of residents served by strengthening the core programs Salem Audubon offers and expanding the scope of programs and experiences offered and their availability to diverse audiences.
- Build community familiarity and appreciation for Salem Audubon as a nature education and advocacy organization.
- Complete stepwise development of the nature center facility and the programs it will offer.
- Ensure financial stability by developing long-term revenue streams and increasing major donor and business/corporate support.

1.4 Purpose and Need for Action

The purpose of this proposal is to provide compatible, high-quality visitor services programs and wildlife-dependent recreation at Ankeny NWR. The need is that there are currently no facilities at the Refuge that provide indoor environmental education and interpretation opportunities, severely limiting the types of programs that could be offered. Public use programs could include environmental education, interpretation, wildlife observation, and wildlife photography. Facilities are needed to support these programs while minimizing impacts to Refuge resources.

1.5 Decisions to be Made

Based on the analysis documented in this EA, tiered from the CCP for WVNWRC, the WVNWRC Project Leader will determine which, if any, of the alternatives to implement. If one of the action alternatives is selected, the Project Leader will determine whether an Environmental Impact Statement (EIS) is necessary. If an EIS is not necessary, a Finding of No Significant Impact (FONSI) would be prepared, which would highlight the alternative selected for implementation.

1.6 Project Background and Goals

The Service and Salem Audubon have compatible goals of providing interpretive and environmental education opportunities to the public. Working together, the partnership can combine resources and provide excellent opportunities for the public to learn about and develop an appreciation for wildlife, the environment, and stewardship of natural resources. The Service and Salem Audubon developed a Memorandum of Understanding (MOU) in 2012 establishing the two organizations as the project sponsors and establishing a framework to collaborate on the conceptual development of the Nature Center. Both organizations strongly believe that the Nature Center would greatly support their efforts to provide educational and interpretive opportunities to connect people with nature and instill a sense of stewardship. The following goals were described in the MOU:

- Provide opportunities for the public to learn about the natural resources, especially the wildlife and plant species, of the Willamette Valley. Emphasis will be on those resources and management techniques which can be explored and experienced at Ankeny NWR.
- Serve as a resource for environmental education with school districts, youth organizations, colleges and universities, conservation organizations, and other groups and individuals interested in wildlife and the environment.
- Provide the public with enjoyable educational experiences that impart the importance of wise stewardship of natural resources.
- Serve as a community resource for conservation and related informational materials, with an emphasis on the importance of area habitats to wildlife and people.
- Provide interpretive and environmental education services to accommodate people of all ages, cultures, and abilities.
- Onsite Service or Salem Audubon staff or volunteers may be available for guided tours, educational programs for groups, schools, and youth organizations. Walk-in visitors would be accommodated through exhibits, interpretive displays, printed materials, and self-guided walking trails.

The Service and Salem Audubon met on several occasions over the following year to

- Identify key project stakeholders
- Put in place a design management team (DMT) and education subcommittee
- Research comparable facilities
- Develop a list of technical studies needed to support the design process
- Develop alternatives for the Nature Center
- Define a preliminary program for the site and building
- Hire a design team to develop concept drawings of the alternatives

Salem Audubon and Friends jointly funded the schematic design phase. The Service provided support by funding the traffic study and the Interpretive and Education Master Plan and providing in-kind support including topographic survey, wetland delineation, compliance-related requirements, as well as Refuge staff time for project planning.

Environmental Science Associates (ESA) and Aron Faegre Associates (AFA) were hired to complete the schematic design phase in the winter of 2013 to

- Prepare a detailed site assessment
- Involve key stakeholders
- Refine the project program
- Develop a set of site and Nature Center design alternatives
- Develop schematic design drawings of the alternatives

The key stakeholders identified by the Service and Salem Audubon included the following:

- U.S. Fish and Wildlife Service (Visitor Services, Refuge Staff, Engineering)
- Salem Audubon Society
- Friends of the Willamette Valley National Wildlife Refuge Complex
- The Confederated Tribes of Grand Ronde
- Neighbors
- Marion County (site access and sanitary)

As part of the schematic design process the DMT reached out to a number of key stakeholders to share ideas and solicit input. Specific activities included:

- Conducting interviews
- Hosting an open house in Jefferson, Oregon
- Facilitating a design charrette

The proposed Nature Center would be located on the 2,796-acre Ankeny NWR, situated within the mid-valley, just off Interstate 5 (Figure 1.1). Communities in the immediate vicinity include Jefferson, Independence, and Turner. The Refuge is also less than an hour's drive from eight out of the ten most populated cities in Oregon. It is located on the Willamette Valley Scenic Bikeway between Salem and Albany and the Willamette Loop of the Willamette Valley Birding Trail. An additional 1.7 million people are expected to reside within the Willamette Valley by 2040, doubling the 2000 population level (Oregon State of the Environment 2000).

Ankeny NWR includes cropland that provides abundant winter forage for geese, as well as native valley habitats, including seasonal emergent and forested wetlands, upland prairie/oak savanna, wet prairie, and riparian gallery forest. Environmental education about the declining native habitats that the Refuge conserves can foster future conservation throughout the valley by providing people with meaningful experiences about the biological values they support. The Refuge is an important stop on the Pacific Flyway, providing a variety of habitats for migrating as well as resident waterfowl, a variety of other birds, mammals, reptiles, and amphibians. A primary management objective of the Refuge is to provide wintering habitat with quality forage for Canada and cackling geese, especially the sub-species dusky Canada goose. The Refuge is also home to several threatened and endangered species, including Nelson's checker-mallow, Willamette daisy, golden paintbrush, and streaked horned lark. All of these species are Service trust resources, and the Refuge's objective is to contribute to recovery of these species by restoring and increasing populations.

During the Schematic Design process it became clear that the funds needed to construct all of the desired elements of the Nature Center would exceed available funds and require a lengthy capital campaign and significant volunteer commitment on behalf of the Salem Audubon membership. As a result, Salem Audubon elected to pursue a phased development approach allocating approximately $500,000 for the first construction phase.

The key milestones in the project schedule are outlined below.

Key Milestones

Award of Schematic Design Contract	March	2014
Completion of Schematic Design Phase	October	2015
Phase 1 Construction	Summer	2017
Phase 2 and 3 Construction	Summer	2022

1.7 Proposed Action – Alternative B

The proposed location of the Nature Center offers a unique opportunity to provide high-quality environmental education and interpretation, while preserving sanctuary for migratory birds, utilizing an existing visitor services area that provides an optimal overlook view of the Refuge, and is in close proximity to each of the priority native Willamette Valley habitats managed by the Refuge. The Ankeny Hill overlook site is the highest elevation on the Refuge. It overlooks agricultural fields heavily utilized by cackling and Canada geese, a recently restored emergent wetland, Peregrine Marsh, a riparian corridor, a 50-acre wet prairie, and a recently restored upland prairie with a large Oregon white oak savanna in the center. Development of a proposed Nature Center at the Ankeny Hill overlook site would be consistent with and support the purpose and operational goals of the Refuge and the mission of the Refuge System. These facilities would be located on a site administered by the Service, constructed and operated in partnership with Salem Audubon and Friends.

The purpose of the Nature Center is to provide environmental education and interpretation opportunity to the public that does not currently exist at Ankeny NWR, the WVNWRC, or the mid-Willamette Valley, including information about declining or lost local native habitats and the wildlife they support. The proposed Nature Center would provide opportunities for wildlife-dependent public use. These opportunities include four of the six priority public uses cited in the Improvement Act. The Service has protected, enhanced, and preserved the various wildlife habitats and attracted numerous species of wildlife within the proposed Nature Center vicinity, in part, to prepare the Refuge for these proposed actions.

The Service proposes to implement the construction of a Nature Center building and associated visitor services facilities at the Ankeny Hill overlook site in partnership with Salem Audubon. The Proposed Action, Alternative B, is intended to open the 25-acre Ankeny Hill overlook area to four compatible priority public use programs providing an opportunity for the visiting public to experience wildlife-dependent recreational use on the Refuge. In addition, the Proposed Action would serve as a gateway to Ankeny NWR, providing the visiting public with a general introduction and orientation to the Refuge, WVNWRC, Salem Audubon, native Willamette Valley habitats and associated wildlife, and information on resources near the facility.

The Proposed Action includes construction for the Nature Center building, a new public entry access off Ankeny Hill Road., parking areas accessible to public transportation, walking trails with interpretive nodes, and an outdoor classroom. The Nature Center, operating as an environmental education and interpretation facility, would include approximately 3,550 square feet of indoor space, a 1,000-square-foot covered exterior classroom, and 350 square feet of exterior decks for viewing. The building would include an indoor and outdoor classroom, interior and exterior restrooms, exhibit area, two offices, and a lunchroom/kitchenette. Additional details of the Proposed Action are provided in Chapter 2.

1.8 Public/Agency Scoping and Involvement

The DMT created a "Question and Answer" booklet to solicit input for the design of the new facility, and interviewed key Service, Salem Audubon, donor, and education specialists to gain recommendations for the design in 2014. This resulted in a thorough "Ankeny Nature Center Workbook" document that contained detailed memoranda from the meetings with 12 interviews, 8 'Question and Answer' responses, along with notes from the June 25, 2014, public meeting held at the Greater Jefferson Community Center. Key findings of the Workbook input were:

1. We Have an Outstanding Team: Our collective team working on this is outstanding, not just in the experience and knowledge each member brings, but equally in their passion for kids, families, and the great effect this Center can have on our community.
2. Be Unique: For this Nature Center to meet its own goal of success, it needs to be unique. Its facility and programs need to be designed to support what is special at Ankeny NWR and what is specially needed in our society today. The facility needs to truly be GREAT.
3. Be Modest: The economic times are tight and public funds are for the moment hard to come by. The $1.3 million donation by Mark Gehlar gives this project a start. The goal for being unique should not base its solution just on large quantities of funds.
4. Find Connectivity: The distance from Salem means that assisted connectivity with Salem must be accommodated. This can be physical with buses and it can be digital by web. On the positive side, the distance from Salem results in a rural experience for urban kids and families.

Ankeny NWR initiated government-to-government Tribal coordination with The Confederated Tribes of the Grand Ronde, The Confederated Tribes of Siletz Indians of Oregon, and Confederated Tribes of Warm Springs in October 2015. The Refuge has continued to work with The Confederated Tribes of the Grand Ronde, who have expressed an interest in the project and a desire to be a project partner. The Nature Center site is of historic and cultural significance to the Tribe.

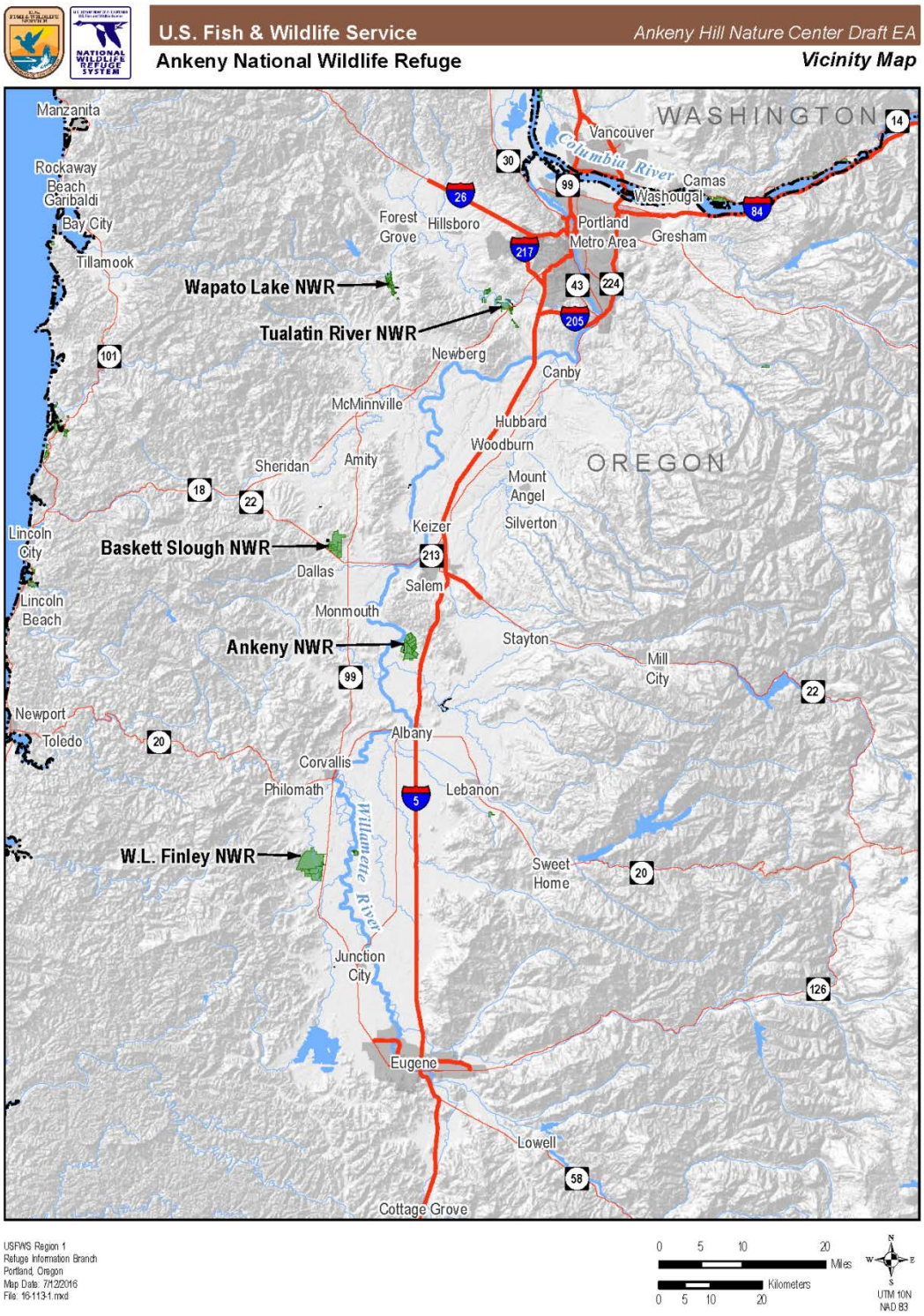


Figure 1.1 Ankeny NWR and vicinity in Mid-Willamette Valley, OR

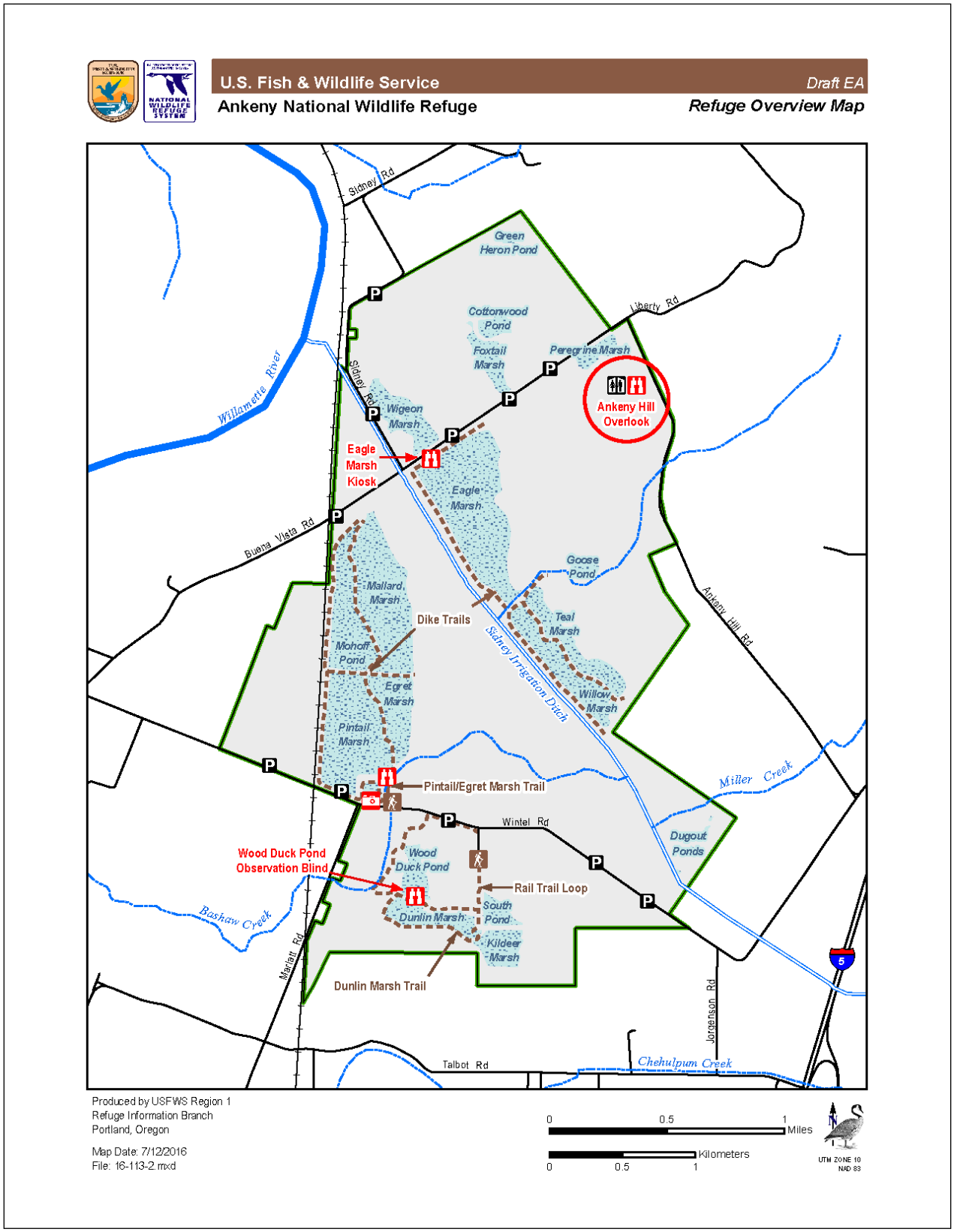


Figure 1.2 Ankeny NWR overview, trails, and existing outdoor visitor service kiosks

2. Summary of Alternatives, Including the Proposed Action

Currently the area surrounding the Ankeny Hill overlook is in non-agricultural grassland, meaning it was previously farmed and is not currently actively managed; however, it is mowed on an annual basis and it still provides winter forage habitat for geese. This field is slated to be restored to a combination of upland prairie/oak savanna and wet prairie as it transitions to Peregrine Marsh per the 2011 CCP and current Refuge planning. Restoration activities would be independent of, but ongoing with, development of the Nature Center from 2017 to 2020 and will occur regardless of which alternative is selected.

Figure 2.1 View of Ankeny NWR southwest from Ankeny Hill.

2.1 Alternative A: No Action/Current Management

The No-Action Alternative represents the current management direction at the Refuge, meaning no activities would change. Existing visitor services (Figure 1.2) include the Ankeny Hill overlook, the interpretive kiosk at Eagle Marsh, the 0.25-mile Pintail and Egret Marsh Boardwalk, and the 0.75-mile Rail Trail boardwalk that leads to an observation blind. From the Rail Trail boardwalk there are additional loop options available from April through September. There are also a number of wildlife viewing sites located on county roads that pass through the Refuge. However, unless arranged with the Visitor Services Manager located at William L. Finley NWR, most visitor services are self-led hikes with limited curriculum, facilities (e.g., blinds and a vault toilet), and guided interpretive or environmental education opportunities. No indoor public facilities currently exist at the Refuge and the only buildings are a residential house for an onsite WVNWRC staff member and a 4,000-sq-foot maintenance shop.

