

BOX ELDER COUNTY COMPREHENSIVE WETLANDS MANAGEMENT PLAN

Submitted to:
**BOX ELDER COUNTY GREAT SALT LAKE
WETLANDS ECOSYSTEM PLAN
STEERING COMMITTEE**

Submitted by:
**SWCA, INC.
ENVIRONMENTAL CONSULTANTS**

August 1999

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TABLE OF CONTENTS

	Page #
STEERING COMMITTEE MEMBERS AND OTHER CONTRIBUTORS	v
ACRONYMS AND ABBREVIATIONS	vii
ES. BOX ELDER COUNTY WETLANDS PLAN EXECUTIVE SUMMARY	ES-1
ES-1. INTRODUCTION	ES-1
ES-2. THE OBJECTIVES OF PLANNING FOR THE FUTURE OF BOX ELDER COUNTY'S WETLANDS	ES-2
ES-2.1 BENEFITS OF A WETLANDS PLAN	ES-2
ES-2.2 DESIRED FUTURE CONDITION	ES-2
ES-2.3 AREAS ADDRESSED BY THE WETLANDS PLAN	ES-4
ES-3. PLANNING DATA	ES-5
ES-3.1 NATURAL RESOURCE DATA	ES-5
ES-3.2 COMMUNITY INVOLVEMENT PROCESS	ES-6
ES-3.3 PROJECTS WITH POTENTIAL LONG-TERM WETLAND IMPACTS	ES-6
ES-4. FRAMEWORK FOR ACHIEVING A DESIRED FUTURE CONDITION ..	ES-7
ES-4.1 WETLAND PLANNING CLASSES (WPCs)	ES-7
ES-4.2 TOOLS TO ACHIEVE GOALS AND DESIRED FUTURE CONDITIONS OF WPCs	ES-8
ES-4.3 WETLANDS PLAN IMPLEMENTATION	ES-10
ES-4.4 PARTNERS INVOLVED IN THE IMPLEMENTATION OF THE WETLANDS PLAN	ES-12
ES-4.5 FUNDING	ES-12
ES-4.6 MONITORING	ES-13
ES-5. SUMMARY	ES-13
1. INTRODUCTION	1-1
1.1 WHAT ARE WETLANDS?	1-1
1.2 WHY ARE WETLANDS IMPORTANT?	1-2
1.3 WETLANDS OF BOX ELDER COUNTY AND GREAT SALT LAKE	1-3
1.4 LAWS AND POLICIES AFFECTING WETLANDS	1-4
1.4.1 Section 404 Permits	1-4
1.4.2 Mitigation for Wetland Impacts	1-5
1.5 WHY DO WE NEED A WETLANDS PLAN?	1-5
1.5.1 Past Wetland Impacts	1-6
1.5.2 Growth Projections	1-7
1.5.3 Conclusion	1-7
2. PLANNING FOR THE FUTURE OF BOX ELDER COUNTY'S WETLANDS	2-1

2.1	BENEFITS OF A WETLANDS PLAN	2-1
2.2	DESIRED FUTURE CONDITIONS	2-2
2.2.1	Wetland Conservation Goals	2-2
2.2.2	Urban Development Goals	2-3
2.3	AREAS ADDRESSED BY THE WETLANDS PLAN	2-4
3.	PLANNING DATA	3-1
3.1	NATURAL RESOURCE DATA	3-1
3.1.1	Jurisdictional Boundaries And Features	3-1
3.1.2	National Wetlands Inventory Data	3-2
3.1.3	Flood plains	3-2
3.1.4	Recharge, Discharge, And Aquifer Protection Areas	3-3
3.1.5	Soil Features	3-3
3.1.6	Agricultural Land Usage And Designation	3-3
3.1.7	UDWR And Functional Assessment of Wetlands	3-4
3.1.8	Near-term Development Potential Areas	3-5
3.1.9	UDWR Priority Wetland Habitat Areas	3-5
3.2	COMMUNITY INVOLVEMENT PROCESS	3-6
3.3	PROJECTS WITH POTENTIAL LONG-TERM WETLAND IMPACTS	3-7
4.	FRAMEWORK FOR ACHIEVING A DESIRED FUTURE CONDITION	4-1
4.1	WETLAND PLANNING CLASSES (WPCs)	4-1
4.1.1	Wetland Planning Class A (Class A) - Areas Already Protected for Wetland Functions and Values	4-2
4.1.2	Wetland Planning Class B (Class B) - Areas for Which Wetland Protection Plans Are Being Developed	4-2
4.1.3	Wetland Planning Class C (Class C) - Large-scale Aquatic Landscape Features	4-4
4.1.4	Wetland Planning Class D (Class D) - Connecting Areas	4-5
4.1.5	Wetland Planning Class E (Class E) - Interface Planning Areas	4-6
4.1.6	Wetland Planning Class F (Class F) - Other Wetlands	4-6
4.1.7	Wetland Planning Class G (Class G) - Remaining Non-wetland Areas	4-7
4.2	TOOLS TO ACHIEVE GOALS AND DESIRED FUTURE CONDITIONS OF WPCs	4-11
4.2.1	Special Area Management Plan (SAMP) Strategy	4-11
4.2.1.1	SAMP Urban Development and Mitigation Areas for Box Elder County	4-11
4.2.1.2	Process for Developing the SAMP	4-14
	Step 1: Functional Assessment of the SAMP Area	4-15
	Step 2: Public Outreach/Communication with Landowners ..	4-16
	Step 3: Conduct Functional Assessments of Future Urban Development and Mitigation Scenarios	4-16
	Step 4: Submit SAMP and General Permit Application Package to the Corps	4-17

	Step 5: Develop and Implement Mitigation Plans	4-18
4.2.2	Additional Tools and Actions	4-18
4.3	WETLANDS LAN IMPLEMENTATION	4-24
4.3.1	Implementation Structure	4-24
4.4	PARTNERS INVOLVED IN THE IMPLEMENTATION OF THE WETLANDS PLAN	4-26
4.4.1	The Role of the Wetlands Coordinator	4-27
4.4.1.2	SAMP Development	4-27
4.4.1.2	Conservation Programs	4-27
4.4.2	Additional Plan Implementation Partners for the Wetlands Coordinator	4-28
4.5	FUNDING	4-34
4.6	MONITORING	4-35
5.	SUMMARY	5-1
6.	LITERATURE CITED	6-1

LIST OF TABLES

Table 4.1.	Wetland Planning Classes and planning goals.	4-8
Table 4.2.	Total and wetland acreage in each Wetland Planning Class for areas east of the Promontory Mountains	4-10
Table 4.3.	NWI and GPS wetland acres within the Box Elder County Special Area Management Plan boundary.	4-13
Table 4.4.	Tools and policies to use in achieving Wetlands Plan conservation goals	4-21
Table 4.5.	Tools and policies to use in achieving Wetlands Plan development goals	4-22
Table 4.6.	Tools and action applicable to each Wetland Planning Class	4-23
Table 4.7.	Agencies that will play a role in the implementation of the Wetlands Plan.	4-29
Table 4.8.	Wetlands Plan Tools and Actions and Partners primarily responsible or included in their implementation.	4-33
Table 5.1.	Wetland Planning Classes, goals, tools and partners responsible for implementing the Wetlands Plan.	5-3

LIST OF FIGURES

Figure 4.1	Process for Developing the Box Elder County SAMP	4-14
Figure 4.2	Implementation structure for the Box Elder County Comprehensive Wetlands Plan	4-25

APPENDICES

Appendix A -	Box Elder County General Plan, Wetlands Element	A-1
Appendix B -	Supporting Data Tables	B-1

Appendix C - Summary of the Community Involvement Process C-1

Appendix D - Description of Wetland Data Collection for Box Elder County D-1

Appendix E - Functional Assessment classifications for the Box Elder County Comprehensive
Wetlands Plan E-1

Appendix F - Federal Programs Addressing Wetland and Aquatic Habitats F-1

Appendix G - Box Elder County Natural Resource Maps G-1

Map 1a. Jurisdictional Boundaries and Features - East

Map 1b. Jurisdictional Boundaries and Features - West

Map 2a. National Wetlands Inventory Date - East

Map 2b. National Wetlands Inventory Date - West

Map 3. Flood plain Map

Map 4. Recharge, Discharge, and Aquifer Protection Areas (available from the Box
Elder County Planning Department)

Map 5a. Soil Features - East (available from the Box Elder County Planning
Department)

Map 5b. Soil Features - West (available from the Box Elder County Planning
Department)

Map 6a. Agricultural Lands Usage & Designations - East (available from the Box
Elder County Planning Department)

Map 6b. Agricultural Lands Usage & Designations - West (available from the Box
Elder County Planning Department)

Map 7a. Functional Assessment Results - Hydrology Values (available from the Box
Elder County Planning Department)

Map 7b. Functional Assessment Results - Biogeochemical Values (available from the
Box Elder County Planning Department)

Map 7c. Functional Assessment Results - Vegetation & Habitat Values (available
from the Box Elder County Planning Department)

Map 7d. Functional Assessment Results - Total Values (available from the Box Elder
County Planning Department)

Map 7e. UDWR Assessment of Wetlands Condition (available from the Box Elder
County Planning Department)

Map 7f. Comparison of UDWR & NWI Wetland Areas (available from the Box Elder
County Planning Department)

Map 8. Near Term Development Potential (available from the Box Elder County
Planning Department)

Map 9. UDWR's Priority Wetland Habitats (available from the Box Elder County
Planning Department)

Map 10a. Wetland Planning Classes - East

Map 10b. Wetland Planning Classes - West

Map 11. Box Elder County SAMP Boundary

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ACRONYMS AND ABBREVIATIONS

ACEC	Area of Critical Environmental Concern
BLM	Bureau of Land Management
BRMBR	Bear River Migratory Bird Refuge
CIP	Community Involvement Process
Corps	United States Army Corps of Engineers
EPA	United States Environmental Protection Agency
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
GPS	Global Positioning System
HCP	Habitat Conservation Plan
HGM	Hydrogeomorphic
NWI	National Wetlands Inventory
NRCS	Natural Resources Conservation Service
RC&D	Resource, Conservation & Development
SAMP	Special Area Management Plan
SCS	Soil Conservation Service
Steering Committee	Box Elder County Great Salt Lake Wetlands Ecosystem Plan Steering Committee
SWCA	SWCA, Inc. Environmental Consultants
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
UCA	Utah Code Annotated
UDNR	Utah Department of Natural Resources
UDFFSL	Utah Division of Forestry, Fire, and State Land
UDOT	Utah Department of Transportation
UDSLF	Utah Division of Sovereign Lands and Forestry
UDWR	Utah Division of Wildlife Resources
UGOPB	Utah Governor's Office of Planning and Budget
UOLCA	Utah Open Lands Conservation Association
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WAW	Wetland Attributes Worksheet
WMA	Waterfowl Management Area
Wetlands Plan	Box Elder County Comprehensive Wetlands Management Plan
Wikstrom	Wikstrom Economic & Planning Consultants
WPC	Wetland Planning Class
WPG	Wetland Planning Group

ES. BOX ELDER COUNTY WETLANDS PLAN EXECUTIVE SUMMARY

ES-1. INTRODUCTION

The Box Elder County Great Salt Lake Wetlands Ecosystem Plan Steering Committee (Steering Committee) was organized, according to its mission statement, “to conserve and enhance the integrity of [the] Great Salt Lake wetland ecosystem in Box Elder County, incorporating provisions for appropriate urban development, infrastructure needs, resident livelihoods, and quality of life, while ensuring perpetuation of these important natural resources” (Appendix A). In November 1997, the Steering Committee began the process of developing the Box Elder County Comprehensive Wetlands Management Plan (Wetlands Plan) to realize the above mission statement.

Laws that regulate wetlands apply to many areas including emergent marshes, wet meadows, mud flats, playas, ponds, riparian (streamside) areas, and some forested areas. According to the Army Corps of Engineers (Corps), “wetlands are areas that are periodically or permanently inundated by surface or ground water and support vegetation adapted for life in saturated soil” (Corps 1985). Under the authority of the Clean Water Act and the Rivers and Harbors Act, the Corps regulates impacts to wetlands. Section 404 of the Clean Water Act requires a permit from the Corps for discharge of dredged or fill material into waters of the United States. In addition, the Corps may require compensatory mitigation for impacts to such waters, including restoration, enhancement, and/or preservation of existing wetlands or creation of new wetlands.

Wetlands are an important part of the landscape and provide many ecological, aesthetic, and socioeconomic benefits (Kentula et al. 1992). Wetlands can slow the runoff of flood waters and provide areas for groundwater recharge. Wetlands improve water quality by removing chemicals, sediments, and excess nutrients from runoff, and by recycling nutrients. In addition, wetlands provide food and habitat for wildlife, and opportunities for recreation, aesthetic enjoyment, education, and scientific research.

Wetlands make up only about 1.5 percent of Utah’s total land area, and 75 percent of those wetlands—500,000 acres—are found on the shores of Great Salt Lake (USGS 1996). The Great Salt Lake’s wetlands are part of the Western Hemisphere Shorebird Reserve Network, signifying their importance to the hemisphere’s shorebirds. Fifty-five to 60 percent of the lake and its associated wetlands are located in Box Elder County. These wetlands are diverse and dynamic, and they expand and contract over time due to long-term and seasonal climatic trends. Box Elder County also has a number of rivers with associated wetlands, including the Bear River, Malad River, Salt Creek, Sulphur Creek, and the Black Slough.

Developing within or adjacent to wetland areas is particularly challenging. Permitting processes are complex and time consuming, and the approved mitigation plans do not always achieve their goals. With these challenges in mind, the Wetlands Plan is being designed to preserve and enhance the quality of area wetlands *and* encourage responsible urban development within appropriate areas.

The Wetlands Plan will ease the citizen's burden of complying with these regulations while also assuring that no net loss of wetlands occurs in Box Elder County.

ES-2. THE OBJECTIVES OF PLANNING FOR THE FUTURE OF BOX ELDER COUNTY'S WETLANDS

ES-2.1 BENEFITS OF A WETLANDS PLAN

Box Elder County community leaders have recognized that the opportunity to plan for conservation and enhancement of County wetlands exists today. If the County implements this Wetlands Plan successfully, predictable instead of haphazard wetland impacts and mitigation will result and the County will realize long-term environmental, economic, and social benefits. The County would coordinate wetland conservation and mitigation efforts in a coherent manner to achieve prioritized goals that maximize ecological benefits and reduce regulatory uncertainty.

The Wetlands Plan would also provide benefits for individual landowners while assuring that no net loss of wetland functions occurs in Box Elder County. The Wetlands Plan proposes strategies that will ease the regulatory burden of project proponents by simplifying the permitting and approval process associated with wetland impacts and reducing the time required to obtain such approval. In addition, the Wetlands Plan would eliminate or significantly reduce project proponent's mitigation efforts, and would also provide incentives for willing landowners to conserve the wetlands on their property.

ES-2.2 DESIRED FUTURE CONDITION

As instructed by the Wetlands Planning Element of the County General Plan (Appendix A), the County's wetland ecosystem and socioeconomic needs were inventoried and assessed during this planning process. Existing data about County natural resources, infrastructure, land ownership, and urban development potential were assembled into a Geographic Information System (GIS) to assist in this planning process. In addition, numerous hours have been spent on the ground collecting data about Box Elder County's wetlands, including assessing wetland type, habitat, hydrology, vegetation, land use, and condition.

Based on the County's wetland ecosystem and socioeconomic needs, the Steering Committee refined and adopted a more detailed set of planning goals. These goals reflect a Desired Future Condition for Box Elder County's wetlands and are stated below.

ES-2.2.1 Wetland Conservation Goals

- (1) Establish an interconnected system of wetlands, rivers, riparian areas, other aquatic resources, and uplands that preserve wetland functions and values, including functioning as

habitat for fish and wildlife that have historically been present on a seasonal or year-round basis in Box Elder County.

- (2) Emphasize the protection, enhancement, and restoration of existing wetlands over the creation of new wetlands.
- (3) Ensure no net loss of wetlands and wetland values.
- (4) Protect the existing 100-year flood plains of Great Salt Lake and Box Elder County rivers, creeks, and streams, and their ability to convey flood flows in a manner that prevents and/or minimizes hazards to public health, safety, and welfare; delineate the 100-year flood plain where it currently has not been delineated.
- (5) Improve the water quality of the rivers, creeks, and streams in Box Elder County, and ensure consistency between water quality objectives and all other plan goals.
- (6) Work cooperatively with landowners who have wetlands or tributaries on or adjacent to their property to adopt Best Management Practices that will reduce non-point source pollution and increase native riparian and/or wetland vegetation cover.
- (7) When appropriate, incorporate public education components, recruit and offer opportunities for public involvement in projects undertaken as part of this Plan.
- (8) Provide for long-term maintenance, management, and monitoring of wetland projects initiated under this Plan to ensure that they meet the Wetlands Plan's goals.

ES-2.2.2 Urban Development Goals

- (1) Simplify the Clean Water Act Section 404 permitting process for impacts to wetlands and mitigation for those impacts. This will occur by developing a Special Area Management Plan (SAMP) and obtaining a General Permit from the Corps (as explained in Section 4.2.1). The SAMP will allow for impacts to certain wetlands within the County to occur while ensuring that there is no net loss of wetland functions.
- (2) Encourage and facilitate urban development that advances the attainment of the Desired Future Condition and minimizes adverse impacts to wetlands. This includes accommodation of urban development in zones of near-term development potential (as defined in Section 3.1.8) that does not conflict with policies of the Wetland Planning Classes (as defined in Section 4.1).
- (3) Encourage the identification and classification of urban development property (excluding existing residential, commercial, and industrial sites which are already developed, or undeveloped property which is unlikely to be available for near-term development that may

occur within the next ten to twenty years) and conservation property that is suitable for mitigating wetland impacts. Provide mapping of these properties.

- (4) Provide for flood control and storm water management needs in a cost-effective manner through wetlands conservation and enhancement. Using wetlands for flood control leaves uplands available for urban development, conserves wetlands, and should be less expensive than excavating detention basins in uplands.
- (5) Ensure that, within this Wetlands Plan, protection of land for growth is equal in importance to wetland conservation and preservation in benefitting current and future generations. In addition, this plan should contain a mechanism for resolving conflicts between wetland conservation and urban development goals and should not place a higher value upon either wetland conservation or urban development. This goal will be met to the extent that it is allowed by federal laws governing the use of wetlands, meaning that the requirement of no net loss of wetland function must be achieved.
- (6) Wetland data mapped for this planning process will not be considered jurisdictional wetlands under the Clean Water Act, but instead will be used for planning purposes. A jurisdictional wetland delineation, conducted by qualified parties and verified by the Corps, will be required for any wetland properties that are either developed or enhanced to determine the positive or negative effect of such actions to wetland functions.

ES-2.3 AREAS ADDRESSED BY THE WETLANDS PLAN

Box Elder County encompasses an extensive area encompassing 6,710 square miles. In this Wetlands Plan, we split the county into two Planning Areas, A and B, based on differences in population and economic growth potential. The boundary line between Range 6 West and Range 7 West is the dividing line between these planning areas. Planning Area A lies to the east of this line and includes incorporated and county areas that are experiencing or have the potential to experience population and economic growth that could substantially impact wetlands. Planning Area B lies to the west of this line and includes areas where potential population and economic growth will have minimal impacts on wetland resources.

For Planning Area A, the final draft of the Wetlands Plan will provide general permitting strategies and suggested locations for a SAMP (Special Area Management Plan) and/or mitigation banks. While this level of detail regarding general permitting strategies and analysis will not be provided for Planning Area B, its key wetland resources will be addressed. In addition, many of the tools identified in the Wetlands Plan are applicable for use in both Planning Areas A and B.

ES-3. PLANNING DATA

Two types of planning data were collected during this planning process to help determine the Desired Future Condition: natural resource data and community involvement and planning data.

ES-3.1 NATURAL RESOURCE DATA

The developers of the Wetlands Plan have assembled existing data about county natural resources, infrastructure, land ownership, and urban development potential in a Geographic Information System (GIS) to assist in this planning process. In addition, numerous hours have been spent ground-truthing and collecting additional data about Box Elder County's wetlands, including assessing wetland type, habitat, hydrology, vegetation, land use, and condition. These data are portrayed with maps that are either included in this report or are available from the Box Elder County Planning Office.

Map 1a displays jurisdictional boundaries, land ownership patterns, existing planning areas, rivers, streams, roads, railroads, and other features relevant to the Wetlands Plan. Included on this map are boundaries of municipalities, Duck Clubs, State of Utah Sovereign Lands, and lands managed by the Utah Division of Wildlife Resources (UDWR), the U.S. Forest Service, the Bureau of Land Management (BLM), the U.S. Fish and Wildlife Service (USFWS), and the National Park Service.

Maps 2a and 2b show the National Wetlands Inventory Data that exist for Box Elder County. The National Wetlands Inventory (NWI) data were produced by the U.S. Fish and Wildlife Service. These data describe the characteristics, extent, and status of the Nation's wetlands and deepwater habitats. Wetlands under NWI are classified according to Cowardin et al. (1979). The NWI data are for inventory and planning purposes and are not meant to portray the extent of jurisdictional wetlands regulated by the Corps.

Map 3 shows flood plain data for Box Elder County. Flood plain data were obtained from the Federal Emergency Management Agency (FEMA) and the Corps.

Map 4 (available from the Box Elder County Planning Department) shows recharge, discharge, and aquifer protection areas for Box Elder County. Two sources of data were used: A hydrogeologic investigation report (Anderson et al. 1994) and the Utah Division of Drinking Water.

Map 5 (available from the Box Elder County Planning Department) shows the county's soil features that are pertinent to wetlands. Data were obtained from the Natural Resource Conservation Service's Soil Surveys for both eastern and western Box Elder County (SCS 1975, NRCS 1997).

Map 6 (available from the Box Elder County Planning Department) shows agricultural land usage and designations. Agricultural land usage was determined from data collected in 1996 for the Utah Water Related Land Use Inventory for Box Elder County by the Utah Division of Water Resources.

Land usage categories were organized into irrigated cropland, non-irrigated cropland, and pasture/hay.

Map 7 (available from the Box Elder County Planning Department) shows Box Elder County wetlands and their functions. As part of this planning process, UDWR identified, classified, evaluated, and mapped information regarding Box Elder County wetlands and their functions in 1998. UDWR focused on wetlands in the eastern portion of Box Elder County, primarily east of Interstate Highway 15. The data they collected are referred to as the "GPS data" in this report. The GPS data are not comprehensive enough to serve as a delineation of jurisdictional wetlands regulated by the Corps; that level of effort is beyond the scope of this project. However, the GPS data are more recent and thorough than the NWI wetlands data, which are based on 1981 aerial photos. In addition, the GPS data can be used for a Functional Assessment (modeled after Hydrogeomorphic (HGM) models), while the NWI data cannot.

Map 8 (available from the Box Elder County Planning Department) shows areas identified by county and city officials as the most likely paths of future urban development. To develop a plan that meets both wetland conservation and urban development goals, near-term development potential (defined as the next ten to twenty years) was evaluated for Box Elder County. This evaluation was based on existing public policy documents (Box Elder County General Plan (1998) and local government master plans and zoning) as well as other factors such as infrastructure availability and transportation access. The data shown in Map 8 is still considered coarse at this point in the wetlands planning process, and will be refined based on input from the Community Involvement Process.

Map 9 (available from the Box Elder County Planning Department) shows areas where wetland complexes provide significant functional values for wildlife to be considered in the planning process. These areas were identified by UDWR personnel.

Maps 10a and 10b show the seven Wetland Planning Classes (WPCs) for the east and west sides of the County, respectively.

Map 11 shows potential areas for developing a SAMP for Box Elder County. These areas are within the boundaries of Perry and Brigham City, additional property located west of Brigham City, and portions of the North Lake area.

ES-3.2 COMMUNITY INVOLVEMENT PROCESS

The Executive Committee felt that the overall utility, acceptance, and success of the Wetlands Plan would improve if responses of city and County leaders were gathered through a formal process. Thus, a Community Involvement Process was organized around the concept of Wetland Planning Groups (WPGs). The Box Elder County Planner asked community leaders to form WPGs for all areas of the County to provide feedback to the planning process. WPGs were formed for the following areas: Brigham City, Perry, Willard, Honeyville, East County, Corrine/West Corrine, West County/Penrose/Lampo Junction, and North Lake.

An all-day workshop was held on Saturday, November 21, 1998 to educate the WPGs about the wetlands planning process. The WPGs were asked to address questions designed to solicit their input. Most WPGs held follow-up meetings to develop their responses. The responses to these questions and other input provided by the WPGs were used to develop the Wetlands Plan.

ES-3.3 PROJECTS WITH POTENTIAL LONG-TERM WETLAND IMPACTS

The Utah Division of Water Resources identifies building a water storage and development project on the lower Bear River, specifically at Honeyville, as part of the Bear River Basin Plan (Utah Division of Water Resources 1994). However, much uncertainty exists as to where and whether such a development will be built. Due to this uncertainty, the effect of a Bear River water project on Box Elder County's wetlands can not be predicted at this time.

Another planning issue considered as part of the Wetlands Planning process is the potential development of new highways in the County. Plans for a Nephi-to-Brigham City Legacy Highway exist, but the Executive Committee deemed that such plans now are conceptual at best.

Because of the uncertainty regarding the issues of highway development and Bear River reservoir development, this Wetlands Plan is considered to be adequate for the next 20 years. Beyond that time period, the above-mentioned planning issues could potentially introduce wetland issues not addressed in this plan.

ES-4. FRAMEWORK FOR ACHIEVING A DESIRED FUTURE CONDITION

ES-4.1 WETLAND PLANNING CLASSES (WPCs)

In Section 4 of the Wetlands Plan, the County has been divided into seven Wetland Planning Classes (WPCs, Maps 10a and 10b). These WPCs are the framework for achieving the Desired Future Condition. Recognition of these seven WPCs allows for protection, conservation, and enhancement of the wetland functions provided and landscape roles filled by each WPC, while also identifying areas more appropriate for urban development. The WPCs and their characteristics and wetland planning goals are summarized in Table 4.1; the Wetlands Plan addresses these issues in more detail.

The number of wetlands and total acres within each WPC for areas east of the Promontory Mountains are presented in Table 4.2. Significant additional acreage exists west of the Promontory Mountains in WPCs A, B, and D; these lands are associated with the north arm and periphery of Great Salt Lake.

Note that although the Bear River flood plain is included in WPC C, electronic NWI data currently are not available for areas along the Bear River north of the Honeyville. If this data were available in an electronic format, the actual NWI wetland acres for WPC C in Table 4.2 would be several hundred acres greater.

UDWR's wetlands classification effort generally found more wetland acres than the NWI data show. However, because the UDWR wetland classification primarily focused on areas east of I-15, thus covering less total acreage than the NWI data, the GPS data are not shown in Table 4.2.

ES-4.2 TOOLS TO ACHIEVE GOALS AND DESIRED FUTURE CONDITIONS OF WPCs

In order to reach the desired future condition of the Wetlands Planning Classes, a set of goals was established for each class. There are many tools available today to facilitate achieving these goals. Tools that are appropriate for the Box Elder County Wetlands Plan are presented in this section. The first tool that is addressed is a strategy for the development of a Special Area Management Plan (SAMP).

ES-4.2.1 Special Area Management Plan (SAMP) Strategy

A SAMP is a plan that addresses wetlands impacts associated with urban development needs, and mitigation for those impacts within defined geographic areas. It must ensure no net loss of wetland function. The SAMP defines (1) the amount of wetland impacts allowable within defined urban development areas and (2) the amount of mitigation required within defined mitigation areas for impacted wetlands.

A major benefit of using a SAMP is that the Wetlands Plan's sponsor, in this case Box Elder County, can receive a Clean Water Act Section 404 General Permit from the Corps for the entire SAMP area. This would simplify and provide a level of certainty and predictability to the Section 404 permitting process. In addition, implementation of large-scale mitigation would provide economies of scale that should result in reduced costs per acre and mitigation that is more ecologically meaningful and effective.

ES-4.2.1.1 SAMP Urban Development and Mitigation Areas for Box Elder County

The Wetlands Plan proposes developing a SAMP for Box Elder County that would be comprised of land located within the boundaries of Perry and Brigham City, additional property located west of Brigham City, and portions of the North Lake area (Map 11). Most of the anticipated urban development-related wetland impacts will occur within the Perry and Brigham City SAMP areas (Map 11). A substantial amount of mitigation would also occur within these areas. Approximately 25 percent of the proposed SAMP acreage lies within the North Lake area 100-year flood plain (4,982 acres). The North Lake SAMP area would mostly be used as a mitigation area, although some portions of this area may be developed, particularly near the Brigham City airport and along I-15. Not all of the wetlands identified in the North Lake area are available for wetlands mitigation due to their proximity to the Brigham City airport. Federal Aviation Administrations guidance discourages the placement of wildlife attractions near airports due to the hazards that wildlife using these areas pose to aircraft safety (FAA 1997).

ES-4.2.1.2 Process for Developing the SAMP

The steps below should be taken to collect the information necessary for developing the SAMP. These steps will allow for assessment of wetland functions, survey of landowner interest and willingness to participate in the SAMP, identification of urban development and mitigation areas within the SAMP boundaries, and application to the Corps for approval of a SAMP and issuance of a General Permit. This process is depicted in a flow chart in Figure 4.1.

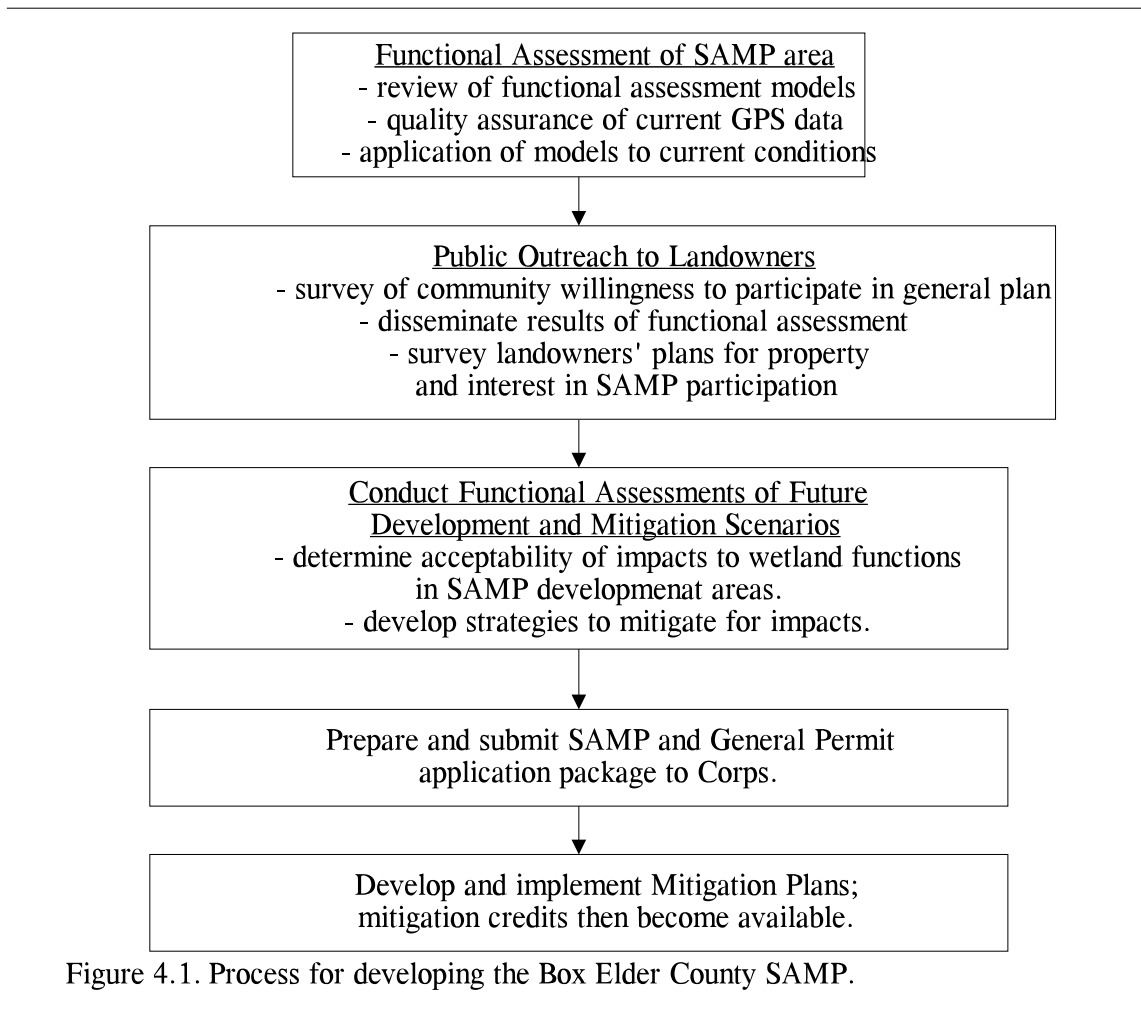


Figure 4.1. Process for developing the Box Elder County SAMP.

ES-4.2.2 Additional Tools and Actions

There are several tools and policies available for achieving this plan's wetland conservation and urban development goals. The use of these tools depends on the ownership, location, and nature of a wetland project or impact. Tools considered in this plan are: land acquisition, conservation easements, collaboration/coordination with and support of agency conservation programs, mitigation banking, flood plain mapping, stormwater planning, and zoning regulations and ordinances. A detailed description of the additional tools and their applicability to the Wetlands Plan is discussed in Section 4.2.2.

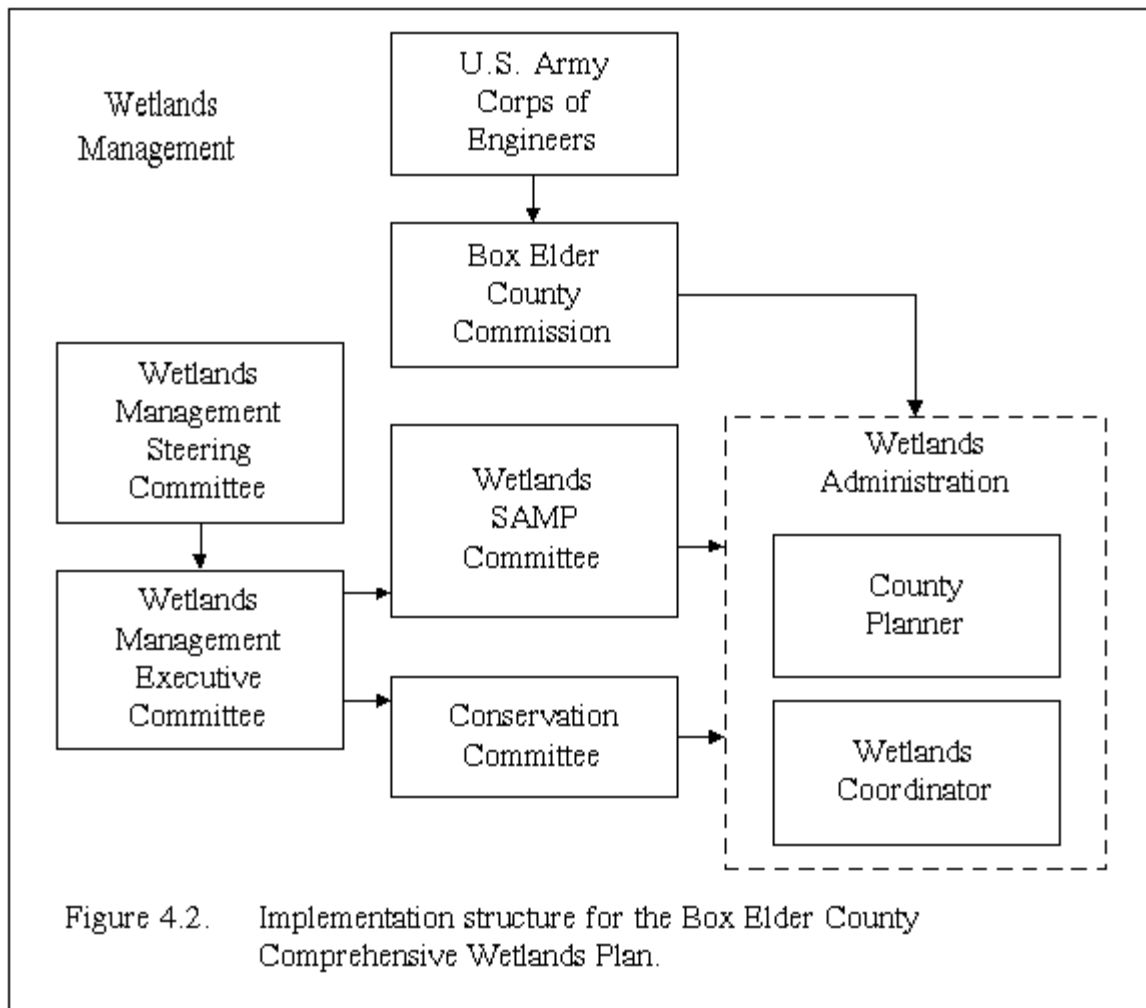
ES-4.3 WETLANDS PLAN IMPLEMENTATION

In this section we have defined an implementation structure for the Wetlands Plan. We have identified a set of tools and actions to address wetland conservation and urban development issues so that the Desired Future Condition can be realized.

An organizational structure similar to that in Figure 4.2 could be used for implementing the Wetlands Plan. This structure was based on a review of similar planning efforts. The Wetlands Plan would be administered by the Box Elder County Commission, which is the entity that would obtain and administer a General Permit for Box Elder County from the Corps. The Box Elder County Commission would hire a Box Elder Wetlands Coordinator who would be responsible for implementing the Wetlands Plan. The Wetlands Coordinator would work in the Box Elder County Planner's office and would have access to secretarial support.

The current Wetlands Steering Committee would be referred to as the Wetlands Management Steering Committee and would meet periodically (quarterly or semi-annually in the first two years, and semiannually or annually thereafter) to provide continued oversight and support of plan implementation. The current Wetlands Executive Committee would be referred to as the Wetlands Management Executive Committee and would continue to meet (quarterly), giving direction to the Wetlands Coordinator (subject to the final review of the Commission), making funding decisions, and reviewing and approving all work plans and reports. These plans and reports would be reviewed and approved by the Commission prior to submittal to the Corps, who would ensure that implementation of the Wetlands Plan complied with the General Permit. The representation that comprises the Wetlands Management Executive and Steering Committees may be adjusted, if necessary, to provide the best mix of skills for implementing the Wetlands Plan.

In addition, two new committees, the Wetlands SAMP Committee and the Conservation Committee, would be formed. These committee members would also serve on the Wetlands Management Steering Committee and some could also serve on the Wetlands Management Executive Committee. The Wetlands SAMP Committee would be responsible for following through on the actions necessary for creating the SAMP, as defined in Section 4.2.1, including application of the functional assessment models. Representatives from the following entities, along with the Wetlands Coordinator and County Planner, are suggested for comprising the Wetlands SAMP Committee:



Corps, UDWR, USFWS, EPA, UGOPB, Brigham City and Perry City Planners, developers or homebuilders, and the Box Elder County Wetlands Foundation.

The Conservation Committee would be responsible for initiating the following programs (described further under Section 4.3.1): working with landowners and agencies to increase participation in agency conservation programs; adopting uniform zoning to protect Box Elder County’s rivers and their riparian vegetation and flood plains; prioritizing target areas for conservation easement and/or property acquisition; and initiating the public education, access, and recreation activities called for in Section 4.3.1. Representatives from the following entities, along with the Wetlands Coordinator and the County Planner, are suggested for comprising the Conservation Committee: Soil Conservation District, NRCS, USFWS, UDWR, The Nature Conservancy, Utah Open Lands (or another Land Trust organization that would be willing to lend expertise), and the Box Elder County Wetlands Foundation.

As implementation of the Wetlands Plan moves forward, the role of the Box Elder County Wetlands Foundation should be more clearly defined. The Foundation has been largely responsible for enabling this planning process to succeed thus far. Its role as a public, non-profit organization holding 501(c)(3) status under the federal tax code would allow supporters of the Wetlands Plan (land owners, other philanthropic foundations, private citizens, etc.) to make tax-deductible contributions for the Wetlands Plan's programs. The Foundation could also be the holder of conservation easements and/or write proposals to obtain foundation grants.

ES-4.4 PARTNERS INVOLVED IN THE IMPLEMENTATION OF THE WETLANDS PLAN

The task of implementing the Wetlands Plan is dependent upon a partnership among the County, regulating agencies and supporting agencies. The County's interests are essentially represented in the planning process by a Wetlands Coordinator, the county planner, citizen members of the Steering, SAMP and Conservation Committees, and the Wetland Planning Groups. Local, Federal and State agencies are also key partners in the planning process. To expedite implementation of the Wetlands Plan and to facilitate a cooperative partnership with the supporting agencies, Box Elder County would create the position of Wetlands Coordinator. The role of the Wetlands Coordinator and agency partners is described.

ES-4.5 FUNDING

Funding for implementation is obviously essential for the Wetlands Plan to succeed. Funding will not come from one source, but rather will need to be acquired from several sources. Startup funding could be provided by the County with some assistance coming from the cities that will most likely benefit from a General Permit—Brigham City and Perry. Also, the cost of conservation easements—reduced tax revenues, and their purchase price in the cases where the easements are not donated—should be considered. Grant money and donation of in-kind services could be acquired for some aspects of the Wetlands Plan from regional or national non-governmental organizations.

Funding sources for various components of the Wetlands Plan could be provided through the following sources:

- (1) Mitigation fees paid by proponents of projects that impact wetlands.
- (2) Bonding to raise the funds needed to set up the initial SAMP conservation areas.
- (3) EPA funding for wetlands programs.
- (4) Cost sharing with other federal programs (Appendix F).
- (5) Private funding and/or collaboration from state, regional, and/or national organization and foundations.
- (6) Open space or other impact fees.
- (7) Storm drainage utility fees.
- (8) County or city taxes.

ES-4.6 MONITORING

An important component of any plan is evaluating its success. Once this Wetlands Plan is accepted by the Box Elder County's Commission and municipal leaders, its implementation will begin. At that time, timelines should be established for making and measuring progress on implementing each of the tools and actions specified in Section 4.2. As progress is made on implementing each tool and action, a more formal monitoring plan will be defined to evaluate implementation success.

In addition, the General Permit application package that the County submits to the Corps should contain a plan for monitoring the General Permit's success. Various other monitoring responsibilities that will be associated with implementation of the Wetlands Plan will include success monitoring of any wetland enhancement projects and/or non-point source pollution reduction projects. In addition, there are monitoring costs associated with the holding of conservation easements.

The cost of monitoring efforts, including reporting, can be substantial and should be included in the budget of any actions and tools implemented as part of this Wetlands Plan. Opportunities for sharing of monitoring responsibilities and costs with collaborating parties will exist. For instance, in projects coordinated through NRCS to reduce non-point source pollution or through USFWS to enhance and/or conserve wetlands habitat, it is reasonable to expect that these agencies would be responsible for monitoring and reporting on the success of these projects. In projects involving conservation easements, budgeting should include provisions for long-term monitoring and maintenance of the easement.

ES-5.0 SUMMARY

Box Elder County undertook this planning effort to reconcile the County's wetland conservation and urban development needs. As directed by the Wetlands Planning Element of the County General Plan, the County's wetland ecosystem and socioeconomic needs were inventoried and assessed during this planning process (Section 3.0). Data about County natural resources, infrastructure, land ownership, and urban development potential were assembled into a Geographic Information System (GIS) to assist the process. In addition, data regarding Box Elder County's wetlands, including assessment of wetland type, habitat, hydrology, vegetation, land use, and condition were collected.

Section 2.2 of this plan describes wetland conservation and urban development goals that reflect a Desired Future Condition for Box Elder County's wetlands. In Section 4.0, the Desired Future Condition is further defined by dividing the County into seven Wetland Planning Classes (WPCs). These Classes provide the structure for achieving the Desired Future Condition. Six of the seven WPCs include wetlands. The seventh, WPC G, includes the remaining non-wetland areas within the County. The distinctions between the other six WPCs is made through a comparison of the existing extent of wetland conservation; the potential for future conservation efforts; the presence of important large-scale aquatic features that are not currently included or planned for inclusion in

conservation protection; the importance of the areas wetlands as a hydrologic connection between conservation areas; wetland areas within the path of future urban development; and smaller, isolated wetland areas that don't fit within the other five classes.

The WPCs were used to focus on solutions and problems that could be addressed through a formal regulatory process. This Plan identified this process and provides information regarding an implementation approach referred to as a Special Area Management Plan (SAMP). A SAMP is an implementation plan that specifies: (1) the amount of wetland impacts allowable within defined urban development areas and (2) the amount of mitigation required within defined mitigation areas for impacted wetlands.

As discussed in Section 4, a major benefit of a SAMP is that the Wetlands Plan's sponsor, in this case Box Elder County, can receive a Clean Water Act Section 404 General Permit from the Corps. This permit simplifies and provides predictability for individual projects that might generate wetland impacts. Project proponents whose project met the requirements of the SAMP would not have to apply for their own Section 404 Permit nor would they be required to develop their own mitigation plans. (However, they would have to demonstrate the purpose and need of their project and take measures to avoid or minimize wetland impacts). In addition, the large-scale mitigation implemented in the mitigation areas would provide economies of scale that should result in reduced mitigation costs per acre and more ecologically meaningful and effective mitigation.

The SAMP must assure that no net loss of wetland functions occurs. Without such assurances, the Corps will not approve a SAMP or issue a General Permit to the County. In addition, the Corps would have significant oversight of the County's implementation of the SAMP. The Corps would retain the authority to revoke the General Permit if the County did not implement the SAMP as agreed.

In the final analysis, this plan provides a strategy for achieving future conditions that further conservation of wetlands and support economic development in Box Elder County. This strategy describes tools that can be employed for planning future urban development within the County that protect the most valuable existing wetlands and encourages planning to minimize impacts to less valuable wetlands. There will be further efforts by the County to implement this plan. These efforts are described in Section 4.3 but essentially require further coordination with the same entities that assisted in the development of this plan and a Wetlands Coordinator described in Section 4.4. It will also require conformance with guidelines and processes implemented by the Corps for the development of a SAMP and General Permit. Regardless of the direction these implementation efforts take, this plan will provide a valuable benchmark regarding the wetlands and philosophy of Box Elder County. An overview of the Wetlands Planning Classes, the goals established to achieve a desired future condition, the tools and partners involved in implementing the Wetlands Plan are presented in Table 5.1.

Table 5.1. Wetland Planning Classes, goals, tools and partners responsible for implementing the Wetlands Plan.

Wetland Planning Class	Wetland Planning Goals	Wetland Planning Tools	Partners Involved in Implementation
<p>A - Areas Already Protected for Wetland Functions and Values</p>	<ul style="list-style-type: none"> • Conduct activities that protect, enhance, and/or restore wetland functions and values and discourage urban development that would diminish wetland functions and values <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • Educate and involve county residents and others 	<ul style="list-style-type: none"> • Application of Best Management Practice <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • Public Outreach and Education 	<ul style="list-style-type: none"> • Bear River Migratory Bird Refuge (BRMBR), UDWR, and Duck Clubs <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • BRMBR, UDWR, NRCS, Wetlands Coordinator, Conservation Committee
<p>B - Areas for Which Wetland Protection Plans Are Being Developed</p>	<ul style="list-style-type: none"> • Conduct activities that protect, enhance, and/or restore wetland functions and values <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • Develop a wetlands/wildlife protection plan for UCA 23-21-5 lands (see section 4.2.1) • Participate in briefings that occur between UDFFSL and Box Elder County officials regarding the Great Salt Lake Planning Project <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • Educate and involve county residents and others 	<ul style="list-style-type: none"> • Application of Best Management Practices <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • Flood plain mapping and ordinances <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • Public Outreach and Education 	<ul style="list-style-type: none"> • UDWR, USFWS, BRMBR, and Duck Clubs <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • Municipalities, Wetland Planning Groups, Wetlands Coordinator, Conservation Committee <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • UDWR, USFWS, BRMBR, NRCS, Wetlands Coordinator, Box Elder County Wetlands Foundation, The Nature Conservancy, and other interested non-profit organizations <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • BRMBR, Wetlands Coordinator, Wetland Planning Groups, Conservation Committee, UDWR, NRCS,

Table 5.1. Wetland Planning Classes, goals, tools and partners responsible for implementing the Wetlands Plan.

Wetland Planning Class	Wetland Planning Goals	Wetland Planning Tools	Partners Involved in Implementation
<p>C - Large-scale Aquatic Landscape Features</p>	<ul style="list-style-type: none"> • Develop a wetlands mitigation area in the North Lake area • Investigate opportunities in the Sulphur Creek area for wetlands enhancement, protection, and mitigation banking 	<ul style="list-style-type: none"> • Develop Special Area Management Plan and obtain General Permit • Mitigation banking 	<ul style="list-style-type: none"> • Corps, USFWS, UDWR, EPA, Wetlands Coordinator, Box Elder County and municipalities, Wetlands SAMP Committee, Wetland Planning Groups, Utah Governor’s Office of Planning and Budget (UGOPB), private or non-profit organizations
	<hr/> <ul style="list-style-type: none"> • Improve water quality and reduce non-point source pollution entering Box Elder County waterways and improve the condition of riparian and emergent vegetation along waterways 	<ul style="list-style-type: none"> • Acquisition of conservation easements and/or property title 	<ul style="list-style-type: none"> • UDWR, NRCS, USFWS, The Nature Conservancy, Box Elder County Wetlands Foundation, Conservation Committee, and other non-profit organizations
	<ul style="list-style-type: none"> • Educate and involve county residents and others 	<ul style="list-style-type: none"> • Encourage application of Best Management Practices 	<ul style="list-style-type: none"> • NRCS, Soil Conservation Districts and working groups, Utah Association of Conservation Districts, landowners
		<ul style="list-style-type: none"> • Flood plain mapping and zoning regulations and ordinances, including riverine and riparian policies • Stormwater planning 	<ul style="list-style-type: none"> • Municipalities, Wetland Planning Groups, Wetlands Coordinator, Conservation Committee
	<ul style="list-style-type: none"> • Public Outreach and Education 	<ul style="list-style-type: none"> • BRMBR, UDWR, NRCS, Wetlands Coordinator, Wetland Planning Groups, Conservation Committee 	

Table 5.1. Wetland Planning Classes, goals, tools and partners responsible for implementing the Wetlands Plan.

Wetland Planning Class	Wetland Planning Goals	Wetland Planning Tools	Partners Involved in Implementation
<p>D - Connecting Areas</p>	<ul style="list-style-type: none"> • Conduct activities that protect, enhance, and/or restore wetland functions and values of these areas that are functionally connected to or link Class A, B, or C wetland areas 	<ul style="list-style-type: none"> • Develop Special Area Management Plan and obtain General Permit • Mitigation banking 	<ul style="list-style-type: none"> • Corps, USFWS, UDWR, EPA, Wetlands Coordinator, Box Elder County and municipalities, Wetlands SAMP Committee, Wetland Planning Groups, UGOPB, private or non-profit organizations
		<ul style="list-style-type: none"> • Acquisition of conservation easements and/or property title 	<ul style="list-style-type: none"> • UDWR, NRCS, USFWS, The Nature Conservancy, Box Elder County Wetlands Foundation, Conservation Committee, and other non-profit organizations
		<ul style="list-style-type: none"> • Encourage application of Best Management Practices 	<ul style="list-style-type: none"> • NRCS, Soil Conservation Districts and working groups, Utah Association of Conservation Districts, landowners
		<ul style="list-style-type: none"> • Flood plain mapping and zoning regulations and ordinances, including riverine and riparian policies • Stormwater planning 	<ul style="list-style-type: none"> • Municipalities, Wetland Planning Groups, Wetlands Coordinator, Conservation Committee
		<ul style="list-style-type: none"> • Educate and involve county residents and others 	<ul style="list-style-type: none"> • Public Outreach and Education

Table 5.1. Wetland Planning Classes, goals, tools and partners responsible for implementing the Wetlands Plan.

Wetland Planning Class	Wetland Planning Goals	Wetland Planning Tools	Partners Involved in Implementation
<p>E - Interface Planning Areas</p>	<ul style="list-style-type: none"> Implement additional planning steps so that sensitive urban development can occur in some wetland areas of these cities without causing an overall net loss of wetland function 	<ul style="list-style-type: none"> Develop Special Area Management Plan and obtain General Permit Mitigation banking 	<ul style="list-style-type: none"> Corps, USFWS, UDWR, EPA, Wetlands Coordinator, Box Elder County and municipalities, Wetlands SAMP Committee, Wetland Planning Groups, UGOPB, private or non-profit organizations
		<ul style="list-style-type: none"> Acquisition of conservation easements and/or property title 	<ul style="list-style-type: none"> UDWR, NRCS, USFWS, The Nature Conservancy, Box Elder County Wetlands Foundation, Conservation Committee, and other non-profit organizations
		<ul style="list-style-type: none"> Encourage application of Best Management Practices 	<ul style="list-style-type: none"> NRCS, Soil Conservation Districts and working groups, Utah Association of Conservation Districts, landowners
		<ul style="list-style-type: none"> Flood plain mapping and zoning regulations and ordinances, including riverine and riparian policies Stormwater planning 	<ul style="list-style-type: none"> Municipalities, Wetland Planning Groups, Wetlands Coordinator, Conservation Committee
	<ul style="list-style-type: none"> Educate and involve county residents and others 	<ul style="list-style-type: none"> Public Outreach and Education 	<ul style="list-style-type: none"> BRMBR, UDWR, NRCS, Wetlands Coordinator, Wetland Planning Groups, Conservation Committee

Table 5.1. Wetland Planning Classes, goals, tools and partners responsible for implementing the Wetlands Plan.

Wetland Planning Class	Wetland Planning Goals	Wetland Planning Tools	Partners Involved in Implementation
F - Other Wetlands	<ul style="list-style-type: none"> • Encourage resource managers to protect, enhance and/or restore wetlands functions and values under the guidelines of this plan should urban development occur in these areas. <hr/> <ul style="list-style-type: none"> • Educate and involve county residents and others 	<ul style="list-style-type: none"> • Collaborate with agency programs that provide technical expertise and funding • Application of Best Management Practices <hr/> <ul style="list-style-type: none"> • Flood plain mapping and ordinances <hr/> <ul style="list-style-type: none"> • Public Outreach and Education 	<ul style="list-style-type: none"> • NRCS, Soil Conservation Districts and working groups, Utah Association of Conservation Districts, Conservation Committee, landowners <hr/> <ul style="list-style-type: none"> • Cities, Wetland Planning Groups, Wetlands Coordinator, Conservation Committee <hr/> <ul style="list-style-type: none"> • BRMBR, UDWR, NRCS, Wetlands Coordinator, Wetland Planning Groups, Conservation Committee
G - Remaining Non-wetland Areas	<ul style="list-style-type: none"> • Encourage sensitive urban development of uplands adjacent to wetlands. <hr/> <ul style="list-style-type: none"> • Educate and involve county residents and others 	<ul style="list-style-type: none"> • Collaborate with agency programs that provide technical expertise and funding for the application of Best Management Practices <hr/> <ul style="list-style-type: none"> • Flood plain mapping and ordinances and stormwater planning <hr/> <ul style="list-style-type: none"> • Public Outreach and Education 	<ul style="list-style-type: none"> • NRCS, EPA, Soil Conservation Districts and working groups, Utah Association of Conservation Districts, Conservation Committee, landowners <hr/> <ul style="list-style-type: none"> • Municipalities, Wetland Planning Groups, Wetlands Coordinator, Conservation Committee <hr/> <ul style="list-style-type: none"> • BRMBR, UDWR, NRCS, Wetlands Coordinator, Wetland Planning Groups, Conservation Committee

1. INTRODUCTION

Many citizens of Box Elder County view its “variety of natural resources and diverse wildlife habitats...as wonderful assets that contribute to the area’s quality of life” (Appendix A). The Box Elder County Great Salt Lake Wetlands Ecosystem Plan Steering Committee (Steering Committee) was organized to preserve and enhance the quality of the County’s wetlands while also encouraging responsible urban development within appropriate areas. The Steering Committee’s mission statement is “to conserve and enhance the integrity of [the] Great Salt Lake wetland ecosystem in Box Elder County, incorporating provisions for appropriate urban development, infrastructure needs, resident livelihoods, and quality of life, while ensuring perpetuation of these important natural resources” (Appendix A).

This document presents a Comprehensive Wetlands Management Plan (Wetlands Plan) for realizing the Steering Committee’s mission statement. Before presenting the Wetlands Plan, background information is presented about wetlands (what they are and why they are important) and why a wetlands plan is needed.

1.1 WHAT ARE WETLANDS?

When one thinks of wetlands, the image that typically comes to mind is a marsh or slough with cattails, open water, and wildlife. However, the laws that regulate wetlands apply to many other types of wetlands that do not fit this conventional image, including wet meadows, mud flats, playas, ponds, riparian (streamside) areas, and some forested areas. According to the Army Corps of Engineers (Corps), “wetlands are areas that are periodically or permanently inundated by surface or ground water and support vegetation adapted for life in saturated soil” (Corps 1995).

Since wetlands are the transition between water and uplands, drawing a line that defines a wetland can be difficult. Thus, the Corps has developed a manual (Corps 1987) to use in determining whether or not an area is a wetland. According to Corps (1987), three features generally must be present for an area to be a wetland:

1. Hydrophytic vegetation: A prevalence of vegetation typically adapted for life in saturated (anaerobic) soils.
2. Wetlands hydrology: Inundation or saturation by surface or ground water for sufficient frequency and duration of the growing season.
3. Hydric soils: Soils have characteristics in the upper stratum that indicate formation under anaerobic conditions (due to saturation, flooding, or ponding).

If these three features are present, then a wetlands is considered “jurisdictional” and regulated by the Corps under the Clean Water Act.

Note that this document addresses palustrine (marsh and wet meadow), lacustrine (lake, playa, and mudflat), and riverine (riparian) wetlands. The term “wetlands” is generally used in this document to jointly reference these three classes of wetlands.

1.2 WHY ARE WETLANDS IMPORTANT?

Wetlands are an important part of the landscape and provide many ecological, aesthetic, and socioeconomic benefits (Kentula et al. 1992). Some of the benefits of wetlands include water quality improvement, flood water retention, ground water recharge, provision of wildlife habitat, and opportunities for recreation and aesthetic enjoyment, education, and scientific research. As wetlands are lost, lakes and rivers can experience an increase in erosion, flooding, and sedimentation, and wildlife populations can decrease (National Wetlands Conservation Alliance 1995).