The No-Action Alternative would maintain the existing lack of indoor public access at the Refuge, with limited environmental education and interpretation opportunities at the Refuge and WVNWRC. There would be no development of the Nature Center, and the existing access and parking lot at Ankeny Hill overlook would remain as-is. General public access would be limited to a kiosk at Eagle Marsh, two trails with boardwalks totaling 1 mile, and 10 pull-out access points off county roads during the wintering sanctuary period of October 1 through March 31. This alternative is the baseline to which the other three alternatives are evaluated.

2.2 Action Alternatives

The following elements were considered during the preparation of the action alternatives:

- WVNWRC CCP (2011)
- Public comments
- Comments from local, state, and Federal agencies as well as nongovernmental organizations
- Comments from the Confederated Tribes of the Grand Ronde Indians and Confederated Tribe of the Siletz Indians
- Refuge System mission, and purposes and operational goals for Ankeny NWR, as well as project goals and objectives
- Laws, regulations, and policies that govern uses on national wildlife refuges.

The DMT considered three action alternatives, in addition to the no-action alternative (Alternative A). The three action alternatives represent a range of master planning concepts including:

- Alternative B: Proposed Action/Preferred alternative
- Alternative C: More Developed Building Facilities/Higher Cost
- Alternative D: Less Developed Building Facilities/Lower Cost

All of the action alternatives include construction of visitor facilities, including a Nature Center building, an outdoor classroom adjacent to Peregrine Marsh, related parking areas, kiosks, and trails (see Figure 2.2, site schematic). Public use facilities include:

- Indoor and outdoor classroom associated with Nature Center building
- Year-round interpretive trails with education nodes
- Interpretive kiosks
- Peregrine Marsh outdoor classroom
- Experience Zone near Nature Center

The three action alternatives have many features in common: they are all designed to meet the same programmatic requirements for the Nature Center's uses and size, parking, and priority public use facilities. The access off Ankeny Hill Road, south of Spring Creek, is the same for all alternatives. The outdoor classroom at Peregrine Marsh, associated parking lot, and access off Buena Vista Road projected in phase 4 is the same in all alternatives. The Nature Center building is located on Ankeny Hill in the same general location for each alternative, due to the view of the Refuge and diversity of habitats. Another important factor in the proposed building location is flat existing conditions that limit site preparation, grading for construction, and ultimately, project cost. The building size will meet the same programmatic requirements; minor variations in size occur due to differing design configurations. The year-round trail network within the Nature Center campus would be the same for all three alternatives. Each alternative would result in minor variations of environmental education, wildlife photography, and interpretive programs due to differences in building design and interior/exterior features.

2.2.1. Alternative B: Proposed Action/Preferred Alternative

The Service and Salem Audubon selected the Ankeny overlook location atop Ankeny Hill as the site for the proposed Nature Center. Ankeny Hill is within 2 miles of Interstate 5 and offers Refuge-wide views (Figure 2.1) as well as a variety of the native priority habitats represented at the Refuge. It is also an ideal location to orient visitors to the available wildlife viewing and educational opportunities. Locally steep slopes (~20 percent) were a consideration when locating site improvements like buildings, access roads, accessible trails, and parking.

It is estimated that the Nature Center would serve an estimated 135,000 visitors annually, double the current estimate of 65,000, including school groups, families, and individuals seeking hiking, birding, photography, and interpretive/educational opportunities. This location would provide existing and new visitors extraordinary opportunities to experience wildlife viewing and environmental education.

The Service provided a number of products to support the development of the schematic design for the Nature Center, including a topographic survey of the Ankeny Hill site. The survey extends from the paved right-of-way (ROW) of Ankeny Hill west to the drainage to Peregrine Marsh and from the paved ROW of Buena Vista Road south to the drainage and beyond. The survey included delineated wetland boundaries associated with Peregrine Marsh. The survey was used as a base map for the site assessment and development of alternatives.

The Service hired David Evans and Associates, Inc. (DEA) in 2012 to prepare a traffic study to investigate safety issues and analyze options associated with providing access to the proposed Nature Center. Current Ankeny NWR visitation is estimated at 65,000 annually. The addition of the Nature Center, including increased field trips from schoolchildren within an hour's drive of the Refuge, is expected to double visitation and increase related traffic. The current access to the site from Ankeny Hill Road (a county road) is unsafe at posted speeds for both ingress and egress due to inadequate sight distance.

The traffic study outlined several alternatives to create safe conditions for ingress and egress, including relocation of the entrance road. The DMT identified the alternative that relocates the driveway south along Ankeny Hill Road as the preferred alternative for schematic design because it provided safe access with a relatively short road length to a Nature Center on Ankeny Hill. The traffic study is included in Appendix A.

The Nature Center would provide the public with an overview, orientation, and exhibits associated with historic Willamette Valley habitats, wildlife species, Tribal use, avian ecology and conservation, and Refuge features, resources, and management. Visitor services facilities would provide the public with a high-quality, resource-based experience. In addition, the project would further economic development within local communities, enhance school district environmental education opportunities, and serve as a public focal point allowing access to public spaces.

The Nature Center area, including the associated trails, would constitute roughly 25 acres, with public access available year round for visitors. This would include the building with indoor and outdoor classrooms, an experience zone for children, new parking lots, trails, and interpretive signs. Many of the priority native Willamette Valley habitats (wetland, prairie, riparian, oak woodland/ savanna) that are conserved on the Refuge can be found in close proximity to the Nature Center with active restoration of riparian, prairie, and oak ongoing and planned in the immediate vicinity. Habitat

restoration projects around the Nature Center would provide unique public visitor opportunities that allow teaching, demonstrating, and participation in Refuge management.

Ankeny Nature Center Vision: *Together with our surrounding community, we dedicate the Nature Center as a gateway to discovery of all living things at Ankeny National Wildlife Refuge. The Center will be a nexus in the Greater Salem area for environmental education, science, and interpretation to excite and inspire visitors and community in their explorations. Trails beginning at the Nature Center will lead people into the Refuge for direct experience with wildlife and plants in a variety of habitats. The Center will foster greater understanding, appreciation, and wonder for the natural world, and will assist in bringing people together in shared stewardship of wild places. We invite the young and the old here, to enjoy this place and leave feeling renewed, inspired, and invigorated.*

The Nature Center building in the Preferred Alternative is illustrated in Figures 2.3 and 2.4 (floor plan and elevation). Of all the alternatives presented herein, each feature and aspect of this alternative was chosen and/or designed to have the least impact on the resource, as well as meet the functional goals and objectives of the project. Most importantly, it satisfies conservation needs of wildlife and associated habitats while providing an opportunity for visitors to engage with nature and adheres to a budget that is realistic and achievable for the Service and Salem Audubon.

The first step in the schematic design process was the development of a number of concept-level building and site improvement design alternatives with preliminary estimates of construction costs. The Service, Salem Audubon, and Friends provided significant input, including participating in a daylong design charrette. At the end of this iterative process a more refined and solid vision for the Nature Center and its associated site improvements emerged.

The scale of the required fundraising effort was also revealed by the preliminary cost estimates, so a phased approach to construction was incorporated into the schematic design of the building and site improvements. The Nature Center has been designed so it can be constructed in as many as four phases: phase 1, including the indoor and outdoor classroom portion of the building; phase 2, adding the exhibit and entry; phase 3, adding the library, two offices, and lunchroom; and phase 4, adding the outdoor classroom at Peregrine Marsh. Conceptually, phases 2 and 3 would be built at the same time depending on funding availability.

The following narrative describes the proposed action with regard to access, buildings, associated site developments, and priority public uses.

Access – The traffic study outlined several alternatives to create safe conditions for ingress and egress, including relocation of the entrance road. The current access to the overlook from Ankeny Hill Road is unsafe at posted speeds for both ingress and egress due to inadequate sight distance. The DMT identified the alternative that relocates the access south along Ankeny Hill Road, approximately 700 feet south of the current access point, as the preferred alternative for schematic design because it would provide safe access with a relatively short driveway length to a Nature Center on Ankeny Hill. This access point is common to all action alternatives.

Parking – The new driveway (approximately 550 feet) would lead to new parking facilities, which would include a 24-car parking lot (two spaces compliant with the Americans with Disabilities Act of 1990 (ADA)) with two bus spaces and a turnaround. The parking lot would be designed to provide treatment for storm-water runoff in planted swales and filter strips. Overflow parking for 20 cars would be located off the driveway to the south. A walkway would transport visitors from the lot to a

small entry plaza at the main entrance to the Nature Center. A second parking lot with parking for one bus and six cars would be located off Buena Vista Road and would serve the Peregrine Marsh outdoor classroom that is intended to be constructed as part of phase 4. The DMT highly desired an educational facility near the wetland that could serve as an outdoor laboratory for children. This parking configuration is common to all action alternatives.

Nature Center building – The full build-out of the Nature Center on Ankeny Hill would include reception, a Friends' store, exhibit, and viewing areas off of the main entrance. The area would separate the Friends' office, storage, and break room into one wing and the classrooms and restrooms in the other. Classrooms would include both indoor and outdoor facilities with water and storage. Each room would accommodate between 30 and 40 students. Two single-sex, two-seat restrooms would be located inside the building for use during operating hours. Two additional single-seat restrooms, accessed from the entry plaza, could be locked automatically. To keep construction costs down, the buildings will be designed using wood frame construction and manufactured truss systems.

The table below provides a summary of the rooms in each phase of the Nature Center construction with square footage. These correspond to the phases described above.

Table 2.1 Nature Center Program and Construction Phasing

Phase 1	
Interior Space	Square Footage
Classroom	1,071
Restroom (space used for offices/storage in Phase 1)	285
Corridor (space part of classroom in Phase 1)	252
Entry	92
Subtotal	1,700
Exterior Space	Square Footage
Classroom	1,007
Restrooms	118
Open Deck	245
Subtotal	1,370
Crawl Space under building for heater	NA

Phases 2 and 3	
Interior Space	Square Footage
Exhibit, Store, Reception	1,100
Offices, Lunch, Storage	835
Subtotal	1,935
Exterior Space	Square Footage
Covered Viewing Deck	347
Covered Entry	432
Open Side Deck and Exit Stairs	114
Subtotal	893

Internet - Many options are available for providing internet service to the proposed Nature Center.

Electrical Power - For the schematic design, the design team assumed one power drop would be provided from the Ankeny Hill ROW to serve all project phases. Electric power would be needed for the Nature Center, the outdoor classroom at Peregrine Marsh, and the pump house. Electricity would power lights, electronics, pumps, and freeze protection. Phase 1 of the Nature Center would require a standard residential service which would also serve the full build-out. The outdoor classroom at Peregrine Marsh would require lighting and three small freeze-protection heaters in the bathrooms and storage area. Power to the outdoor classroom would be provided from the Nature Center. For the purpose of cost estimating, trenching for utilities would be accommodated below the accessible path connecting both buildings. This approach increases the length of conduit but minimizes disturbance to site habitats. The pump house would also have an electric feed from the Nature Center for the pump, lights, and freeze protection.

Heat - For the schematic design, the design team assumed that heat for the Nature Center would be provided by one propane tank located within 100 feet of the Nature Center. As mentioned above in the electrical discussion, two small electric freeze-protection heaters are included for the restrooms accessed from the outdoors.

Water Supply - A well would need to be drilled to serve the Nature Center and outdoor classroom at Peregrine Marsh. The exact well location would not be determined until a well contractor is hired. For the schematic design, the design team assumed that the well would be located within 400 feet of the Nature Center, which would allow power and utilities to be efficiently interconnected. Since this location would likely be lower in elevation than the Nature Center, we assumed that a well house (approximately 10 feet by 10 feet) would be needed for pressure tanks, electric water heater, alarm system, and any required water filters. Power, low-voltage conduit, and a water line would connect to the Nature Center. Water supply would be the same for all action alternatives.

Sanitary System - For schematic design budget purposes, the DMT assumed that separate drain fields would be needed for the Nature Center and outdoor classroom at Peregrine Marsh because of their great distance from each other. Providing an interconnected pressure line from the outdoor classroom to the Nature Center septic system was considered but rejected because of the risk of septic effluent escaping to a larger area of the site. For the schematic design, the drainfield for the Nature Center would be located in the well-drained Woodburn Silt Loam and the drainfield for the outdoor classroom in the Amity silt loam near the marsh. These locations were selected to keep the drainfields out of major viewsheds and restoration areas.

These locations are subject to change because Marion County would need to conduct a site evaluation to determine the suitability of specific locations for use as drainfields. Locating the drainfields is complicated by the fact that the new well and associated waterlines would require a 100-foot horizontal separation from any septic lines and/or piped storm water per State standards. The DMT recommended that the well site be determined first and the septic tanks and drainfields afterward.

To allow septic drainfields to be located in whatever area is most advantageous, the schematic design included a typical septic system with pumps in both locations. The Nature Center would have a 1,500-gallon septic tank with a 1,500-gallon pump tank and a pair of pumps for redundancy. A low-voltage conduit would connect back to the Nature Center for septic system alarms. Smaller septic tanks could possibly be used; however, larger tankage promotes better biological processing of the effluent and reduces maintenance of the overall system. Both septic systems would be expected to have a large number of users and flows when the facility is fully functioning as an important site for school science programs. The sanitary system would be the same for all action alternatives.

Stormwater - Stormwater runoff would be managed onsite using planted swales and filter strips to treat runoff from impervious surfaces before it runs off into the landscape. Stormwater management would be the same for all action alternatives.

Peregrine Marsh outdoor classroom - The outdoor classroom at Peregrine Marsh (Figure 2.6) would be the last phase of construction. It would include outdoor covered class facilities for up to 30 students with water and storage and two single-sex, single-seat restrooms that can be locked automatically. When students are not present, the covered outdoor classroom space could be used as a Peregrine Marsh overlook. The classroom could be accessed by trail from the Nature Center or from a second parking lot off Buena Vista Road. This lot would provide parking and turn around for six cars (one ADA-compliant) and one bus. The Peregrine Marsh outdoor classroom is common to all action alternatives.

The table below provides a summary of the rooms in the outdoor classroom with square footage.

Table 2.2 Outdoor Classroom at Peregrine Marsh Program and Construction Phasing

Phase 4	
Interior/Covered Space	Square Footage
Classroom	768

Phase 4	
Restroom	130
Storage and Sinks	240
Subtotal	1,138
Exterior Space	Square Footage
Access Walkway	416

Priority Public Uses - Six public uses were identified in the Improvement Act for priority consideration in refuge planning: wildlife observation, environmental education, wildlife photography, interpretation, hunting, and fishing (see Chapter 1.5). Hunting and fishing are prohibited at Ankeny NWR because they are not compatible with Refuge purposes. Priority public uses would be the same under all action alternatives.

Wildlife Observation – The Nature Center entry would also serve as a trailhead to an approximately 750-foot accessible gravel loop trail around the experience zone and a longer (over ¾-mile) accessible gravel loop trail to Peregrine Marsh. These trail systems would include three overlook/education nodes that would provide access to habitats represented at the Refuge. Nodes would be incorporated into the curriculum but would also serve an interpretive function to visitors. The project's goal of constructing the Nature Center in close proximity to all of the native historic Willamette Valley habitats managed by the Service is intended to maximize wildlife observation potential. Exhibits in both the Nature Center and experience zone would educate and prepare the visitor for what they might see at the Refuge and also encourage them to experience nature and find the flora and fauna that interests them. Adequate signage would also make the visiting public aware that outside the winter closure period (Oct. 1–March 31) they are welcome to explore all of the Refuge, except for the residence and shop on the south end that are closed to the public.

Environmental Education –The Service hired Alchemy of Design, an exhibit planning and design firm, to create a Master Interpretive Plan. The contractor and their work will support the efforts of the Environmental Education and Interpretive Subcommittee which is made up of participants from the Service, Salem Audubon, Friends, and other partnering organizations. The subcommittee will work to offer education programs for the Nature Center that meet science, technology, engineering, and mathematics (STEM) requirements and that acknowledge the diversifying demographic makeup of the Willamette Valley. Programs would use birds and other wildlife as a springboard for conversations and learning opportunities about habitats and ecological systems and processes. In early scoping meetings, hands-on learning opportunities and citizen science were seen as key ways to provide experiential learning. A draft Environmental Education and Interpretive Subcommittee White Paper is included in Appendix B. Alchemy of Design is currently developing a master plan for the Nature Center that would identify themes or stories upon which interpretive exhibits and signage could be based. This work is ongoing, and the Environmental Education and Interpretive Subcommittee will provide edits and feedback to the draft master plan.

Wildlife Photography – A dedicated wildlife photography blind is not incorporated into the schematic design at this point; however the habitat diversity coupled with previous and ongoing habitat

restoration efforts would afford the public ample opportunities to observe and photograph wildlife at the Nature Center. When open, the Peregrine Marsh outdoor classroom could serve as a fixed location to photograph wildlife.

Interpretation – Interpretive exhibits would be located within the exhibit/entryway of the Nature Center building, within the indoor and outdoor classroom of the Nature Center, Peregrine Marsh outdoor classroom, the three education nodes along the trail, and within the experience zone outside the Nature Center. An interpretive trail brochure would be available that describes and interprets resources found within the Nature Center campus and the rest of Ankeny NWR.

Hunting – Hunting is not permitted at the Refuge. Waterfowl hunting is closed to provide wintering sanctuary for Canada geese, particularly dusky Canada geese, as well as decreasing crop depredation by geese on private agricultural lands. Big game hunting is currently not permitted due to the lack of sufficient habitat to support significant big game populations and the potential conflicts hunting could create with other public use activities.

Fishing – Fishing is not permitted at the Refuge. Many of the wetland areas are seasonal in nature and dry up during the summer months. Access to these areas during fall and winter is closed to provide sanctuary for migratory birds. As such, these areas do not provide high-quality fishing opportunities for the public. Moreover, one permanent wetland, Willow Marsh, is home to a recently delisted freshwater minnow, the Oregon chub.

2.2.2. Alternative C: More Developed Building Facilities/Higher Cost/Willamette Prairie Building

This alternative would result in the greatest amount of development (i.e., earth moving, robust building materials, highest cost) associated with the Nature Center building and the greatest level of required capital investment. The site developments of the Nature Center, illustrated in the site schematic (Figure 2.7), would be nearly identical to the Proposed Action. The differences associated with the Nature Center building, as depicted in Figures 2.8 and 2.9 (floor plan and elevation respectively), include:

- Floor plan option with 4,290 square feet
- Low profile for the Nature Center, not exceeding 14 feet in height, and would require excavation into the hillside with the building being approximately 5 feet below the grade of the parking lot and entry
- Low, earthen roof with the option of native prairie plants occupying the roof
- Sawtooth photo-voltaic solar panels and meet the highest energy efficiency certifications, LEED Platinum
- More expensive building materials such as steel framing, concrete or stucco exterior, higher load bearing capacity for earthen roof, increased design cost

2.2.3. Alternative D: Less Developed Building Facilities/Lower Cost/Modern Metal Barn

This alternative would result in the least amount of development (i.e., limited earth moving, pre-fabricated building materials, lowest cost) associated with the Nature Center building and the lowest level of required capital investment. The site developments of the Nature Center, illustrated in the

site schematic (Figure 2.10), are nearly identical to the Proposed Action, with minor differences in building location. The differences associated with the Nature Center building, as depicted in Figures 2.11 and 2.12 (floor plan and elevation) include:

- Floor plan option with 3,888 square feet
- Standard steel pre-manufactured building with concrete foundations
- Peaked gable approximately 27-feet tall
- Corrugated steel siding
- Pre-engineered and pre-fabricated offsite, with the lowest relative cost building materials and finished onsite

2.3 Alternatives Considered But Not Studied Further

Outdoor classroom at Peregrine Marsh only – In the early stages of the schematic design process, initial cost estimates for all site developments, including the Nature Center building, separate outdoor classroom, parking lots, and trail development, were over $6 million dollars. These initial conceptual designs (15 percent development) were preliminary, therefore cost estimates included substantial contingency at approximately 40 percent of total construction cost. Given the current budget of approximately $1.3 million and Salem Audubon's desire to limit phase 1implementation to $600,000, the DMT elected to pursue a design and cost estimate for the outdoor classroom at Peregrine Marsh and no further Nature Center developments. The DMT quickly decided that a single outdoor classroom did not meet the purpose and need for the proposed action, which is to provide compatible, high-quality visitor service programs, and wildlife-dependent recreation. The priority public uses of environmental education and interpretation would be significantly reduced. Moreover, an indoor space for visitor services, environmental education, and interpretation does not currently exist within the WVNWRC and implementation of such a structure is a high priority.

Nature Center located adjacent to Peregrine Marsh – Other locations near the Ankeny Hill overlook, namely adjacent to Peregrine Marsh and at the current Eagle Marsh kiosk, were initially considered by the DMT. Following initial consideration, they were not studied further given their less-favorable ability to satisfy or meet site selection criteria. More specifically, construction of the Nature Center adjacent to Peregrine Marsh could have potential negative impacts to the affected environment. Additionally, constructing facilities beyond an outdoor classroom adjacent to Peregrine Marsh could potentially not be compatible with providing sanctuary for migratory birds, including dusky Canada geese.

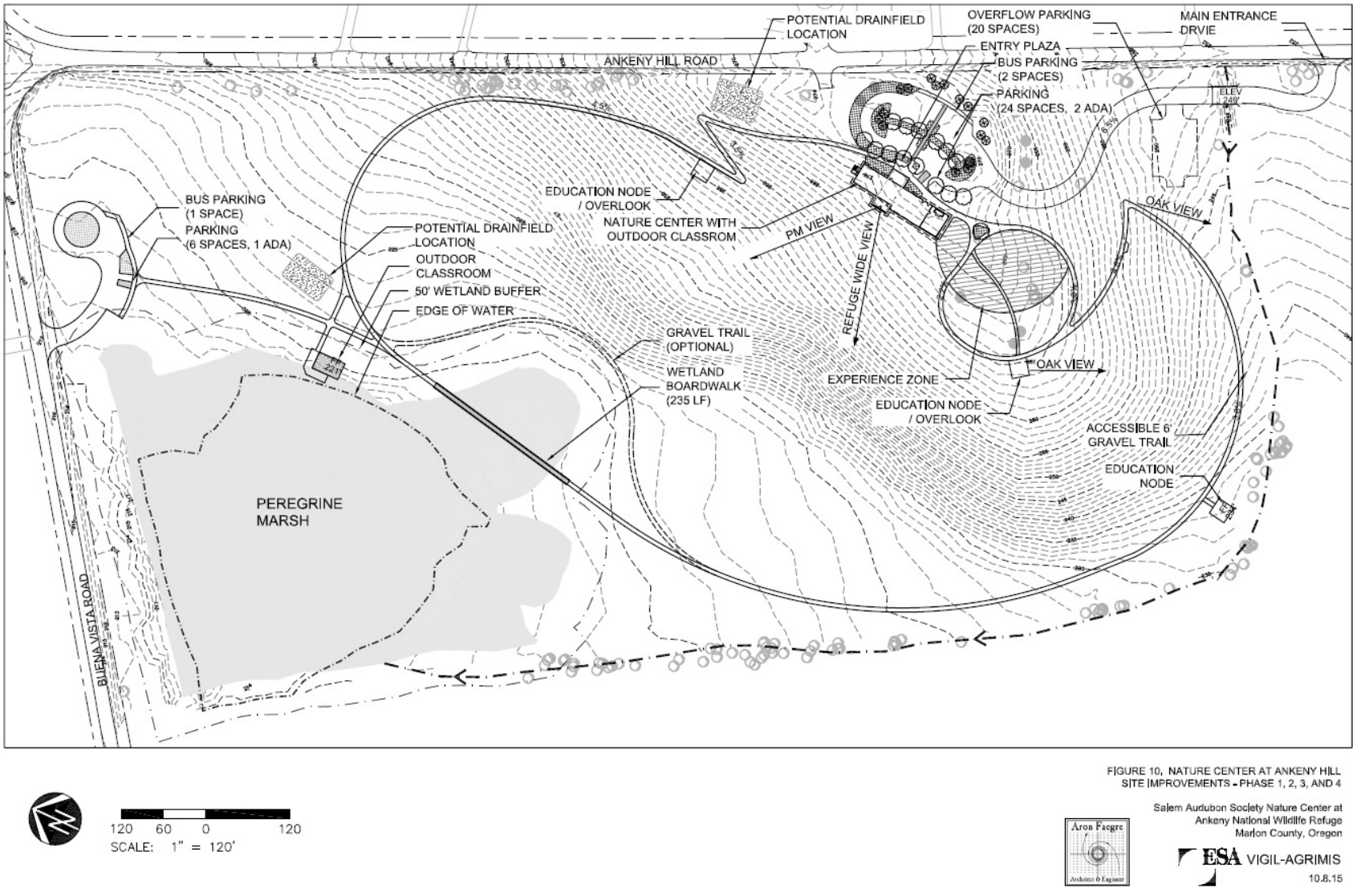


Figure 2.2 Site schematic of proposed Nature Center at full development

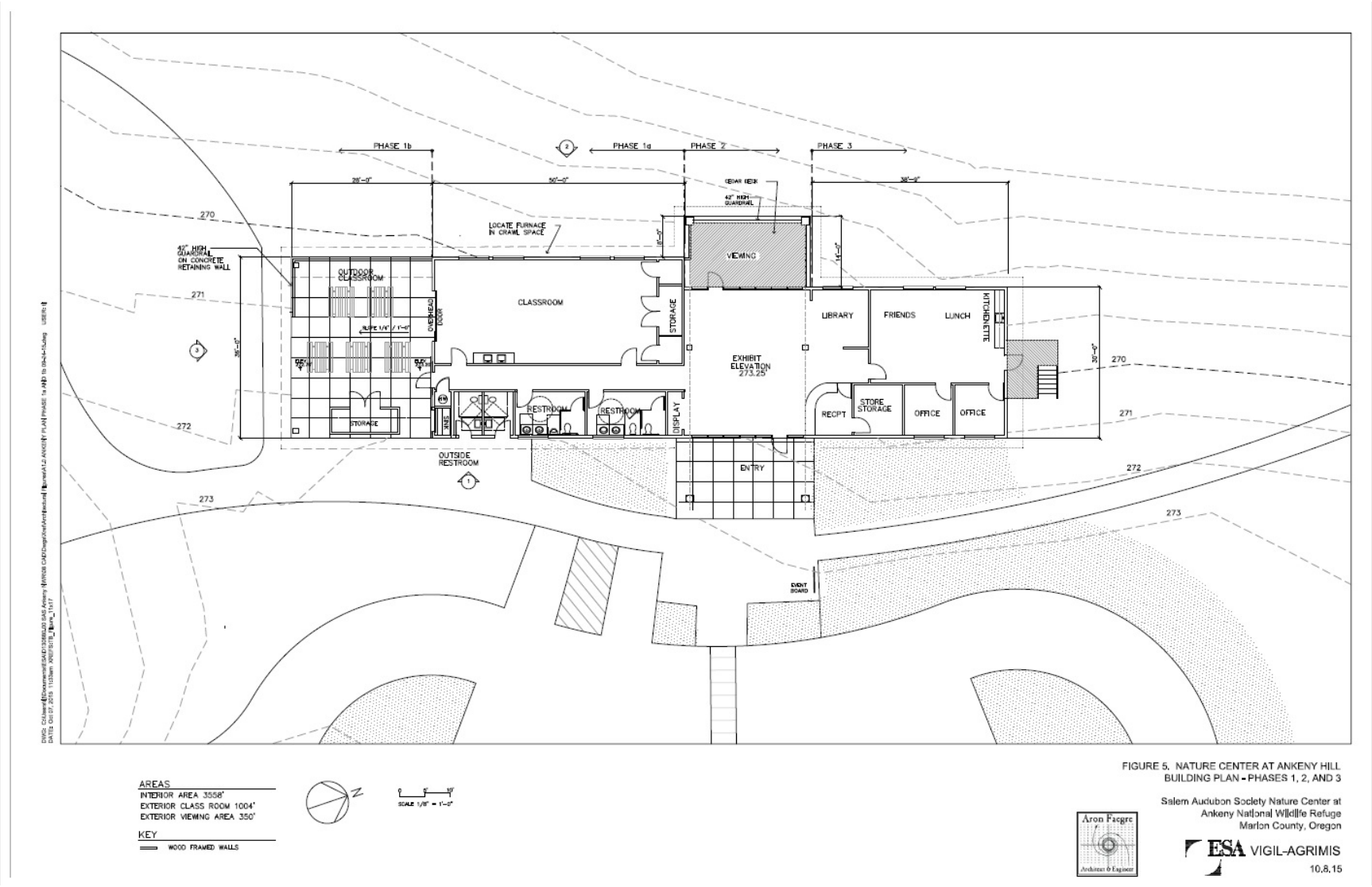


Figure 2.3 Floor plan of Preferred Alternative Nature Center Building

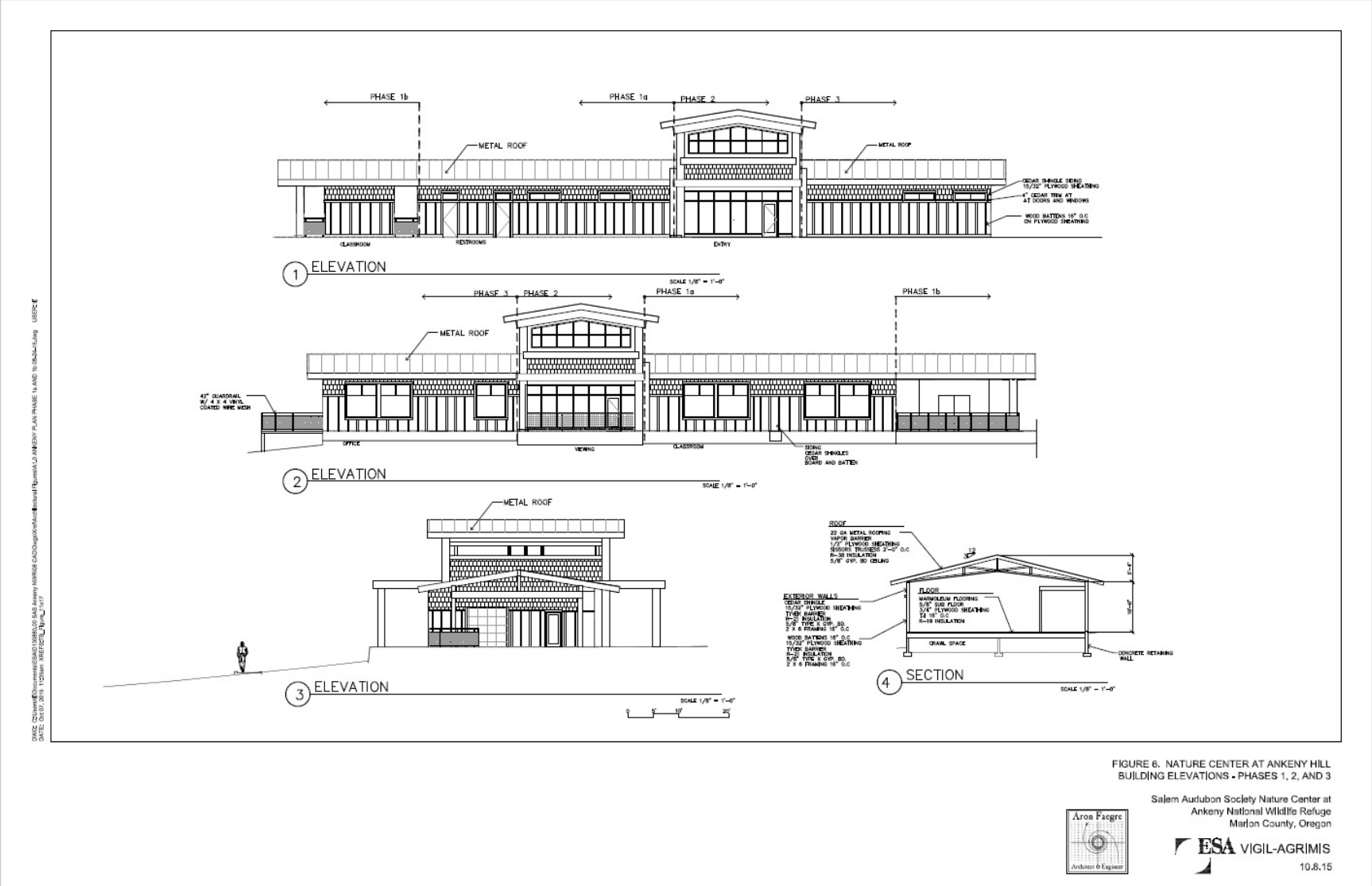


Figure 2.4 Elevation of Preferred Alternative Nature Center Building

Figure 2.5 Nature Center at Ankeny NWR Bird's Eye View Looking West. An artist's illustration provides a vision of the completed Nature Center on Ankeny Hill with views to Eagle Marsh and Peregrine Marsh in the distance. The boardwalk and outdoor classroom at Peregrine Marsh are also shown along with the trail network and the experience zone to the left of the Nature Center.

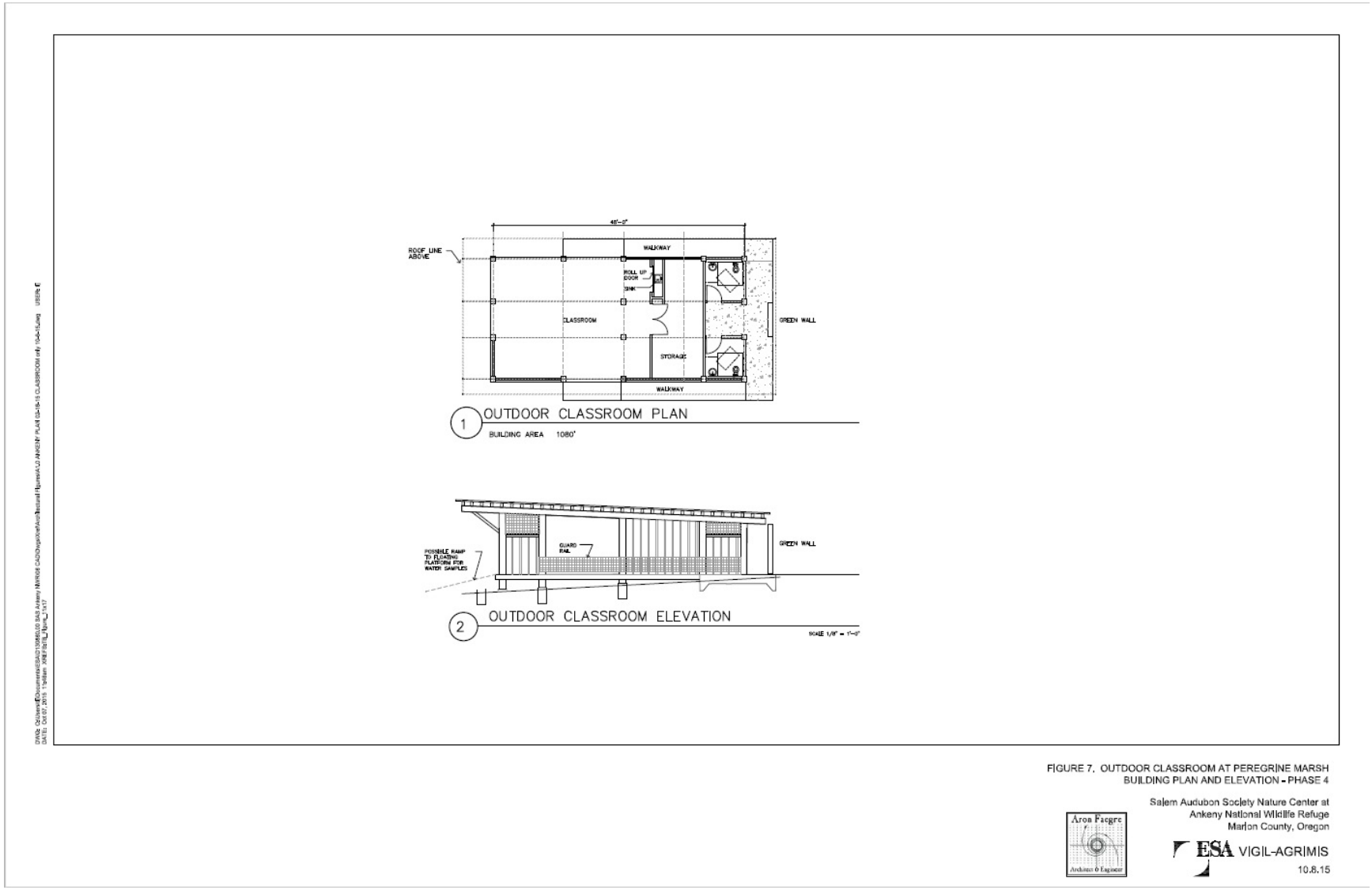


Figure 2.6 Elevation and floor plan for Peregrine Marsh Outdoor Classroom associated with Phase 4.

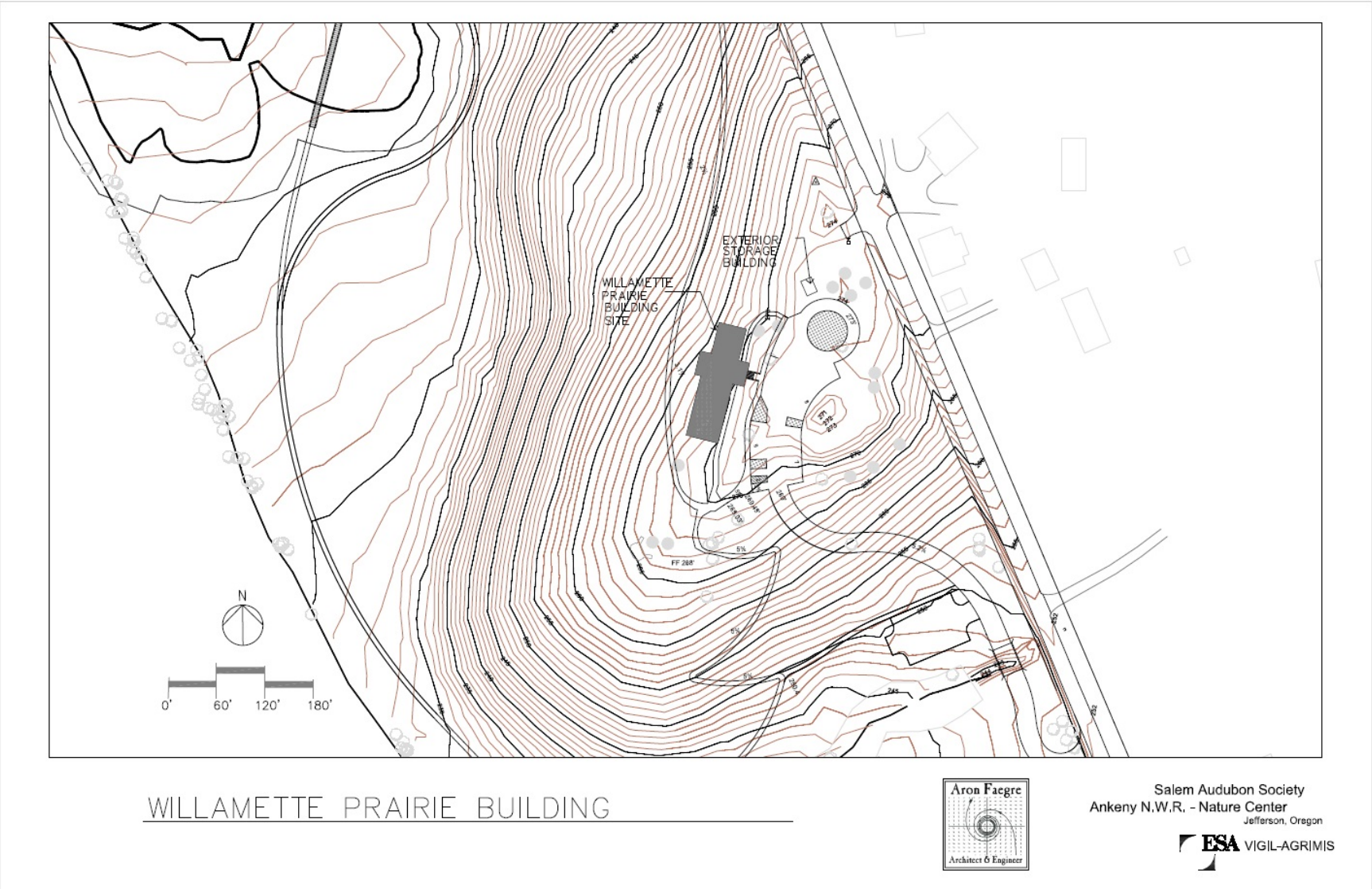


Figure 2.7 Site schematic for Alternative C, Willamette Prairie building.