Wetlands improve water quality by removing chemicals, sediments, and excess nutrients from runoff, and by recycling nutrients. Because wetlands are located predominantly between terrestrial and aquatic ecosystems, they have the unique capability of intercepting runoff waters which may contain both point source and non-point source pollutants before they reach aquatic environments. Suspended solids settle out of the slowed water in wetlands and are absorbed into wetland soils. Often, suspended solids contain adsorbed chemicals such as pesticides, and these chemicals sink into wetland soils with the suspended solid load (Dancy 1997). Excess nutrients are used up by wetland vegetation and thus prevent algae blooms and other excessive weed growths from occurring downstream. Some studies have found that up to 70 percent of pesticides and 94 percent of sediment runoff can be removed from runoff by flow of water through vegetated wetlands (Dancy 1997).

Wetlands also have the capability of moderating the impacts of excess runoff and floods. With soils that have up to 80 percent porosity (Dancy 1997), wetlands serve as sponges that store water during flood events. A study in the Devil’s Lake Basin of North Dakota found that even small wetlands can store 72 percent of the total runoff from 2 year flood events, and 41 percent from 100-year flood events (NRCS 1998). That stored water is kept out of rivers and streams where overflow can cause property damage and sometimes loss of life. Water stored in wetlands is subsequently released during dry periods, thus supporting base flows that maintain aquatic habitat. In addition, water stored in wetlands often seeps downward and recharges ground water aquifers, which half of Americans depend on for drinking water (National Wildlife Federation 1998). Furthermore, as urban and residential growth causes an increase in the amount of impervious surfaces and surface water runoff within our watersheds, the flood mitigating potential of wetlands becomes increasingly important.

Wetlands are among some of the most biologically diverse ecosystems on earth. Some of the first people to call attention to the value of wetlands to wildlife were hunters and fishermen, who recognized the relationship between declining wetlands and declining numbers of fish, birds, reptiles and mammals. Almost all species of birds utilize wetlands, and one-third of North American bird species directly rely on wetlands (Hammer 1992). Across the United States, 28 percent of the endangered plants, and 50 percent of the endangered animals depend on wetland habitats for some

portion of their lifecycle (Dancy 1997). The diversity of benefits provided by wetlands discussed above makes them a valuable resource to hunters, fishermen, bird watchers, and other recreationists, as well as teachers and scientists.

Wetlands would not be able to provide many of their functions and values without healthy surrounding uplands. Thus, degradation of uplands can degrade the ability of adjacent wetlands to function in many ways. For instance, the wetland's ability to store surface water can be adversely impacted if storm runoff increases to such an extent that the wetland would be channelized by increased flow velocities. Similarly, adjacent urban development can adversely impact the ability of a wetland to remove dissolved elements and compounds and retain particulate matter.

Wildlife also use the uplands adjacent to a wetland. If these uplands are developed, and its wildlife use eliminated, this will reduce the wetland's function for those species that need the combination of upland and wetland. In addition, some species of wildlife are sensitive to human activities. For these species, urban development on adjacent uplands can eliminate or reduce their use of the wetlands.

1.3 WETLANDS OF BOX ELDER COUNTY AND GREAT SALT LAKE

Wetlands make up only about 1.5 percent of Utah's total land area, and 75 percent of those wetlands—approximately 500,000 acres—are found on the shores of Great Salt Lake (USGS 1996). Fifty-five to 60 percent of the lake and its associated wetlands are located in Box Elder County. Depending on its lake level, Great Salt Lake has covered between eight percent (1963) and twenty percent (1986) of Box Elder County's 4.3 million acres.

Box Elder County's wetlands are diverse and dynamic. Emergent marshes, wet meadows, artesian springs, saline playas, and mudflats combine with open water and uplands to provide gradients and mosaics of soil salinity, moisture, plant communities, and wildlife habitats. These habitats vary in the type and quality of water, food, and shelter they provide, and they exert control over the animal community which assembles there. Long-term and seasonal climatic trends cause the lake and its surrounding wetlands to expand and contract, resulting in a shifting mosaic of landscape features and wildlife habitats.

The Great Salt Lake's wetlands are part of the Western Hemisphere Shorebird Reserve Network, signifying their importance to the hemisphere's shorebirds. At least 33 species of shorebirds, represented by two to five million individuals, utilize the Great Salt Lake annually (UDWR 1992). Overall, 257 avian species utilize the Great Salt Lake ecosystem. Of these 257 species, 112 are exclusively associated with the lake's varied wetland areas, while 117 reportedly nest on the lake's periphery or islands (Rawley et al. 1974). Approximately 30 percent of the waterfowl migrating along the Pacific Flyway stop at the Great Salt Lake's wetlands (Rawley 1980).

Box Elder County also has a number of rivers with associated wetlands. The Bear River, with its meanders, oxbow lakes, terraces, and delta, is one of the County's major landscape features. Many

of Box Elder County's waterways, such as the Malad River, Salt Creek, Sulphur Creek, and the Black Slough, have been ecologically impaired by human activities. Land use practices have adversely affected riparian vegetation and streambank stability and altered the natural flow regimes. Many rivers, particularly stretches of the Malad, are deeply incised. In addition, water quality problems (high phosphorus and fecal coliform levels) have been measured and are largely attributed to non-point sources.

1.4 LAWS AND POLICIES AFFECTING WETLANDS

Regulation of wetlands by federal and state agencies has continually changed over its 100-year history through the creation of laws and policies and through legal challenges and judicial rulings. A brief description of major wetland laws and policies and their affects on landowners is presented below. For a more comprehensive discussion, the reader is referred to *Utah's Wetlands Workbook* (Lock, no date), which is the reference for much of the following information and is available from the Utah Division of Wildlife Resources or at the Box Elder County Planning Department.

The main laws which regulate activities in wetlands are the federal Clean Water Act and the state Stream Alteration Act. The Clean Water Act is administered jointly by the Corps and U.S. Environmental Protection Agency (EPA) and applies to all waters of the U.S., including wetlands and other special aquatic sites, such as mudflats, streams, and rivers. Section 404 of the Clean Water Act instructs the Corps to regulate the discharge of dredged or fill material into waters of the U.S. The intent of Section 404 is to ensure that "no net loss" of wetland functions and values occurs. The Stream Alteration Act, administered by the Utah Division of Water Rights, regulates activities within Utah's streams. Whenever a person attempts to alter a wetland or river in Utah by the discharge of dredged or fill material, or by altering flow, he/she must first obtain, depending on the nature of their activity, either a Section 404 permit from the Corps or a stream alteration permit from the Division of Water Rights. For stream alteration activities that are regulated under the Clean Water Act and the Stream Alteration Act, applicants can file one joint application which is evaluated by both agencies.

1.4.1 Section 404 Permits

Using fill or dredged material to change the physical nature of a wetland or any other waters of the U.S. is considered a discharge and thus requires a Section 404 permit. Activities that would require a Section 404 permit include filling a wetland with any materials, stabilizing stream banks, or constructing roads, bridges, or impoundments. There are two types of Section 404 permits the Corps issues: general and individual permits.

General permits were established to expedite the permitting process for projects substantially similar in nature and causing only minimal individual and cumulative environmental impacts. There are three types of general permits: nationwide, state, and regional permits. Nationwide permits authorize certain types of dredge and fill activities on a nationwide basis, while state and regional permits authorize certain activities in a specific state or region. Over 40 types of activities are

covered under nationwide permits. Most common repair and maintenance projects fall under a general permit. Obtaining authorization for an activity under an existing general permit is fairly straightforward as long as the proposed project meets the conditions predefined by that permit.

Any project that could result in large environmental impacts must be permitted by an individual permit instead of a general permit. In the case of an individual 404 permit application, public notices are issued by the Corps and public comment is considered. In addition, various natural resource agencies are involved in the permit review process. The goal of this process is ensure that the project addresses public concerns and meets the needs of the project proponent.

1.4.2 Mitigation for Wetland Impacts

Due to the “no net loss policy,” impacts to waters of the U.S. resulting from an applicant’s projects must be mitigated. As part of the mitigation process, an applicant must consider *avoidance*, *minimization*, and *compensation* of impacts to waters of the U.S. When wetland impacts cannot be avoided, the applicant must justify the need for the project and demonstrate that its purpose can not be fulfilled without impacting wetlands and that no practicable alternative exists. In addition, the applicant must demonstrate that the project design minimizes the wetland area impacted.

Compensation must be provided by the applicant for any unavoidable adverse wetland impacts that occur after avoidance and minimization have been considered. Compensation is described in a mitigation plan developed by the applicant, who is responsible for the long-term success of the mitigation actions. Based on guidelines provided to them by the EPA, the Corps gives preference to on-site mitigation versus off-site mitigation and to mitigating for the type of wetland impacted (“in-kind” mitigation) versus another type of wetland (“out-of-kind” mitigation).

The functions and values of the total wetland area impacted must be considered and compensated for. As a result, the actual acreage provided as compensation under a mitigation plan frequently exceeds the number of wetland acres impacted. Mitigation plans usually involve some sort of enhancement or restoration of existing wetlands and/or creation of new wetlands. The applicant is responsible for the success of the wetlands mitigation in perpetuity. Frequently, this responsibility is transferred to an agency or other organization along with ownership of the wetlands. The hydrogeomorphic models described in Appendix E are currently under development for the purpose of quantifying wetland functions and determining whether the mitigation plan proposed by an applicant provides adequate compensation for wetland functions impacted.

1.5 WHY DO WE NEED A WETLANDS PLAN?

As growth occurs in Box Elder County, urban development pressure on wetlands will increase as the more desirable building sites are used up and subsequent urban development is forced into less suitable areas. It is the County’s position that urban development within and/or adjacent to unique and sensitive areas should occur in a well-planned and responsible manner.

Developing within or adjacent to wetland areas is particularly challenging. Individual permitting processes are complex and time consuming. In addition, approved mitigation plans may meet agency expectations, but fail to meet habitat objectives. With these challenges in mind, the Wetlands Plan is being designed to preserve and enhance the integrity of area wetlands *and* encourage responsible urban development within appropriate areas. The Wetlands Plan will ease the citizen's burden of complying with these regulations while also assuring that no net loss of wetlands occur in Box Elder County.

The need for wetlands planning can be demonstrated by analyzing past wetland impacts in and growth projections for Box Elder County.

1.5.1 Past Wetland Impacts

In Utah, wetland acreage statewide declined from 1,200,000 acres in the 1950's (USFWS 1955) to 558,000 acres in 1974 (Jensen 1974). However, long-term data on wetlands losses in Box Elder County have not been compiled. As part of this planning process, SWCA, Inc. Environmental Consultants (SWCA) investigated the history of projects permitted between January 1994 and August 1998 for Box Elder County by the Corps under individual and general Section 404 permits. The Corps provided a list of permits issued during this time period, and SWCA reviewed the Corps files to determine acres of impacts and mitigation due to these projects.

Of the 21 individual permits and 57 general permits issued, files for 15 and 38 permits, respectively, contained enough information to assess impacts and mitigation associated with the permitted action.¹ Permitted projects for which wetland impacts and/or mitigation figures are available are presented in Appendix B, Table B-1 (individual permits) and Table B-2 (nationwide and general permits).

Of the 15 projects for which individual permits were issued (Appendix B, Table B-1), 11 of them occurred in or immediately adjacent to Great Salt Lake and were associated with either wetland habitat management by an agency or duck club (five projects), dredging of boat harbors (four projects), or mineral extraction (two projects).

Of the 38 permitted projects for which wetland impacts were reported, over 75 percent (29 projects) impacted ≤ 1.0 acres each.² Of the remaining nine projects, two projects impacted between one to four acres each, and five projects impacted five to ten acres each. Only two projects impacted more than ten acres each, and they both were associated with Great Salt Lake Minerals: one project impacted 2500 acres and another impacted 25 acres.

¹For the remainder of the files, impact and mitigation numbers were not available because either (a) the permitted project did not result in a permanent loss of wetlands or require mitigation (e.g. permits for stream alterations or ditch/dike maintenance); (b) the project was not yet complete; or (c) the files were incomplete.

²Of these 29 projects impacting ≤ 1.0 acres, 18 projects impacted ≤ 0.1 acres, nine projects impacted 0.1 to 0.5 acres, and two projects impacted 0.5 to 1.0.

Excluding the Great Salt Lake Mineral projects, approximately 93 acres of wetlands mitigation were provided for 49 acres of wetlands that were impacted. Great Salt Lake Mineral provided 4210 acres of mitigation for the 2525 acres impacted by their projects.

1.5.2 Growth Projections

Box Elder County is expected to increase from 38,900 in 1995 to 61,290 in 2020, representing an average annualized growth rate of 1.74 percent (Utah Governor's Office of Planning and Budget (UGOPB), 1997; also see Appendix B, Table B-3). This absolute projected increase of 22,390 people is not as dramatic as that predicted for Davis (139,041), Weber (109,172) or Salt Lake Counties (495,094). In fact, the population in Davis County increased by 28,059 people from 1990 to 1995, an amount greater than that expected for Box Elder County from 1995 to 2020.

Although the population increase for Box Elder County projected by UGOPB is less than that expected elsewhere along the Wasatch Front, the absolute increase has been and will continue to be noticeable. Manufacturing and retail growth will accompany an increase in population. Urban development pressures exist in and near Brigham City, Perry, and Willard, particularly along Interstate 15, and fifty-eight percent of Box Elder County's projected population increase between 1996 and 2020 is expected to occur in these three cities (Appendix B, Table B-4).

In addition, Box Elder County leaders feel that these projections from UGOPB may understate growth figures for Box Elder County for a variety of reasons. First, the projections are partially based on past growth rates of the County. Average annual past growth may not provide a very good indicator of the future because of such recent past events as the layoffs and downsizing at Thiokol, an anomaly that skews the picture. Also, a look at more recent growth is quite dramatic, especially in the Perry and Brigham City area where many wetlands are found. For the past couple of years, for example, the City of Perry has had an annual growth rate of between 20 and 30 percent (Perry City 1998). County leaders expect Box Elder County, with its relative abundance of land, to have a growth rate higher than it has been and higher than the rest of the Wasatch Front as the more urban areas to the south become developed. Based on these local concerns, the UGOPB is reevaluating their underlying assumptions for Box Elder County growth.

1.5.3 Conclusion

Most projects affecting wetlands in Box Elder County have had small impacts individually, but collectively these impacts add up. The UGOPB and Box Elder County predict continued growth, particularly in Brigham City, Perry, and Willard. More growth will result in more wetland impacts and more time spent complying with wetlands regulations. However, since growth in Box Elder County has lagged behind that experienced elsewhere along the Wasatch Front, an opportunity now exists to preserve and enhance wetland areas *and* encourage responsible urban development within appropriate areas.

2. PLANNING FOR THE FUTURE OF BOX ELDER COUNTY'S WETLANDS

2.1 BENEFITS OF A WETLANDS PLAN AND ITS INITIATION IN BOX ELDER COUNTY

Box Elder County community leaders have recognized that the opportunity to plan for conservation and enhancement of County wetlands exists today. Box Elder County has a larger land base, a smaller population, and a smaller growth rate than other Wasatch Front counties, resulting in less intense urban development pressure. However, considering that most of the wetlands and population are located in the eastern portion of Box Elder County, the planning window prior to the occurrence of greater growth is limited. It is prudent that the County leaders have elected to develop a Wetlands Plan at this time.

Wetlands planning, if conducted effectively, will provide the County with a blueprint for wetland conservation with which the residents and agencies can work. If the County implements this Wetlands Plan successfully, predictable instead of haphazard wetland impacts and mitigation will result and the County will realize long-term environmental, economic, and social benefits. The County would coordinate wetland conservation and mitigation efforts in a coherent manner to achieve prioritized goals that maximize ecological benefits and reduce regulatory uncertainty.

The Wetlands Plan would also provide benefits for individual landowners while assuring that no net loss of wetland functions occurs in Box Elder County. The Wetlands Plan proposes strategies that will ease the regulatory burden of project proponents by simplifying the permitting and approval process associated with wetland impacts and reducing the time required to acquire such approval. In addition, the Wetlands Plan would eliminate or significantly reduce project proponent's mitigation efforts, and would also provide incentives for willing landowners to conserve the wetlands on their property.

In addition to providing urban development benefits, the Wetlands Plan would focus technical expertise on: ensuring that wetland benefits for communities, such as water quality improvement, floodwater retention, and groundwater recharge, are not impaired; protecting the habitat, open space, and wildlife functions and values provided by wetlands; reducing non-point source pollution in County waterways; and providing opportunities for public education about and enjoyment of the County's wetlands. Furthermore, the County would likely be more successful in efforts to obtain funding for wetlands conservation because of the presence of a comprehensive Wetlands Plan.

The County began the process of Wetlands Planning through the County General Planning Process. One part of the County General Plan is the Wetlands Planning Element (Appendix A). A Steering Committee has been organized with the specific charge to develop a Box Elder County Wetlands Management Plan. An Executive Committee was formed from the Steering Committee to more closely guide this process. A list of Steering and Executive Committee members is presented at the beginning of this document. In addition, SWCA and Wikstrom Economic & Planning Consultants

(Wikstrom) were hired to assist the Committees. These Committees have been working since November 1997 on this Wetlands Plan. Meeting minutes are available from the Box Elder County Planner. In addition, local community leaders and citizens have provided input into this plan through a Community Involvement Process (see Section 3.2 and Appendix C).

2.2 DESIRED FUTURE CONDITIONS

Box Elder County has undertaken this planning effort to reconcile the County's wetland conservation and urban development needs. As instructed by the Wetlands Planning Element of the County General Plan (Appendix A), the County's wetland ecosystem and socioeconomic needs were inventoried and assessed during this planning process. Existing data about County natural resources, infrastructure, land ownership, and urban development potential were assembled into a Geographic Information System (GIS) to assist in this planning process. In addition, data regarding Box Elder County's wetlands, including assessment of wetland type, habitat, hydrology, vegetation, land use, and condition have been collected.

The County's wetland ecosystem and socioeconomic needs were then compared to the Steering Committee's original goals, as stated in Appendix A. These goals can be broadly categorized as either wetland conservation-oriented (goals 1 through 6, and 12) or urban development-oriented (goals 7 through 11).

Wetland Conservation goals - these goals are based on conservation and enhancement of wetland ecosystem functions and values (goal 1), including wildlife habitat (goal 2), water quality (goals 6 and 12), and flood water retention and storage (goal 12). Additional conservation goals pertain to public education (goal 3), recreation (goal 4), and open space (goal 5).

Urban Development goals - goals 7 through 11 are oriented toward facilitating economic urban development, responding to infrastructure needs, and respecting the rights of landowners and water users. In addition, an overall urban development goal is to expedite and simplify compliance with wetlands regulations through mechanisms such as a General Permit.

Based on the County's wetland ecosystem and socioeconomic needs, the Steering Committee refined and adopted a more detailed set of planning goals. These goals reflect a Desired Future Condition for Box Elder County's wetlands and are stated below.

2.2.1 Wetland Conservation Goals

- (1) Establish an interconnected system of wetlands, rivers, riparian areas, other aquatic resources, and uplands that preserve wetland functions and values, including functioning as habitat for fish and wildlife that have historically been present on a seasonal or year-round basis in Box Elder County.

- (2) Emphasize protection, enhancement, and restoration of existing wetlands over creation of new wetlands.
- (3) Ensure no net loss of wetlands and wetland values.
- (4) Protect the existing 100-year flood plains of Great Salt Lake and Box Elder County rivers, creeks, and streams, and their ability to convey flood flows in a manner that prevents and/or minimizes hazards to public health, safety, and welfare; delineate the 100-year flood plain where it currently has not been delineated.
- (5) Improve the water quality of the rivers, creeks, and streams in Box Elder County, and ensure consistency between water quality objectives and all other plan goals.
- (6) Work cooperatively with landowners who have wetlands or tributaries on or adjacent to their property to adopt Best Management Practices that will reduce non-point source pollution and increase native riparian and/or wetland vegetation cover.
- (7) When appropriate, incorporate public education components, recruit and offer opportunities for public involvement in projects undertaken as part of this Plan.
- (8) Provide for long-term maintenance, management, and monitoring of wetland projects initiated under this Plan to ensure that they meet the Wetlands Plan's goals.

2.2.2 Urban Development Goals

- (1) Simplify the Clean Water Act Section 404 permitting process for impacts to wetlands and mitigation for those impacts. This will occur by developing a Special Area Management Plan (SAMP) and obtaining a General Permit from the Corps (as explained in Section 4.2.1). The SAMP will allow for impacts to certain wetlands within the County to occur while ensuring that there is no net loss of wetland functions.
- (2) Encourage and facilitate urban development that advances the attainment of the Desired Future Condition and minimizes adverse impacts to wetlands. This includes accommodation of urban development in zones of near-term development potential (as defined in Section 3.1.8) that does not conflict with policies of the Wetland Planning Classes (as defined in Section 4.1).
- (3) Encourage the identification and classification of urban development property (excluding existing residential, commercial, and industrial sites which are already developed, or undeveloped property which is unlikely to be available for near-term development) and conservation property that is suitable for mitigating wetland impacts. Provide mapping of these properties.

- (4) Provide for flood control and storm water management needs in a cost-effective manner through wetlands conservation and enhancement. Using wetlands for flood control leaves uplands available for urban development, conserves wetlands, and should be less expensive than excavating detention basins in uplands.
- (5) Ensure that, within this Wetlands Plan, protection of land for growth is equal in importance to wetland conservation and preservation in benefitting current and future generations. In addition, this plan should contain a mechanism for resolving conflicts between wetland conservation and urban development goals and should not place a higher value upon either wetland conservation or urban development. This goal will be met to the extent that it is allowed by federal laws governing the use of wetlands, meaning that the requirement of no net loss of wetland function must be achieved.
- (6) Wetland data mapped for this planning process will not be considered jurisdictional wetlands under the Clean Water Act, but instead will be used for planning purposes. A jurisdictional wetland delineation, conducted by qualified parties and verified by the Corps, will be required for any wetland properties that are either developed or enhanced to determine the positive or negative effect of such actions to wetland functions.

2.3 AREAS ADDRESSED BY THE WETLANDS PLAN

Box Elder County encompasses an extensive area encompassing 6,710 square miles. In this Wetlands Plan, we split the County into two Planning Areas, A and B, based on differences in population and economic growth potential. The boundary line between Range 6 West and Range 7 West is the dividing line between these planning areas (available from the Box Elder County Planning Department; these maps will be included in the final draft of the Wetlands Plan). Planning Area A lies to the east of this line and includes incorporated and County areas that are experiencing or have the potential to experience population and economic growth that could substantially impact wetlands. Planning Area B lies to the west of this line and includes areas where potential population and economic growth will have minimal impacts on wetland resources.

Since Planning Area A includes significant wetland and aquatic resources in the proximity of these “growth” areas, the Wetlands Plan proposes strategies and solutions for reconciling growth and wetlands conservation for Planning Area A at a more detailed level than is provided for Planning Area B. Although detailed strategies are not required for Planning Area B, key wetland resources within Planning Area B are addressed. In addition, many of the tools identified in the Wetlands Plan are applicable for use in both Planning Areas A and B.

3. PLANNING DATA

Two types of planning data were collected during this planning process to help determine the Desired Future Condition: natural resource data and community involvement and planning data. These data are described below.

3.1 NATURAL RESOURCE DATA

The natural resource data collected during the planning process and the sources they were acquired from are explained below. These data were managed in a Geographic Information System (GIS) by SWCA. A GIS is a computer system used to efficiently capture, store, and update geographically referenced information. A GIS provides the ability to spatially analyze and display data in a manner that would otherwise be very time consuming and/or difficult (ESRI 1990). This project's maps were created using a GIS.

3.1.1 Jurisdictional Boundaries And Features

Maps 1a and 1b display jurisdictional boundaries, land ownership patterns, existing planning areas, rivers, streams, roads, railroads, and other features relevant to the Wetlands Plan. Included on this map are boundaries of municipalities, Duck Clubs, State of Utah Sovereign Lands, and lands managed by the Utah Division of Wildlife Resources (UDWR), the U.S. Forest Service, the Bureau of Land Management (BLM), the U.S. Fish and Wildlife Service (USFWS), and the National Park Service.

Map 1a shows the boundary of the Bear River Migratory Bird Refuge (BRMBR), which is managed by USFWS. In addition to lands already part of the BRMBR, USFWS has delineated three acquisition/conservation areas adjacent to the current BRMBR boundary (USFWS 1992). Priority A and B areas are first and second priority tracts that the USFWS would like to acquire ownership of through purchase; priority C areas are those where the USFWS would like to acquire conservation easements to protect wetland resources. USFWS plans emphasize acquisition from willing-sellers only. Many acquisitions have already occurred within areas A and B and are shown on Map 1a.

The Bureau of Land Management has identified areas for addition to their two Areas of Critical Environmental Concern—Blue Springs (Map 1a) and Salt Wells (Map 1b). Land would be acquired on a willing-seller basis only.

Wetland properties owned by UDWR in Box Elder County include the Salt Creek, Public Shooting Grounds, Locomotive Springs, and Harold Crane Waterfowl Management Areas (WMAs) (Maps 1a and 1b).

Data for Maps 1a and 1b were acquired from the State of Utah Automated Geographic Reference Center, with corrections and additions made based on data acquired from the following: Box Elder

County; UDWR; Utah Division of Forestry, Fire, and State Lands (UDFFSL); Utah School and Institutional Trust Lands; USFWS; and BLM.

3.1.2 National Wetlands Inventory Data

Maps 2a and 2b show the National Wetlands Inventory Data that exist for Box Elder County. The data are shown overlaying data from United States Geological Survey 30 minute x 60 minute quadrangle maps.

The National Wetlands Inventory (NWI) data were produced by the U.S. Fish and Wildlife Service. These data describe the characteristics, extent, and status of the Nation's wetlands and deepwater habitats. Wetlands under NWI are classified according to Cowardin et al. (1979).

The NWI data for Box Elder County were collected primarily by stereoscopic analysis of high altitude aerial photographs taken in 1981. Wetlands were identified on the photographs based on vegetation, visible hydrology, and geography. Margins of error are inherently introduced into the data by using aerial photos and due to the conditions reflected during the season and year when the photos were taken. Some of the data were ground-checked. Due to the methodology used by the NWI, the data do not reflect the extent of wetlands considered jurisdictional by the Corps. However, they do provide useful information for planning purposes. NWI data have only been collected for a portion of the County. Maps 2a and 2b show the boundary of the area in Box Elder County for which NWI data has been collected and mapped electronically.

3.1.3 Flood plains

Map 3 shows flood plain data for Box Elder County. Two sources of flood plain data were used: Federal Emergency Management Agency (FEMA) and the Corps.

The FEMA data were digitized by SWCA from FEMA Flood Insurance Rate Maps available for Box Elder County. The 100-year flood plain is shown. For many areas in the County, including several municipalities, the 100-year flood plain has not been mapped. The boundary of the area for which the 100-year flood plain has been mapped in Box Elder County is shown on Map 3.

The Corps has conducted an engineering study to determine the 100-year shoreline boundary of the Great Salt Lake flood plain (Corps 1997). This 100-year shoreline boundary is based on the sum of the still water elevation plus windset. The Corps determined windset by studying weather conditions, lake bottom morphometry (shape of the lake's bottom slope), and fetch (open water distance across which wind can travel unimpeded by major landforms).

3.1.4 Recharge, Discharge, And Aquifer Protection Areas

Map 4 (available from the Box Elder County Planning Department) shows recharge, discharge, and aquifer protection areas for Box Elder County. Two sources of data were used: a hydrogeologic investigation report (Anderson et al. 1994) and the Utah Division of Drinking Water.

Anderson et al. (1994) maps and provides the following definitions for the primary and secondary recharge areas and discharge areas along the Wasatch Front and adjacent areas. Primary recharge areas are areas where the basin-fill deposits between the land surface and the water table consist of sediments that contain no confining layers thicker than about 20 feet. Secondary recharge areas are areas where a confining layer is present between the land surface and the principal aquifer. Discharge areas are areas where the direction of ground-water movement is upward from the principal aquifer into the shallow unconfined aquifer.

Drinking water source protection zones were provided by the Division of Drinking Water (Mark E. Jensen, 801-536-4199). These zones are defined as part of State of Utah's Drinking Water Source Protection program. Zones are identified as either aquifer protection areas or spring recharge areas. Aquifer protection areas are delineated into zones 2, 3, and 4, based on the time it would take groundwater to travel from the outer boundary of a zone to the drinking water source. The travel time for zones 2, 3, and 4, respectively, are 250 days, 3 years, and 15 years. The travel times from the boundary of the spring recharge areas to the source is considered to be 250 days.

3.1.5 Soil Features

The County's soil features pertinent to wetlands are presented in Map 5 (available from the Box Elder County Planning Department). The sources for these data were the Natural Resource Conservation Service's Soil Surveys for eastern and western Box Elder County (SCS 1975, NRCS 1997). SWCA digitized soil associations data from SCS (1975) and NRCS (1997) that included playas and poorly or somewhat poorly drained soils. In addition, SWCA used soil mapping data for the Clarkston, Cutler Dam, Honeyville, Brigham City, and Portage USGS 7.5' quadrangle maps that were digitized by NRCS (1997) to identify soils of wetland drainage classes.

Utah Association of Conservation Districts (UACD) is currently digitizing soils data for additional quadrangle maps in Eastern Box Elder County that will be included in later versions of this document as the data become available. In addition, soils data for the entirety of western Box Elder County from NRCS (1997) will be available within the next few months in electronic format.

3.1.6 Agricultural Land Usage And Designation

Agricultural lands usage and designations are presented in Map 6 (available from the Box Elder County Planning Department). Agricultural land usage was determined from an electronic data collection in 1996 for the Utah Water Related Land Use Inventory for Box Elder County by the Utah

Division of Water Resources. Land usage categories were aggregated into irrigated cropland, non-irrigated cropland, and pasture/hay.

Agricultural land designation data were acquired from the Utah Association of Conservation Districts (1998), which used definitions and data from Utah Agricultural Experiment Station reports for Box Elder County and NRCS data. The following agricultural land designations are shown on Map 6: prime; statewide important; statewide important, irrigated; statewide important, non-irrigated; unique; local important; and other.

The boundaries of land designation polygons and land usage polygons do not always match due to different data sources and methods used by the compilers of each data set.

3.1.7 UDWR And Functional Assessment of Wetlands

UDWR conducted a wetlands evaluation as part of this planning process. The purpose of the evaluation was to identify, classify, and evaluate Box Elder County wetlands and their functions. UDWR collected detailed information about wetlands in the eastern portion of Box Elder County, primarily east of Interstate Highway 15. The evaluation methodology is described in Appendix D. The UDWR data are not comprehensive enough to serve as a delineation of jurisdictional wetlands; that level of effort is far beyond the scope of this project. However, the UDWR data are more recent and thorough than the NWI wetlands data, which are based on 1981 aerial photos. In addition, the UDWR data provide an assessment of wetland functions (adapted from models described below), something the NWI data do not do.

The wetlands data collected were used to conduct a functional assessment modeled after Hydrogeomorphic (HGM) models. The functional assessment evaluates and quantifies the physical, chemical, and biological functions of wetlands. A description of the functional assessment is presented in Appendix E. The State of Utah and the Corps, with assistance from numerous governmental agencies, have been developing HGM models for use in Utah since 1995. The functional assessment used for Box Elder County was modeled after the HGM model that was developed primarily for the Utah Department of Transportation's Legacy Parkway environmental studies.

One of two functional assessments, depending on wetland type, was applied to each wetland evaluated by UDWR in Box Elder County. Using the assessments, values were calculated for hydrology, biogeochemical, and habitat (plant and animal) functions. Values between 0.00 (lowest) and 1.00 (highest) were calculated. The wetlands evaluated by UDWR and the functional assessment values (hydrology, biogeochemical, habitat, and overall functional assessment values) calculated for them are shown on Maps 7a-d (available from the Box Elder County Planning Department). In addition, UDWR rated each wetland qualitatively based on its overall condition (Map 7e - available from the Box Elder County Planning Department). Lastly, a comparison was made of the extent of UDWR and NWI wetlands (Map 7f - available from the Box Elder County

Planning Department). Note that the aerial extent of UDWR's wetlands evaluation is much smaller than that covered by the NWI data.

3.1.8 Near-term Development Potential Areas

Urban development goals are an important part of this wetlands planning process. To develop a plan that meets both wetland conservation and urban development goals, SWCA and Wikstrom were asked to evaluate near-term development potential (defined as the next ten to twenty years) in Box Elder County. This evaluation was based on existing public policy documents (the Box Elder County General Plan (1998) and local government master plans and zoning) as well as other factors such as infrastructure availability and transportation access. In addition, Wikstrom and SWCA toured the County with County planning officials and met with County and city officials. Areas identified by these County and city officials as the most likely paths of future urban development are shown on Map 8 (available from the Box Elder County Planning Department).

3.1.9 UDWR Priority Wetland Habitat Areas

UDWR personnel reviewed wetland maps for Box Elder County and, relying on their collective experience, identified areas where wetland complexes provide significant functional values for wildlife (Map 9, available from the Box Elder County Planning Department). UDWR compiled Map 9 in order for their on-the-ground knowledge of Box Elder County wetlands to be used in the planning process. UDWR designated wetland complexes as priority habitats based on the following: parcel size and ownership; proximity to UDWR or other agency's conservation properties; anticipated urban development; threat of immediate impact or loss; mitigation values and needs; water rights availability; current and potential wetland conditions; relative abundance of a particular habitat type; and land economic value. The priority habitats identified are the following:

1. Bear and Malad River corridors.
2. Bear River Bay: lands within the East Arm of the Great Salt Lake not in state or federal ownership.
3. Bear River Migratory Bird Refuge.
4. Black Slough/North Lake: wetland complexes stretching from south of Honeyville to north of Brigham City, and then southwest to BRMBR.
5. Blue Creek riparian area: wet meadows and open water areas located in Howell Valley.
6. Salt Creek riparian area: wet meadows and stream channel located southwest from Tremonton; this is the main water source for Salt Creek WMA.
7. Duck Clubs: agricultural areas and wetlands with significant wildlife values in close proximity to BRMBR with varying levels of conservation management.
8. Mantua Reservoir
9. Bear River Delta
10. Salt Wells: a large mosaic of various wetlands types with diverse ownership (state, federal, private).

11. Urban Interface: wetlands adjacent to or in close proximity to urban areas.
12. WMAs: lands owned by UDWR including Salt Creek, Public Shooting Grounds, and Locomotives Springs WMAs.
13. WMA Adjacent: wetland complexes with significant wildlife values in close proximity to UDWR WMA properties.

The maps within the side bar show the following:

1. The priority areas mentioned above (Map 9, inset 9a).
2. Farmland designated as prime or statewide important (Map 9, inset 9b).
3. The intersection significant agricultural lands (Map 9, inset 9a) and priority wetland habitats (Map 9, inset 9b), shown in Map 9, inset 9c.

3.2 COMMUNITY INVOLVEMENT PROCESS

As part of the wetlands planning process, some members of the Wetlands Executive Committee and consultants from SWCA and Wikstrom met with various city and County officials as concepts for the Wetlands Plan were developed. Feedback from these community members led the Wetlands Executive Committee to the conclusion that the overall utility, acceptance, and success of the Wetlands Plan would be increased if additional community involvement was sought through a more formal process. Thus, the Wetlands Executive Committee designed a Community Involvement Process (CIP) to solicit this input.

The Community Involvement Process was organized around the concept of Wetland Planning Groups (WPGs). The Box Elder County Planner asked community leaders to form WPGs for all areas of the County to provide planning input. One or more members of the Wetlands Plan Steering Committee were appointed to assist each WPG. WPGs were formed for the following areas.

- (1) Brigham City
- (2) Perry
- (3) Willard
- (4) Honeyville
- (5) East County - areas east of (and including) the Malad River, including Bear River City, Deweyville, Elwood, Fielding, Garland, Plymouth, Portage, and Tremonton, and unincorporated areas.
- (6) Corrine / West Corrine - Corrine City and the unincorporated areas west of the Malad River but east of Little Mountain, including the Sulphur Creek drainage.
- (7) West County / Penrose / Lampo Junction - the unincorporated areas west of Little Mountain in the vicinity of Bothwell/Thatcher/Penrose/Lampo Junction, lands adjacent to Salt Creek and Public Shooting Grounds WMA and Blue Springs ACEC, lands east of the Promontory Mountains, and the west portion of the County ("Planning Zone B").
- (8) North Lake - the area east of the Bear River, north of Brigham City, south of Honeyville, and west of the Wellsville Mountains.

An all-day workshop was held on Saturday, November 21, 1998 to educate the WPGs about the wetlands planning process. At the workshop, representatives of the Executive Committee, UDWR, Corps, and SWCA made presentations to the WPGs. The WPGs were asked to address the questions listed below. Additional, area-specific questions were also provided for some WPGs. Most WPGs held follow-up meetings to develop their input. The responses to these questions and other input provided by the WPGs were used to develop the Wetlands Plan.

Questions for Wetland Planning Groups

- (1) Where in your community do you anticipate conflicts between urban development and wetlands?
- (2) Are there opportunities to combine wetlands conservation with other community goals (e.g. flood control, open space preservation, aesthetics, recreation, education, wildlife habitat needs)? Where?
- (3) Are there wetland resources within you community that are good candidates for protection, enhancement, and/or mitigation? Where?
- (4) Is your community willing to develop ordinances/zoning or use other planning tools to address wetlands conservation? If so, what tools/options are viable or preferred?
- (5) Are there any questions above with which the community is likely require additional research or studies and with which you may need technical assistance?
- (6) What is your feedback and comment on the draft Wetlands Plan?

Some of the WPG input is included in Appendix C. This and other input from the WPGs was used to develop the framework for achieving the Desired Future Condition recommended in this Wetlands Plan (Section 4).

3.3 PROJECTS WITH POTENTIAL LONG-TERM WETLAND IMPACTS

The Utah Division of Water Resources identifies building a water storage and development project on the lower Bear River, specifically at Honeyville, as part of the Bear River Basin Plan (Utah Division of Water Resources 1994). However, much uncertainty exists as to where and whether such a development will be built. Due to this uncertainty, the effect of a Bear River water project on Box Elder County's wetlands can not be predicted at this time. However, some benefits and drawbacks of a Honeyville water project for Box Elder County's wetlands have been identified (Kadlec and Adair 1994, BIO/WEST 1995).

One potential benefit for wetlands from a Honeyville project would be that more water would be available in July and August for the Bear River Migratory Bird Refuge to manage their wetlands. Currently, only in 1 of 2 years with normal summer weather is "low level" botulism management

possible. A reservoir at the Honeyville site could allow low level botulism management in 9 of 10 years (Kadlec and Adair 1994). Although water need shortfalls currently exist, the wetlands of the Bear River delta are adapted to seasonal drying and periodic drought, so shortages in a few years are not disastrous. The USFWS currently has no official position on whether or not they favor a dam and reservoir on the Bear River at Honeyville and will not form a position until a formal project proposal is available for review (Al Trout, pers. comm., 1999).

Potential adverse effects on the County's wetlands from a Honeyville water project would be the inundation of 13 miles of river corridor and loss of 1,590 acres of wetlands and open water and 462 acres of riverine habitat (BIO/WEST 1995). In addition, approximately 500,000 of 1.2 million acre-feet of Bear River water currently diverted in Box Elder County returns to the river or groundwater. This amount would most likely be depleted by out-of-basin transfers for municipal and industrial usage. Any additional depletion of water from Bear River Bay would also deplete inflows to Great Salt Lake and could reduce lake surface elevation, depending on the final fate of the additional depletions (Kadlec and Adair 1994).

Another planning issue considered as part of the Wetlands Planning process was potential development of new highways in the County. Plans for a Nephi-to-Brigham City Legacy Highway exist, but the Executive Committee deemed that such plans now are conceptual at best. Because of the uncertainty regarding the issues of highway development and Bear River reservoir development, this Wetlands Plan is considered to be adequate for the next 20 years. Beyond that time period, the above-mentioned planning issues could potentially introduce wetland issues not addressed in this plan.

4. FRAMEWORK FOR ACHIEVING A DESIRED FUTURE CONDITION

Section 2.2 of this plan describes wetland conservation and urban development goals that reflect a Desired Future Condition for Box Elder County's wetlands. In this section, we define the Desired Future Condition by dividing the County into building blocks called Wetland Planning Classes (WPCs). We also define the wetland planning goals for each WPC and the tools to be used within each WPC to achieve those goals. Additionally, we present the framework to be used to implement this plan. Ultimately, by achieving the planning goals of each WPC, the Desired Future Condition will be achieved.

4.1 WETLAND PLANNING CLASSES (WPCs)

We have divided the County into seven WPCs (Appendix G, Maps 10a and 10b). These WPCs are the framework for achieving the Desired Future Condition. Recognition of these seven WPCs allows for protection, conservation, and enhancement of the wetland functions and landscape roles filled by each WPC, and identifies areas appropriate for urban development. The WPCs, their characteristics and wetland planning goals are summarized in Table 4.1.

The number of wetlands and total acres within each WPC for areas east of the Promontory Mountains (Area A) are presented in Table 4.2. Significant additional acreage exists west of the Promontory Mountains in WPCs A, B, and D; these lands are associated with the north arm and periphery of Great Salt Lake.

The Bear River flood plain is included in WPC C, however, electronic NWI data were not available at the time acreage was tabulated for areas along the Bear River north of Honeyville. If these data were included in this plan, the actual NWI wetland acres for WPC C in Table 4.2 would be several hundred acres greater. This data have recently become available and should be included in future planning documents.

UDWR's wetlands classification effort generally found more wetland acres than the NWI data show. However, because the UDWR wetland classification primarily focused on areas east of I-15, thus covering less total acreage than the NWI data, the UDWR data are not shown in Table 4.2.

Six of the seven WPCs include wetlands. The seventh, WPC G includes the remaining non-wetland areas within the County. The distinctions between the other six WPCs is made through a comparison of the existing extent of wetland conservation; the potential for future conservation efforts; the presence of important large-scale aquatic features that are not currently included or planned for inclusion in conservation protection; the importance of the areas wetlands as a hydrologic connection between conservation areas; wetland areas within the path of future urban development; and smaller, isolated wetland areas that don't fit within the other five classes.

4.1.1 Wetland Planning Class A (Class A) - Areas Already Protected for Wetland Functions and Values

Class A is comprised of wetlands and supporting uplands already protected through restrictive title by public entities such as the UDWR, USFWS, and BLM. These areas, such as the Bear River Migratory Bird Refuge, Public Shooting Grounds, Salt Creek, and Locomotive Springs WMAs, and Blue Springs and Salt Wells Areas of Critical Environmental Concern (ACEC), are already managed for wetland values. Most of the Steering Committee's conservation goals are currently being met in these areas. Although there are several Duck Clubs in Box Elder County that manage and enhance wetland habitats, none of the property owned by these clubs have long-term conservation easements associated with them. Thus, no duck club properties are included in Class A.

Class A Planning Goals: It is the goal of the Wetlands Plan to encourage activities by resource managers that protect, enhance, and/or restore wetland functions and values within Class A areas. Conversely, the Wetlands Plan discourages urban development within Class A areas that would diminish wetland functions and values.

4.1.2 Wetland Planning Class B (Class B) - Areas for Which Wetland Protection Plans Are Being Developed

Class B is comprised of wetlands and supporting uplands identified in resource management agency plans for protection. For instance, some Class B areas have been identified by resource managers for acquisition of title or conservation easement on a willing-seller basis (e.g. privately owned lands near Blue Springs ACEC, Salt Wells ACEC, and BRMBR), or for future management to protect wildlife resources (lands below the Great Salt Lake meander line, described below). In these areas, it is assumed that perpetual achievement of many Steering Committee conservation goals will be secured if these actions occur. In essence, these are properties for which efforts are underway to qualify them for Class A.

There are many wetland complexes in Box Elder County that agencies are interested in protecting (areas near Salt Creek and Public Shooting Grounds WMA) or that are currently managed for wetland values (e.g. Duck Clubs). However, many of these areas currently do not enjoy long-term guarantees of protection (such as through deed restrictions), nor are plans in place to secure that protection. Such areas have not been included in areas A or B. Instead, they fall into Wetland Planning Classes C or D below. In addition, there are no guarantees that the areas included within Class B will be ultimately protected. Landowners may not be willing to sell, or conservation agencies/organizations may not be able to afford land prices.

Many wetlands and deep water habitat areas associated with Great Salt Lake lie below the Great Salt Lake meander line. These areas are managed by UDFSL (previously known as the Utah Division of Sovereign Land and Forestry, or UDSLFL). Some of these areas are currently leased or available for mineral leasing, while other areas have been withdrawn from mineral leasing (UDSLFL 1996). Areas currently leased for mineral extraction are noted on Maps 10a and 10b.

The Utah legislature has authorized the UDWR to utilize all or parts of 39 townships of sovereign lands on Great Salt Lake below the meander line for the “creation, operation, maintenance and management of wildlife management areas, fishing waters and other recreational activities” (Section 23-21-5, Utah Code Annotated (UCA)). Not all of the lands so authorized under UCA 23-21-5 are now managed by UDWR (Utah Department of Natural Resources 1998).

However, as part of the Great Salt Lake Planning Project currently being conducted by the Utah Department of Natural Resources (UDNR), management responsibilities for these lands will be determined. The Great Salt Lake Planning Project was begun in August 1997 to clarify management objectives of UDNR for the Lake, and to reconcile the diverse mandates of the various divisions within UDNR and the interests of the public regarding the future management direction of the Lake (UDNR 1999). An intended outcome of the planning process is for UDWR to develop management plans to protect wildlife resources and wetland values in many UCA 23-21-5 areas in Box Elder County (personal communication, Karl Kappe, UDFFSL, 1998). These areas are located below the meander line in Great Salt Lake’s Bear River Bay and Spring Bay, and are included in Class B under this plan.

While the Great Salt Lake Planning Project will apparently further some wetland conservation efforts on sovereign lands in Box Elder County, UDFFSL has a multiple use mandate and their planning process should not be viewed as a Great Salt Lake conservation effort. UDFFSL is considering several development prospects in the Great Salt Lake’s north arm, including development of brine shrimp harbors west of the Deseret Ranch, development possibilities near Rossel Point and the Spiral Jetty, and off-highway vehicle usage on the Great Salt Lake shoreline in Township 11 North, Range 11 West (personal communication, Karl Kappe, UDFFSL, 1999).

The schedule for completion of a comprehensive management plan for Great Salt Lake has been modified following a series of public meetings. A draft plan was originally scheduled for release on April 15, 1999, but it now is not expected to be released until later this year (UDNR 1999). Prior to its release, UDFFSL representatives plan to meet with commissioners and state legislators from the counties within which Great Salt Lake is located, including Box Elder County (personal communication, Karl Kappe, UDFFSL, 1999).

Areas above the meander line where Class B designation would conflict with near-term development potential areas have been included in Wetland Planning Class E. This applies to two areas in the County: (1) the portion of Perry City that lies west of I-15 and is designated as part of the BRMBR’s priority B expansion area, and (2) the southern portion of Corrine that is designated as part of the BRMBR’s priority C expansion area.

Class B Planning Goals: It is the goal of the Wetlands Plan to encourage activities by resource managers to protect, enhance, and/or restore wetlands functions and values within Class B through acquisition of property and/or conservation easements on a willing-seller basis. In addition, the Wetlands Plan recommends development of a wetlands/wildlife protection plan by UDWR for UCA 23-21-5 lands. Representatives of the committees that will implement the Wetlands Plan (described

in Section 4.3.1 should participate in any briefings that occur between UDFFSL and Box Elder County officials regarding the Great Salt Lake Planning Project.

4.1.3 Wetland Planning Class C (Class C) - Large-scale Aquatic Landscape Features

Besides Great Salt Lake and its associated wetlands, there are other distinct large-scale landscape wetland features (with supporting uplands) in Box Elder County. Some of these areas are still providing a high level of wetland functions and values, while others have experienced various degrees of degradation. Continued stewardship and, where necessary, enhancement of these areas will achieve many of the Steering Committee conservation goals. These wetland areas are grouped into two categories: lacustrine/palustrine and riverine.

4.1.3.1 Lacustrine/Palustrine Areas

There are two lacustrine/palustrine complexes in Class C: the North Lake area and Sulphur Creek area. The North Lake complex is located north of S.R. 13, west of the Wellsville Mountains, and east of the Bear River, while the Sulphur Creek complex is located east of Little Mountain and north of S.R. 83. The Sulphur Creek wetland complex is in good condition and managed by the Sagebrush Duck Club.

The North Lake area has long been recognized for its habitat values. However, portions of it have been substantially degraded. This area encompasses emergent marshes, wet meadows, playas, open water, springs, and streams. According to long-time County residents, Box Elder and Salt Creeks used to drain into North Lake (personal communication, Clinton Burt, Bear River Water Conservancy District, and Quinn Eskelsen, Box Elder Wetlands Foundation). However, these creeks are now diverted and no longer drain into North Lake. In addition, numerous other diversions and ditches currently prevent water from accumulating in this area to the extent it has historically.

Although wetland functions and values in portions of the North Lake area have been degraded over the years, the potential for habitat enhancement of large areas is enormous. According to Don Paul (DWR), the North Lake area was very valuable for waterfowl when the Great Salt Lake flooded in the 1980s. Since agriculture is the primary use of the North Lake area and much of it lies within the 100-year flood plain, urban development is minimal. This area presents several opportunities for use as a large wetlands mitigation area. However, this opportunity will face some restrictions due to the presence of the Brigham City airport and the existence of Federal Aviation Administration (FAA) regulations concerning the proximity to airports of wildlife habitat enhancements (FAA 1997; also see Section 4.2.1.1 below).

4.1.3.2 Riverine Areas

The primary riparian/riverine areas addressed by this plan are the Bear River, Malad River, Sulphur Creek, and Salt Creek. (Black Slough is addressed under Wetland Planning Class D.) Box Elder County's rivers have been degraded over time due to land use practices that have adversely affected

riparian vegetation and streambank stability and altered the natural flow regimes. Many rivers, particularly stretches of the Malad, are deeply incised. In addition, water quality problems (high phosphorus and fecal coliform levels) have been measured and are largely attributed to non-point sources, both from within and upstream of Box Elder County (Ecosystems Research Institute and Bear River RC&D 1995; personal communication, Jim Christensen, Utah Division of Water Quality 1998). Lastly, while palustrine wetlands in the Sulphur Creek complex are in good condition, degradation has occurred in the stretch of the creek below these wetlands.

The timing is appropriate to take measures to improve water quality and riparian values along Box Elder County rivers. In Cache County, efforts are underway to improve Bear River water quality as problem areas have been targeted and Total Maximum Daily Loads (TMDLs) for certain pollutants have been recommended (Ecosystems Research Institute and Bear River RC&D 1995). These efforts should have a positive effect on Bear River water quality in Box Elder County. In addition, the Division of Water Quality is currently (1998-1999) collecting data on the Bear and Malad Rivers in Box Elder County so that TMDLs for the Bear River can be established, beginning in late 1999.

Class C Planning Goals: It is the goal of the Wetlands Plan to encourage development of a wetlands mitigation area as part of a Special Area Management Plan (SAMP) in the North Lake area. A SAMP is a plan that addresses wetlands impacts associated with urban development and is explained further under Section 4.2.1. In addition, further investigation of cooperative efforts in the Sulphur Creek area may yield additional opportunities for wetlands enhancement, protection, and, possibly, mitigation banking, although the demand for such mitigation is not anticipated in the near future. Regarding riverine and riparian areas, wetlands management will be enhanced by the improvement of water quality and reduction of non-point source pollution entering Box Elder County waterways. An improved condition of riparian and emergent vegetation along those waterways is the goal of the Wetlands Management Plan.

4.1.4 Wetland Planning Class D (Class D) - Connecting Areas

Classes A through C encompass thousands of acres of palustrine, lacustrine, and riverine wetlands. However, many of the vital connections between these important County wetland areas are not included in Classes A through C. These connecting areas comprise Class D. These connecting areas are important for many reasons including hydrologic connectivity, passage of floodwater, wildlife movement and migration, and genetic interchange between isolated wildlife populations. For example, the Black Slough links the North Lake area with the Bear River delta and Great Salt Lake wetlands, but currently it is not protected in any manner. Also, Salt Creek and Public Shooting Grounds WMAs are separated by privately owned lands. In addition, there are wetlands and uplands connected to areas in Class A and Class B that are part of or support these wetland complexes, but are not included within their boundaries.

Class D Planning Goals: It is the goal of the Wetlands Plan to encourage protection, restoration, and enhancement of Class D areas that are functionally connected to or link Class A, B, or C wetland areas.

4.1.5 Wetland Planning Class E (Class E) - Interface Planning Areas

The wetlands in the interface planning area are primarily located in Brigham City, Perry, and Willard. Some of these wetlands are surrounded by uplands that are important areas for near-term and long-term urban development. However, many of these wetlands function as hydrologic receiving areas for the adjacent urban areas. As these cities become more developed, the extent of impermeable surfaces and the stormwater runoff quantities will increase, as will the importance of these wetlands in storing and conveying this runoff. In addition, these wetlands provide wildlife habitat, open space, and scenic vistas which contribute to Box Elder County residents' quality of life.

The cities in Box Elder County have the opportunity to contribute to wetland conservation efforts by integrating wetlands into their stormwater plans as receiving areas and detention areas. This approach could be cheaper than building detention basins and other stormwater infrastructure as the sole solution to handling increased stormwater. Wetland conservation for stormwater purposes could also preserve open space, aesthetic, and wildlife habitat values. Currently, Perry and Brigham City do not consider using wetlands in their stormwater management plans (Jones and Associates Consulting Engineers 1997, RB&G Engineering 1997).

Some impacts to wetlands are inevitable in Class E areas as human population and urban development increase. Input collected through the Community Involvement Process indicated that the greatest potential near- and long-term conflicts between urban development and wetlands conservation exist within the boundaries of Perry and Brigham City. The Wetlands Plan attempts to balance these needs through the SAMP strategy proposed in Section 4.2.1. In addition, the County and cities can minimize urban development-induced wetland impacts by encouraging urban development practices that are sensitive to wetland functions. Examples of sensitive urban development practices are described in Ewing (1996), which is available from the Box Elder County Planner's office.

Class E Planning Goals: Based on input received through the Community Involvement Process, it is the goal of the Wetlands Plan to encourage Brigham City, Perry City, and Box Elder County to implement additional planning steps required to develop a SAMP, as described in Section 4.2.1, so that sensitive urban development can occur in some wetland areas of these cities without causing an overall net loss of wetland function.

4.1.6 Wetland Planning Class F (Class F) - Other Wetlands

All wetlands not included in Classes A through E are in Class F. The majority of these wetlands are located west of Corrine and east of Little Mountain. Some of these areas, although they show up as part of the NWI data, are not actually jurisdictional wetlands. These areas are primarily used for agriculture. Input received as part of the Community Involvement Process projected little urban development activity in these areas.

Class F Planning Goals: Mitigation for impacts to Class F wetlands will occur through the normal Section 404 permitting process. These areas will not be included in the SAMP strategy described in Section 4.2.1 because of the limited urban development activities projected in their vicinity. However, it is the goal of the Wetlands Plan to encourage resource managers to protect, enhance and/or restore wetlands functions and values under the guidelines of this plan should urban development occur in these areas.

4.1.7 Wetland Planning Class G (Class G) - Remaining Non-wetland Areas

Class G is comprised of all remaining uplands in the County not included in Classes A through F. Urban development on uplands is not regulated by the Section 404 permitting process. However, land use on uplands adjacent to wetlands can have a strong effect on wetland ecology. Thus, the County and cities can minimize deleterious effects on wetlands resulting from urban development of uplands by encouraging resource-sensitive development practices. Examples of sensitive development practices are described in Ewing (1996), which is available from the Box Elder County Planner's office.

Class G Planning Goals: Urban development within these areas is not affected by Section 404 wetland regulations and will not be addressed as part of the SAMP strategy described in Section 4.2.1. However, it is the goal of the Wetlands Plan to encourage sensitive urban development of uplands adjacent to wetlands.

Table 4.1. Wetland Planning Classes and planning goals.

Wetland Planning Class	Characteristics	Wetland Planning Goals
A - Areas Already Protected for Wetland Functions and Values	Wetlands and supporting uplands already protected through restrictive title by public entities.	<ul style="list-style-type: none"> • Encourage activities by resource managers that protect, enhance, and/or restore wetland functions and values within Class A areas. • Discourage urban development within Class A areas that would diminish wetland functions and values.
B - Areas for Which Wetland Protection Plans Are Being Developed	Wetlands and supporting uplands identified in resource agencies plans for protection.	<ul style="list-style-type: none"> • Encourage activities by resource managers to protect, enhance, and/or restore wetlands functions and values within Class B through acquisition of property and/or conservation easements on a willing-seller basis. • Encourage development by UDWR of a wetlands/wildlife protection plan for UCA 23-21-5 lands. • Encourage representatives of the committees that will implement the Wetlands Plan (described in Section 4.2) to participate in any briefings that occur between UDFFSL and Box Elder County officials regarding the Great Salt Lake Planning Project. • Areas above the meander line where Class B designation would conflict with near-term development potential areas have been included in Wetland Planning Class E.
C - Large-scale Aquatic Landscape Features	North Lake area, Sulphur Creek area, Bear River, Malad River, and Salt Creek.	<ul style="list-style-type: none"> • Encourage development of a wetlands mitigation area in the North Lake area as part of a SAMP. • Encourage investigation of cooperative efforts in the Sulphur Creek area for wetlands enhancement, protection, and, possibly, mitigation banking. • Encourage improvement of water quality and reduction of non-point source pollution entering Box Elder County waterways • Encourage improvement of condition of riparian and emergent vegetation along those waterways.
D - Connecting Areas	Vital connections between and to areas included in Classes A through C.	<ul style="list-style-type: none"> • Encourage activities by resource managers that protect, restore, and/or enhancement Class D areas that are functionally connected to or link Class A, B, or C wetland areas.
E - Interface Planning Areas	Near populated areas and under urban development pressure. Function as hydrologic receiving areas, providing wildlife habitat and open space, and serve as buffers to other Wetland Planning Classes.	<ul style="list-style-type: none"> • Encourage Brigham City, Perry, and Box Elder County to implement additional planning steps required to develop a SAMP, as described in Section 4.2.1, so that sensitive urban development can occur in some wetland areas of these cities without causing an overall net loss of wetland function.

Table 4.1. Wetland Planning Classes and planning goals.

Wetland Planning Class	Characteristics	Wetland Planning Goals
F - Other Wetlands	All remaining wetlands not included in Classes A through E.	<ul style="list-style-type: none"> • Mitigation for impacts to Class F wetlands will occur through the normal Section 404 permitting process. These areas will not be included of the SAMP strategy described in Section 4.2.1 because of the limited urban development activities projected in their vicinity. However, it is the goal of the Wetlands Plan to encourage resource managers to protect, enhance and/or restore wetlands functions and values under the guidelines of this plan should urban development occur in these areas.
G - Remaining Non-wetland Areas	All remaining uplands not included in Classes A through F.	<ul style="list-style-type: none"> • Urban development within these areas is not affected by Section 404 wetland regulations and will not be addressed as part of the SAMP strategy described in Section 4.2.1. However, it is the goal of the Wetlands Plan to encourage sensitive urban development of uplands adjacent to wetlands.