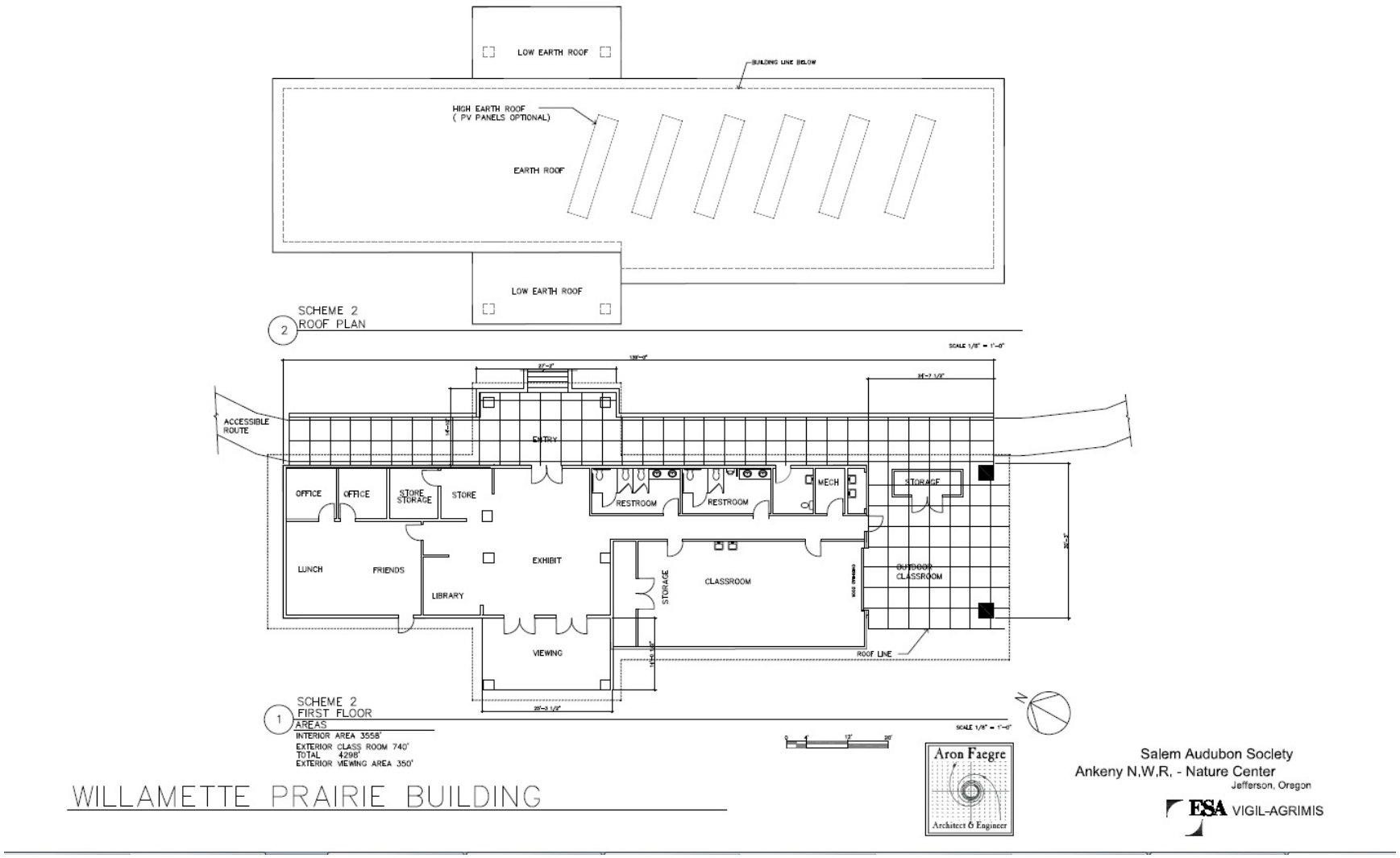


Figure 2.8 Floor plan for Alternative C, Willamette Prairie building.

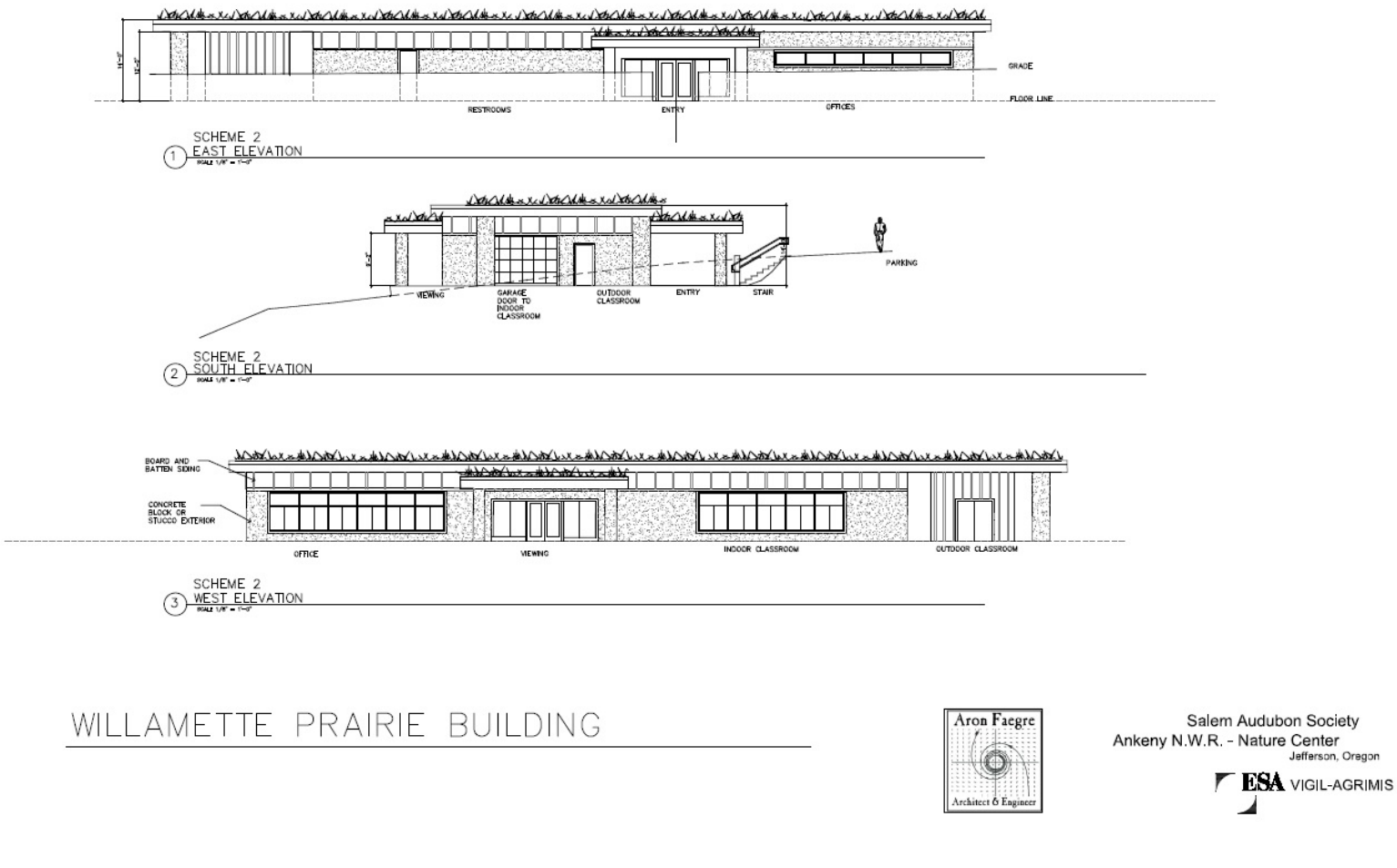


Figure 2.9 Elevation for Alternative C, Willamette Prairie building.

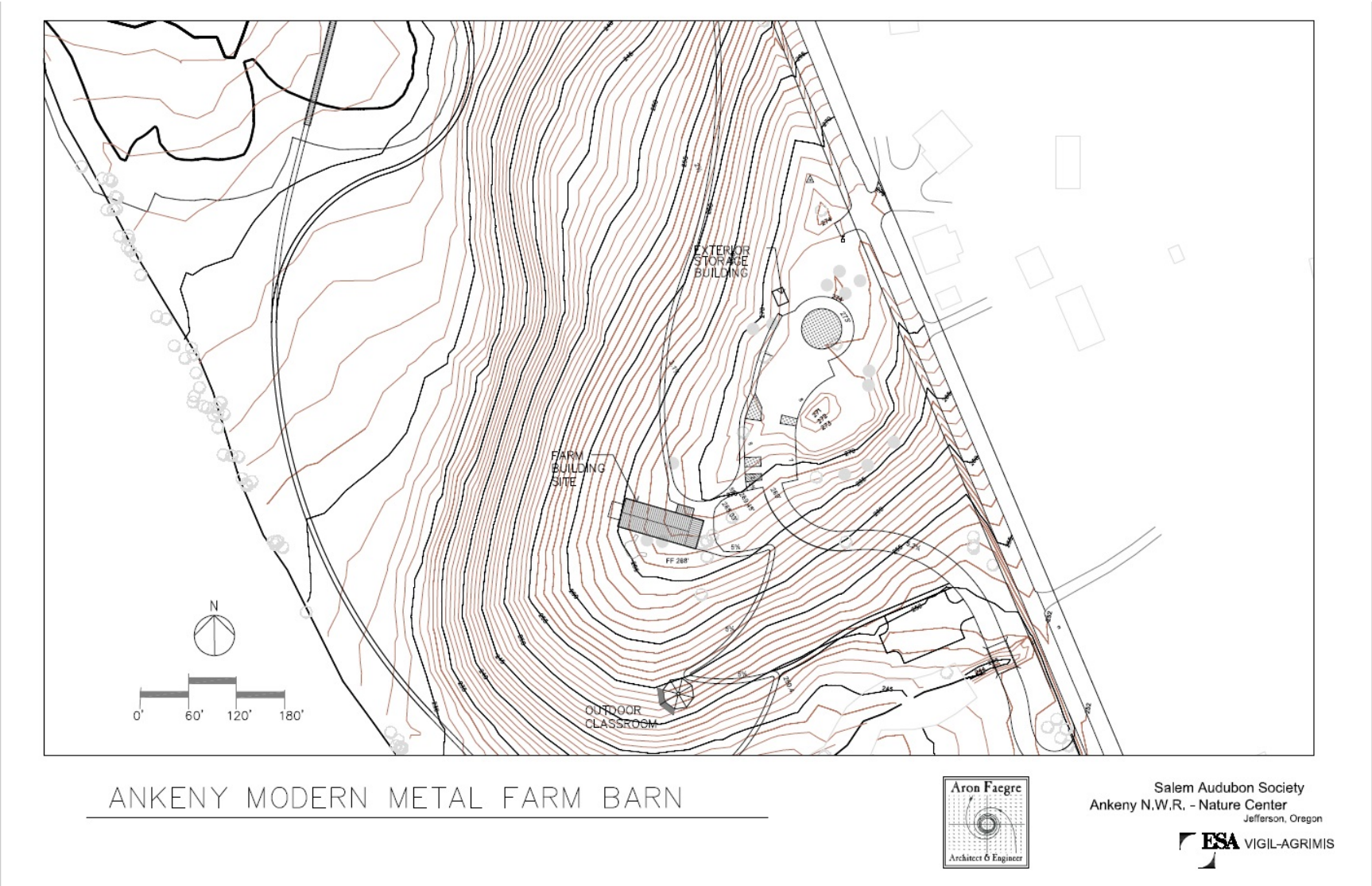


Figure 2.10 Site schematic for Alternative D, Modern Metal Farm Barn building.

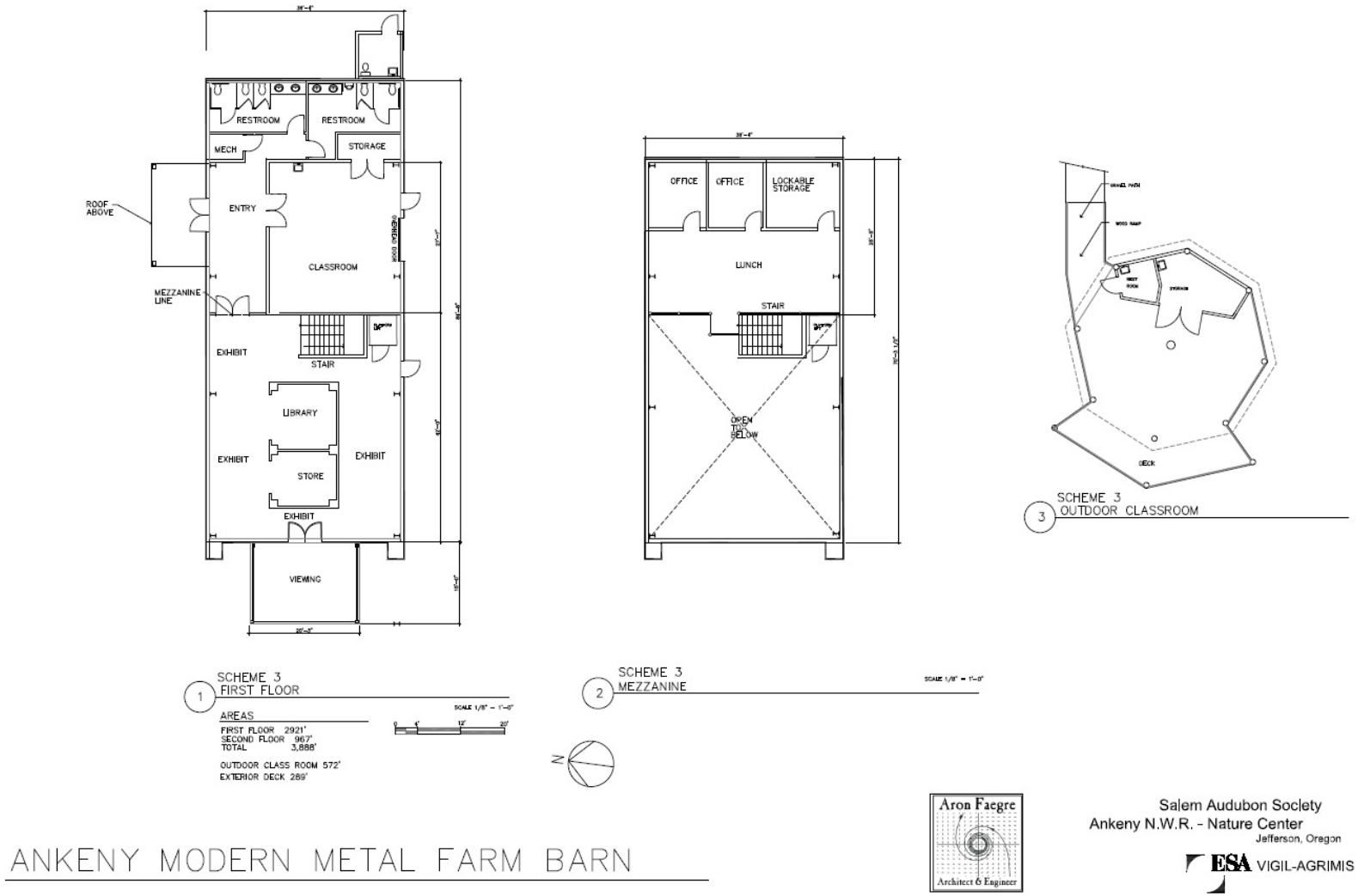


Figure 2.11 Floor plan for Alternative D, Modern Metal Farm Barn building.

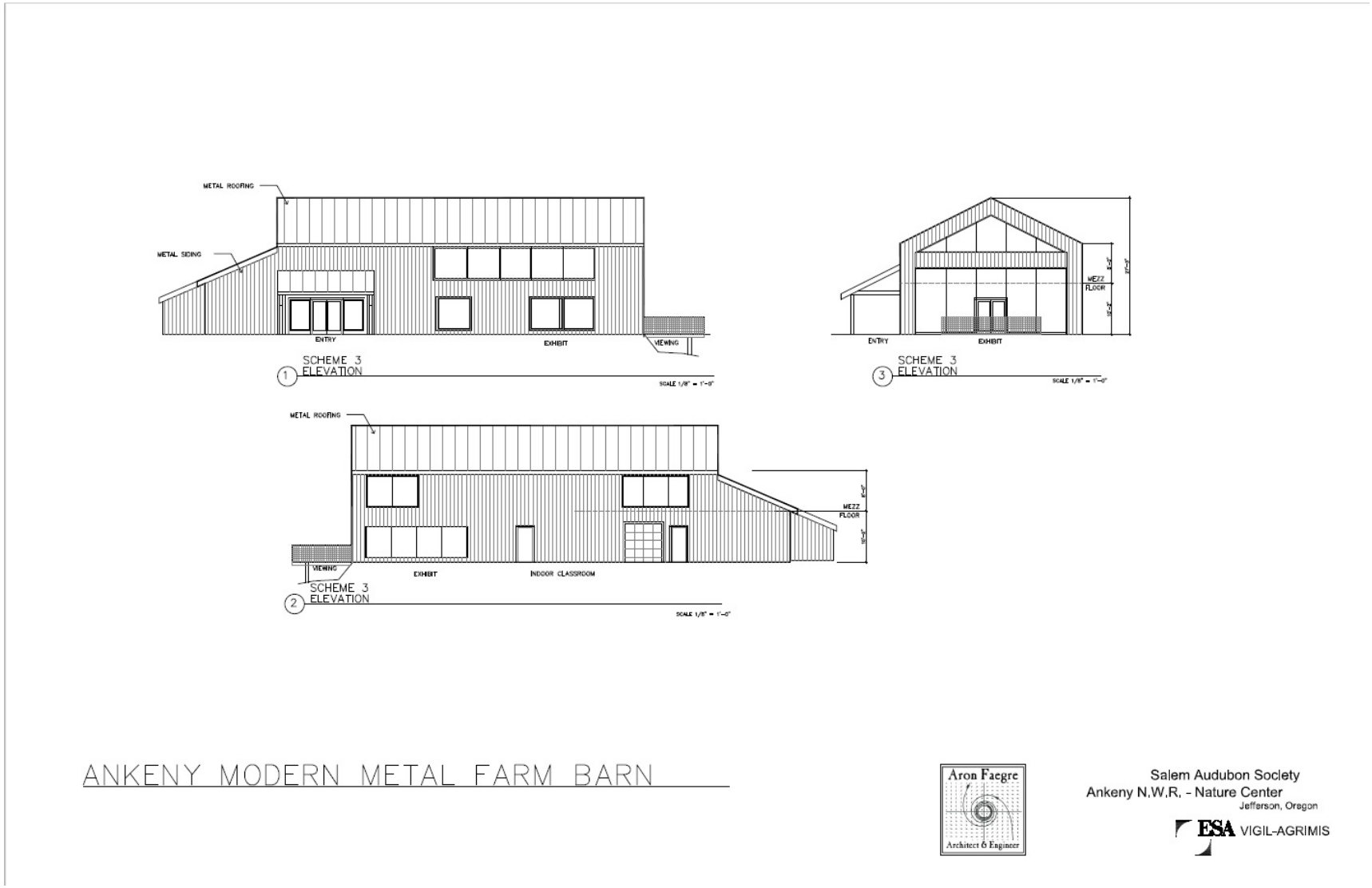


Figure 2.12 Elevation plan for Alternative D, Modern Metal Farm Barn building

3. Affected Environment

3.1 Introduction

This chapter describes the affected environment or current environmental conditions for Ankeny NWR and the proposed Nature Center. The natural environment such as geology, soils, water quality, hydrology, fish, and wildlife, as well as built environment aspects such as priority public uses, land use, cultural resources, transportation, and socioeconomics are described based on current conditions and available information.

3.2 Geology and Soils

Ankeny NWR is located within Oregon's Willamette Valley, a broad, low-elevation valley surrounded by the Coast Range to the west, the Calapooya Mountains to the south, and the Cascade Range to the east. The valley is oriented north-south and measures roughly 180 miles long and 60 miles wide. Most of the 187-mile channel of the Willamette River is braided or meandering and flows through a flood plain that ranges from about 0.5 to 4 miles wide. The flood plain contains irregular alluvial terraces and is characterized by many cutoff meanders, oxbow lakes, braided and distributing channels, and sloughs (Woodward et al. 1998). Alluvial deposits from the Willamette River and its tributaries, as well as glacio-lacustrine deposits from the Missoula Floods, fill the valley floor.

The Refuge occupies former floodplains of both the Willamette and Santiam Rivers approximately 5.3 miles downstream of the present mouth of the Santiam River. The northeastern boundary of the Refuge cuts along the footslopes and toeslopes of the Salem Hills that rise to heights above 1,100 feet to the northeast of the Refuge. The highest elevation is 290 feet and the lowest is approximately 194 feet where Sidney Ditch leaves the Refuge.

The Refuge lies within Ecoregion Levels I and II – Marine West Coast Forest (Omernik 1995). At a finer scale, the Refuge is within Ecoregion Level III – Willamette Valley. Pre-settlement conditions in the Willamette Valley ecoregion consisted of rolling prairies, both deciduous and coniferous forests, and extensive wetlands. Compared to the neighboring Coast Range and Cascades ecoregions, the Willamette Valley has lower precipitation, less relief and elevation, and both mesic and xeric vegetation assemblages. At the finest ecoregion scale, the Refuge occupies the Prairie Terraces ecoregion. Prairie Terraces are nearly level, slightly depressional, or undulating fluvial terraces with sluggish, meandering streams and rivers. Ponds and seasonal wetlands were common pre-settlement. Today, many of the streams are channelized (Thorson et al. 2003).

During the late Pleistocene (between 15,500 and 13,000 years ago), a series of catastrophic floods associated with glacial ice dams near present day Missoula, Montana, sent 500 cubic miles of water down the Columbia River channel. Backwater from these floods filled the Willamette Valley up to an elevation of 400 feet above current sea level and left a layer of fine sediments up to 130 feet deep on the valley floor. The Pleistocene lacustrine deposits, known also as the Willamette Valley silts, are considerably shallower in the southern valley and on valley margins. Willamette silt is the parent material for much of the soil formation in the valley. Holocene alluvial deposits consisting of sand, gravel, and silt continue to form geomorphic surfaces along active floodplains of rivers and streams in the valley (Branscomb 2002, Gannett and Caldwell 1998).

Soils are forming in a mixture of younger river and stream deposits, finely textured and stratified Missoula flood deposits, and older residuum and erosional deposits from nearby hillslopes. The Missoula flood deposits left thick, fine textured silts—up to 30 meters thick—over most of the Willamette Valley. Alluvium from the Willamette River and its tributaries also form the parent material for many of the soils of the Refuge.

Three soil series cover the majority of Ankeny NWR: Dayton, Bashaw, and Concord. They are all prominent Willamette Valley soils and are deep, poorly drained, and frequently ponded. Poor drainage and ponding is to be expected due to the location relative to the Willamette River floodplain, the seasonal rainfall pattern, and the very fine, stratified soil deposits. All three major soils and several of the minor soils contain shrink-swell clays that become sticky when wet and hard and compact when dry. Seasonally, climate and soil texture combine to raise the water table to near the land surface during the months of October through May.

3.3 Hydrology and Water Quality

During the winter rainy season, runoff is collected in wetland units on the Refuge. As the seasonal rains subside, the wetlands begin to naturally dry out. In wetter years, the wetlands may be drained a little faster through water control outlets. Depending on Refuge management objectives, water is delivered to managed wetlands in the summer to irrigate moist soil vegetation or to provide additional habitat for waterfowl during the dry season. Abundant winter rainfall and fine textured soils that hold moisture well into the growing season reduce early season irrigation needs. Cooperative farmers irrigate a number of fields.

Miller Creek enters the Refuge from the east and runs 0.3 miles until its confluence with the Sidney Power Ditch. The channel above Sidney Ditch, known today as Miller Creek, was originally the upper portion of Bashaw Creek (Sharon Selvaggio pers. comm.). From the Sidney Ditch, the creek continues westward as Bashaw Creek and meanders 1.9 miles to the western boundary. It then continues until it becomes known as Rock Creek shortly before meeting the Willamette River. Sidney Power Ditch diverts water from the North Santiam River downstream of Jefferson and delivers the water approximately 1.4 miles to Chehulpum Creek. From there, Chehulpum Creek flows another 3.8 miles before it meets another segment of Sidney Ditch upstream of the Refuge boundary. The Sidney Ditch then flows northwest through the Refuge and into the Willamette River.

Riparian habitat along the waterways has increased greatly since Ankeny NWR was established. There are now over 400 acres of riparian habitat, mostly along Bashaw Creek and Sidney Ditch. When the Refuge was established, agricultural fields extended to the streambank in all but a few stretches of Bashaw Creek.

There are 23 impoundments, ponds, or marshes that all fill with precipitation and surface runoff during the winter rainy season; water is typically held until it evaporates in the summer dry season. When soils are saturated, surface runoff contributes to all impoundments. Wetlands historically occurred on the land base occupied by the Refuge, but these were drained for agriculture prior to Service acquisition. Early Refuge management activities focused on grass forage, and wetland acreage remained limited. In the 1990s, the WVNWRC began an active program of wetland restoration. There are over 530 acres of managed wetlands on Ankeny NWR. Many of the managed wetlands are seasonal wetlands and are drawn down or are allowed to evaporate in late spring/early summer to promote the growth of moist soil vegetation. These areas become saturated by rainfall and

surface runoff during fall and winter precipitation. Much of the native wetland vegetation in the Willamette Valley is adapted to this natural hydroperiod.

The Oregon Department of Environmental Quality (OR DEQ) has determined that there are currently insufficient data to list Bashaw Creek for exceeding criteria for excess nutrients. Other streams are unimpaired or unassessed for water quality limitations (OR DEQ 2010). Section 303(d) of the Clean Water Act requires each state to develop limits, or a Total Maximum Daily Load (TMDL), on the amount of a pollutant that can enter a water body and still meet water quality standards. TMDLs lead to watershed implementation plans designed to meet water quality standards and restore impaired water bodies. In 2006, OR DEQ developed a TMDL Water Quality Management Plan (WQMP) for the Willamette Basin (OR DEQ 2014).

TMDLs to address bacteria, mercury, and temperature for nine of the Willamette River Subbasins, including the Middle Willamette and North and South Santiam, were adopted by OR DEQ for the Willamette WQMP in September 2006. Since then, data collection has identified additional water quality concerns in the subbasin, indicated by such conditions as low dissolved oxygen, harmful algae blooms, and biological impairment. Land use practices that are potential pollutant sources in rural areas are generally those that disturb soil and allow sediment to enter waterways, add nutrients or pesticides beyond what can be taken up by plants or broken down, alter surface or groundwater hydrology, or degrade the filtering, bank stability, and shade producing functions of riparian vegetation (OR DEQ 2014).

Within the Willamette Basin WQMP, OR DEQ includes a list of best management practices to protect water quality on agricultural lands that includes streamside buffers with appropriate site vegetation and prevention of soil erosion and nutrient loss. In addition the WQMP recognizes that conservation and restoration of functioning riparian areas on the valley floor would have the highest value for improving stream temperatures (OR DEQ 2006). As a landowner in the Willamette Valley, the Service has been named by DEQ as one of 97 Designated Management Agencies (DMAs) in the TMDL. A DMA is an entity with legal authority over a source of water quality pollutants. DMAs are required to adopt management strategies for improving and protecting water quality on lands within their ownership. The Service has submitted a completed TMDL Implementation Plan which was approved by OR DEQ in 2008 (USFWS 2008).

3.4 Vegetation

Prior to acquisition by the Service, the lands within the Refuge boundary had been ditched, tilled, and drained and the lowlands intensively farmed. Since establishment, an active program of habitat restoration has taken place. The Service is actively preserving and restoring native habitats, including riparian areas and wetlands, wet prairie, and upland prairie/oak savannah. Today, habitats on the Refuge vary from agricultural fields maintained to provide forage for Canada geese to predominantly seasonal wetlands. Additional acreage consists of riparian vegetation and grassland. Table 1 summarizes the amount of each habitat type found on Ankeny NWR. This section describes habitat types that are management priorities, in proximity to the Nature Center, and would serve as reference for environmental education opportunities.

Table 3.1 Ankeny NWR Habitat Types

Habitat	**Acres***	**% of Total**
Agricultural Fields	1,508	54
Riparian	414	15
Seasonal Wetland	302	11
Non-Agricultural Grassland	276	10
Seasonal or Permanent Wetland	186	7
Wet Prairie	78	3
Permanent Wetland	42	1
Administrative Developed	9	>1
Total	**2,815**	

*Acreage calculated in GIS. May not match actual acreage due to rounding differences.

3.4.1. Croplands

The primary agricultural crops grown on Ankeny NWR are grass seed (annual ryegrass, perennial ryegrass, and fescue) grown as green forage for wintering Canada and cackling geese. Most farming is conducted via cooperative agreements with local farmers whereby the farmer is responsible for the costs of production, they are allowed to retain 100 percent of the crop yield when harvested, and the Refuge retains 100 percent of goose browse throughout the wintering period while geese are present. In some cases, cooperative farmers are permitted to grow a summer row crop in the event that the grass seed crop is not providing sufficient yields to sustain a profit as long as it is compatible with providing winter forage. The Refuge contains approximately 1,500 acres of croplands. All cooperative farmers renew agreements annually, approved by the Refuge Manager, and must abide by the special conditions provided by the manager. Special conditions include a restricted list of approved pesticides, implementing best management practices stipulated by the Refuge, allowing 100 percent winter browse, maintaining accurate records, and open communication with the manager.

The area surrounding the Ankeny Hill overlook is in non-agricultural grassland, meaning it was farmed and is now not actively managed, but mowed annually and still provides winter forage habitat for geese. This field is slated to be restored to a combination of upland prairie/oak savanna and wet prairie as it transitions to Peregrine Marsh. Restoration activities would be ongoing with development of the Nature Center from 2017 to 2020 and will occur regardless of which alternative is selected.

3.4.2. Wetlands

Managed wetlands are a significant habitat type in the WVNWRC and serve as key habitats for thousands of migratory waterfowl, shorebirds, waterbirds, and other wetland-dependent wildlife wintering in or migrating through the Willamette Valley. A majority of the Refuge wetlands are seasonal, filling via fall and winter precipitation and drying in the late spring and summer.

Ankeny NWR has 530 acres of wetlands (Eagle Marsh, Pintail, Willow, etc.) with a majority being seasonal palustrine emergent marshes. Most of these wetlands were restored in the mid-late 1990s and are managed using a combination of berms, spillways, and water control structures. Delivered water is available from a local irrigation cooperative, and this is used to maintain permanent wetlands as well as to flood-irrigate some seasonal wetlands to maximize food production and sustain healthy plant communities for wildlife benefits. Managed seasonal wetlands are usually drawn-down slowly or evaporate in June, with irrigation via shallow flooding occurring in July or August.

Peregrine Marsh, a 12-acre seasonal wetland, bi-sects the Nature Center footprint and is fed by Spring Creek, an intermittent stream. The marsh was restored in summer 2015 to provide high-quality, native, priority habitats. Restoration activities include lowering and broadening the berm, adding deeper swales for topographic diversity, mowing, herbicide application, discing and scalping reed canarygrass, as well as extensive seeding of native wetland plants.

3.4.3. Wet Prairie

Wet prairies are characterized by saturated soil and shallow ponding of water (< 6 inches deep) throughout the winter and early spring. The prairies have a bunchgrass-forb matrix, with the dominant vegetation as tufted hairgrass and a large diversity of other grasses, sedges, and forbs distributed throughout. Wet prairies are known for mounded topography, with interstitial spaces that support many of the plant species. Anthills are common in undisturbed prairie and are good indicators of the hydrology needed to support wet prairie species, as the elevated ant hills are built to stay above the water level. Oregon ash is the most common tree, and nootka rose is the most abundant shrub, but both are held in check with periodic fire.

The Refuge has approximately 78 acres of wet prairie habitat that supports grassland birds, a diversity of native wildflower species, and a threatened plant, Nelson's checkermallow. Field 1, the largest wet prairie, is a 40-acre, poorly drained area on the northeast boundary. Surveys by The Nature Conservancy in 2001 indicated that it supported a low diversity of native wet prairie species. However, the habitat has been degraded by a history of grazing, cultivation, and hydrologic alterations making it wetter than historical condition. A majority of the large woody vegetation was cleared and removed in 2002–2005 and the site was burned in 2007 (Refuge records indicate it was also burned in 1983). Herbaceous cover increased significantly following the removal of the trees and subsequent use of prescribed fire. Management applications include late summer mowing and prescribed fire on a 3–4 year interval. Eagle Marsh Prairie is the second largest at 23 acres and contains hundreds of threatened Nelson's checkermallow plants. Enhancement activities are ongoing to increase prairie quality including the diversity of native forbs and grasses.

Threats to wet prairie habitat include encroachment of woody vegetation and the invasion of nonnative weeds. Periodic disturbance is necessary to retain these sites in a grassland condition so they are suitable for that suite of birds. Prescribed fire at regular intervals, mowing, and removal of both invasive woody species (native and nonnative) are management techniques used to maintain

habitat for grassland birds such as western meadowlark, grasshopper sparrow, and lazuli bunting. The primary management concerns for wet prairie habitats are (1) maintaining prairies in a grassland condition by reducing densities of woody shrubs and trees and preventing their encroachment/ establishment, (2) maintaining and/or increasing native plant species diversity, (3) reducing levels of nonnative herbaceous species, especially those that threaten the integrity or function of wet prairies, and (4) maximize parcel size on the landscape to provide greatest benefits for grassland birds and other wildlife.

Field 1 and Eagle Marsh Prairie are both outside the Nature Center area, but within ¼-mile and can be viewed by the visiting public outside the winter sanctuary period. Ongoing and planned enhancement activities for Field 1 include mechanical removal of encroaching woody vegetation in summer 2016 and 2017 and prescribed burning in 2017. Planned management in Eagle Marsh Prairie includes prescribed fire in 2016 and 2017 (only half the unit can be burned per year per Section 7 requirements), grass-specific herbicide applications post-burn, and inter-seeding with native wildflowers first, followed by native grasses in later years. A small amount of wet prairie (~5 acres) would also be restored at the Nature Center along the margins of Peregrine Marsh, where hydrology supports, as it transitions into restored upland prairie.

3.4.4. Upland Prairie/Oak Savanna

Oak savannah is characterized by widely spaced Oregon white oak trees with grassland habitats (upland prairie) occurring between them. Native grasses commonly found in upland prairies include Roemer's fescue, blue wildrye, California oatgrass, and prairie junegrass. Common forbs include camas, spurred lupine, rose checkermallow, and cat's ear lily. Much of the oak savannah habitat has been degraded by nonnative grasses and forbs, as well as invasive woody vegetation such as Himalayan blackberry. Poison oak, although native, is also more abundant today in most oak habitats because of the lack of fire. Management and restoration focuses on improving the quality of existing habitat and reducing the threats to those areas from invasive species.

Ankeny NWR has one unit of recently restored upland prairie, although most of the Refuge is comprised of floodplain lowlands, hence the dominance of agriculture, wetland, and riparian habitats. However, there are a number of large savannah-form oaks present on the north and east sides in agricultural settings. The recent restoration occurred just south of the Nature Center campus, approximately 500 feet from the proposed access, and includes a large savanna oak in the center that is likely over 150 years old. The 6-acre site was formerly an agricultural field and restoration activities included chemical fallowing the site for two growing seasons, and no-till drilling a native upland forb diversity mix of over 20 species that included Willamette daisy (endangered), golden paintbrush (threatened) seed and Roemer's fescue, a fine leaved native bunchgrass. Approximately 20 acres of the Nature Center footprint, formerly agricultural grasslands, would be restored to upland prairie/oak savanna in concurrence with site developments and construction of the Nature Center.

3.4.5. Riparian

Riparian vegetative communities in the Willamette Valley are hardwood forest, dominated by species such as black cottonwood, Oregon ash, and willow. Many other trees and shrubs make up riparian forests, including big-leaf maple, red-osier dogwood, blue elderberry, Douglas spirea, nootka rose, and Oregon white oak. Plant community composition is dependent on soil type, deposition, hydrology, duration and depth of flooding, and seed source. The riparian vegetation found along the slow-moving valley streams are dominated by Oregon ash, with Oregon white oak on streambank

edges that are slightly higher and better drained. In contrast, the riparian zones adjacent to the Willamette River in well-drained gravelly soils are primarily composed of black cottonwood and willow.

Historically, bottomland hardwood and riparian forests dominated the floodplains of the Willamette River and lower reaches of the tributaries. At the arrival of European settlers, these forests made up about 10 percent of the vegetative cover of the valley. Since the 1850s, bottomland forests and riparian areas have declined by over 70 percent in the Willamette Valley.

Riparian habitats have been undergoing restoration on the WVNWRC since the mid-1990s. Establishment of new riparian habitats through planting has the most success when watered the first year. In addition, mowing or spraying of competing grass surrounding the new plantings has been used to boost survival. Tree tubes to protect young saplings from rodent damage have been used in select locations. Tree planting efforts through 2005 emphasized species diversity, however, poor survival of many species have resulted in scaling back to fewer species since then. Oregon ash and black cottonwood are the primary species used to establish new riparian habitats.