Table 4.2. Total and wetland acreage in each Wetland Planning Class for areas east of the Promontory Mountains (Area A).
*

Wetland Planning Class	Total Acreage	Wetlands Acreage
A - Areas Already Protected for Wetland Functions and Values	98,645	93,032
B - Areas for Which Wetland Protection Plans Are Being Developed	106,264	88,695
C - Large-scale Aquatic Landscape Features	24,114	8,631
D - Connecting Areas	22,038	12,525
E - Interface Planning Areas	9,795	1,665
F - Other Wetlands	-----	340
G - Remaining Non-wetland Areas	737,824	-----

* = Deep water areas of Great Salt Lake is not included in any of these acreage sums.

4.2 TOOLS TO ACHIEVE GOALS AND DESIRED FUTURE CONDITION OF WPCs

In order to reach the desired future condition of the Wetlands Planning Classes, a set of goals was established for each class. There are many tools available today to facilitate the achievement of these goals. Tools that are appropriate for the Box Elder County Wetlands Plan are presented in this section. The first tool that is addressed is a strategy for the development of a Special Area Management Plan (SAMP).

4.2.1 Special Area Management Plan (SAMP) Strategy

The Box Elder County Wetlands Plan is not a Special Area Management Plan (SAMP), however the Wetlands Plan identifies a process by which a SAMP can be developed. The Wetlands Plan provides background information regarding a SAMP for Box Elder County, its proposed location, and the process recommended for developing the SAMP.

A SAMP is a plan that addresses wetlands impacts associated with urban development needs, and mitigation for those impacts within defined geographic areas. It must ensure no net loss of wetland function. The SAMP defines (1) the amount of wetland impacts allowable within defined urban development areas and (2) the amount of mitigation required within defined mitigation areas for impacted wetlands.

A major benefit of a SAMP is that the Wetlands Plan's sponsor, in this case Box Elder County, can receive a Clean Water Act Section 404 General Permit from the Corps. This would simplify the Section 404 permitting process required for individual projects. Project proponents whose project met the requirements of the SAMP would not have to apply for their own Section 404 Permit nor would they be required to develop their own mitigation plans (however, they would have to demonstrate the purpose and need of their project and take measures to avoid or minimize wetland impacts). This would provide a level of certainty and predictability to the permitting process and each project would receive less public and agency scrutiny. In addition, the large-scale mitigation implemented in the mitigation areas would provide economies of scale that should result in reduced mitigation costs per acre and more ecologically meaningful and effective mitigation.

The SAMP must assure that no net loss of wetland functions occurs. Without such assurances, the Corps will not approve a SAMP or issue a General Permit to the County. In addition, the Corps would have significant oversight of the County's implementation of the SAMP. The Corps would retain the authority to revoke the General Permit if the County did not implement the SAMP as agreed.

4.2.1.1 SAMP Urban Development and Mitigation Areas for Box Elder County

Throughout the wetlands planning process, the Executive Committee has focused on identifying areas within Box Elder County (1) where potential urban development and wetland conservation conflicts might occur in the future and (2) where opportunities for wetland enhancement, restoration,

and preservation currently exist. In the context of the SAMP, these areas respectively are referred to as urban development areas and mitigation areas.

As an outcome of the wetlands planning process, the Wetlands Plan proposes developing a SAMP for Box Elder County that would be comprised of land located within the boundaries of Perry and Brigham City, additional property located west of Brigham City, and portions of the North Lake area (Map 11). Willard and portions of the North Lake area located in Honeyville were excluded from the SAMP but could possibly be added at a later date if the need arises.

Most of the anticipated urban development-related wetland impacts will occur within the Perry and Brigham City SAMP areas (Map 11). A substantial amount of mitigation would also occur within these areas and would most likely occur within the North Lake SAMP. Although some portions of this area may be developed, particularly near the Brigham City airport and along I-15, much of it lies within the 100-year flood plain and could serve as potential sites for mitigation (see Section 4.1.3.1). This Wetlands Plan does not determine which wetlands within the SAMP areas will be developed or conserved. That information will be the outcome of the SAMP development process described in Section 4.2.1.2.

The SAMP area consist of approximately 16,176 acres. Approximately 25 percent of that acreage lies within the North Lake area 100-year flood plain (4,982 acres). Wetland acreage within the SAMP area, calculated from the NWI and UDWR's GPS data, is shown in Table 4.3. Note that GPS wetland acreage figures are greater than the NWI wetland acreage figures for the same land area. The actual jurisdictional wetland acreage probably lies somewhere in between the NWI and GPS acreage figures. This assumption is made because the GPS wetlands were classified without the benefit of analyzing soil conditions, which could exclude some of the wetlands from being jurisdictional.

Not all of the wetlands identified in the North Lake area are available for wetlands mitigation because of their proximity to the Brigham City airport. The FAA has provided guidance discouraging the placement of wildlife attractions near airports due to the hazards that wildlife using these areas pose to aircraft safety (FAA 1997). In particular, the FAA recommends separations of 10,000 feet for wetland mitigation areas from aircraft movement areas, loading ramps, and aircraft parking areas. This separation is recommended for a distance of five statute miles along the approach or departure airspace.

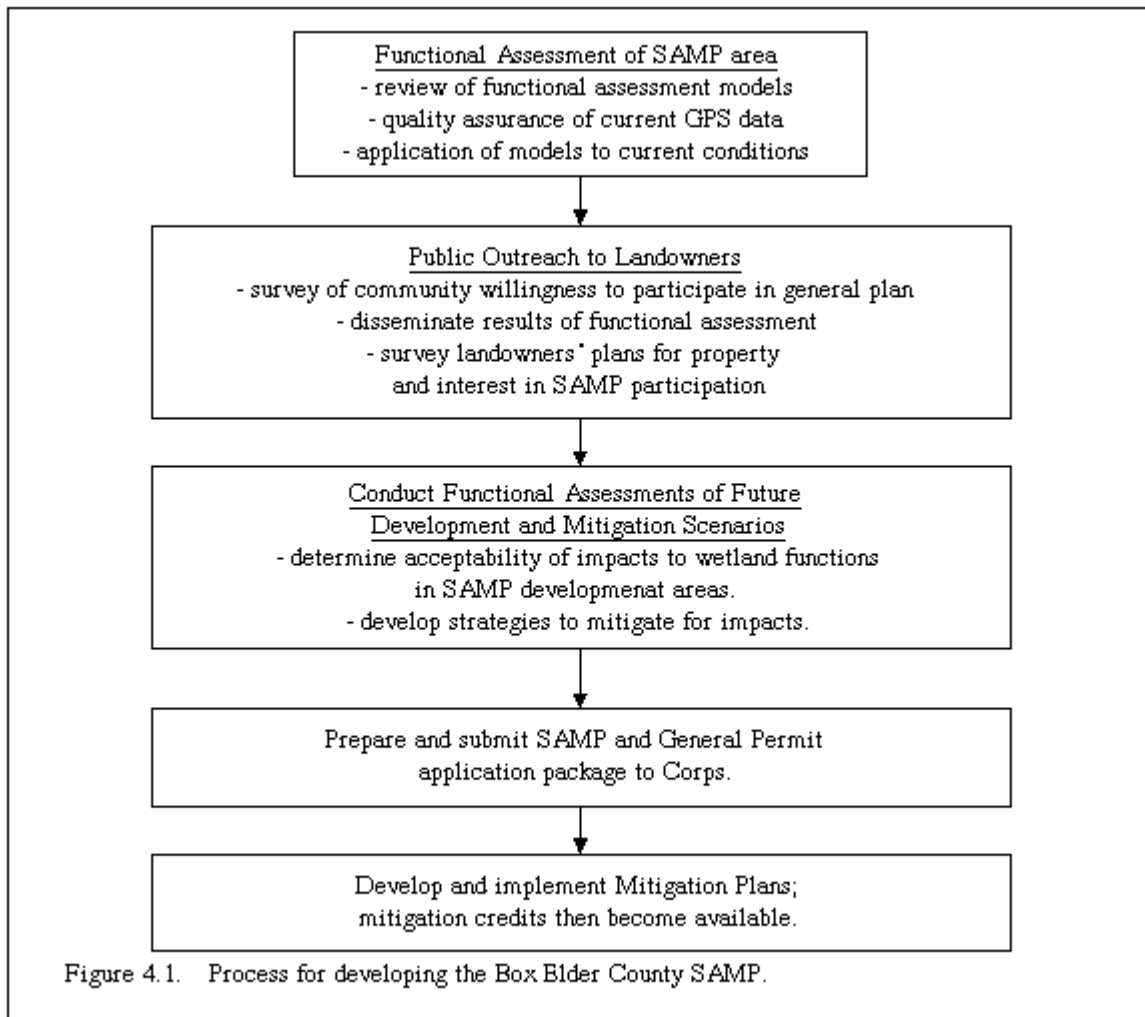
Table 4.3. NWI and GPS wetland acres within the Box Elder County Special Area Management Plan boundary.

Location	Total SAMP Area	NWI Wetlands	GPS Wetlands
Brigham City	5,342	1,022	1,744
Perry	3,286	730	465 *
North Lake	7,548	5,113	5,406
SAMP Area Total	16,176	6,865	7,615

* = GPS acreage for Perry is less than that identified on the NWI because GPS coverage only includes land east of Interstate 15. The NWI coverage includes both sides of I-15 within Perry's incorporated boundaries. East of I-15 in Perry, GPS mapping identified more wetland areas than were identified by the NWI.

4.2.1.2 Process for Developing the SAMP

The steps below should be taken to collect the information necessary for developing the SAMP. These steps will allow for assessment of wetland functions, survey of landowner interest and willingness to participate in the SAMP, identification of urban development and mitigation areas within the SAMP boundaries, and application to the Corps for approval of a SAMP and issuance of a General Permit. This process is depicted in a flow chart in Figure 4.1.



Step 1: Functional Assessment of the SAMP Area

If a project results in wetland impacts, the Corps requires compensatory mitigation to replace the type of wetlands and quantity of wetland *functions* lost (as described in Section 1.4.2). Note that the emphasis is on wetland functions rather than wetland acres. In other words, not all wetlands are created equal; some provide more function per acre than others. If a project impacted a wetland area that was functioning at a high level, more significant mitigation would be required than if the project impacted a wetland area of the same size that was functioning at a lower level.

To quantify impacts to wetland functions, the Corps uses wetland functional assessment models. Because the type of wetlands and the functions they perform vary regionally throughout the U.S., numerous regional models have been or are being developed. The functional assessment calculates Functional Capacity Indexes (FCIs) between 0.0 and 1.0 for several different wetland functions, including hydrologic, biogeochemical, and wildlife habitat functions. The FCI for each wetland function is then multiplied by the size of the wetland (in acres) to determine the Functional Capacity Units provided by a wetland. Thus, the Functional Capacity Units represent the currency of the functional assessment methodology and a direct measure of the quantity and type of wetland function provided by a wetland.

The Corps requires that functional assessment models be applied to all wetlands within the proposed SAMP area. This will enable Box Elder County to (1) set up the initial balance sheet against which debits and credits will be made; and (2) identify the high quality wetlands that should be conserved and the low quality wetlands where some urban development could be allowed. In addition, it will provide the Corps with the a tool to help ensure that no net loss of wetland function occurs.

The initial functional assessment will look at current on-the-ground conditions. The Corps has requested that Box Elder County use a modified version of the functional assessment models being used for the Utah Department of Transportation's (UDOT's) Legacy Parkway project. These models have been modified recently, and the UGOPB, in cooperation with participating natural resource agencies, plans to modify these models further in the near future (personal communication, Nancy Keate, UGOPB, 1999). However, a fairly stable version of the models exist now and the Corps has recommended their use in Box Elder County (personal communication, Michael Schwinn, Corps, 1999). Prior to their use, the Corps would like representatives of the Corps, County, UGOPB, and other cooperating agencies to meet to discuss and track usage of the models. It is possible that further modification of the models may be recommended prior to their use in Box Elder County.

The wetland classification data collected by UDWR in 1998 will be used to conduct the functional assessment. Efforts will be made to incorporate all existing jurisdictional wetland delineations into the Wetlands Plan GIS database for use as part of the functional assessment. A subset of the wetland areas that UDWR classified will be delineated to determine how close the classification is to a delineation and to rectify uncertainties related to specific wetland areas. Areas that are more likely to be developed in the near future are also candidates for delineation.

Step 2: Public Outreach/Communication with Landowners

Once the functional assessment is complete, the County will undertake a public outreach effort to disseminate the results of the functional assessment to landowners. Part of this outreach process will involve educating landowners on how the benefits of a SAMP can provide for them, whether they are interested in enhancing, restoring, and/or preserving the wetlands on their property, developing their property, or maintaining the status quo. Wetlands conservation and urban development alternatives with and without a SAMP will be explained. It is important that landowners understand that there are economic benefits to preserving their wetlands, such as mitigation revenues paid by project proponents and tax breaks resulting from conservation easements.

The public outreach effort will also provide the County with an opportunity to conduct a survey of landowners' interests regarding their land and to determine whether or not landowners would be interested in participating in a SAMP. The results of the survey should provide adequate data to (1) project future land use scenarios within the SAMP area and (2) map potential urban development and mitigation areas within the SAMP boundary.

Step 3: Conduct Functional Assessments of Future Urban Development and Mitigation Scenarios

After collecting the survey data mentioned above in Step 2, the next step would be to conduct functional assessments of the future urban development and mitigation scenarios discussed below. These assessments would be conducted in concert with guidance from the Corps. Ultimately, these modeling efforts provide the Corps, USFWS, UDWR, and EPA with information they will use to determine an acceptable amount of impacts to wetland functions they could allow under the SAMP, along with a strategy to mitigate those impacts.

(1) Scenario I: This scenario would model urban development and mitigation based on the landowner survey results, reflecting landowner desires to either develop their property, enhance their wetlands, or maintain the status quo. Information from the WPGs would also be used. If modeling of this scenario results in a net loss of wetland functions, then that information can be used to determine either the additional mitigation or the reduction in urban development that would be necessary to ensure no net loss of wetland functions.

(2) Scenario II: The Corps has requested that a functional assessment be conducted that simulates conditions in the SAMP area in year 2020 if urban development occurred only in uplands and no wetlands were filled. This would help the Corps determine how much wetland function would be lost in the SAMP area due to urban development and sprawl in uplands adjacent to wetlands. The modeling results should be able to identify wetlands where the functions will be diminished by adjacent upland urban development. The Corps may allow some of these wetlands to be candidates for urban development.

Note that the functional assessments will be conducted using the GPS wetland data, which should be viewed as planning data only. Once the SAMP is operational, when projects occur that will

impact wetlands, or when mitigation projects are being planned that will enhance/restore wetlands, the affected wetlands would have to be jurisdictionally delineated and the functional assessment would require fine-tuning based on the jurisdictional acreage. This would be necessary to accurately determine the quantity of wetland functions either lost due to the impacts or gained due to the enhancements.

Step 4: Submit SAMP and General Permit Application Package to the Corps

The County, led by the Wetlands SAMP Committee, will implement the SAMP development process as described in Section 4.2.1.2, including development of an application package for a General Permit and submittal of the package to the Corps. The results of the functional assessment modeling and public outreach will be used to define SAMP urban development and conservation areas, determine an acceptable amount of impacts to wetland functions allowable under the SAMP, and elaborate on how those impacts will be mitigated. This package should specify/define the following items:

- (1) The SAMP boundary, including urban development and mitigation areas.
- (2) The functional assessment models used to quantify wetland functions.
- (3) The pre- and post-urban development scenarios modeled and the results of those modeling efforts.
- (4) Conceptual Mitigation Plan(s) explaining the timeline, implementation, and nature of enhancements planned for the mitigation areas and the availability of mitigation credits from those areas (note that the initial SAMP does not have to include this; however, Conceptual Mitigation Plans will require Corps approval and agency review prior to their implementation).

The Conceptual Mitigation Plan should define the following areas:

(a) Mitigation area(s): within these areas, no or limited development would occur. Instead of being impacted or continuing under current land use, wetlands within these areas would be enhanced in perpetuity by reducing/eliminating disturbance, managing water and vegetation in a manner favorable to wildlife, and implementing other appropriate habitat improvement measures. The County and/or cities would administer these area(s). "Development areas" would be designated outside of mitigation areas and within which wetland impacts could occur and be mitigated by use of the mitigation "credits" resulting from creation of the mitigation area(s).

(b) Development areas: within these areas, development and impacts to wetlands would be permitted depending on the General Permit's eligibility criteria. Mitigation would occur in the mitigation area(s). Proponents whose projects met the General Permit's eligibility criteria would not have to apply for their own Section 404 permit nor would they be required to develop their own mitigation plans (however, they would have to demonstrate the purpose and need of their project and take measures to avoid or minimize wetland impacts). Instead of developing their own mitigation, the proponent would buy mitigation credits from the mitigation area, which would

serve as a mitigation bank. Thus, permitting time would be reduced and the proponent's mitigation efforts would be eliminated or significantly reduced.

- (5) The process required under the General Permit for project impacts to be allowed within the SAMP urban development areas.

Step 5: Develop and Implement Mitigation Plans

Once the SAMP is approved and a General Permit is issued, a mitigation plan must be developed and approved by the Corps before implementing the mitigation plan. After the mitigation plan has been implemented, mitigation credits will be available to use for mitigating wetland impacts in the SAMP urban development areas.

4.2.2 Additional Tools and Actions

In addition to a SAMP, there are several other tools and actions that are available for achieving the goals of the Wetlands Plan. The use of these tools and actions will vary based on their applicability to the various wetland conservation and urban development goals (Tables 4.4 and 4.5), WPCs (Table 4.6), and the ownership, location, and nature of a wetland project or impact. A description and the applicability of these additional tools are detailed below.

- (1) Land acquisition and conservation easements: Purchase of wetland properties is a direct method of conserving wetlands and controlling land use, while also compensating landowners for the appraised value of their property. Acquisition on a willing-seller basis may be appropriate for lands used as mitigation properties, stormwater planning, open space preservation, and/or wildlife habitat. Either the cities or County would hold title to acquired properties. Conservation easements could be applied to acquired properties. A conservation easement enables a willing landowner to restrict future development and activities on their property that would impact its wetlands and provides the landowner with a property tax break to reflect the lost development potential. In addition, the landowner retains ownership of the property. The County or a non-profit [501(c)(3)] non-governmental organization typically becomes the holder of the easement and is responsible for conservation easement monitoring and maintenance.
- (2) Collaboration/coordination with and support of agency conservation programs: numerous federal programs address conservation of wetlands and aquatic habitats, integration of such habitats into the rural landscape. Programs with which to coordinate are primarily available through the Natural Resource Conservation Service or the USFWS and provide financial and/or technical assistance in achieving various wetland and wildlife conservation and/or non-point source pollution reduction goals. Other agencies and their programs are listed in Appendix F. The duration of landowner commitment and amount of total cost provided by the agency varies depending on the program.

- (3) Application of Best Management Practices: to reduce non-point source pollution loading into aquatic habitats. Some Best Management Practices that are applicable to Box Elder County are as follows: agricultural waste management systems, conservation tillage, integrated pest management, irrigation water management, livestock exclusion, nutrient management, pasture management, strip cropping, contour farming, and also use of cover crops, crop rotation, field borders, diversions, terraces, water and sediment control basins, filter strips, and grade stabilization structures (Allred 1998). These practices are supported by some of the agencies that are listed in Appendix F.
- (4) Mitigation banking: A mitigation bank is similar to a SAMP in that mitigation is performed on a large scale in advance of wetland impacts, and project proponents may purchase the mitigation credits in lieu of developing their own mitigation. The project proponents benefit from the economy of scale resulting from aggregated mitigation. However, when created independent of a General Permit and SAMP, a mitigation bank does not simplify the Section 404 permitting process, it only simplifies the mitigation process. The project proponent would still have to go through the Section 404 permitting process with the Corps instead of using a General Permit administered by the County.
- (5) Public Outreach and Education: The Wetlands Management Steering Committee has stated that (1) providing settings for outdoor recreation and (2) increasing public understanding of, and involvement in, wetlands conservation are goals of the Wetlands Plan (Appendix A). Within the structure of the Wetlands Plan are provisions for public outreach. In addition to efforts by USFWS at the Bear River Migratory Bird Refuge (BRMBR), UDWR, and Duck Clubs, the responsibility of promoting the Wetlands Plan is delegated to two entities, which are discussed in further detail in the following Sections: the Conservation Committee (Section 4.3.1) and the Wetlands Coordinator (Section 4.4.1.)

The following is a list of tools and actions to assist in the promotion of the Wetlands Plan:

1. Distribute materials to educate the public about the following:
 - a. the importance of Box Elder County's wetlands to humans and wildlife.
 - b. the numerous opportunities currently available for recreation at State and federally owned wetland areas in Box Elder County.
 - c. the purpose and goals of the Wetlands Plan.
 - d. the tools that can be used to implement the Wetlands Plan.
2. Educate landowners about the tools and programs that can be used to protect wetlands on their property.
3. Coordinate visits with civic and other groups to explain the items listed above in (1). Either the Wetlands Coordinator or competent personnel from appropriate agencies will conduct these visits (see Section 4.4.1).

4. Work with resource managers, where appropriate, to ensure that adequate opportunities exist, including signage and/or interpretive materials, so that visitors may access public areas and be educated about wetland resources.
 5. Encourage incorporation of low-impact visitor facilities, where appropriate, into the site plan for any mitigation banks, including hiking trails, observation blinds, and interpretive facilities.
 6. Encourage and advertise opportunities for volunteers to participate in wetland and riparian enhancement projects being undertaken in Box Elder County.
- (6) Flood plain mapping and ordinances: As mentioned in Section 3.1.3, the 100-year flood plain has not been mapped for many areas in the County, including several municipalities. The County and cities should ensure that the 100-year flood plain is completely mapped in order to document existing natural resources within their jurisdiction and adopt ordinances prohibiting or limiting urban development in the 100-year flood plain of both Great Salt Lake and County waterways.
- (7) Stormwater planning: A primary function of wetlands is to receive and detain stormwater. Cities can integrate wetlands into their stormwater master plans as a cost-effective means of managing stormwater while also preserving wetlands. The effects of sudden stormwater inundation on wetlands ecology must be considered as part of the stormwater planning process.
- (8) Zoning regulations and ordinances, including riverine and riparian policies: The County and/or cities may adopt zoning regulations or ordinances depending on their goals regarding wetlands, open space, aesthetics, and development. For instance, a city could adopt a zoning regulation that limits the type of development allowed in the vicinity of important wetlands within their jurisdiction. Other regulations could require the integration of wetland features into development plans and also guide aesthetics and conservation of wetland functions. The County and the cities located along the Bear and Malad Rivers should work together to adopt uniform zoning to protect the rivers and their riparian vegetation and flood plains.

Table 4.4. Tools and policies to use in achieving Wetlands Plan conservation goals (as stated in Section 2.2.1) are marked and shaded.

Tool / Action	Conservation Goals							
	(1) Establish an interconnected system of wetlands, rivers, .	(2) Emphasize protection, enhancement, and restoration of existing wetlands over creation of new wetlands.	(3) Ensure a net gain of wetland functions and values.	(4) Delineate and protect the existing 100-year flood plains .	(5) Improve the water quality of the rivers, creeks, and streams in Box Elder County.	(6) Work with landowners to reduce non-point source pollution and increase native riparian and/or wetland	(7) Public education and involvement program.	(8) Ensure long-term maintenance, management, and monitoring of projects initiated under this Plan.
Acquisition of conservation easements and/or property title								
Collaborate with agency programs that provide technical expertise and funding								
Application of Best Management Practices to reduce non-point source								
Develop a Special Area Management Plan and obtain a General Permit								
Mitigation Banking								
Public education and involvement								
Flood plain mapping and ordinances								
Stormwater planning								
Zoning regulations and ordinances, including riverine and riparian policies								

Table 4.5. Tools and policies to use in achieving Wetlands Plan development goals (as stated in Section 2.2.2) are marked and shaded.

Tool / Action	Urban Development Goals					
	(1) Simplify the Clean Water Act Section 404 permitting and mitigation process.	(2) Identify and classify urban development and conservation properties.	(3) Encourage and facilitate urban development that helps attain the Desired Future Condition.	(4) Incorporate wetlands into flood control and storm water management plans.	(5) Treat urban development as equal in importance to wetland conservation within this Wetlands Plan.	(6) Wetland data mapped for this Plan are for planning purposes and do not indicate whether or not a wetland is jurisdictional under the Clean Water Act.
Acquisition of conservation easements and/or property title				X		
Collaborate with agency programs that provide technical expertise and funding						
Support urban development in areas deemed as appropriate and encourage use of Best Management Practices			X		X	X
Develop a Special Area Management Plan and obtain a General Permit	X	X	X		X	X
Mitigation banking	X	X	X		X	X
Public education and involvement			X		X	X
Flood plain mapping and ordinances		X				
Stormwater planning				X	X	
Zoning regulations and ordinances, including riverine and riparian policies		X				

Table 4.6. Tools and action applicable to each Wetland Planning Class are marked and shaded.

Conservation Tool / Action	Wetland Planning Class						
	A	B	C	D	E	F	G
Acquisition of conservation easements and/or property title			X	X	X		
Collaborate with agency programs that provide technical expertise and funding			X	X	X	X	X
Application of Best Management Practices to reduce non-point source pollution and encourage sensitive urban development near wetlands	X	X	X	X	X	X	X
Develop a Special Area Management Plan and obtain a General Permit			X	X	X		
Mitigation Banking			X	X	X		
Public education and involvement	X	X	X	X	X	X	X
Flood plain mapping and ordinances		X	X	X	X	X	X
Stormwater planning			X	X	X		
Zoning regulations and ordinances, including riverine and riparian policies			X	X	X		

4.3 WETLANDS PLAN IMPLEMENTATION

Defining a Desired Future Condition for wetlands in itself does not conserve any of Box Elder County's natural resources or facilitate urban development. Thus, in this section we have defined an implementation structure and identified a set of tools and actions so that facilitated conservation and urban development can occur and the Desired Future Condition can be realized.

4.3.1 Implementation Structure

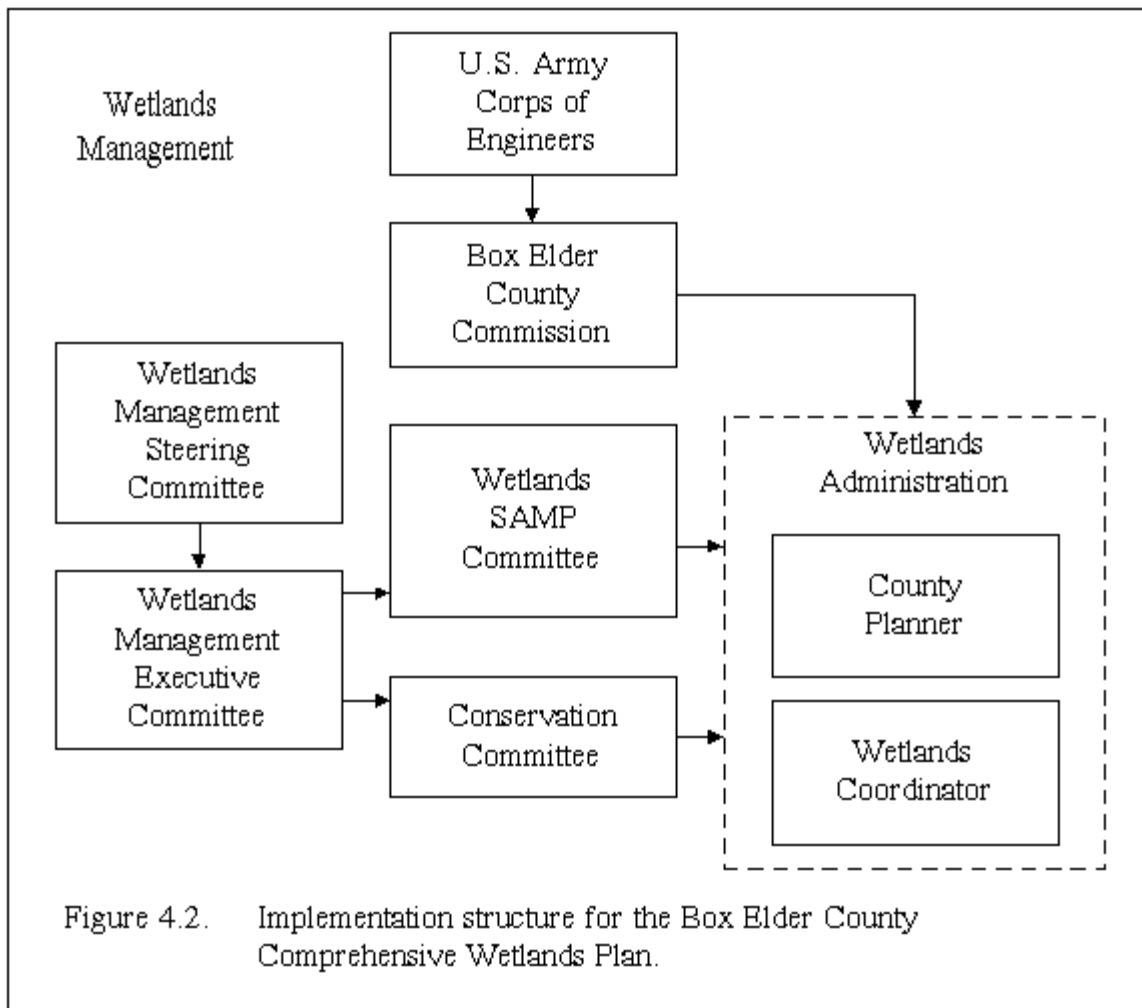
This Wetlands Plan contains recommendations for reconciling urban development and wetlands conservation needs in Box Elder County. To coordinate and implement these recommendations, an organizational structure will be required. Some models for such a structure are discussed below.