Ankeny NWR contains approximately 414 acres of riparian forest and is restoring a 1,900-foot segment of riparian habitat along the ephemeral Spring Creek that flows along the edge of the Nature Center campus and into Peregrine Marsh. Riparian forest exists in small pockets and narrow strips along the Sidney Irrigation Ditch and Bashaw Creek. A small stand of mature cottonwoods is present on the west side of Cottonwood Marsh. Areas of new riparian communities are becoming established on the edges of seasonal wetlands and are primarily made up of willow and black cottonwood. The east side of Eagle Marsh is the largest developing riparian community. Riparian plantings have occurred in retired farm fields in the vicinity of Rail Trail. A narrow band of riparian trees exists along Spring Creek and the Refuge plans to restore an approximate 75-foot native riparian buffer along each side. Site prep has included blackberry treatment and nonnative tree removal. In winter 2015, WVNWRC staff and volunteers planted approximately 1,000 native trees and shrubs, with an emphasis on flowering shrub species that would not block the Nature Center viewshed and attract a diverse assemblage of wildlife.

3.5 Birds

Ankeny NWR was established to provide winter foraging and roosting areas for dusky Canada geese. Only about 15,000 geese wintered in the Willamette Valley area at that time. Changes in migration patterns, especially with cackling geese, have resulted in the current wintering total geese estimated at over 350,000 for this same area.

Dusky Canada geese have declined significantly in recent years, largely attributed to changes to their breeding grounds on the Cooper River Delta in Alaska as a result of uplifting from the 1964 earthquake. Their population fluctuated between 10,000 and 20,000 birds, and is currently estimated at approximately 16,000 (Pacific Flyway Council 2015). They make up less than 10 percent of the winter flock in the valley and are below flyway objectives. Dusky Canada geese generally arrive in the Willamette Valley in late October-early November and remain until they migrate back north in early April.

The cackling goose is now the most abundant goose on the Refuge. In addition to the cackling and dusky geese, other species of Canada geese that regularly winter in large numbers include taverner, lesser, and western. Other geese found mixed in with flocks of Canada geese include white-fronted,

snow, and Ross' geese, and an occasional black brant. White-fronted geese are more common during the spring migration in late April and early May. Most migratory geese leave the Willamette Valley for nesting grounds by early May. Non-migratory western Canada geese are present year round and nest on the Refuge. All of the geese forage on agricultural crops grown through the Cooperative Farming Program and roost on the wetlands.

Ducks are plentiful in late fall through the winter months, utilizing wetlands and flooded grass fields. The average number of ducks wintering in the Willamette Valley over the last 10 years has been about 125,000 (USFWS 2010b). Numbers vary greatly depending on habitat conditions and yearly variables such as weather and breeding production. The number of wintering ducks in the Willamette Valley has more than doubled when compared to the early 1990s. Although this increase is partially attributed to increased flyway populations, it also reflects the significant wetland habitat developments on the Refuge and the WVNWRC in general in the late 1990s and additional habitat restoration efforts on both Refuge and private lands over the past decade. The most abundant duck species found on the mid-winter survey are the green-winged teal, northern pintail, mallard, and American wigeon. Of the 20 duck species that can be found wintering in the Willamette Valley, 13 of those have been documented as breeders. Wintering tundra swans roost on the large wetlands, with peak numbers occurring in December. They traditionally move off-Refuge during the day to feed on nearby agricultural lands when winter rainfall floods the fields.

Commonly observed waterbirds include great blue and green herons; great egrets; American bittern; American coot; Virginia rail; sora; and pied-billed, horned, eared, and western grebes. Double-crested cormorants are observed in small numbers. Eleven species of gulls and terns are all generally rare visitors.

Of the 16 species of shorebirds found either as migrants or wintering on the Refuge, dunlin are the most numerous (past averages have been 10,000 and 20,000 in winter months). In 1996, wintering dunlin exceeded 22,000 (K. Viste-sparkman pers. comm.). In part due to natural succession of wetland vegetation over subsequent years and a decrease in open mudflats, wintering dunlin numbers have declined, dropping to less than 8,000 in 2007. Periodic marsh rehabilitation efforts, usually spring drawdowns combined with summer discing to set back undesirable wetland vegetation, are expected to return some of the wetland margins to early successional mudflats and could result in a rebound of wintering numbers of dunlin. However, wintering dunlin are transitory and have been documented using wetlands across the valley that have been restored under the Natural Resources Conservation Service Wetland Reserve Program and the Partners for Fish and Wildlife Program.

Shorebird species, including yellowlegs, sandpipers, and dowitchers pass through Ankeny NWR in small numbers en route to wintering or nesting grounds, with concentrations in May and late summer. Nesting shorebirds include killdeer, spotted sandpiper, and Wilson's phalarope. Killdeer are a year-round resident, nesting on road sides and gravel pullouts and wintering in high numbers on grazed farm fields (Sanzenbacher and Haig 2002). Killdeer nests are subject to both predation and accidental destruction by vehicles because of their preference for open nest sites on gravel. Wilson's snipe were documented nesting at the Refuge in 2007.

Landbirds can be found in all habitats of the Refuge, including riparian woodlands, agricultural farm fields, oak savanna and seasonal and permanent wetlands. Over 128 species of resident and migrant landbirds have been observed, including 22 species of raptors (e.g., owls, hawks, falcons, and eagles), 15 non-passerines (e.g., woodpeckers, hummingbirds, kingfishers, doves, and pigeons), and 91 species of passerines (e.g., sparrows, finches, warblers, flycatchers, and swallows). Long-distance

migrants travel between breeding grounds in temperate North America and wintering grounds in Central and South America. Resident species both breed and winter in the local area, migrating short distances.

Raptors reside on the Refuge year round as well as during migration to and from their nesting grounds. Greater species diversity and larger numbers are observed in the fall and winter months. Nesting raptors include barn, western screech and great-horned owls; osprey; northern harrier; red-tailed and Cooper's hawk; American kestrel; and bald eagle. Bald eagles reside year round with nests on waterways adjacent to the Refuge. Annual bald eagle surveys are conducted in January as part of a coordinated statewide effort. Winter months draw small concentrations of eagles and an occasional peregrine falcon, attracted to the abundant waterfowl and shorebirds. Rough-legged hawks are common winter residents, but numbers fluctuate depending on migration. Osprey nest on nearby Willamette and Santiam Rivers and can often be seen fishing the larger impoundments throughout the breeding season.

Several habitat types support 91 species of songbirds, most of which are observed during the spring and summer months. Sixty-three species have been documented nesting on one or more of the Refuges in the WVNWRC. Rarities include black phoebes and streaked horned larks. Western meadowlarks nest as well as winter on remnant prairie pieces. The Refuge supports a diversity of warblers, most of which are migrants. Oak savanna provides critical habitat for nesting white-breasted nuthatch, black-throated gray and orange-crowned warblers, western wood-peewee, and western bluebird. White-breasted nuthatch, acorn woodpecker, and western wood-pewee, all species of concern to the WVNWRC, depend on large, open canopy, savanna-type oaks for both nesting and foraging. Orange-crowned warblers depend on oak woodlands with a diverse native understory.

3.6 Mammals

A variety of mammals occur on Ankeny NWR, especially those associated with wetland and riparian habitats. River otter, mink, and beaver inhabit the wetlands and stream channels. Coyotes are commonly seen, finding abundant avian prey. Small numbers of elk can be found and are thought to come from a herd in the nearby hills east of Interstate 5. They spend most daylight hours within the riparian areas on the east side of the Refuge, venturing into the open fields under the cover of darkness.

3.7 Fish

The Willamette River, and to a lesser extent the connected Sidney Ditch, is the main location on the Refuge that supports native migratory fish. The Willamette River supports steelhead, chinook salmon, and sea-run cutthroat trout, seasonally for returning adults and year round for rearing juveniles. A number of wetland impoundments and stream channels support a small number of fish species, mostly introduced. Mosquito fish, carp, and brown bullheads are the most widespread. Periodic de-watering of seasonal wetlands helps to control carp populations and other warm-water exotic fish. A number of small native minnows can be found in Sidney Ditch. Willow Marsh supports the largest population of Oregon chub, a freshwater minnow native to the Willamette watershed, and has significantly contributed to the delisting of that species in 2015.

3.8 Other Wildlife

Twenty-one species of reptiles and amphibians occur in the Willamette Valley, most of which have been observed on WVNWRC refuges. Northern red-legged frogs and Pacific chorus frogs inhabit riparian areas and utilize many of the seasonal and permanent wetlands as breeding habitat. Rough-skinned newts, northwestern salamanders, and the introduced bullfrog are other common amphibians found on the Refuge. Much of the native wetland habitat in the valley has been degraded due to exotic plants like reed canarygrass (McAllister and Leonard 1997), and drained or ditched for agriculture. Many reptiles found in the Willamette Valley occur more frequently in open habitats, suggesting that succession to closed-canopy conditions (e.g., the loss of oak savannah) may be restricting their range and numbers (Pacific Wildlife Research Inc. 1999). Some common reptiles present in the grassland habitats include gopher snakes, garter snakes, and racers.

The Refuge provides vital habitat for the northern red-legged frog, also a species of concern. Red-legged frogs have declined due to a number of factors including habitat loss, hydrological alteration of wetlands, establishment of nonnative predators, and widespread application of fertilizers and pesticides. Management of permanent and seasonal wetlands with adjacent riparian areas provides quality habitat. The Refuge has a number of northern red-legged frog breeding sites and has been the focus of numerous surveys and reproductive monitoring efforts. Continuing studies by the United States Geological Survey (USGS) at the Refuge provide important biological data on the northern red-legged frog, which is especially important in light of the paucity of data available on this species. The surveys revealed that the presence of red-legged frogs was closely associated with riparian woodlands and wetlands in close proximity to riparian woodlands. Measures to protect these populations have included retaining water in seasonal wetlands through the end of June in order to avoid stranding tadpoles prior to emergence.

Both terrestrial and aquatic invertebrates are an important food source for many species A number of studies have been conducted over the past decade, but there is no comprehensive list of invertebrates found on the WVNWRC. Aquatic invertebrate surveys were conducted in 2007 and 2008 by USGS researchers in the Refuge wetlands as part of a valley-wide study. Additional aquatic invertebrate sampling was conducted by the Xerces Society as part of an Oregon Watershed Enhancement Board grant. Dragonflies and damselflies were inventoried across the WVNWRC in 2005 to help with preparation of an identification guidebook (S. Gordon pers. comm.). Eighty-four moss and 24 liverwort species have been collected and cataloged.

3.9 Threatened and Endangered Species

No federally listed threatened or endangered species, or candidate species, are known to use the Nature Center vicinity. Three plants and one bird listed as either threatened or endangered under the Endangered Species Act can be found on Ankeny NWR.

Golden paintbrush: Golden paintbrush is a federally threatened species that had been extirpated from Oregon. The historic range included the upland prairies of the Willamette Valley. As part of a recent Cooperative Recovery Initiative, Ankeny NWR and partners introduced new populations from seed in summer 2015, including a 6-acre upland prairie site south of the Nature Center. Management includes fall mowing and, in some years, prescribed fire.

Willamette daisy: The Willamette daisy was listed as endangered in 2000. It is a perennial herb found on both wet and upland prairies. The loss of native Willamette Valley prairie is the primary

reason for the decline, and it appears to be a poor competitor with nonnative grasses. Willamette daisy was seeded in summer 2015 in a 6-acre upland prairie site south of the Nature Center. Management efforts to protect and maintain Willamette daisy populations include herbicide treatments focused on nonnative grasses and broadleafs, mechanical treatments to reduce woody vegetation, and conducting prescribed burns.

Nelson's checkermallow: This species was federally listed as threatened in 1993. Within the Willamette Valley, Nelson's checkermallow most frequently occurs in Oregon ash swales and meadows with wet depressions or along streams. It also populates wetlands within remnant prairie grasslands and roadsides. Due to an intolerance of encroachment of woody vegetation, Nelson's checkermallow has declined. Efforts to conserve and restore this threatened species have occurred at WVNWRC, including annual mowing, prescribed fire, extensive out-planting of nursery plants, protection of roadside populations, and plant relocation as needed to prevent mortality from flooding or agricultural activities.

Streaked Horned Lark: This small passerine species was listed as threatened in 2013 and is a sub-species of the horned lark endemic to western Oregon and Washington. The streaked horned lark prefers flat, sparsely vegetated ground on which to forage and nest. If the vegetation is above a few inches high, the lark will avoid the habitat because of a decrease in foraging and predator detection abilities. The Refuge provides large tracts of suitable habitat for the streaked horned lark. Flat fields planted with grass seed crops but then intensely grazed by wintering geese are preferred foraging grounds for the lark.

3.10 Priority Public Uses

Nationwide, national wildlife refuges pumped $2.4 billion into the economy, supported more than 35,000 private-sector jobs, and produced $792.7 million in job income for local communities in Fiscal Year 2011 (Carver and Caudill 2013). Ankeny NWR's location, only 12 miles south of Salem and 9 miles north of Albany, creates a perfect opportunity to provide quality, wildlife-oriented recreation, education, and interpretation to a large segment of the mid-Willamette Valley population.

There are six public entrances to the Refuge, as indicated on Map 8. All six of these entrances are from county roads (Ankeny Hill, Buena Vista, Liberty, River/Sidney and Wintel) and are identified with entrance signs. There are ten vehicle pullouts along Wintel, Sidney, and Buena Vista Roads. The Refuge shop, closed to the public, is located north of Wintel Road. The Refuge maintains approximately 6 miles of interior roads for use by staff for management. These interior roads are open to the public as hiking routes during the open season and closed with permanent gates and/or signs during the closure periods. There are also 10 miles of Marion County-maintained roads that either bisect or border the Refuge.

There are five primary designated parking areas. These are located at Ankeny Hill overlook off Ankeny Hill Road: Eagle Marsh Kiosk off Buena Vista Road, Pintail Marsh overlook/Frog Pond Photo Blind off Wintel Road, Pintail/Egret Marsh Boardwalk and Observation Blind off Wintel Road, and Rail Trail Boardwalk off Wintel Road. Vehicular pull-outs are located off Buena Vista Road, Sidney Road, and Wintel Road.

Ankeny NWR receives approximately 60,000 visitors annually. All visitors engage in wildlife observation, while approximately 5 percent of visits are estimated to include wildlife photography.

Environmental education, interpretation, and special events represented about 1 percent of visitor use.

Trails and Other Facilities: There are 2.5 miles of established trails on the Refuge. An estimated 14,500 visits were recorded on the trails in 2009. The ¾-mile long Rail Trail was designated a National Recreation Trail in June 2006. This accessible boardwalk takes visitors through a seasonally flooded Oregon ash riparian habitat. Located south of Wintel Road, the 0.4-mile long Rail Trail follows an earthen path that leads to a boardwalk and observation blind culminating at Wood Duck Pond. Wood ducks and hooded mergansers are often seen on the pond. During the open season, visitors may continue on two separate loops, varying in length from ¼ mile to ¾ mile through forest and field habitat. Pintail/Egret Trail, located north of Wintel Road, offers an accessible ¼-mile boardwalk, following Bashaw Creek, where red-legged frogs are often seen. The observation blind at the end overlooks Pintail and Egret Marshes, where many species of waterfowl may be seen. Eagle Marsh Kiosk, conveniently located south off Buena Vista Road, has a covered shelter next to the parking lot that provides visitors with a great place to view wintering waterfowl on the marsh. It is easily accessible by bicycle or vehicle. Eagle Marsh is the largest wetland on the Refuge and provides viewing opportunities for species like cinnamon teal, Canada geese, eagles, osprey, and northern pintails. The Ankeny Hill overlook offers a parking area, restroom facilities, and a short path leading to a wooden deck offering a panoramic vista of the Refuge. A photography blind overlooking Frog Pond, located north of Wintel Road, was opened during late 2008. A reservation system is in place during the closed season. Access is provided from a parking area just west of the blind and down a short path below the dike. Reservations are not required during the open season. There are 10 vehicular pull-outs along county roads that provide visitors with opportunities to view wildlife that use the wetlands and crop fields.

3.11 Land Use

Ankeny NWR, including the Nature Center area, is located in the southwest corner of Marion County, 12 miles south of Salem, the State capital, in the mid-Willamette Valley. The Refuge is situated between the Willamette and Santiam Rivers, approximately 5 miles downstream of the confluence. The Refuge is surrounded by agriculture, including grass seed, dairies, row crops, hazelnuts, and other crops representative of the Willamette Valley. There are many rural residential properties around the Refuge associated with the communities of Talbot, Jefferson, Buena Vista, and South Salem.

The Willamette Valley serves as the heart of Oregon's agricultural industry. Marion County regularly leads the State in gross farm and ranch sales, with $639,326,000 in 2012. Marion County contains 639,326 acres of farmland among 2,567 farms, with an average size of 111 acres. The Willamette Valley is home to over 17,300 farms, mostly family-owned and operated, with an average of 700 acres per farm (US Census 2016). The valley is a leading producer of grass seed, producing nearly two-thirds of the United States' cool-season grasses. Over 60 percent of the nation's annual ryegrass supply comes from the Willamette Valley (OSU 2013). Grass seed farming is ideal in the region thanks to its wet, fertile soil. The valley also has the largest concentration of vineyards and wineries in Oregon (Oregon Wine Board 2013). The abundance of the rivers, lakes, and waterfalls provide numerous recreation and tourism opportunities in the Willamette Valley area.

3.12 Cultural Resources

The cultural history explained below provides an overview of the known archaeological and ethnographic use of Ankeny NWR, which would be an important part of the interpretation and environmental education curriculum of the Nature Center. It is excerpted primarily from cultural resource reconnaissance surveys and overviews prepared by Kindred (1980) for Ankeny and Baskett Slough NWRs.

Although little is known about the earliest inhabitants of the Willamette Valley, clues are emerging that suggest they may have occupied the area as early as 12,000 years ago. The first concrete archaeological evidence dates human occupation in the Willamette Valley to approximately 8,000 years ago at the Cascadia Cave site (Pettigrew 1990), whereas bulbs from a camas oven at the Hannavan Creek site near Eugene date to 7,800 and 6,880 years ago. Based on archaeological, ethnographical, and historical information, the Willamette Valley has most recently been occupied by the Kalapuya, a Chinookan term for the Willamette Valley people. There is disagreement among scholars as to the names and exact territories of the groups that made up the Kalapuyans, but they are generally divided into 13 groups. Each of these groups spoke separate but related dialects which were part of three related languages (White 1996). The Kalapuyan territory consisted of a broad expanse of well-watered prairie and oak woodland in the Willamette Valley flanked by wooded hills in the Coast Range to the west and the Cascade Mountains to the east. Deliberate fires were frequently set by the Kalapuya on the valley floor, thus helping maintain the presence of substantial areas of open prairie that were conducive to a better harvest and to maintain the foraging grounds of the white-tailed deer (Sperlin 1937, Habeck 1961).

The area now encompassed by the Refuge was most likely occupied by the Pudding River (Anhan cuyuk) band of the Kalapuya, although there may have been some Santiam bands in the area as well (Kindred 1980). The Pudding River band utilized the area from French Prairie, south to the Santiam River and east to the foothills (Berreman 1937). According to Collins (1951), “nothing of the culture of the Pudding River Indians can be located in the literature.”

Native Americans used plant resources that included cattails for mat-making, camas for food, willow for fiber to make twine, acorns of Oregon oak, berries for food and pigment, and tarweed for their edible seeds. Wilkes (1852) refers to the tarweed as “sunflower” which forms a large portion of their food. Tarweed seeds were collected after the prairies had been fired.

Settlement by Euro-Americans began in the mid-1840s. The Ankeny area attracted many settlers because of its good farmland. One of the earliest settlers was Henry Ankeny who came to Oregon in 1850 and purchased over 4,000 acres of farmland. By 1870, the town of Sidney was established around a grist mill built on the Willamette River. Power for the mill came from a ditch dug across what is now the Refuge.

Kindred (1980) completed a cultural resource inventory and overview of Ankeny and Baskett Slough NWRs, and other surveys have been completed since then for various National Historic Preservation Act Section 106 projects. More prehistoric sites were found at Ankeny than at Baskett Slough, most likely because of the proximity of Ankeny NWR to the Willamette and Santiam Rivers versus the marshy, lake-like conditions once present at Baskett Slough NWR. A total of 11 cultural resource sites occur on the Refuge, 7 of which are prehistoric lithic scatter sites, 2 are multi-component (historic refuse and lithic scatter), and 1 a historic site associated with the Henry Ankeny house. All of the sites have experienced some disturbance from farming activities.

The Service is leading the cultural resources work for this project to satisfy Section 106 compliance. Service's Cultural Resource staff recommended that it was most appropriate to invite the Tribes to the entire planning process in the concept stage instead of introducing them to the project via the Section 106 consultation process. Government-to-government tribal coordination for both project planning and compliance began upon completion of the schematic design contract when the implementation timeline would be clearer.

In the interim, Refuge staff submitted a Request for Cultural Resource Compliance (RCRC) to the Service's Cultural Resource team on February 5, 2015, for proposed enhancements of Peregrine Marsh, a project that is independent of this proposed action. In April 2015 Refuge staff was informed that there was a pre-recorded archeological site adjacent to Peregrine Marsh.

With the knowledge that pre-recorded sites exist within the broader Ankeny Hill Nature Center site, Refuge staff decided to delay geotechnical investigations associated with the Nature Center until a site schematic was complete and Refuge staff were ready to initiate Tribal coordination.

Refuge staff initiated Tribal coordination with project planning and Section 106 compliance simultaneously in fall 2015. The RCRC is based on the site schematic design for Alternative B, the proposed action. Staff are currently working with the Confederated Tribes of the Grand Ronde to explore partnership opportunities through the education/interpretation sub-committee, interpretive master planning, potential restoration planning and native plant materials for the site, along with Section 106 compliance. Currently, Tribal archeologists are working with the Service's Cultural Resource staff to formulate a sampling design that is appropriate for the site, given the previously recorded artifacts in the area.

3.13 Transportation/Access

The Service hired David Evans and Associates, Inc. (DEA) in 2012 to prepare a traffic study to investigate safety issues and analyze options associated with providing access to the proposed Nature Center. Current visitation is estimated at 60,000 annually. Service staff have previously noted concerns regarding available sight distance at the overlook access point as well as the layout of the parking area. The combination of these concerns has resulted in a traffic study to identify feasible alternatives and provide an evaluation of their impacts to traffic safety and circulation. Each alternative was evaluated based on three main goals: safety, infrastructure cost, and impacts to the surrounding environment. The initial phase of the project included a site visit to assess the sight distance and circulation concerns at the overlook. The assessment concluded that the overlook access provides insufficient sight distance. Ankeny Hill Road and Buena Vista Road are low-volume roadways that primarily serve local residents. An assessment of the most recent 5 years of crash data revealed no history associated with the overlook access (only two crashes in 5 years).

Because the site visit determined the sight distance at the existing access point to be insufficient, three site access alternatives were chosen to move forward to the evaluation stage:

1. **Alternative 1** is a two-way access taken from Buena Vista Road
    a. **Alternative 1a** places the Nature Center adjacent to the overlook and includes a meandering access roadway

b. **Alternative 1b** places the Nature Center adjacent to Buena Vista Road (not originally considered by the Service, added as part of this analysis to achieve the three goals of the study)

2. **Alternative 2** is a two-way access taken from Ankeny Hill Road (to the south of the existing access point)
3. **Alternative 3** is a one-way circulation route taken from Ankeny Hill Road

The Traffic Study is included in Appendix A.

3.14 Socioeconomics

Ankeny NWR is located within Marion County, with a 2015 human population estimate of 320,700, a 4.9 percent increase from the 2010 census. The valley population has doubled in just over 25 years from 2 million people in 1990 to over 4 million people currently (US Census Bureau 2015). Oregon is becoming increasingly urbanized with approximately 2.8 million people residing in incorporated cities. Portland became the 15th fastest growing U.S. city among the 50 largest cities in the U.S. in 2015 (oregonmetro.gov 2015). Oregon's population is increasingly diverse with approximately 67 percent of the population in the valley being Caucasian and 26 percent Hispanic or Latino.

Not only is the valley the most densely populated portion of the state, but it is also productive farmland the supports one of the biggest agricultural economies in the northwest. Tradition industries surrounded by farming and natural resources combine with high technology in the major cities of Portland, Salem, Corvallis, and Eugene contribute to a vibrant economy. Interstate 5 runs centrally through the entire length of the valley, which shapes the region's transportation system and flow of goods (ODFW 2004). Important industries in the region include agriculture, manufacturing, high technology, forest products, construction, retail, services, government, and health care. The valley is a leading producer of grass seed, producing nearly two-thirds of the United States' cool-season grasses. Over 60 percent of the nation's annual ryegrass supply comes from the valley (OSU 2013). Grass-seed farming is ideal in the region due to its wet, fertile soil.

The valley is also home to a growing wine industry. Over 200 wineries and 10,000 planted acres are located in the valley, which is home to two-thirds of the State's vineyards and wineries. Travel and tourism is one of the most important industries in Oregon (Dean Runyan Assoc. 2013). Total 2012 traveler expenditures varied across the four counties from approximately $113 million in Benton County to $350 million in Marion County.

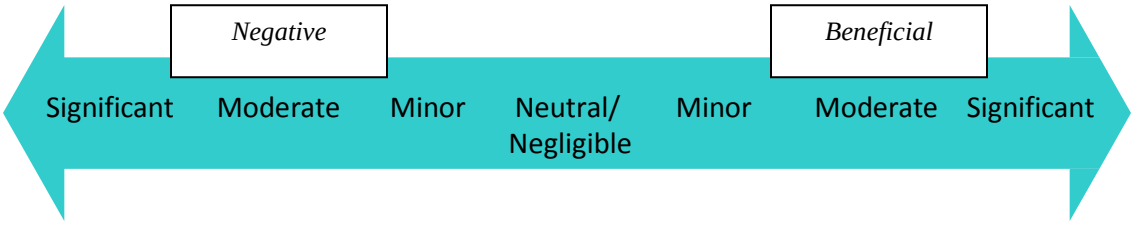
Over 96 percent of the land is privately owned, increasing the importance of public lands and conservation programs that allow the public to be connected with the natural environment, while still protecting, conserving, and restoring natural resources, native habitats, and wildlife. Within the Willamette Valley there are four refuges: the three within the Willamette Valley National Wildlife Refuge Complex and Tualatin River NWR in Tualatin. Oregon has two State Wildlife Management Areas (Fern Ridge and Sauvie Island) and a growing number of conservation easements associated with Natural Resources Conservation Service and the Willamette Wildlife Mitigation Program.

4. Environmental Effects

The effects analysis has been developed by identifying the species groups, habitats, Refuge users, aspects of the physical environment, and other resources of interest and then identifying effects to

these resources that could potentially result from implementing the actions described under each alternative. Effects are described in terms of the change from current conditions. Thus, Alternative A: No Action/Current Management has a neutral effect because minimal or no changes to management programs would occur.

The information used in this EA was obtained from relevant scientific literature, existing databases and inventories, consultations with other professionals, and professional knowledge of resources based on field visits, and experience.



The terms identified below were used to describe the scope, scale, and intensity of effects on natural, cultural, social, and economic (including recreational) resources. Effects may be identified further as beneficial or negative.

Neutral or Negligible. Resources would not be affected, or the effects would be at or near the lowest level of detection. Resource conditions would not change or would be so slight there would not be any measurable or perceptible consequence to a population, wildlife or plant community, recreation opportunity, visitor experience, or cultural resource. If an impact is not discussed, it is assumed to be neutral.

Minor. Effects would be detectable but localized, small, and of little consequence to a population, wildlife or plant community, other natural resources, social and economic values (including recreational), visitor experience, or cultural resources. Mitigation, if needed to offset adverse effects, would be easily implemented and successful, based on knowledge and experience.

Moderate. Effects would be readily detectable and localized with measurable consequences to a population, wildlife or plant community, other natural resources, social and economic values (including recreation), visitor experience, or cultural resources. Mitigation measures would likely be needed to offset adverse effects and could be extensive, moderately complicated to implement, and probably successful based on knowledge and experience.

Significant (major). Effects would be obvious and would result in substantial consequences to a population, wildlife or plant community, other natural resources, social and economic values (including recreation), visitor experience, or cultural resources within the local area or region. Extensive mitigating measures may be needed to offset adverse effects and would be large-scale in nature, possibly complicated to implement, and may not have a high degree of probability for success. In some instances, major effects would include the irretrievable loss of the resource.

Time and duration of effects have been defined as follows:

Short-term or Temporary. An effect that generally would last less than a year or season.

Long-term. A change in a resource or its condition that would last longer than a single year or season.

This chapter describes the environmental impacts of the action alternatives in relation to the no-action alternative (Alternative A).

4.1 NO-ACTION ALTERNATIVE

Under the no-action alternative, there would be no change to the existing site. This alternative would not address the purpose and need for the action or the priority public uses of the Refuge System, and would not help fulfill operational goals of Ankeny NWR. The Refuge would continue to be managed primarily for wildlife and habitat resource values. The WVNWRC would not realize the partnership potential associated with Salem Audubon and the funding contribution towards the mutual goals and objectives of the Service and Salem Audubon. The MOU between the Service and Salem Audubon for the Nature Center in 2012 and all associated projects and investments would not be implemented.

This alternative would also not address further economic development of local cities and the enhancement of school district outdoor environmental education curriculums. It would not allow the Refuge to serve as a public focal point for green spaces benefitting residents of the mid-Willamette Valley and the Salem–Albany metropolitan areas. This alternative would forgo the opportunity to be a primary conservation partner with multiple existing, trusted conservation organizations with mutual goals and interests.

4.1.1. Effects to Geology and Soils

There would be neutral changes to the site's geology or soils since no physical changes would be made. The soils would continue to be subjected to standard agricultural practices such as periodic mowing, discing, planting, and harvest related to grass seed farming for geese and potentially prairie restoration efforts in the future.

4.1.2. Effects to Hydrology and Water Quality

There would be moderate to no changes to the site's hydrology and water quality since no physical developments would be made and any habitat restoration in the vicinity would have equal priority with the rest of Ankeny NWR. As time and resources allow, the Refuge and partners may increase the buffer width of the riparian corridor along Spring Creek that flows into Peregrine Marsh. This would have positive effects to water quality, namely via shading and reducing summer temperatures.

4.1.3. Effects to Vegetation and Fish and Wildlife

Under the no-action alternative, management would continue to be provided for migratory birds and resident fish and wildlife as described in the CCP. Native habitat restoration on the 25-acre Nature Center area would have equal priority with the rest of Ankeny NWR. In summer 2015, Peregrine Marsh was enhanced by mowing, herbicide application, scalping reed canary-grass, berm broadening and lowering, and grading swales for topographic diversity. Similar restoration projects are in planning stages for upland prairie/oak savanna, riparian, and wet-prairie on Ankeny Hill and in the vicinity.

4.1.4. Effects to Priority Public Uses

There would be no priority public uses added to the site since there would be no changes to current management. The Ankeny Hill overlook would still serve as a parking area with a restroom, overlook, and one interpretive kiosk. The site accommodates approximately 12 cars, has 2 both-sex restrooms with no running water, and is open from dawn till dusk. Wildlife observation and wildlife photography would continue to be the two primary forms of public uses offered.

4.1.5. Effects to Land Use

There would be no land use changes associated with the no-action alternative beyond the Nature Center campus. Approximately 18 acres of the Nature Center area that is currently maintained as cropland for geese may be restored to native wet and upland prairie; however, this would be subject to available funding, staff, and other resources. Another 3 acres of riparian restoration could occur as resources allow.

4.1.6. Effects to Cultural Resources

Historic and cultural resources would not be directly affected since there would be no change to the existing site.

4.1.7. Effects to Transportation

No additional traffic would visit the Refuge if the Nature Center was not built. Access would remain as it currently exists and no recommendations from the traffic study or Marion County's Department of Public Works would be implemented.

4.1.8. Economic Effects

There would be no changes to local communities and no increased socioeconomic benefits because of the lack of Refuge activities and partnership with Salem Audubon. Public use at Ankeny NWR would remain limited to outdoor kiosks, self-serve interpretive signs, and no indoor facilities to the public.

4.2 ACTION ALTERNATIVES

The following is a discussion by element of the environmental effects for Alternative B: Proposed Action/Preferred Alternative, Alternative C: More Developed Building Facilities/Higher Cost, and Alternative D: Less Developed Building Facilities/Lower Cost

4.2.1. Effects to Geology and Soils

Each of the action alternatives have similar impacts on soils, with the new Nature Center building located on uplands on top of Ankeny Hill and an outdoor classroom built on uplands adjacent to Peregrine Marsh. The Preferred Alternative provides less disturbance than Alternative C with its increased excavation for the Nature Center building and, Alternative D due to a separate structure for the outdoor classroom on Ankeny Hill.

Each action alternative would result in similar disturbed land area for site preparation, grading, and development. In addition to the building footprint, approximately 3 acres of disturbed area is distributed throughout the Nature Center area for all alternatives and is associated with development of a new driveway, a new paved parking lot with a gravel overflow lot, a loop trail, experience zone, a separate outdoor classroom adjacent to Peregrine Marsh and associated parking lot, and two septic drain fields.

Earthwork activities during construction of the proposed facilities present the greatest potential for soil impacts. Earthwork would be required to build the entrance road, parking areas, Nature Center building, outdoor classroom, trails, and associated facilities. Operational impacts would be limited by performing all earthwork and construction during the dry season and employing a variety of best management practices to minimize soil disturbance and erosion which would include single point of ingress/egress for construction equipment, single location for fueling and cleaning equipment on existing gravel parking lot, mulching and/or seeding disturbed soils, and dust control via water truck as needed

Driveway and Parking Areas

The driveway is the same for all alternatives and would have similar impacts. The proposed access point has been identified in the traffic study as a safety improvement and has been reviewed and approved by Marion County's Department of Public Works. The road would be approximately 600 feet long, 24 feet wide, and would be asphalt. It would require minor grading to achieve a smooth elevation transition from Ankeny Hill Road to the new parking area, with a maximum 6.5 percent grade for a short segment up the hill. Freshly excavated areas and cut slopes are subject to erosion from precipitation and run-off. This would be mitigated by performing construction in the dry season, seeding disturbed ground with native herbaceous cover, and straw wattle if needed. Organic material will need to be scraped (1–2 inches) in the road, parking area, and trail footprints to get to mineral soils. That soil material will be disposed of onsite by placing it at the toe of Ankeny Hill in uplands. A 30- by 20-foot box culvert would need to be installed in Spring Creek to allow vehicle crossing at the new access location, which will require environmental permits for removal/fill activities in jurisdictional wetlands from Oregon Department of State Lands and U.S. Army Corps of Engineers.

Buildings

Earthwork for buildings varies. The Preferred Alternative proposes standard wood-framed construction with concrete foundations and requires the least amount of excavation. The building has a low profile, something neighbors identified as desirable in the planning process; therefore, it is situated on the top of the Ankeny Hill overlook, utilizing flat existing conditions. The low profile would require minimal grading, low foundations, minimize visual impacts to neighbors, and help shield wildlife from disturbance. Alternative C proposes the greatest amount of earthwork, and excess fill, because of lowering the grade an additional 2–3 feet and providing an earth roof to maximize blending the structure into the landscape and maintaining the viewshed. Excess soil would need to be dumped onsite, preferably on top of Ankeny Hill adjacent to the existing parking lot. Alternative D requires slightly more grading than the Preferred Alternative because the building would be a pre-manufactured steel building with concrete foundations, which requires anchor-rod footings that are generally 2–4 feet deep at each main vertical structural support. While Alternative D does not require significantly more grading than the Preferred Alternative, the building would be over 27 feet tall, which would partially block the neighbors' viewshed and it does not shield wildlife

from visitors as does the Preferred Alternative. Therefore, Alternative B emerges as the optimal choice in terms of function and grading.

Trails and Observation Nodes

Trail construction is the same for all three action alternatives. Construction considerations of trails are outlined below.

Trail construction would require lightly scalping the top organic layer from the soil and/or chemical fallowing the trail footprint with non-selective herbicide to remove existing vegetation. Native soils would be exposed during construction making them subject to erosion from precipitation, stormwater runoff, and wind. However, trail construction would occur during the dry season and the proposed trails are in areas that have been intensively farmed for decades, with active soil disturbance. Education nodes would likely consist of a bench for seating and an interpretive sign for outdoor education. One observation overlook is proposed on the south end of the experience zone where a wooden overlook currently exists on the site. A 235-foot wetland boardwalk is proposed in phase 4 over part of Peregrine Marsh that would allow visitors to observe wetland flora and fauna and to collect samples that could be taken back to the classroom for study.

Potential impacts from construction of these structures depend on the materials and methods used. Wooden structures would require columns founded on pier blocks, pinned foundations, or cast concrete footings. Foundational structures would be needed approximately every 10–15 feet through the wetland boardwalk, which is approximately 235 feet long. This work will require environmental permits for removal/fill activities in jurisdictional wetlands from Oregon Department of State Lands and U.S. Army Corps of Engineers. Excavations for cast concrete footings may expose soils to erosion due to precipitation, stormwater runoff, or wind. Pinned foundations and pier blocks require little or no excavation, limiting soil exposure and erosion. These foundations could all suffer from differential settlement in soft native soils. The proposed wetland boardwalk would be built in summer when the seasonally inundated Peregrine Marsh is dry.

4.2.2. Effects to Hydrology and Water Quality

All of the action alternatives would be expected to have modest temporary impacts to water quality and hydrology given that development largely occurs in areas that have already been developed or extensively farmed for decades. The schematic design consultant reviewed the FEMA floodplain mapping and found that the entire Ankeny Hill site is outside the 100-year floodplain. While the Peregrine Marsh outdoor classroom would be located adjacent to the wetland, the location abruptly transitions to upland. The impoundment was created in the early 2000s and that location was cut into the uplands. Additionally, Peregrine Marsh is a restored, managed wetland, therefore maximum water level elevations are controlled by a flash-board riser water control structure and two emergency spillways. The classroom would be located at least 2 feet above the maximum water surface elevation in uplands. The new driveway for both the Nature Center and outdoor classroom would be paved with asphalt, therefore there would be minor, long-term effects from stormwater run-off. This would be mitigated by having native vegetation and swales between the development and Spring Creek or jurisdictional wetlands. The Nature Center parking lot footprint largely utilizes the existing Ankeny Hill overlook parking lot footprint. Spring Creek is an intermittent, non–fish-bearing stream the runs through a culver under Ankeny Hill Road, through the Refuge for approximately 1,900 feet before entering Peregrine Marsh. The new box culvert that would provide vehicle access would have minimal temporary impact and would be installed when no live flow exists. This work will require

environmental permits for removal/fill activities in jurisdictional wetlands from Oregon Department of State Lands and U.S. Army Corps of Engineers. Extensive riparian restoration would occur during and after construction of the Nature Center resulting in an expanded native riparian corridor that would result in shading and cooler water temperatures.