Washington County, Utah, has prepared a Habitat Conservation Plan (HCP) and obtained an Incidental Take Permit under the Endangered Species Act from the U.S. Fish and Wildlife Service. The Washington County HCP describes a comprehensive approach to preserving and protecting Mojave desert tortoise habitat while also allowing controlled growth and urban development in portions of desert tortoise habitat that are less essential to the species (Washington County Commission 1995). This plan is administered by the Washington County Commission. The Commission hired an HCP administrator who is responsible for implementing the HCP under the terms of the Incidental Take Permit. The HCP administrator works with a Habitat Conservation Advisory Committee and is assisted by a full-time County biologist and part-time secretarial support. A Technical Committee provides technical expertise.

Clark County, Nevada, is also in the process of setting up a HCP (Clark County Department of Comprehensive Planning 1998). The Clark County HCP is multi-species in nature, addressing 223 species, several of which are threatened, endangered, or candidate species. The Clark County HCP will be implemented by an Implementation & Monitoring Committee, comprised of representatives of city, County, state, and federal agencies.

While both of these models were developed in response to the requirements of the Endangered Species Act, they nevertheless suggest a structure appropriate for Box Elder County. An organizational structure similar to that shown in Figure 4.2 could be used for implementing the Wetlands Plan. This structure is similar to that used in the Washington County HCP. The Wetlands Plan would be administered by the Box Elder County Commission, which is the entity that would obtain and administer a General Permit for Box Elder County from the Corps. The Box Elder County Commission would hire a Box Elder Wetlands Coordinator who would be responsible for implementing the Wetlands Plan. The Wetlands Coordinator would work in the Box Elder County Planner's office and would have access to secretarial support.

The current Wetlands Steering Committee now referred to as the Wetlands Management Steering Committee would meet periodically (quarterly or semi-annually in the first two years, and semiannually or annually thereafter) to provide continued oversight and support of plan



implementation. The current Wetlands Executive Committee now referred to as the Wetlands Management Executive Committee would continue to meet (quarterly), giving direction to the Wetlands Coordinator (subject to the final review of the Commission), making funding decisions, and reviewing and approving all work plans and reports. These plans and reports would be reviewed and approved by the Commission prior to submittal to the Corps, who would ensure that implementation of the Wetlands Plan complied with the General Permit. The representation that comprises the Wetlands Management Executive and Steering committees may be adjusted, if necessary, to provide the best mix of skills for implementing the Wetlands Plan.

In addition, two new committees, the Wetlands SAMP Committee and the Conservation Committee, would be formed. These committee members would also serve on the Wetlands Management Steering Committee and some could also serve on the Wetlands Management Executive Committee.

The Wetlands SAMP Committee would be responsible for following through on the actions necessary for creating the SAMP, as defined in Section 4.2.1, including application of the functional assessment models. Representatives from the following entities, along with the Wetlands Coordinator and County Planner, are suggested for comprising the Wetlands SAMP Committee: Corps, UDWR, USFWS, EPA, UGOPB, Brigham City and Perry City Planners, developers or homebuilders, and the Box Elder County Wetlands Foundation. It is recommended that the Wetlands SAMP Committee also reconvene the Wetland Planning Groups involved in the development of the Wetlands Plan, as necessary, to assist in development of the SAMP.

The Conservation Committee would be responsible for initiating the following programs (described under Section 4.2.2): working with landowners and agencies to increase participation in agency conservation programs; adopting uniform zoning to protect Box Elder County's rivers and their riparian vegetation and flood plains; prioritizing target areas for conservation easement and/or property acquisition; and initiating the public education, access, and recreation activities called for in Section 4.4.2. Representatives from the following entities, along with the Wetlands Coordinator and the County Planner, are suggested for comprising the Conservation Committee: NRCS, USFWS, UDWR, The Nature Conservancy, Utah Open Lands (or another Land Trust organization that would be willing to lend expertise), and the Box Elder County Wetlands Foundation. It is recommended that the Conservation Committee meet with the Wetland Planning Groups, as necessary.

As implementation of the Wetlands Plan moves forward, the role of the Box Elder County Wetlands Foundation should be more clearly defined. The Foundation has been largely responsible for enabling this planning process to succeed thus far. Now that goals, tools, and actions have been identified by the Wetlands Plan, the Foundation can determine how it wishes to contribute in the future. Its role as a public, non-profit organization holding 501(c)(3) status under the federal tax code would allow supporters of the Wetlands Plan (land owners, other philanthropic foundations, private citizens, etc.) to make tax-deductible contributions to the Wetlands Plan's programs. The Foundation could also be the holder of conservation easements, and/or write proposals to obtain foundation grants.

4.4 PARTNERS INVOLVED IN THE IMPLEMENTATION OF THE WETLANDS PLAN

The task of implementing the Wetlands Plan is dependent upon a partnership among the County, regulating agencies and supporting agencies. The County's interests are essentially represented in the planning process by a Wetlands Coordinator, the county planner, citizen members of the Steering, SAMP and Conservation Committees, and the Wetland Planning Groups. Local, Federal and State agencies are also key partners in the planning process. To expedite implementation of the Wetlands Plan and to facilitate a cooperative partnership with the supporting agencies, Box Elder County would create the position of Wetlands Coordinator. The role of the Wetlands Coordinator and agency partners is described in the following sections.

4.4.1 The Role of the Wetlands Coordinator

The Wetlands Coordinator would be responsible for implementing the Wetlands Plan, using the tools/actions described in Section 4.2 of the Wetlands Plan. The major role of the Wetlands Coordinator is the coordination of the SAMP Development and Wetlands Conservation Programs.

4.4.1.1 SAMP Development

The Wetlands Plan describes a strategy for developing a SAMP (Section 4.2.1). In addition, the Wetlands Plan recommends the formation of a Wetlands / SAMP Committee (Section 4.3.1) to follow through on the actions necessary for creating the SAMP. It is assumed that Box Elder County will continue to enlist the services of environmental consultants to assist in the SAMP development process.

One of the Wetlands Coordinator's highest priority tasks will be to participate in the SAMP development process. Although the entities described above will also be involved in this process, there are numerous tasks which the Wetlands Coordinator will be involved in. These tasks include the following:

- (1) Functional assessment of SAMP area;
- (2) Addressing landowners questions and directing them to appropriate agencies or information sources;
- (3) Functional assessment of future development and mitigation scenarios;
- (4) Support of consultant preparation and submittal of SAMP package; and
- (5) Support of consultant preparation of Conceptual Mitigation Plan(s).

While it is assumed that the environmental consultants will be involved in the above tasks, the County can save significant costs by having the Wetlands Coordinator work closely with the consultants.

4.4.1.2 Conservation Programs

The Wetlands Plan describes several tools/actions for improving the condition of Box Elder County's wetlands that are not associated with mitigating for wetlands impacts. These tools/actions are referred to as conservation activities. The formation of a Conservation Committee to assist in the implementation of these programs is recommended in Section 4.3.1. The Wetlands Coordinator would be responsible for working with the Conservation Committee on the following tasks.

Priority A - These actions can start before the functional assessment and landowner outreach processes are complete:

- Maintain familiarity with local, federal and state agency conservation programs and be able to inform interested landowners of their conservation program options.
- Maintain a library of helpful materials and brochures that the public can use

- Assist in the adoption of uniform zoning to protect Box Elder County's rivers and their riparian vegetation and flood plains.
- Incorporate access, and recreation activities called for in Section 4.2.2 on the Wetlands Plan into other recreation and access plans within Box Elder County.
- Work with BEC Wetland Foundation on identifying and writing grants for plan implementation; work with County Planner on investigating other funding mechanisms recommended in the Wetlands Plan.
- Cooperate with the NRCS, SCD and USFWS to attend local SCD working group meetings.
- Cooperate with BRMBR and Utah State University in their public education efforts.

Priority B - These actions should be implemented after the functional assessment and landowner outreach processes are complete:

- In conjunction with the Conservation Committee, work with other agencies to prioritize target areas for conservation easement and/or property acquisition and set acquisition goals and schedules.
- Initiate flood plain mapping for areas in the County where this has not occurred, and adoption of ordinances prohibiting or limiting development in the 100-year flood plain of both Great Salt Lake and County waterways.
- Incorporate wetland preservation into city stormwater master plans, rather than excavating detention basins in upland areas.
- Encourage the County and/or cities to adopt zoning regulations or ordinances to limit or specify the type of development allowed within their jurisdiction in order to achieve community goals regarding wetlands, open space, aesthetics, and development.

4.4.2 Additional Plan Implementation Partners for the Wetlands Coordinator

Other agencies and groups are extremely important to the implementation of the Wetlands Plan. A list describing the missions of agencies and other groups and their roles in the implementation of the Wetlands Plan are presented in Table 4.7. This list is not all inclusive, numerous local resources such as Soil Conservation District members are available and serve roles on Committees identified as a part of the SAMP development and conservation effort.

Table 4.7. Agencies that will play a role in the implementation of the Wetlands Plan.

Agency	Mission Statement	Role in Wetlands Plan	Contact
U.S. Army Corps of Engineers (Corps)	<i>Working to provide strong protection of the Nation's aquatic environment, efficient administration of the Corps' regulatory program, and fair and reasonable decision-making for the regulated public.</i>	Regulatory authority for the CWA and the wetland permitting process. Jurisdiction over wetlands. They have final approval/disapproval authority for the SAMP and General Permit. They would preside over the SAMP development process.	Michael Schwinn, Chief of the Utah Regulatory Branch, U.S. Army Corps of Engineers, 1403 South 600 West, Suite A Bountiful, UT 84010 (801) 295-8380 http://www.usace.mil
U.S. Environmental Protection Agency (EPA)	<i>To protect human health and safeguard the natural environment.</i>	Provides regulatory oversight for the CWA and the Corps permitting authority. Must be consulted, usually through the Corps in the development of a SAMP. Can provide funding for wetland programs.	REGION 8 OFFICE U.S. Environmental Protection Agency 999-18th St., Suite 500 Denver, Colorado 80202-2466 U.S.A. 1-800-227-8917 http://www.epa.gov
U.S. Fish and Wildlife Service 404 Regulatory Program (USFWS)	<i>Our mission is working with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.</i>	A frequent partner with the Corps as a technical participant in the SAMP development process under CWA guidance. Can provide technical evaluation of conservation and mitigation proposals.	Bob Freeman, Wildlife Biologist, 404 Regulatory Program U.S. Fish and Wildlife Service 145 East 1300 South, Lincoln Plaza Salt Lake City, UT 84115 (801) 524-5001 http://www.fws.gov
U.S. Fish and Wildlife Service Refuge Program (USFWS)	<i>Our mission is working with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.</i>	A technical participant in the SAMP development process. Can provide technical evaluation of conservation and mitigation proposals. Also responsible for Bear River Bird Refuge in Planning Class A	Al Trout, Refuge Manager, Bear River Migratory Bird Refuge. U.S. Fish and Wildlife Service, 58 South 950 West Brigham City, UT 84302 (435) 723-5887 http://www.fws.gov

Table 4.7. Agencies that will play a role in the implementation of the Wetlands Plan.

Agency	Mission Statement	Role in Wetlands Plan	Contact
Utah Division of Wildlife Resources (UDWR)	<i>To assure the future of protected wildlife for its intrinsic, scientific, educational and recreational values through protection, propagation, management, conservation and distribution</i>	A usual partner with the Corps as a technical participant in the SAMP development process under CWA guidance. Can provide technical evaluation of conservation and mitigation proposals. Also has Authority over state Wildlife Management Areas. Jurisdiction over the State's wildlife. Manage Public Shooting Grounds WMA, Salt Creek WMA, Locomotive Springs WMA and Harold Crane WMA.	<p>Pamela C. Kramer and David Lee, Habitat Biologists Division of Wildlife Resources, Northern Region, State of Utah, 515 East 5300 South, Ogden, Utah 84405-4599 (801) 479-5143</p> <p>State Office 1596 West North Temple, Salt Lake City, Utah, 84116 (801) 538-4700</p> <p>Randy Berger Manager Public Shooting Grounds Water Management Area 8475 N 1660 Tremonton, UT 84337 (435) 854-3610</p>
Natural Resource Conservation Service (NRCS)	<i>To provide leadership in a partnership effort to help people conserve, improve, and sustain our natural resources and environment.</i>	Provide technical, planning, and financial assistance to farmers, ranchers, communities, state and local governments, and other land users to develop conservation systems suited to non-federal lands in Box Elder County. Includes coordination with local Soil Conservation Districts.	<p>Phillip J. Nelson State Conservationist 125 South State Street P.O. Box 11350 Salt Lake City, UT 84147-0350 (801)524-4551 or (801)524-4550 http://www.nrcs.usda.gov</p>

Table 4.7. Agencies that will play a role in the implementation of the Wetlands Plan.

Agency	Mission Statement	Role in Wetlands Plan	Contact
National Association of Conservation Districts (NACD)	<i>To coordinate assistance from all available sources: public, private, local, state, and federal in an effort to develop locally driven solutions to local natural resource concerns.</i>	Local technical assistance and provision of operating and programmatic funds in the form of state grants.	1880 North 100 East Logan, UT 84341-2215 (801) 753-6029 http://www.uacd.state.ut.us
Utah Government Office of Planning and Budget (UGOPB)	<i>Provides leadership in strategic and comprehensive planning, serves as a primary resource for state agencies and local governments, provides quality technical assistance, and facilitates intergovernmental coordination.</i>	Currently the UGOPB has taken the lead role in the development of Hydrogeomorphic models (HGM) for the quantification of wetland functions and values. UGOPB will provide technical assistance in the application of HGM to the SAMPs functional assessment.	Nancy Keate, State Wetlands Coordinator, Governor's Office Planning & Budget, (801) 538-1548 nkeat@gateway.gv.ex.state.ut.us 116 State Capitol Salt Lake City, UT 84114 http://www.governor.state.ut.us/gopb/html/planning.html
The Nature Conservancy (TNC)	<i>The mission of Nature Conservancy is to preserve plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive.</i>	TNC owns and manages wetland preserve properties on the shore of the Great Salt Lake in Davis County. In addition, they can provide technical expertise on conservation easement and ownership tools important to the development of the SAMP	Kerry Green, Utah Field Office, The Nature Conservancy, 559 E. South Temple, Salt Lake City, UT 84102 (801) 531-0999 http://www.tnc.org

Table 4.7. Agencies that will play a role in the implementation of the Wetlands Plan.

Agency	Mission Statement	Role in Wetlands Plan	Contact
Utah Open Lands Conservation Association (UOLCA)	<i>To encourage volunteer protection of open land.</i>	The Land Trust works with land owners by developing conservation easements whereby the land owner retains ownership and the Trust holds the conservation easement. The terms are up to the land owner and the Land Trust can help appropriate funds.	Adaire Bonsal (801) 463-6156

In addition to these entities, the Wetland Planning Groups (Appendix C) are a valuable resource and should participate in the Wetlands Plan implementation. The groups are from: Brigham City, Honeyville, Perry City, North East Box Elder County, West County, Willard, and North Lake. If issues arise during implementation of the Wetlands Plan, the Wetlands Coordinator can convene with the groups to resolve issues that pertain to their area in Box Elder County.

In an effort to demonstrate the partnership necessary for the implementation of the Wetlands Plan, the partners involved in the implementation and the tools and actions available to them are presented in Table 4.8.

Table 4.8. Wetlands Plan Tools and Actions and Partners primarily responsible or included in their implementation.	
TOOLS / ACTIONS	WETLANDS PLAN PARTNERS
Acquisition of conservation easements and/or property title	UDWR, NRCS, USFWS, TNC, Box Elder County Wetlands Foundations, other non-profit organizations
Collaborate with agency programs that provide technical expertise and funding	NRCS, EPA, Soil Conservation Districts, Utah Association of Conservation Districts
Adopt and Encourage Best Management Practices to reduce non-point source pollution & encourage sensitive urban development	NRCS, EPA, Soil Conservation Districts, Utah Association of Conservation Districts and landowners
Develop a Special Area Management Plan and obtain a General Permit	Corps, USFWS, UDWR, EPA, Wetlands Coordinator, Box Elder County, Brigham City, Perry City, UGOPB, Wetland Planning Groups and Wetlands SAMP Committee
Mitigation banking	Corps, USFWS, UDWR EPA, Wetlands Coordinator, Wetlands Planning Groups, Box Elder County or municipalities, private or non-profit organization
Public education and involvement	USFWS (Bear River Migratory Bird Refuge), UDWR, NRCS, Wetlands Coordinator, Wetland Planning Groups
Flood plain mapping and ordinances	Municipalities, Wetland Planning Groups, Wetlands Coordinator
Stormwater planning	Municipalities, Wetland Planning Groups, Wetlands Coordinator
Zoning regulations and ordinances, including riverine and riparian policies	Municipalities, Wetland Planning Groups, Wetlands Coordinator

4.5 FUNDING

Funding for implementation is obviously essential for the Wetlands Plan to succeed. Funding will not come from one source, but rather will need to be acquired from several sources. Funding will be necessary to establish, implement, and sustain the Wetlands Plan.

Startup funding could be provided by the County with some assistance coming from the cities that will most likely benefit from a General Permit—Brigham City and Perry. Also, the cost of conservation easements (e.g. reduced tax revenues, and their purchase price in the cases where the easements are not donated) should be considered. Grant money and donation of in-kind services could be acquired for some aspects of the Wetlands Plan from regional or national non-governmental organizations.

Funding sources for various components of the Wetlands Plan could be provided through the following sources:

- (1) Mitigation fees paid by proponents of projects that impact wetlands: Once the SAMP is in place and operational, proponents whose projects impact wetlands may purchase mitigation credits from the SAMP's conservation areas. These revenues could be used for SAMP administration, monitoring, and maintenance costs, to create additional SAMP conservation areas, and to compensate landowners for their participation in the SAMP conservation areas. Mitigation credits in Davis and Salt Lake County typically cost \$15,000-\$25,000 per acre. This represents significant savings over the cost of individual, smaller mitigation projects (1 to 5 acres), which could exceed \$60,000/acre (UDOT 1997).
- (2) Bonding: The County could issue a general bond to raise the funds needed to set up the initial SAMP conservation areas.
- (3) EPA funding for wetlands programs: The EPA provides substantial funding for the Utah's State Wetlands Grant program. Nancy Keate of the UGOPB and Ed Sterns of the EPA Region VIII in Denver administer this program. The UGOPB considers developing SAMPs at the local level as something that would be worthy of funding. EPA also makes funds available for planning management of waters on the EPA 303 list. These are waters that exceed water quality standards and are usually given Total Maximum Daily Limits (TMDLs) for certain pollutants in an effort to improve water quality.
- (4) Cost sharing with other federal programs (Appendix F): Most of the programs described in Appendix F provide at least partial funding for technical expertise and implementing

measures that could improve the condition of the County's wetlands, riverine and riparian areas, and water quality.

- (5) Private funding and/or collaboration from state, regional, and/or national organization and foundations: Wetlands conservation and education are viewed as worthy of funding by many organizations and foundations. For instance, the Utah Wetlands Foundation and The Nature Conservancy have been able to raise and use hundreds of thousands of dollars for purchase and protection of wetland properties around Great Salt Lake. These organizations and several other Utah and regional foundations have provided funding for the wetlands education efforts put forth by numerous entities, including URMCC, UDWR, and Friends of Great Salt Lake.

It is likely that the financial support of several foundations could be enlisted to support the non-compensatory components of the Wetlands Plan, such as conservation easement and land acquisition and as matching funds toward some of the programs described in Appendix F. However, philanthropic foundations and environmental organizations will probably be reluctant to support components of the SAMP, as they would prefer to see their funding used for wetland preservation efforts unrelated to wetland impacts that necessitate mitigation.

- (6) Real estate transfer fees and/or open space or other impact fees: The County and/or cities should investigate and determine whether transfer fees or impact fees could be used for funding certain aspects of the Wetlands Plan.
- (7) Storm drainage utility fees: These fees are used to fund the implementation of storm water management plans. If wetland conservation can be incorporated into the storm water management plans, then some of these fees can be justifiably be used for wetlands conservation.
- (8) County or city taxes: A portion of city of County tax revenues can be used to fund the implementation of the Wetlands Plan.

4.6 MONITORING

An important component of any plan is evaluating its success. Once this Wetlands Plan is accepted by the Box Elder County's Commission and municipal leaders, its implementation will begin. At that time, timelines should be established for making and measuring progress on implementing each of the tools and actions specified in Section 4.2.2. As progress is made on implementing each tool and action, then a more formal monitoring plan will be defined to evaluate implementation success.

In addition, the General Permit application package that the County submits to the Corps should contain a plan for monitoring the General Permit's success. Various other monitoring responsibilities that will be associated with implementation of the Wetlands Plan include success monitoring of any wetland enhancement projects, and/or non-point source pollution reduction projects. In addition, there are monitoring costs associated with the holding of conservation easements.

The cost of monitoring efforts, including reporting, can be substantial and should be included in the budget of any actions and tools implemented as part of this Wetlands Plan. Opportunities for sharing of monitoring responsibilities and costs with collaborating parties will exist. For instance, in projects coordinated through NRCS to reduce non-point source pollution or through USFWS to enhance and/or conserve wetlands habitat, it is reasonable to expect that these agencies would be responsible for monitoring and reporting on the success of these projects. In projects involving conservation easements, budgeting should include provisions for long-term monitoring and maintenance of the easement.

5. SUMMARY

Box Elder County undertook this planning effort to reconcile the County's wetland conservation and urban development needs. As directed by the Wetlands Planning Element of the County General Plan, the County's wetland ecosystem and socioeconomic needs were inventoried and assessed during this planning process. Existing data about County natural resources, infrastructure, land ownership, and urban development potential were assembled into a Geographic Information System (GIS) to assist the process. In addition, data regarding Box Elder County's wetlands, including assessment of wetland type, habitat, hydrology, vegetation, land use, and condition was collected.

Section 2.2 of this plan describes wetland conservation and urban development goals that reflect a Desired Future Condition for Box Elder County's wetlands. In section 4.0, the Desired Future Condition is further defined by dividing the County into seven Wetland Planning Classes (WPCs). These Classes provide the structure for achieving the Desired Future Condition. Six of the seven WPCs include wetlands. The seventh, WPC G, includes the remaining non-wetland areas within the County. The distinctions between the other six WPCs are made through a comparison of the existing extent of wetland conservation; the potential for future conservation efforts; the presence of important large-scale aquatic features that are not currently included or planned for inclusion in conservation protection; the importance of the areas wetlands as a hydrologic connection between conservation areas; wetland areas within the path of future urban development; and smaller, isolated wetland areas that don't fit within the other five classes.

The WPCs were used to focus on solutions and problems that could be addressed through a formal regulatory process. This Plan identified this process and provides information regarding an implementation approach referred to as a Special Area Management Plan (SAMP). A SAMP is an implementation plan that specifies: (1) the amount of wetland impacts allowable within defined urban development areas and (2) the amount of mitigation required within defined mitigation areas for impacted wetlands.

As discussed in Section 4, a major benefit of a SAMP is that the Wetlands Plan's sponsor, in this case Box Elder County, can receive a Clean Water Act Section 404 General Permit from the Corps. This permit simplifies and provides predictability for individual projects that might generate wetland impacts. Project proponents whose project met the requirements of the SAMP would not have to apply for their own Section 404 Permit nor would they be required to develop their own mitigation plans (however, they would have to demonstrate the purpose and need of their project and take measures to avoid or minimize wetland impacts). In addition, the large-scale mitigation implemented in the mitigation areas would provide economies of scale that should result in reduced mitigation costs per acre and more ecologically meaningful and effective mitigation.

The SAMP must assure that no net loss of wetland functions occurs. Without such assurances, the Corps will not approve a SAMP or issue a General Permit to the County. In addition, the Corps would have significant oversight of the County's implementation of the SAMP. The Corps would retain the authority to revoke the General Permit if the County did not implement the SAMP as agreed.

In the final analysis, this plan provides a strategy for achieving future conditions that further conservation of wetlands and support economic development in Box Elder County. This strategy describes tools that can be employed for planning future urban development within the County that protect the most valuable existing wetlands and encourages planning to minimize impacts to less valuable wetlands. There will be further efforts by the County to implement this plan. These efforts are described in Section 4.2.1.2 but essentially require further coordination with the same entities that assisted in the development of this plan. It will also require conformance with guidelines and processes implemented by the Corps for the development of a SAMP and General Permit. Regardless of the direction these implementation efforts take, this plan will provide a valuable benchmark regarding the wetlands and philosophy of Box Elder County. An overview of the Wetlands Planning Classes, the goals established to achieve a desired future condition, the tools and partners involved in implementing the Wetlands Plan are presented in Table 5.1.

Table 5.1. Wetland Planning Classes, goals, tools and partners responsible for implementing the Wetlands Plan.

Wetland Planning Class	Wetland Planning Goals	Wetland Planning Tools	Partners Involved in Implementation
<p>A - Areas Already Protected for Wetland Functions and Values</p>	<ul style="list-style-type: none"> • Conduct activities that protect, enhance, and/or restore wetland functions and values and discourage urban development that would diminish wetland functions and values <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • Educate and involve county residents and others 	<ul style="list-style-type: none"> • Application of Best Management Practice <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • Public Outreach and Education 	<ul style="list-style-type: none"> • Bear River Migratory Bird Refuge (BRMBR), UDWR, and Duck Clubs <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • BRMBR, UDWR, NRCS, Wetlands Coordinator, Conservation Committee
<p>B - Areas for Which Wetland Protection Plans Are Being Developed</p>	<ul style="list-style-type: none"> • Conduct activities that protect, enhance, and/or restore wetland functions and values <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • Develop a wetlands/wildlife protection plan for UCA 23-21-5 lands (see section 4.2.1) • Participate in briefings that occur between UDFSL and Box Elder County officials regarding the Great Salt Lake Planning Project <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • Educate and involve county residents and others 	<ul style="list-style-type: none"> • Application of Best Management Practices <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • Flood plain mapping and ordinances <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • Public Outreach and Education 	<ul style="list-style-type: none"> • UDWR, USFWS, BRMBR, and Duck Clubs <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • Municipalities, Wetland Planning Groups, Wetlands Coordinator, Conservation Committee <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • UDWR, USFWS, BRMBR, NRCS, Wetlands Coordinator, Box Elder County Wetlands Foundation, The Nature Conservancy, and other interested non-profit organizations <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> • BRMBR, Wetlands Coordinator, Wetland Planning Groups, Conservation Committee, UDWR, NRCS,

Table 5.1. Wetland Planning Classes, goals, tools and partners responsible for implementing the Wetlands Plan.

Wetland Planning Class	Wetland Planning Goals	Wetland Planning Tools	Partners Involved in Implementation
<p>C - Large-scale Aquatic Landscape Features</p>	<ul style="list-style-type: none"> • Develop a wetlands mitigation area in the North Lake area • Investigate opportunities in the Sulphur Creek area for wetlands enhancement, protection, and mitigation banking 	<ul style="list-style-type: none"> • Develop Special Area Management Plan and obtain General Permit • Mitigation banking 	<ul style="list-style-type: none"> • Corps, USFWS, UDWR, EPA, Wetlands Coordinator, Box Elder County and municipalities, Wetlands SAMP Committee, Wetland Planning Groups, Utah Governor’s Office of Planning and Budget (UGOPB), private or non-profit organizations
	<ul style="list-style-type: none"> • Improve water quality and reduce non-point source pollution entering Box Elder County waterways and improve the condition of riparian and emergent vegetation along waterways 	<ul style="list-style-type: none"> • Acquisition of conservation easements and/or property title 	<ul style="list-style-type: none"> • UDWR, NRCS, USFWS, The Nature Conservancy, Box Elder County Wetlands Foundation, Conservation Committee, and other non-profit organizations
	<ul style="list-style-type: none"> • Educate and involve county residents and others 	<ul style="list-style-type: none"> • Encourage application of Best Management Practices • Flood plain mapping and zoning regulations and ordinances, including riverine and riparian policies • Stormwater planning 	<ul style="list-style-type: none"> • NRCS, Soil Conservation Districts and working groups, Utah Association of Conservation Districts, landowners • Municipalities, Wetland Planning Groups, Wetlands Coordinator, Conservation Committee
		<ul style="list-style-type: none"> • Public Outreach and Education 	<ul style="list-style-type: none"> • BRMBR, UDWR, NRCS, Wetlands Coordinator, Wetland Planning Groups, Conservation Committee

Table 5.1. Wetland Planning Classes, goals, tools and partners responsible for implementing the Wetlands Plan.