4.2.3. Effects to Vegetation, Fish, and Wildlife

All of the action alternatives would have similar and no significant impact on native vegetation, fish, or wildlife, and no effects to threatened or endangered species, reaching a determination of "no effect." Each action alternative was prepared in a manner to minimize or avoid impacts on fish and wildlife. In fact, extensive habitat restoration of native habitat types proposed at the Nature Center would have moderate benefits to vegetation, fish, and wildlife. The current habitat condition of the Nature Center area is largely non-agricultural grassland dominated by introduced cool-season grasses. The area was formerly in agricultural, specifically tall fescue, to provide winter forage habitat for wintering Canada and cackling geese. Goose use was relatively low in this area due to the topographic relief compared to the flat floodplain lowlands that are predominant on the Refuge.

Restoration and enhancement of native habitats near the Nature Center area would provide improved habitat quantity and quality for native plant communities and associated wildlife. There would be minimal displacement impacts on the Nature Center campus as new infrastructure would largely occur where prior disturbance and existing infrastructure occurs. For example, the new parking lot would be built where the existing parking lot exists. The trail network, overlook, experience zone, and education nodes would have equal impact regardless of the alternative. There is no development through jurisdictional wetland except for the proposed 235 feet of wetland boardwalk trail at Peregrine Marsh and installation of the box culvert in Spring Creek. There will be no fill placed in wetlands. There may be minor, temporary effects associated with installation of boardwalk foundations in Peregrine Marsh, but the environmental education benefits to the public would outweigh those temporary effects. Several other alternatives were initially considered, but were viewed unreasonable as action alternatives and rejected for a variety of reasons, which included the conservation needs for fish and wildlife.

Ankeny NWR management has conducted a Biological Evaluation for relevant species protected under the Endangered Species Act (refer to Appendix C for Biological Assessment).

The general location of the Nature Center building in all alternatives provides the best viewing area for an overview of the Refuge, scenic vistas, and proximity to a variety of priority habitat types. Additionally, the location is at the highest upland point on the Refuge, resulting in no impact to wetlands and utilizing an existing overlook and year-round public use site with modest existing infrastructure. The proposed Nature Center site provides convenient access off I-5 and a staging area for the environmental education uses and year-round trails. Most areas are in the 100- year floodplain of the Willamette and Santiam Rivers, therefore avoiding negative environmental impacts and flood risk would be difficult.

The building is designed to blend in with the natural surroundings, with the intent that the focus is on the natural habitats and resources, not the built environment. In Alternatives B (preferred) and C (more developed), the building is one story to keep the mass low to blend in and also to respect the private residences upslope who that share the view. Alternative D (less developed) proposes a two-story building; the location is slightly downslope to avoid significantly blocking the viewshed. The building would be over 27 feet tall which would have moderate effects by partially blocking the

neighbors' view and not shielding wildlife from visitors. Reflective materials would be minimized to avoid impacts to wildlife such as bird collisions. All alternatives include an experience zone south of the Nature Center building that forms a nature outdoor gathering place for visitors and allows concentrated outdoor exploration and adventure for children that may be less compatible with wildlife in other parts of the Refuge. Visitors are expected to not disturb wildlife, which includes a variety of regulations (i.e., no jogging, no dogs) and also to practice environmental ethics such as keeping voices down and not yelling. The experience zone will be a designated area where safe outdoor play is encouraged. The area on top of the knoll around the building and experience zone would be planted with Oregon white oak and other flowering, smaller-statured, native trees and shrubs. This would result in restoration of oak savanna, an imperiled, native habitat type and the historic habitat of this area, with education opportunities and near-term improvement in food and cover for wildlife; the tree structure would continue to conceal and blend the building in with the built environment

In Alternative C, the Nature Center building would be built 5 feet below grade with the building not exceeding 14 feet in height and having an earthen roof. Visitors would encounter a largely natural landscape with a building that maximized blending into the environment. This alternative would provide the most natural setting and would be most energy efficient. However, the building would require the most capital investment and would require the most maintenance given the earthen roof. Alternative D would have to be moved downslope, therefore requiring more grading. It would blend into the environment the least due to the height and metal exterior.

4.2.4. Effects to Priority Public Uses

All of the action alternatives offer similar recreation opportunities, including wildlife observation and photography, environmental education and interpretation, and access to open space. The Nature Center would provide an indoor education facility for all the refuges of the WVNWRC. The action alternatives would provide the public with high-quality, resource-based experiences. The proposed facilities and associated developments give the public the opportunity to access a local national wildlife refuge that has many imperiled, native habitats and would provide the above listed opportunities in a landscape that is predominantly in private ownership.

Results of preliminary analysis show that visitors would be projected to double on Ankeny NWR from 60,000 annually to 120,000 and significantly more students would be served. However, containing the Nature Center to a 25-acre area with a variety of native habitats and wildlife in close proximity allows for a quality outdoor and educational experience while still protecting and limiting impacts to wildlife. All alternatives would be fully ADA-accessible. The alternatives do not differ in their effects to public uses.

4.2.5. Effects to Land Use

All of the action alternatives would result in similar negligible land use impacts on adjacent existing land uses. Most of Ankeny NWR is being either restored or managed to its historic habitat type (pre–Euro-American condition) or is being maintained as agriculture, cooperatively managed by local farmers, to provide abundant forage and sanctuary for wintering geese.

Buildings and related facilities constructed on Federal lands generally do not fall within the purview of local jurisdictions; however, the Service would seek review and comments from Marion County Public Works Department. The Service has conducted a traffic study and worked with Marion

County Public Works traffic engineers to identify a preferred ingress/egress location with improved sight distance to provide the safest access for visitors. The Service would also work in partnership with Marion County Water Resources Department and OR DEQ to seek review and comment on site and building plans and on all public services (e.g., water supply, sanitary, stormwater, and power) for consistency with local codes.

4.2.6. Effects to Cultural Resources

All action alternatives would be subject to meeting compliance with Section 106 of the National Historic Preservation Act of 1966, which requires Federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. The Service initiated this consultation with the State Historic Preservation Office and local Tribes in October 2015. The Service would take all reasonable accommodations to avoid historic artifacts and honor the history of the site. The Refuge is conducting government-to-government coordination with local Tribes as well as seeking partnership opportunities with the greater project. Early coordination with Service archeologists during the project planning process identified known archeological sites and previously conducted surveys and associated documents. The action alternatives intentionally excluded potential development and specific locations of proposed facilities that may potentially affect known sites, therefore there will likely be no effect. Moreover, field surveys will be conducted onsite prior to any earthwork to determine the presence/absence of cultural artifacts.

4.2.7. Effects to Transportation

The impacts on traffic and transportation access were analyzed in a detailed traffic study included in Appendix A. All action alternatives proposed the same preferred access location to both the Nature Center building along Ankeny Hill Road and the outdoor classroom along Buena Vista Road, which were two of three alternatives evaluated. The addition of the Nature Center, including increased field trips from schoolchildren within an hour's drive of the Refuge, is expected to double visitation and increase related traffic. The current access to the site from Ankeny Hill Road (a county road) is unsafe at posted speeds for both ingress and egress due to inadequate sight distance. The traffic study outlined several alternatives to create safe conditions for ingress and egress, including relocation of the entrance road. The DMT identified the alternative that relocates the access south along Ankeny Hill Road as the preferred alternative for schematic design because it provided safe access with a relatively short road length to a Nature Center on Ankeny Hill. See Appendix A for details.

4.2.8. Socioeconomic Effects

Moderate, equal socioeconomic benefits are anticipated to result from the development of the Nature Center under all action alternatives. Spending associated with recreational visits to refuges generates significant economic activity. In fact, 34.8 million visits were made to refuges in FY 2006, which generated $1.7 billion of sales in regional economies (Carver and Caudill 2007). The Nature Center and associated public use facilities are anticipated to improve the overall appeal of the Salem/Albany mid-Willamette Valley area and surrounding small communities, including Jefferson, Independence, and Turner. Open spaces such as parks, natural areas, and refuges may have positive influences on the sale of homes in proximity to those resources (Bolitzer and Netusil 2000). In addition to the positive, short-term construction benefits from the expenditure of the capital investment by Salem Audubon and the Service, the permanent long-term benefits include increased direct and indirect consumer expenditures associated with increased site visitation. Wildlife based recreation and

educational ecotourism would provide a source of external revenue to surrounding towns and communities.

5. Conditions for Achieving Project Goals and NWR Compatibility

5.1 Introduction

The affected environment and impacts of the siting for the Nature Center and associated site developments have been evaluated, and a number of conditions for achieving goals, objectives, and compatibility have been identified for the project. These conditions are presented below.

5.2 Geology and Soils

Construction best management practices such as dry season construction, limited ingress/egress access, defined fueling and equipment servicing areas in existing gravel parking lot, filter fabric fences, dust control using water trucks, and slope coverings (straw bales) would be used to protect water resources and reduce erosion as needed.

The stormwater design would satisfy the Marion County Stormwater Quality Treatment Engineering Standards guidelines.

Geotechnical investigations and reports would be implemented with recommendations for:

Sanitary systems, likely a traditional septic system

A domestic water supply well

Foundations for buildings and the box culvert across Spring Creek

5.3 Water Quality and Hydrology

Design and install stormwater management system with best management practices

Provide buffer for trails and surface water bodies, unless a boardwalk is desired

Slope parking lot to prevent pooling of surface water; direct runoff to stormwater management system

Regulate domestic water system as a public facility

Design an onsite sewage disposal system in accordance with DEQ guidelines

5.4 Vegetation, Fish, and Wildlife

Restrict year-round visitor use to the 25-acre Nature Center area via foot traffic only

Strategically locate trails and with vegetative buffers and appropriate distance to screen noise and visual human disturbance throughout the site

Design facilities to avoid disturbance to wetlands, while allowing for educational opportunities within the important habitat type

Remove nonnative plant communities and restore priority native habitats (i.e., prairie, wetland, riparian, and oak) within the Nature Center campus and the small disturbed area resulting from construction

Deter the spread and growth of noxious and undesirable weeds near disturbed areas

5.5 Priority Public Uses

Monitor visitor use to assure wildlife is not adversely impacted by an increase in public visitation

Enforce closed access to sanctuary areas outside of the Nature Center Campus during the winter closure period (October 1 thru March 31)

5.6 Land Use

Refer to and follow guidelines in the 2011 WVNWRC CCP and EA to guide management program needs of the Refuge from a broad perspective

Continue community and public outreach in association with the interpretive master planning for design and curriculum of the facilities

5.7 Cultural/Historic Resources

Any known archeological site(s) and/or cultural and historic resources would be avoided through the careful planning, siting, and construction phases of the project

Construction would cease immediately and consultation with archeologists would be initiated upon discovery of any site and/or historic resource

5.8 Transportation

Limit access to the two locations outlined in the schematic design and identified in the traffic study: Ankeny Hill Road south of Spring Creek (Nature Center) and Buena Vista Road (Peregrine Marsh outdoor classroom)

Provide two ADA parking spaces and two bus parking spaces in the Nature Center parking lot as well as one bus and one ADA parking space in the Peregrine Marsh outdoor classroom parking lot

Bicycle parking stalls would be provided on the site

Appropriate signage would be provided to guide and inform drivers (e.g., bus drivers) of appropriate routes to use when entering and exiting the site to avoid U-turns

6. List of Preparers

This Environmental Assessment was prepared by staff of the Willamette Valley National Wildlife Refuge Complex and reviewed by Project Leader Damien Miller. Editing and review was also provided by the DMT including Salem Audubon (Ray Temple and Michael Babbitt), Friends (Doug Spencer), the Service's Region 1 Visitor Services Program (Mike Marxen and Matthew Hasti), and the Service's Region 1 Engineering Program (Greg Hranec).

7. Consultation and Coordination with the Public and Others

The DMT created a "Question and Answer" booklet to solicit input for the design of the new facility, and interviewed key Service, Salem Audubon, donor, and education specialists to gain recommendations for the design in 2014. This resulted in a 181-page "Ankeny Nature Center Workbook" that contained detailed memoranda from the meetings with 12 interviews, 8 detailed "Question and Answer" responses, along with notes from the June 25, 2014, public meeting held at the Greater Jefferson Community Center.

The general public will be made aware of the document along with an invitation to provide comments through a news release on October 17, 2016. Comments will be accepted for 45 days through November 29, 2016. An open house style public meeting will also be held the evening of November 3rd from 6-8 pm at Pringle Hall Community Center, located at 606 Church St. SE in Salem, OR. A short overview presentation of the project will be made at 6:30. Comments will be solicited via hardcopy during the public meeting and all other comments are encourage via email at ankeny_nature_center@fws.gov

Copies of this draft EA are being made available for public review upon request at the Complex Headquarters located at 26208 Finley NWR Road, Corvallis, Oregon 97333, beginning on October 17, 2016 and on Ankeny NWR's website at https://www.fws.gov/NWR/ankeny/

All comments received from individuals become part of the official public record. All requests for such comments will be handled in accordance with the Freedom of Information Act and the Council on Environmental Quality's NEPA regulations in 40 CFR 1506.6(f). Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours.

Individual respondents may request that we withhold their home address from the record, which we will honor to the extent allowable by law. If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comments.

8. Environmental Compliance

Implementing the Preferred Alternative would comply with Federal laws, regulations, and Executive Orders. The following section describes specifically how the proposed action would comply with the National Environmental Policy Act (NEPA), National Historic Preservation Act (NPHA), Endangered Species Act (ESA), and other relevant Federal laws, regulations, and Executive Orders.

8.1 National Environmental Policy Act

As a Federal agency, the Service must comply with provisions of NEPA, as amended (42 U.S.C. 4321-4347). An environmental analysis is required under NEPA to evaluate reasonable alternatives that will meet stated objectives and to assess the possible environmental, social, and economic impacts to the human environment. This EA serves as the basis for determining whether implementation of the proposed action would constitute a major Federal action significantly affecting the quality of the human environment and it fulfills Service requirements under NEPA. This EA facilitates the involvement of government agencies and the public in the decision-making process.

8.2 Executive Order 11593: Protection Of Historical, Archaeological, and Scientific Properties and The National Historic Preservation Act

Executive Order 11593 established the policy that the Federal Government shall provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the Nation. Section 106 of the NHPA (16 U.S.C. 469) requires Federal agencies to take into account the effects of their undertakings on historic properties. This includes complying with the NHPA and other cultural resource preservation laws, and consulting with the State Historic Preservation Office and appropriate Native American governments, if applicable, over any future management actions which may have the potential to affect historic properties.

Pursuant to Section 106 of the NHPA and promulgated regulations, the Service has determined the proposed action constitutes an undertaking under the NHPA (36 CFR 800.3(a)). The proposed action would comply with the NHPA because the design has intentionally excluded areas of know cultural resources. Additionally, field surveys would be conducted prior to any earthwork to determine the presence/absence of cultural artifacts and to take appropriate action should artifacts be discovered during the course of construction.

8.3 Endangered Species Act And The Magnuson-Stevens Fishery Conservation and Management Act

The ESA (16 U.S.C. § 1531 et seq.) directs all Federal agencies to work to conserve endangered and threatened species and to use their authorities to further the purposes of the ESA. Section 7 of the ESA is the mechanism by which Federal agencies ensure their actions do not jeopardize the existence of any listed species. Under Section 7, Federal agencies must consult with the Service or the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) when any action an agency carries out, funds, or authorizes may affect a listed endangered or threatened species.

The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1855(b)) provides that Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect essential fish habitat (EFH). EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.

The Service completed a Section 7 Biological Assessment, including an analysis of EFH, for the proposed action. Four species listed under the federal ESA occur within Ankeny NWR: the listed-endangered Willamette Daisy (*Erigeron decumbens*) and three species listed as threatened: Nelson's checker-mallow (*Sidalcea nelsoniana*), streaked horned lark (*Eremophila alpestris strigata*), and

golden paintbrush (*Castilleja levisecta*). Critical habitat for the streaked horned lark has been designated in field 6T, 6N, 6SW, and 6SE, but these fields will be unaffected by the proposed action. Upper Willamette River chinook salmon (*Oncorhynchus tshawytscha*) and Upper Willamette River steelhead trout (*Oncorhynchus mykiss*) both listed as threatened occur nearby in the Willamette and Santiam rivers. No listed species, critical habitat, or EFH occurs within 0.5 miles of areas potentially impacted by the proposed action, nor would they be attracted to the area as a result of the proposed action. The analysis concluded that there would be no effect to the listed species and no adverse modification to designated critical habitat and EFH.

8.4 Executive Order 11988: Floodplain Management.

Executive Order 11988 requires Federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.

The Flood Insurance Rate Map (FIRM) for Marion County, Oregon, and Incorporated Areas (Panel 675 of 1150) does not map any floodplains on the Refuge. The proposed action is consistent with EO 11988 because floodplains would be unaffected by the proposed action.

8.5 Executive Order 11990: Protection Of Wetlands

Executive Order 11990 requires Federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative.

Wetlands were avoided to the maximum extent possible. There would be no development through jurisdictional wetlands associated with constructing the proposed Nature Center and related facilities except for the proposed 235-foot long boardwalk trail at Peregrine Marsh and installation of a box culvert in Spring Creek. The Service would secure permits from the U.S. Army Corps of Engineers and the Oregon Division of State Lands prior to initiating any work in jurisdictional wetlands.

8.6 Comprehensive Environmental Response, Compensation, And Liability Act And Secretarial Order 3127

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (42 U.S.C. 9601 et seq.) requires Federal agencies to evaluate the environmental condition of property and to take remedial actions as necessary to protect human health and the environment. Areas that would be affected by construction of the proposed Nature Center and related facilities have been part of the Refuge System since the 1970s. No hazardous wastes have ever been stored on the areas affected by the proposed action, nor have there been any accidents, spills, or other releases of hazardous wastes. No remedial actions are necessary to protect human health and the environment related to hazardous wastes.

8.7 Coastal Zone Management Act

The goal of the Coastal Zone Management Act (CZMA) is to preserve, protect, develop, and where possible, to restore or enhance the resources of the nation’s coastal zone. Oregon’s federally approved Coastal Zone extends from the coast inland to the crest of the coastal mountain range. The

Willamette Valley, including Ankeny NWR, is outside Oregon's federally approved Coastal Zone and exempt from the requirements of CZMA.

8.8 Executive Order 12372: Intergovernmental Review

Executive Order 12372 was issued with the goal of fostering an intergovernmental partnership by relying on State and local processes for the coordination and review of Federal development projects. Ankeny NWR initiated government-to-government Tribal coordination with The Confederated Tribes of the Grand Ronde, The Confederated Tribes of Siletz Indians of Oregon, and Confederated Tribes of Warm Springs in October 2015. Ankeny NWR has continued to work with The Confederated Tribes of the Grand Ronde, who have expressed an interest in the project and a desire to be a project partner. The Refuge has been in coordination with Marion County Public Works Department regarding safe access to the proposed alternatives and ultimately completed an independent traffic study to evaluate safety concerns. The Refuge would also be in consultation with Marion County to secure septic and well permits should the preferred alternative be implemented. Coordination and consultation with local and State governments and other Federal agencies has been completed by the Willamette Valley Wildlife Refuge Complex Project Leader.

8.9 Executive Order 12898: Federal Actions To Address Environmental Justice In Minority And Low-Income Populations

All Federal actions must address and identify, as appropriate, disproportionately high and adverse human or environmental effects of its programs, policies, and activities on minority populations, low-income populations, and Indian Tribes in the United States. The proposed action would take place on vacant Refuge land. Developing the proposed Nature Center would not result in displacements and would not have adverse human health or environmental effects on minority or low-income populations, Indian Tribes, or anyone else.

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