Wetland Planning Class	Wetland Planning Goals	Wetland Planning Tools	Partners Involved in Implementation
<p>D - Connecting Areas</p>	<ul style="list-style-type: none"> Conduct activities that protect, enhance, and/or restore wetland functions and values of these areas that are functionally connected to or link Class A, B, or C wetland areas 	<ul style="list-style-type: none"> Develop Special Area Management Plan and obtain General Permit Mitigation banking 	<ul style="list-style-type: none"> Corps, USFWS, UDWR, EPA, Wetlands Coordinator, Box Elder County and municipalities, Wetlands SAMP Committee, Wetland Planning Groups, UGOPB, private or non-profit organizations
		<ul style="list-style-type: none"> Acquisition of conservation easements and/or property title 	<ul style="list-style-type: none"> UDWR, NRCS, USFWS, The Nature Conservancy, Box Elder County Wetlands Foundation, Conservation Committee, and other non-profit organizations
		<ul style="list-style-type: none"> Encourage application of Best Management Practices 	<ul style="list-style-type: none"> NRCS, Soil Conservation Districts and working groups, Utah Association of Conservation Districts, landowners
		<ul style="list-style-type: none"> Flood plain mapping and zoning regulations and ordinances, including riverine and riparian policies Stormwater planning 	<ul style="list-style-type: none"> Municipalities, Wetland Planning Groups, Wetlands Coordinator, Conservation Committee
	<ul style="list-style-type: none"> Educate and involve county residents and others 	<ul style="list-style-type: none"> Public Outreach and Education 	<ul style="list-style-type: none"> BRMBR, UDWR, NRCS, Wetlands Coordinator, Wetland Planning Groups, Conservation Committee

Table 5.1. Wetland Planning Classes, goals, tools and partners responsible for implementing the Wetlands Plan.

Wetland Planning Class	Wetland Planning Goals	Wetland Planning Tools	Partners Involved in Implementation
<p>E - Interface Planning Areas</p>	<ul style="list-style-type: none"> • Implement additional planning steps so that sensitive urban development can occur in some wetland areas of these cities without causing an overall net loss of wetland function <hr/> <ul style="list-style-type: none"> • Educate and involve county residents and other 	<ul style="list-style-type: none"> • Develop Special Area Management Plan and obtain General Permit • Mitigation banking <hr/> <ul style="list-style-type: none"> • Acquisition of conservation easements and/or property title <hr/> <ul style="list-style-type: none"> • Encourage application of Best Management Practices <hr/> <ul style="list-style-type: none"> • Flood plain mapping and zoning regulations and ordinances, including riverine and riparian policies • Stormwater planning <hr/> <ul style="list-style-type: none"> • Public Outreach and Education 	<ul style="list-style-type: none"> • Corps, USFWS, UDWR, EPA, Wetlands Coordinator, Box Elder County and municipalities, Wetlands SAMP Committee, Wetland Planning Groups, UGOPB, private or non-profit organizations <hr/> <ul style="list-style-type: none"> • UDWR, NRCS, USFWS, The Nature Conservancy, Box Elder County Wetlands Foundation, Conservation Committee, and other non-profit organizations <hr/> <ul style="list-style-type: none"> • NRCS, Soil Conservation Districts and working groups, Utah Association of Conservation Districts, landowners <hr/> <ul style="list-style-type: none"> • Municipalities, Wetland Planning Groups, Wetlands Coordinator, Conservation Committee <hr/> <ul style="list-style-type: none"> • BRMBR, UDWR, NRCS, Wetlands Coordinator, Wetland Planning Groups, Conservation Committee

Table 5.1. Wetland Planning Classes, goals, tools and partners responsible for implementing the Wetlands Plan.

Wetland Planning Class	Wetland Planning Goals	Wetland Planning Tools	Partners Involved in Implementation
F - Other Wetlands	<ul style="list-style-type: none"> • Encourage resource managers to protect, enhance and/or restore wetlands functions and values under the guidelines of this plan should urban development occur in these areas. <hr/> <ul style="list-style-type: none"> • Educate and involve county residents and others 	<ul style="list-style-type: none"> • Collaborate with agency programs that provide technical expertise and funding • Application of Best Management Practices <hr/> <ul style="list-style-type: none"> • Flood plain mapping and ordinances <hr/> <ul style="list-style-type: none"> • Public Outreach and Education 	<ul style="list-style-type: none"> • NRCS, Soil Conservation Districts and working groups, Utah Association of Conservation Districts, Conservation Committee, landowners <hr/> <ul style="list-style-type: none"> • Cities, Wetland Planning Groups, Wetlands Coordinator, Conservation Committee <hr/> <ul style="list-style-type: none"> • BRMBR, UDWR, NRCS, Wetlands Coordinator, Wetland Planning Groups, Conservation Committee
G - Remaining Non-wetland Areas	<ul style="list-style-type: none"> • Encourage sensitive urban development of uplands adjacent to wetlands. <hr/> <ul style="list-style-type: none"> • Educate and involve county residents and others 	<ul style="list-style-type: none"> • Collaborate with agency programs that provide technical expertise and funding for the application of Best Management Practices <hr/> <ul style="list-style-type: none"> • Flood plain mapping and ordinances and stormwater planning <hr/> <ul style="list-style-type: none"> • Public Outreach and Education 	<ul style="list-style-type: none"> • NRCS, EPA, Soil Conservation Districts and working groups, Utah Association of Conservation Districts, Conservation Committee, landowners <hr/> <ul style="list-style-type: none"> • Municipalities, Wetland Planning Groups, Wetlands Coordinator, Conservation Committee <hr/> <ul style="list-style-type: none"> • BRMBR, UDWR, NRCS, Wetlands Coordinator, Wetland Planning Groups, Conservation Committee

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Appendix A - Box Elder County General Plan, Wetlands Element

County Goal Statements, Objectives and Implementation Strategies

(Box Elder County 1998)

Wetlands

Box Elder County contains a variety of natural resources and diverse wildlife habitats. The County views these resources as wonderful assets that contribute to the area's quality of life. As growth in the County continues, these resources may come under tremendous urban development pressure. It is the County's position that urban development within and/or adjacent to unique and sensitive areas should occur in a well-planned and responsible manner.

Developing within or adjacent to wetland areas is particularly challenging. Permitting processes are complex and time consuming. In addition, approved mitigation plans may meet agency regulations, but fail to meet habitat objectives. With these challenges in mind, Box Elder County is taking proactive steps to develop a resource management plan designed to preserve and enhance the quality of area wetland environment(s) and encourage responsible urban development within appropriate areas.

Box Elder County Great Salt Lake Wetlands Ecosystem Plan Steering Committee

The Box Elder County Great Salt Lake Wetlands Ecosystem Plan Steering Committee has been organized with the specific charge to develop a Box Elder County Wetlands Management Plan. The Committee's Mission Statement and preliminary Goals, Objectives and Implementation Strategies are listed below.

Steering Committee Mission Statement

To conserve and enhance the integrity of Great Salt Lake wetland ecosystem in Box Elder County, incorporating provisions for appropriate urban development, infrastructure needs, resident livelihoods, and quality of life, while ensuring perpetuation of these important natural resources. The methods for achieving this mission will be defined in a broadly supported plan.

Committee Goals

The Committee has identified the following as committee goals:

1. Conserve and enhance wetland and riparian area functions and values.
2. Conserve and enhance fish and wildlife habitat values.
3. Increase public understanding of, and involvement in, wetlands conservation.
4. Provide settings for outdoor recreation
5. Conserve "open space" (defined generally as broad undeveloped areas).
6. Improve water quality.
7. Respect the rights of landowners and water users.
8. Respond to infrastructure needs, including flood control and transportation.
9. Provide for economic urban development.

10. Provide for human population growth.
11. Insure compatibility with a viable agriculture economic sector.
12. Protect public health.

Committee Objectives

The Committee has identified the following as committee objectives:

1. Inventory of existing natural resources including prioritizing wetland ecosystem needs.
2. Identify socio-economic needs, including prioritization.
3. Using #1 & #2, establish a “Desired Future Condition”.
4. Prepare a plan to attain the Desired Future Condition.

Suggested Implementation Strategies

Implementation strategies to be further explored by the Committee include:

- Special Area Management Plans (SAMP) and General Permits
- Environmental Education Center
- Mitigation Banking
- Conservation Easements
- Land Acquisition

Appendix B - Supporting Data Tables

Table B-1. Individual permits w/ wetland impacts and/or mitigation.

Permit No.	Project Name	Wetland Acres Impacted	Volume of fill/dredged material *	Wetland Acres Mitigated
199107651	Great Salt Lake Mineral	2500		4210
199450022	BLM (4 dikes) Salt Wells Springs	0.3		0.3
199450196	BLM (Rd. crossing and constructed ponds (construction of 2 dikes)) Salt Wells Springs	2.5		10.0
199450226	DWR reestablishment of wetland vegetation - Locomotive Springs; 32 new ditches		150.5 yds ³	0.0
199450521	BLM Salt Wells Springs (construction of 3 dikes)		1330 yds ³	4.0
199550132	Golden West Artemia Boat Harbor (dike extension in the Great Salt Lake)		3040 yds ³	0
199550289	Great Salt Lake Minerals - North Clymer Bay Canal	25.0		0
199550360	Sanders Shrimp Co. 5 AF Boat Harbors	0.26		0
199550439	Bear River Club Pond & Road	0.50		35.0
199550541	Ocean Star Boat Harbor-Indian Cove	0.10		0
199650054	North Shore Limited Partnership Canal	0.80		0
199650560	Stangl's Access Road - 3.25 miles	1.16		1.16
199750458	Vulcraft mitigation for 8629 Ind. Permit	0.10		0.10
199850014	Brigham City - Beecher Spring Development	0.07		0.00
199850206	Salt Creek Inc. Dredge Harbor GSL	0.10		0.10

* Figures in some permits were given as cubic yards of material removed and/or placed in wetlands. These values are estimated to be less than 0.10 acres.

Table B-2. Nationwide and general permits w/ wetland impacts and/or mitigation.

Permit No.	Project Name	Permit Type	Wetland Acres Impacted	Volume of fill/dredged material *	Wetland Acres Mitigated
199101163	UDOT US 89/91 Brigham to Wellsville	Nationwide ?	9.0		9.0
199450045	Brigham City Corp. (Pipeline crossing- Big Creek)	Nationwide 12	0.02		0.0
199450529	Bear River Migratory Bird Refuge - channel constr.	Nationwide 27		880 yds ³	100
199550032	Ron Rothbone Channel Restoration	Nationwide 27		150 yds ³	**
199550130	Victor Romer's Road Crossing	Nationwide 14	0.009		0.009
199550233	Victor Romer's (Violation) Brigham A-T-F	Nationwide 14	0.25		0.25
199550400	Baker Spring Dikes at Locomotive WMA	General 44	0.10		0.10
199550540	The Buzinas Brothers Div. Structure	Nationwide 3	0.10		0.10
199550633	Box Elder Co. Jail Fill (PDN)	Nationwide ?	9.70		9.70
199550706	Bear River Migratory Bird Refuge	General 44	5.0		5.0
199650029	Morton Int. Access Rd. Widening	Nationwide 26	0.088		0.088
199650093	Mayor Pond's Brigham City	Nationwide 26	0.01		0.00
199650093	Ron and Steve's Water Cont Struc (PDN)	Nationwide 18	0.01		0.01
199650183	Salt Creek WMA By-pass-channel	General 44	9.70		9.70
199650541	GP-40 McMurdie Farms, Dewey Spring	Nationwide ?	0.10		0.10
199750020	Westwood Subdiv. Phase 1 Brigham	Nationwide 12	0.10		0.10
199750064	Willard Bay North Jetty Repair	Nationwide 3	0.10		0.10
199750364	Daniel Wooldridge Lot	Nationwide 26	0.07		0.07
199750439	Brigham City, sidewalk on Forest St.	Nationwide 26	0.10		0.10
199750465	Lorin Smith House Pad Fill, Brigham	Nationwide 26	0.10		0.10
199750556	Brigham, Beecher Spring Development	Nationwide 26	0.01		0.01
199850032	Bear River Bird Refuge Dikes/Canal	General 44	8.0		8.0
199850045	Water Line Crossing	Nationwide ?	0.001		0.00

* Figures in some permits were given as cubic yards of material removed and/or placed in wetlands. These values are estimated to be less than 0.10 acres per project.

** permitted activity restored flow to downstream wetlands, however an acreage figure was not reported.

Table B-3. Projected population increases for counties along the Wasatch Front (Source: Governor's Office of Planning and Budget).				
County	Box Elder	Weber	Davis	Salt Lake
Year				
1980	33222	144616	146540	619066
1990	36485	158330	187941	725956
1995	38900	175000	216000	806000
2000	42667	190716	235610	872375
2005	47016	212036	262170	959002
2010	52466	238086	295187	1079236
2015	57579	263781	328208	1200811
2020	61290	284172	355041	1301094
Average Annual Rate	1.74%	1.97%	2.14%	1.96%

Table B-4. Projected population increases for cities in Box Elder County, 1996-2020 (source: Bear River Association of Governments, 1997).		
City	1996	2020
Bear River	763	1,026
Brigham	16,224	27,202
Corinne	671	982
Deweyville	346	446
Elwood	601	827
Fielding	422	588
Garland	1,787	2,857
Honeyville	1,217	1,869
Howell	254	312
Mantua	739	1,121
Perry	1,771	2,846
Plymouth	283	358
Portage	218	271
Snowville	257	342
Tremonton	4,875	7,742
Willard	1,485	2,221

Balance of Box Elder County	7,264	10,280
Total for Box Elder County	39,177	61,290

Appendix C - Summary of the Community Involvement Process

Box Elder County Comprehensive Wetlands Plan

Community Involvement Process Workshop

Saturday, November 21, 1998

The Community Involvement Process Workshop is being held to ensure that communities in Box Elder County are being provided with an adequate opportunity to provide input into the Box Elder County Comprehensive Wetlands Plan (Wetlands Plan). The overall success of the Wetlands Plan depends on its acceptance by the County and its cities—the Wetlands Plan must help them to preserve and enhance the quality of the County’s wetlands while also encouraging responsible urban development within appropriate areas. To facilitate input from the cities, we are hosting this Workshop to solicit your input.

We would like your community’s Wetlands Planning Group (WPG) to address the questions listed below. One or more members of the Wetlands Plan Steering Committee have been appointed to assist you in this process. It is our hope that your responses to the questions below can fit into the framework set out by the working draft of the Wetlands Plan (dated November 1998). Responses to the questions should be received by the Box Elder County Planner, Jim Marwedel (734-3304), by December 18, 1998. In addition to the questions below, which have been provided to each WPG, additional, area-specific questions have been provided for some WPGs.

Questions for Wetland Planning Groups

- (1) Where in your community do you anticipate conflicts between urban development and wetlands?

- (2) Are there opportunities to combine wetlands conservation with other community goals (e.g. flood control, open space preservation, aesthetics, recreation, education, wildlife habitat needs)? Where?

- (3) Are there wetland resources within you community that are good candidates for protection, enhancement, and/or mitigation? Where?

- (4) Is your community willing to develop ordinances/zoning or use other planning tools to address wetlands conservation? If so, what tools/options are viable or preferred?

(5) Are there any questions above with which the community is likely require additional research or studies and with which you may need technical assistance?

(6) What is your feedback and comment on the draft Wetlands Plan?

I. Introduction, Wetlands Plan Goals (9:00-9:45 a.m.)

- A. Planning Process to date (Jerry Mason)
- B. Community Involvement Process (Jim Marwedel)
- C. Wetland Plan Goals (Mark Raming)
 - 1. Need for a Wetlands Plan
 - 2. Advantages of a Wetlands Plan
 - a. Simplify wetlands permitting and mitigation processes
 - b. Comprehensive planning for meaningful wetlands mitigation
 - c. Conservation of County wetland resources
 - 3. General Permit/SAMP approach
 - 4. Conservation approach
 - 5. Wetlands functions and values

II. Benefits of wetlands for the County and community (9:45-9:55 a.m., Russ Lawrence)

III. Wetlands Regulatory Framework (9:55-10:40 a.m., Michael Schwinn)

- A. Corps regulatory authority and responsibilities
 - 1. 404 permitting
 - 2. General permits
- B. Expectations about a General Permit/SAMP
 - 1. Responsibilities and benefits for Box Elder County
 - 2. Responsibilities and benefits for the Corps
 - 3. Experiences with SAMPs in Utah
- C. Mitigation banking
 - 1. How it works

2. Differences between having a mitigation bank as part of a General Permit vs. having one independent of a General Permit.

D. Questions and Answers

IV. Break (10:40-10:50 a.m.)

V. Progress made on Wetlands Plan (10:50-11:50 a.m., Mark Raming, Howard Gross)

A. Review of plan goals and planning data collected to date

B. Desired Future Condition, Wetland Planning Class

C. Implementation and tools

D. Plan alternatives

E. Input being sought from Wetland Planning Groups

VI. Lunch (11:50-1:00 p.m.)

VII. Wetland Planning Groups breakout sessions (1:00-2:30 p.m.)

VII. Wetland Planning Groups feedback and discussion (2:30-3:30 p.m., Mark Raming)

Responses of Brigham City
to the Box Elder County Comprehensive Wetlands Plan Questions
November 21, 1998

Question 1. Where in your community do you anticipate conflicts between development and wetlands?

Brigham City has adopted a general plan which anticipates residential and industrial growth west of the currently developed portion of the City. Population in Brigham City has been projected to reach approximately 23,168 by 2020. This represents an increase of approximately 26% above the current population. While Brigham City has substantial potential for infill development and redevelopment which can accommodate a portion of this added population, the need for additional land for residential expansion is unavoidable. This residential expansion will likely occur in two general areas. The first is located west of the currently developed area on the City to 1200 W. in the short term, and to I-15 in the long term, and south of 400 S. The other area is generally north of S.R.13 between the Wellsville Mountains and the North lake wetland complex. There is also a need for additional industrial and commercial development to support this population and provide jobs and income. Industrial expansion will occur west of the UPRR right-of-way to 1200 W./Watery Lane, and north of 400 S. The area between 800 N and S.R. 13 and between Watery Lane and I-15 is also anticipated to develop with industrial uses, as will the area between Airport Toad and I-15, north to and including the Brigham City Airport. The Brigham City Airport is the final area of anticipated growth. It is within all of these areas that wetlands are most prevalent within the Brigham city corporate limits. Therefore, it is anticipated that conflicts between development and wetlands, which are common now, will become increasingly common.

Another area in which wetland regulations have come into conflict with community planning efforts has been the Beecher Spring development proposal. Beecher Spring is located near the mouth of Flat Bottom Canyon on the mountains east of Brigham City. A riparian habitat is associated with the spring. The City acquired water rights to the spring with the intent of developing it as a supplementary water source. Water from the spring would be used to supplement the supply and help increase water pressures in an area of the City which currently experiences water pressures low enough to be of concern. Safe drinking water regulations require removal of deep rooted vegetation within a certain distance of a water source. This was anticipated by the City. In consultation with the Corps of Engineers, it was determined that a section 404 permit would be required for the spring's development. It was initially determined that the project would qualify for a nationwide permit. It was subsequently determined by the Corps that an individual permit would be required. A 404 permit application was submitted to the Corps of Engineers for development of the spring. The Corps

informed the City that the development existed, and that although the City proposed to mitigate by replacing vegetation elsewhere near the site, removal of deep rooted vegetation would be unduly harmful to the environment. Subsequently the City withdrew the application in order to preserve the option to resubmit it at a later date.

The Beecher Spring example illustrates a number of the conflicts communities and private sector land owners currently encounter with wetland regulations. First, the development of the spring was consistent with locally developed and adopted land use and infrastructure planning. Second, the City was unaware until late in the process that the area was considered jurisdictional under the Clean Water Act. Third, there were conflicting regulations. On the one hand, the safe drinking water regulations required removal of the deep rooted vegetation. On the other hand the Corps, invoking section 404 of the Clean Water Act, would not allow removal of the deep rooted vegetation. Fourth, uncertainty about whether the development was covered under a nationwide permit or would require an individual permit cause delays in the process. A related result of the Beecher Spring case has been an increased antagonism toward wetland regulation and distrust of the process among City officials.

In order to be effective and attractive for affected communities, the final plan needs to address these issues and provide a clear and identifiable advantage over the current regulatory framework. It must first recognize the validity of local land use decisions. This places responsibility on the local community to genuinely factor environmental considerations into the decision making process, but once the decisions have been made, the presumption should be that the practicable alternatives test has been met. In the Beecher Spring example, the Corps substituted its judgment for the City's in determining that the water supply functions of the Beecher Spring development could be provided by other means. In the City's view, the alternative is cost prohibitive, and thus not practicable.

Second, the Wetlands Plan should provide clear guidance to communities regarding the extent of wetland regulatory authority. Although the Wetlands Plan does not and will not provide jurisdictional delineations, it can and should provide information and descriptions of the types of wetlands and special aquatic sites that are subject to regulation and this provide a useful reference for affected communities.

Third, where conflicts between regulatory efforts exist, they should be identified and reconciled through the wetland planning process. The Beecher Spring case provides an extreme but very real example of such conflicts.

Fourth, clear guidance needs to be provided for those seeking permits under the Wetlands Plan and any associated SAMP or general permit. The type of permits required and the process to be followed should be clearly spelled out.

Question 2. Are there opportunities to combine wetlands conservation with other community goals (e.g. flood control, open space preservation, aesthetics, recreation, education, wildlife habitat needs)? Where?

- A) Flood control - The Brigham City Storm Drainage Master Plan which has been incorporated by reference into the Brigham City General Plan, anticipates large regional detention basins to accommodate storm runoff. Storm runoff is currently feeding several wetlands that are within the areas identified as detention basins in the Storm Drainage Master Plan. It is likely that a number of these could be combined with wetland functions, and through the use of easements or acquisitions, and with proper treatment, the wetlands could be left to function as the needed detention facilities. Wetlands should also be incorporated into stormwater management plans for development projects.
- II. Open Space Preservation - The use of wetlands within the residential expansion areas to achieve open space preservation goals would most likely occur within the context of conservation design. Under this scenario, a parcel of land would be developed leaving a portion if not all of the wetland property protected as open space and as an amenity for the development. Housing density would be concentrated onto the upland portion of the property. However, even with the use of conservation design, there are certain realities which cannot be escaped. The need for streets, utility concerns, and design constraints will mean that wetlands will be impacted to a greater or lesser degree in every such development. The City will need the flexibility that can be achieved with a Special Area Management Plan to provide incentives to developers for doing this kind of development.
- III. Aesthetics, Recreation, Education, and Wildlife Habitat - Brigham City's park system will expand as residential growth occurs. High quality wetland sites will make good candidates for preservation as City parks with recreation, education, and wildlife habitat emphasis. The Box Elder Creek corridor at the mouth of Box Elder Canyon and on the west side of the City, certain wetlands on the west and north sides of the City, and the Black Slough corridor are also good candidates for preserving and restoring or enhancing wetland functions within a City park setting. The City is already undertaking some of these efforts.

Question 3. Is your community willing to develop ordinances/zoning or use other planning tools to address wetlands conservation? If so, what tools/options are viable or preferred?

There are a variety of tools that can be used to address wetlands conservation. Brigham City will evaluate these tools and determine which are appropriate to the particular setting in the areas of the City anticipated to experience wetland conflicts. Some of the tools to be considered include:

- **Mitigation Banking:** When unavoidable impacts occur, mitigation should be allowed. Larger mitigation areas are generally considered to be more functionally successful, and ecologically beneficial. A mitigation bank allows the consolidation of many small mitigation efforts into one large mitigation site. The use of mitigation banking should also streamline the permitting process and help make the development process more predictable.
- **Conservation Design:** Conservation design utilizes a process that identifies key features in a landscape and designs development to preserve those features, or minimize the impact of development on them. This is a particularly useful concept in residential development, but also has application to commercial and other types of development.
- **Best Development Practices:** This is somewhat related to the concept of conservation design, but applies more broadly to the developed portion of a site, as well as to sites that may be removed from wetlands but still generate impacts to them. Best development practices can be used to help minimize development impacts on wetlands and other sensitive lands.
- **Park/Open Space Planning:** As previously mentioned, wetlands offer an opportunity to provide a park and open space amenity for the public. The City should consider targeting particular wetlands of high values for park land and open space acquisitions.

Question 4. Are there any questions above with which the community is likely to require additional research or studies and with which you may need some technical assistance?

Mitigation banking, conservation design and other tools will require extensive research and technical assistance to set up. Ordinance changes will be needed and the potential for unintended consequences will be great. Therefore, these should be given careful consideration and guidance should be sought from qualified individuals with experience setting up similar programs.

Question 5. What is your feedback and comment on the draft Wetlands Management Plan?

#Wetland Acres potential lost to development requiring mitigation: Approximately 1114 (this includes areas where some on-site mitigation or preservation may be accomplished. The full 1114 acres is included to reflect maximum potential loss).

#Wetland Acres anticipated to be preserved: Approximately 939.

Mitigation is anticipated to occur on site in some developments where feasible. This would primarily involve conservation design in residential and multi-use developments. Off site mitigation is expected to be needed for industrial and commercial developments and for wetlands that cannot be preserved or mitigated on site through conservation design. Brigham City proposed to combine mitigation with storm water management of certain parcels between 1200 W. and I-15, and between 600 N. and Forest Street. Integration of wetlands into parks is a mitigation concept that needs to be considered in more detail based on the City's future park needs and the geographical location of wetlands. The bulk of the remaining mitigation is proposed for the North Lakes area. A variety of methods would be proposed to fund these mitigation efforts. These would include fees paid within a "special service district" encompassing the area of the City affected by wetland planning issues, wetland mitigation banking with credits purchased by developments creating wetland impacts, and other sources. The City also proposes to partner with the U.S. Fish and Wildlife Service, the Utah Division of Wildlife Resources, the Nature Conservancy, and other interested parties to provide long term management and ownership of mitigation areas such as the North Lake area and other large mitigation and wetland complexes.

Responses of Honeyville

For input into the Box Elder county Comprehensive Plan
Gathered during the Community Involvement Process Workshop
November 21, 1998

Question 1. Where in your community do you anticipate conflicts between development and wetlands?

Response 1. The areas where Honeyville anticipates development that may conflict with wetlands are 1) along Salt Creek, in the vicinity of 6900 North; and 2) along Calls Fork Road (this could be as far as 20 years out).

Question 2. Are there opportunities to combine wetlands conservation with other community goals (e.g., flood control, open space preservation, aesthetics, recreation, education, wildlife habitat needs)? Where?

Response 2. If wetlands are preserved, e.g. in a mitigation bank, then that site (if publicly owned) should also be used for educational purposes. There is the possibility for recreation use along the river, e.g. biking, jogging path. Leaving a portion of the river corridor free of development could help flood control.

Question 3. Are wetland resources within your community that are good candidates for protection, enhancement, and/or mitigation? Where?

Response 3. Depending on the willingness of private landowners to participate in a mitigation bank, the portion of North Lakes in Honeyville would be a candidate for protection, enhancement and/or mitigation.

Question 4. Is your community willing to develop ordinances/zoning or use other planning tools to address wetlands conservation? If so, what tools/options are viable or preferred?

Response 4. Honeyville would

- 1) Cooperate in a County general Permit/SAMP;

- 2) If a mitigation bank were established, support the use of acquisition or easements;
- 3) If private landowners were interested, Honeyville could support entities outside of Honeyville using a mitigation bank in Honeyville;
- 4) Honeyville's General Plan already protects Salt Creek (50 feet out from the center); Honeyville is reviewing this provision to make sure it is adequate.

Question 5. Are there any questions above with which the community is likely to require additional research or studies and with which you may need technical assistance?

Response 5.

1. The wetlands, and hence the flood plain, in Honeyville's portion of the North Lakes may have been artificially created by the Cold Springs Dam and Irrigation water ditch (almost a 100 years ago). A more specific delineation needs to be done to determine whether this area contains jurisdictional wetlands.
2. Can you have storm water run-off drain into Salt Creek. Who would issue such a permit?
3. What is the hydrology of the North Lakes, where does the water supply come from? Would development in the foothills (housing) negatively affect the wetlands?

Question 6. What is your feedback and comment on the draft Wetlands Plan?

Response 6.

1. The Honeyville north well is not identified on the map. It is located southwest of Deweyville.
2. Honeyville concurs that the North Lake could support a mitigation bank (page 4-4 of the Wetlands Plan).
3. Honeyville is not in financial position to buy land; they perhaps could purchase conservation easements depending on the price.

4. Honeyville would cooperate with governmental entities involved in wetlands planning and implementation. They also support the idea of a wetlands/land Coordinator.

**Perry City Responses to
Box Elder County Comprehensive Wetlands Plan Questions
November 21, 1998**

Question 1. Where in your community do you anticipate conflicts between development and wetlands?

Response 1. Although Brigham City owns an approximate 300 foot strip on the South side of 11th South running west from Highway 89 to Interstate 15, it is anticipated that this area will develop commercially within Perry City limits in the future.

A corridor connecting 11th South at the Brigham City Fifth West entrance to 11th South and running approximately South to Perry's 1200 West may be commercially developed.

The entire corridor on the East side of Interstate 5 from 11th South entrance to Interstate 15 and running south to Perry City's South boundary is currently zoned Commercial/Manufacturing in the Perry City Master Plan. This area will, due to Interstate and railroad access, come under pressure to be developed at some future time.

A limited amount of property on the west side of Interstate 15 from the 11th South access to Interstate 15 running south to the Perry City boundary could also be developed. This area is adjacent to the Bird Refuge and depending on exact boundaries may be limited to development due to boundary features.

Question 2. Are there opportunities to combine wetlands conservation with other community goals (e.g., flood control, open space preservation, aesthetics, recreation, education, wildlife habitat needs)? Where?

Response 2. The answer is yes. Flood control, particularly along the Perry Canyon drainage running west from Perry Canyon to the marsh area west of the Interstate. Certainly area's on the south side of 11th south between Highway 89 and the Interstate, and along both east and west sides of Interstate 15, could be controlled via ordinance or policy to require a blend of wetlands and developed lands.

Question 3. Are wetland resources within your community that are good candidates for protection, enhancement, and/or mitigation? Where?

Response 3. The answer is yes. Both the Walker Springs and Del Young Park areas are wetlands that should be protected. Del Young Park is currently owned by the city and is being improved as wetlands to provide recreation, add aesthetic value to our community, and provide for wildlife habitat,

open space, and flood control. Development along the 11th south and Interstate 15 corridors have a random blend of wetlands and uplands, and could be developed in such a way as to provide for some minor mitigation within these areas.

Question 4. Is your community willing to develop ordinances/zoning or use other planning tools to address wetlands conservation? If so, what tools/options are viable or preferred?

Response 4. A significant portion of the undeveloped area of Perry City has been identified as wetlands by the box Elder County Wetlands Management Plan. Currently, our ordinances do not adequately address the goals of the draft wetlands management plan. It would appear that steps should be taken to integrate our policy/ordinance documents to take advantage of the overall County approach to management of wetlands. It would be our intent to do so, and we would appreciate some advice and assistance from the County planner/resources in accomplishing this task.

Question 5. Are there any questions above with which the community is likely to require additional research or studies and with which you may need technical assistance?

Response 5. The answer is yes.

1. A characterization of the land on the west side of Interstate 15 from the 11th South access to Interstate 15 to the south Perry City boundary is needed to detail the Bird Refuge boundaries. An evaluation of the percentage of wetlands and uplands of that portion of land, which is not bird refuge land, is also needed.
2. Perry City will provide a map, which sections the undeveloped portions of our city having identified wetlands, and would request assistance in defining the approximate areas of wetlands and uplands in these sections of our city. This information will assist us in determining what quantity of land we may require outside Perry City boundaries for mitigation purposes.
3. In our response to question 4 we requested assistance in developing appropriate ordinance/policy documents to govern development within our city of wetland areas.

Brigham City - Community Process Workshop Nov. 21, 1998
Notes from the North East Box Elder Co. Wetland sub-Committee
compiled by Jim Christensen

Attendance

Clint Burt - Bear River Water Conservation Dist. (Chair of sub committee)

Steve Holgren - Bear river City

Russ Lawrence - Utah Division of Wildlife Resources (Facilitator)

Jim Christensen - Utah Division of Water Quality

Noted that there were no representatives from the other communities within the north east sub committee. The group felt that representation from these towns need to be contacted before the report is finalized.

Russ presented two questions that had been formulated for the north east group in addition to the six questions assigned to all groups.

1. What kind of past experiences have landowners had with agencies in your area?

Clint related several encounters that he was aware of with COE in securing 404 permit. All were difficult with an exaggerated sense of wetland value to the property in question and demands of 10 to 1 and more exchange with mitigation values. Unreasonable costs were often needed to satisfy the process. It was also felt that the mitigation work complete were not effective. General feeling of skepticism of the process and the fear that this current process would be treated lightly by the COE, EPA, and USFWS when it came to an actual project.

Committee wants to put actual past experience cases on the table and walk through that process as though it were a SAMP. Would want the COE final decision maker present in this exercise.

2. Land use considerations along Malad River in the north east area.

Jim Christensen owns wetland property on the Malad River and had a mid 1950 air photo showing the area of East Garland with the Malad and Bear Rivers. It was pointed out that there are many degraded wetlands that are neither good pasture nor good wetland habitat. In Jim's case, the small open potholes that were there in the 1950s are now filled in with an accompanying loss of wildlife diversity particularly waterfowl. The COE is reluctant to alter the present wetland habitat but have verbally suggested that if change is less than 10% of whole they would allow it. Jim would readily move to upgrade his Malad pasture if non restrictive wetland improvement funds were available. Non restrictive means limiting the benefits to actual improved diversity and production and do not have

to open property to public access or to banish some compatible grazing. It was his opinion that many other land owners on the Malad and Bear Rivers would also consider doing the same.

One question regarded whether bringing some of these heavily degraded wetlands into good wetland habitat be considered for inclusion in a wetland bank mitigation pool.

We then turned to the six general questions:

Question 1. Where in your community do you anticipate conflicts between development and wetlands?

Response 1. Bear River City is concerned with proposed new development to the west of town. It is an area of high water table presently drained by old crop land drains. They have notified developers that they cannot have basements and may need to improve the drainage system to the land. Group again said the other communities not present need to speak for themselves.

Question 2. Are there opportunities to combine wetlands conservation with other community goals (e.g., flood control, open space preservation, aesthetics, recreation, education, wildlife habitat needs)? Where?

Response 2. Bear River City says yes.

Question 3. Are wetland resources within your community that are good candidates for protection, enhancement, and/or mitigation? Where?

Response 3. Probably yes but would need to identify in conjunction with identifying those area that could be designed available for development. Where requires intense sessions with maps and all players present. Clint pointed out that any lands designated for mitigation would have a sure water source with an accompanying water right. This might not always be possible.

Question 4. Is your community willing to develop ordinances/zoning or use other planning tools to address wetlands conservation? If so, what tools/options are viable or preferred?

Response 4. The Mayor of Bear River City says yes. They have already identified sensitive lands along the river in town that have wetland values.

Question 5. Are there any questions above with which the community is likely to require additional research or studies and with which you may need technical assistance?

Response 5. No.

Question 6. What is your feedback and comment on the draft Wetlands Plan?

Response 6. Would like to think it is a good idea, but skeptical if true coordination and cooperation will occur when the tough actual situation and location of lands available for development and suitable mitigation land with reasonable ratios is faced. Others will be commenting individually on the document.

Willard Wetland Planning Group Feedback from Planning Session

Held the afternoon of November 21, 1998

Question 1. Where in your community do you anticipate conflicts between development and wetlands?

Response 1. Primarily along highway 315, but also these places they noted conflict:

- Possibly between the divided portion of U.S. 89 (where the lanes are divided with some land between the road that goes north and the road that goes south).
- The area just south of Willard and the east of the railroad they wondered if these would be wetlands if culvert under the railroad was cleared up and the irrigation water stopped. They had the same question about wetlands north of 315 and just east of the railroad.
- The area along Willard Creek between Second West and U.S. 89. Also the south side of Willard Creek west of 200 W. could possibly pose conflicts.
- They perceive that 200 W will someday continue north into Perry. If so, there could be conflicts in the north central Willard.
- On the west side of the freeway, north of Willard Bay State Park, they foresee some tourist related development and the expansion of an existing dirt road. Outside of road expansion, however, they believe that development should take place only on uplands.

Question 2. Are there opportunities to combine wetlands conservation with other community goals (e.g., flood control, open space preservation, aesthetics, recreation, education, wildlife habitat needs)? Where?

Response 2. The area along Willard Creek (except between 200 W and U.S. 89) they foresee a park system that could protect wetland values and functions. They can also foresee that a park could eventually go in the northwest part of the city.

Question 3. Are wetland resources within your community that are good candidates for protection, enhancement, and/or mitigation? Where?

Response 3. The area between 200 W and freeway along the north side of the Creek would be a good place for a mitigation bank. Also, the area in the northwest part of the city may be a good candidate (both sides of the freeway) if property owners are willing.

Question 4. Is your community willing to develop ordinances/zoning or use other planning tools to address wetlands conservation? If so, what tools/options are viable or preferred?

Response 4. They may consider a regulation to prohibit building in the riparian and flood zone area. They are currently looking at how to get funds for the city or another public agency to buy land along Willard Creek for parks and trails.

Question 5. Are there any questions above with which the community is likely to require additional research or studies and with which you may need technical assistance?

Response 5. Yes, have blocked culverts and irrigation caused wetlands, as mentioned in question 1.

Question 6. What is your feedback and comment on the draft Wetlands Plan?

Response 6. They also would like local control of wetlands in the city, with all mitigation occurring within city limits.

Other:

Jim will meet with the Willard Planning Commission on December 16 to get their consensus. He will also make contact with John Larkins regarding the area southwest of Willard. The group was not too familiar with that area and felt Mr. Larkins would know.

Box Elder County Wetlands Conservation Plan

Community Involvement Process Feedback- West County Group

compiled by David Lee, Utah Division of Wildlife Resources

In general, the West County group seemed OK with the Wetlands Plan itself. In fact, they seemed to appreciate the chance to be involved in the planning process. I feel they came away with a better understanding of the Wetlands Regulatory Process. The biggest concern the group had came in the mapping classification area. I realize that this area is still in the draft state and modifications are as ongoing process, so I will list the issues individually to enable the planners to handle the issues efficiently at their convenience.

1. The “Planning Areas” (A and B). All members felt “A” should be expanded westward to Snowville (as a minimum and probably to Grouse Creek). This is due to the relative abundance of wetlands and freshwater in the area. The law of marginal value is a good way to illustrate this point. The less you have of a commodity, the higher its value. Concerns in this part of the county are different than other areas, i.e. residential housing projects etc. Agriculture development is the biggest concern. Locomotive Springs is a case point. Spring flows have been reduced by over 80% over the past twenty years and the loss can be directly attributed to over-allocation of well permits on the Curlew Aquifer. Given the local significance of the Salt Wells/Locomotive Springs complex to resident and migratory wildlife, the BLM and DWR would like to see these locally important wetlands given full consideration during the planning process.

2. “For the map makers” ... The group all felt a need to clarify the “Streams” feature on the “Wetland Planning Classes” map. They feel there needs to be a more detailed classification of stream types. Most of the blue lined shown to represent streams are merely the bottoms of ravines and gullies and serve no wetland functions. Perhaps a light dashed line could be used to designate these features and use the heavy blue lines only for perennial streams.

3. Also for the map makers ... see Map 1a. It shows a large parcel of state ground directly west of Tremonton. In reality, this property is a farm under private ownership State Rep. Eli Anderson (D).

4. The group spent a good deal of time reviewing the map for accuracy and completeness after that, and found a number of errors in the Wetland Planning Classes Map.

- a- Blue Creek Spring/Howell Reservoir; the reservoir is ok, but the upper water body is only a seasonal catch basin installed by Soil Conservation Service to protect the Spring from erosion.
- b- Salt Creek WMA (SCWMA); the north-east corner doesn't show a portion of a stream that should be there, and on the property to the immediate north, they show a stream that doesn't exist.
- c- Just south of 4b is another section of "stream" that is actually an underground tile drain
- d- The map shows a wetland in an area that has been a dry farm for many years. The area recently became wet as a result of road construction by Box Elder County when they raised and widened the road for the new county landfill.
- e- At the south-west corner of SCWMA, a spring has been left off (Poison Springs0.
- f- Some landowners would rather see their land changed to a different planning class, (from B to D), as a group, they liked the categories and designation Map 9.
- g- Salt Creek Spring, the main water source for SCWMA has been left off.
- h- Blind Spring, an important water source for wildlife at the north end of Bothwell has been left off.
- i- Bill Johnson Spring and other wells and springs west of Garland have been left off.

*To reiterate, I realize these issues will be dealt with at the proper time and place, it is merely a matter of record that I mention them in this detail.

5. More of a regulatory issue I haven't looked into yet. Apparently some ponds have been built, and wells drilled in the North end of the Bear River Bay. Some committee members were wondering about the legality of these projects.

Answers to Planned Questions

1. Zoning Ordinances- The group seemed hesitant to accept additional zoning ordinances at this time. They are currently dealing with controversial zoning of residential development. They question whether these zoning laws are capable of producing the desired end result. Due to the rural setting of most of this group, there was not a lot of consideration to this question.

2. Anticipated Conflicts-

- a- There is a great deal of concern among Promontory residents over the proposed Davis Lake and what such a project would do to their community.
 - b- Restoration of the Historic Golden Spike Railroad- viewed as potential for good (economics) and bad (increase human activity and wetlands impacts). Support will depend on how implementation proceeds.
3. Candidates for protection, enhancements or mitigation-
- b- Lower Malad River and Blue Creek - numerous opportunities for cleanup/mitigation projects.
 - c- Concern over plans to take Bear River water away from its present use and convert it to culinary water for Salt Lake County.
4. Opportunities to combine community goals with wetland conservation-
- Group as a whole recognize the role of wetlands for wildlife and society. They want others to recognize their dependence on their land to make a living. There is potential for future conservation easements and rehabilitation projects as long as it doesn't infringe on their property ownership rights and farming/ranching operations.
5. Need for future assistance? None at the present time, but that could change as these developments progress.
6. General feedback - included in this text.

NORTH LAKE WPG RESPONSE

With regard to the questions presented to the Wetland Planning Groups, the following responses are hereby provided:

Question 1. Where in your community do you anticipate conflicts between development and wetlands?

Answer: It is anticipated that airport expansion and private holdings between Highway 38 and 13 will have conflicting interests with wetland preservation/enhancement.

Question 2. Are there opportunities to combine wetlands conservation with other community goals (e.g., flood control, open space preservation, aesthetics, recreation, education, wildlife habitat needs)? Where?

Answer: Yes. The North Lake area can provide for preservation of open space, flood control, water quality improvement, recreation and wildlife habitat as well as a great opportunity for wetlands enhancement.

Question 3. Are wetland resources within your community that are good candidates for protection, enhancement, and/or mitigation? Where?

Answer: Yes. A large portion of the area bounded by I-15 on the west, Highway 38 on the east and north of SR 13.

Question 4. Is your community willing to develop ordinances/zoning or use other planning tools to address wetlands conservation? If so, what tools/options are viable or preferred?

Answer: Brigham City and Box Elder County representation agree. All tools/options are available in the Wetlands Plan.

Question 5. Are there any questions above with which the community is likely to require additional research or studies and with which you may need technical assistance?

Answer: Yes. We'll need help in resolving land owner conflicts where conservation easements may be more advantageous to the land owner.

Question 6. What is your feedback and comment on the draft Wetlands Plan?

Answer: The consensus of the group was that the Wetlands Plan is excellent.

Tom Walker, Leader
North Lake Wetlands
Planning Group

Appendix D - Description of Wetland Data Collection for Box Elder County

(By Charles T. Shaw, Utah Division of Wildlife Resources)

As part of the development of the Box Elder Comprehensive Wetlands Management Plan, it was the Utah Division of Wildlife Resource's (UDWR) responsibility to identify, classify, and evaluate wetlands and their functions.

DATA COLLECTION TOOLS

Data was gathered using a Wetland Attributes Worksheet (WAW) assembled by UDWR coupled with the use of Global Positioning Systems (GPS). WAW is geared toward data collection applicable to Hydrogeomorphic (HGM) modeling, an assessment of the physical, chemical, and biological functions of wetlands and was used for the Box Elder County wetland Functional Assessment models. (See Attachment A for an example of the Wetlands Attribute Worksheet).

WAW instructs the collector to look for wetland information for the following areas:

- * Wetland types (open water, riparian, marsh etc.)
- * Cowardin classification (palustrine, lacustrine, riverine)
- * Dominance of vegetation
- * Percent values for emergent, submergent, floating vegetation and open water and bare ground
- * Water inputs (precipitation, groundwater, surface flow)
- * Water Flow (surface or subsurface)
- * Geomorphic setting (riverine, slope, depression etc.)
- * Hydro Regime (permanent, seasonal, temporary, etc.)
- * Impacts in and adjacent to wetlands (grazing, urban development, fill, etc.)
- * Adjacent upland vegetation
- * Wildlife habitat types (deep water, wet meadows, emergent vegetation, etc.)
- * Habitat diversity ratings (structurally/spatially and plant species)
- * Qualitative assessments

- * Wildlife observations
- * etc.

GPS was used to document each wetland's size and shape for mapping purposes. GPS is a satellite based positioning system, that uses signals sent from satellites to determine where the satellites are and then uses this information to calculate the GPS unit's location on earth. Once the GPS data is corrected, it provides accuracy typically within 2 to 5 meters.

WETLAND DATA COLLECTION

Wetland data collection began by locating wetlands with the use of National Wetland Inventory (NWI) maps or upon discovery. The GPS unit was programmed to collect a data point on the ground every three seconds. With the GPS unit in hand, the perimeter of the wetland was walked. The perimeter was determined by following vegetation described by the USWFS (1988). The following are the indicator categories used:

Obligate Wetland - (OBL) plants found growing 99% or more of the
time in wetlands

Facultative Wetland - (FACW) plants found growing 66 to 99% of the
time in wetlands

Facultative - (FAC) plants found growing 34 to 66% of the time
in wetlands

(See Attachment B for an example of vegetation associated with each wetland type and their indicator categories).

An inventory of wetland vegetation, wildlife species, wetland types, water inputs, geomorphic setting, impacts, land-use, roads and adjacent upland vegetation were documented upon their discovery.

The communities of vegetation growing within each wetland were used to help identify wetland types (See Attachments A & B for examples of wetland types and their associated communities of vegetation). Most often wetlands inventoried were composed of more than one wetland type (i.e. a marsh, wet meadow and playa were occasionally combined to constitute one wetland).

WAW's section on types of wildlife habitat is similar to wetland types, but is more interested in structure (i.e. water depth, island/uplands, downed logs, rocks with gaps, canopy layers etc.). Both wildlife habitat and wetland types were used for rating habitat diversity.

Water inputs, such as springs, seeps and wells, was documented with the GPS unit. These water inputs should not be assumed as the only groundwater sources feeding individual wetlands. Due to the approach used to collect data, groundwater inputs were mainly discovered near the periphery of the wetland, and possible sources within the interior of the wetland were often left undocumented.

In addition, surface flow designation didn't differentiate between channelized flow and unchannelized flow. Water inputs was generally thought of from the perspective, "which input seems to be supplying the wetland most: precipitation, groundwater or surface flow?"

Determining geomorphic setting proved to be challenging because most of the wetlands being inventoried were situated east of I-15, within the areas of Willard, Perry and Brigham City. I-15 and the adjacent railroad grade serves as an obstacle to water flow, seemingly converting slope wetlands into depressional wetlands.

Not surprising, many of these wetlands had an outlet leading beneath the interstate and railroad grade. However, water was still impounded similar to that of a depressional wetland.

After completing a wetland, percent values for each plant species were visually estimated. From apparent dominance and distribution, the top 5 to 6 plant species were identified. (Visual estimates were also helpful in gauging a wetland's percent composition for both open water and bare ground (i.e. playas) in relation to the entire wetland).

With estimates for each plant species, values for percent emergent, submergent and floating vegetation were tabulated. Although, emergent vegetation was the only one estimated on a regular basis.

Utah's Wetland Workbook (Lock, no date), a workbook written by Patricia A. Lock and developed through a Wetlands Protection Grant funded by the United States Environmental Protection Agency and UDWR, was used frequently for its Cowardin classification system. After completion of a

wetland, reading through the key helped determine its system, class and water regime. (See Attachment C for an example of the key). Although, the NWI was also used to yield a Cowardin classification.

Habitat diversity was given a rating for two of its aspects; structurally/ spatially and plant species. Each of these two aspects were given one of the following ratings:

- * High
- * High/Moderate
- * Moderate
- * Moderate/Low
- * Low

The structurally/spatially aspect rating was determined by the amount of structure (wildlife habitat and wetland types) combined with its overall size. While the overall number of different plant species found within a wetland (although subjective during winter months) determined the rating for the plant species aspect. (See Attachment D for general determination of ratings for both habitat diversity aspects).

Likewise, each wetland received a qualitative assessment denoting its overall condition as:

- * Good
- * Good/Fair
- * Fair
- * Fair/Poor
- * Poor

The qualitative assessment was determined primarily upon its appearance (i.e. heavily grazed and trampled vs. lightly grazed with thick growths of vegetation).

All of the inventoried wetlands had one form of disturbance or another, whether it be grazing, filling, channelizing, roads, etc. Assessments were generally determined by each wetland's condition in

relation to all others (see Attachment D for general determination of ratings for qualitative assessment).

CONCLUSION

Additional wetland data could have been gathered using WAW. However, this would have required additional equipment, people, expertise and time. Data gathered was sufficient for describing each wetland's value to wildlife, vegetation communities, classification, function and use—much of which were used in calculating Functional Assessment values for each wetland.

APPENDIX D, ATTACHMENT A

WETLANDS ATTRIBUTES WORKSHEET

Time: GPS file#:

Date: Weather:

Place Name: County: Box Elder

Location (UTM coord.):

Type: Open Water Riparian Marsh Spring Seep

Wet Meadow Bog Playa Scrub Shrub

Class (Cowardin): Differing Opinion?

NWI map:

Class (UT):

% cover height

Dom. Veg.:

Veg. 2:

Veg. 3:

Veg. 4:

Veg. 5:

head gates beaver- current or pastgrazing _____
agriculture _____ urban development _____
recreation _____ other _____

Distance to nearest urban development: _____ Describe:

Surrounding land-use: Agriculture % Urban development % Range %
None Other: _____

Types of roads (in or near wetland): _____

Distance of wetland to nearest: wetland _____ river _____ lake _____

Upland Cover (refer to habitat index):
(include % adjacent to wetland)

Vegetation growing on adjacent upland:

Public access: Yes No How?

Landowner: BLM USFS State NPS USFWS BIA

Private: Name _____ Address _____
Phone _____

Elevation _____ Aspect _____

Wildlife Habitat: list of specific habitat types contained within the wetland.

Deep water > 1m (area) _____, shallow water 0-3cm (area) _____,

APPENDIX D, ATTACHMENT B

Functional Assessment Subclasses & Habitat Description

Source: Legacy West Davis Parkway HGM Model (UDOT 1998)

Forested Wetland (FO)

Wetlands dominated by woody vegetation 6 meters tall or taller. Includes an overstory of trees, an understory of young trees and/or shrubs, and a herbaceous layer.

Vegetation:	Indicator Categories:
* narrow-leaf cottonwood (<i>Populus angustifolia</i>)	FAC
* Russian olive (<i>Elaeagnus angustifolia</i>)	FAC
* reed canary grass (<i>Phalaris arundinacea</i>)	OBL

Scrub- Shrub Wetland (SS)

Wetlands dominated by woody vegetation less than 6 meters tall. Vegetation includes true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions.

Vegetation:	Indicator Categories:
* tamarisk (<i>Tamarix ramosissima</i>)	FACW
* juvenile box-elder (<i>Acer negundo</i>)	FACW
* coyote willow (<i>Salix exigua</i>)	OBL
* salt grass (<i>Distichlis spicata</i>)	FAC
* Baltic rush (<i>Juncus balticus</i>)	FACW
* common reed (<i>Phragmites australis</i>)	FACW
* reed canary grass (<i>Phalaris arundinacea</i>)	OBL
* foxtail barley (<i>Hordeum jubatum</i>)	FAC
* little foxtail (<i>Hordeum pusillum</i>)	FAC

Wet Meadow (WM)

Wetlands dominated by emergent, herbaceous vegetation that is typically adapted to conditions in a temporarily or seasonally flooded hydrological regime.

Vegetation:

Indicator Categories:

* Baltic rush (<i>Juncus balticus</i>)	FACW
* creeping spikerush (<i>Eleocharis palustris</i>)	OBL
* clustered field sedge (<i>Carex praegracilis</i>)	FACW
* Nebraska sedge (<i>Carex nebrascensis</i>)	OBL
* rabbitsfoot grass (<i>Polypogon monspeliensis</i>)	FACW
* foxtail barley (<i>Hordeum jubatum</i>)	FAC
* little foxtail (<i>Hordeum pusillum</i>)	FAC
* curly dock (<i>Rumex crispus</i>)	FACW
* salt grass (<i>Distichlis spicata</i>)	FAC

Marsh (MA)

Wetlands dominated by emergent, herbaceous vegetation that is typically adapted to conditions under semi-permanently flooded or greater hydrologic regime.

Vegetation:

Indicator Categories:

* hard stem bulrush (<i>Scirpus acutus</i>)	OBL
* alkali bulrush (<i>Scirpus maritimus</i>)	OBL
* three square bulrush (<i>Scirpus americanus</i> and <i>pungens</i>)	OBL
* cattail (<i>Typha latifolia</i>)	OBL
* creeping spikerush (<i>Eleocharis palustris</i>)	OBL
* reed canary grass (<i>Phalaris arundinacea</i>)	OBL
* common reed (<i>Phragmites australis</i>)	FACW
* blister buttercup (<i>Ranunculus scleratus</i>)	OBL
* water buttercup (<i>Ranunculus aquatilis</i>)	OBL
* Nebraska sedge (<i>Carex nebrascensis</i>)	OBL

Playa (P)

Areas that have 30% or less vegetative aerial cover that are less than 20 acres in size are considered un-vegetated mudflats or playas. These areas are regulated and are regulated as special

aquatic sites. If an area has more than 30% vegetative aerial cover, it is classified as a vegetated mudflat or playa and is regulated as jurisdictional wetlands. Primary hydrological source comes from precipitation events and/or snow melts.

Vegetation:	Indicator Categories:
* western seepweed (<i>Suaeda occidentalis</i>)	FACW
* slender seepweed (<i>Suaeda depressa</i>)	FACW
* pickleweed (<i>Salicornia europea</i>)	OBL
* salt grass (<i>Distichlis spicata</i>)	FAC
* iodinebush (<i>Allenrolfea occidentalis</i>)	FACW
* fat-hen saltbush (<i>Atriplex patula</i>)	FACW
* nuttall alkaligrass (<i>Puccinellia nuttalliana</i>)	OBL

Sometimes after a playa dries, foxtail barley will grow.

Open Water (OW)

Areas of surface water where the depth to bottom is unknown or there is standing water with no emergent vegetation present. They are less than 20 acres in size. These open water areas sometimes become dry during the summer, which allows emergent vegetation to grow for short period of time. This is known as seasonal succession.

APPENDIX D, ATTACHMENT C

Source: Utah's Wetland Workbook

Wetland Classification Key

SYSTEM

1. Is the area situated in a river channel; is water, when present, usually flowing?

Yes.....RIVERINE, Go to 8

No.....Go to 2

2. Is the area situated in a basin, depression, catchment, on level or gently sloping ground with slow moving or stationary water?

Yes.....Go to 3

No.....Unknown

3. Is the area greater than 20 acres?

Yes.....LACUSTRINE, Go to 7

No.....Go to 4

4. Is the water depth in the deepest part 6 feet or deeper?

Yes.....LACUSTRINE, Go to 7

No.....PALUSTRINE, Go to 6

Wetland Subsystem

- 6. Palustrine wetlands have no subsystem..... Go to 10
- 7. Is the area a shoreline or playa, less than six feet deep?
Yes.....Littoral, Go to 10
No.....Limnetic, Go to 10
- 8. Does water flow year round?
Yes.....Go to 9
No.....Intermittent, Go to 19
- 9. Is water velocity slow and gradient low with a well-developed flood plain?
Yes.....Lower Perennial, Go to 10
No.....Upper Perennial, Go to 10

Wetland Class

- 10. Is the area vegetated?
Yes.....Go to 15
No.....Go to 11
- 11. Is the area a shoreline?
Yes.....Go to 12
No.....Go to 13
- 12. Is the shoreline comprised mainly of large rocks and boulders?{1}

Yes.....Rocky shore

No.....Unconsolidated shore

13. Can you see the bottom of the wetland?

Yes.....Go to 14

No.....Open water

14. Is the bottom comprised mainly of large rocks and boulders?

Yes.....Rock bottom

No.....Unconsolidated bottom

15. Is the wetland plant community dominated by submergent aquatic plants such as algae, pondweed, duckweed, submerged moss, or waterlily? {2}

Yes.....Aquatic bed

No.....Go to 16

16. Is the wetland plant community dominated by cattails, bulrush, saltgrass, or wet meadow grasses? {3}

Yes.....Emergent

No.....Go to 17

17. Is the ground cover dominated by sphagnum or peat (organic materials)?

Yes.....moss/ lichen

No.....Go to 18

18. Is the plant community comprised mainly of shrubs and trees?

Less than 20 feet

tall.....scrub/shrub

Greater than 20 feet

tall.....forested

19. Intermittent subsystems have only one class – Streambed

Water regime

If the area is MOSTLY WET, choose the best descriptor:

- (a) Permanently flooded: Water covers the land surface throughout the year in all years.
- (b) Intermittently flooded: Surface water is present throughout the year except in years of extreme drought.
- (c) Semipermanently flooded: Surface water persists throughout the growing season in most years. When surface water is absent, the water table is usually at, or very near, the land surface.
- (d) Saturated: The ground is saturated to the surface for extended periods during the growing season, but surface water is seldom present.

If the area is MOSTLY DRY, choose the best descriptor:

- (a) Seasonally flooded: Surface water is present for extended periods especially during the growing season, but is absent by the end of the season in most years. When surface water is absent, the water table is often near the land surface.
- (b) Temporarily flooded: Surface water is present for brief periods during the growing season, but the water table usually lies well below the soil surface for most of the season. Plants that grow both in uplands and wetlands are characteristic of temporarily flooded regime.
- (c) Intermittently flooded: Surface water is present for variable periods without detectable season periodicity. Weeks, months, or even years may intervene between periods of inundation. The dominant plant communities under this regime may change as soil moisture conditions change. Some areas exhibiting this regime are not defined as wetlands because they do not have hydric soils or support hydrophytic vegetation.

OTHER:

- (a) Artificially flooded: The amount and duration of flooding is controlled by humans, such as some waterfowl management areas. Wetlands created by leakage from human-made impoundments and irrigated pastures are not included in this category.

APPENDIX D, ATTACHMENT D

Habitat Diversity Ratings & Qualitative Assessment Guide

Habitat Diversity (structurally/spatially)

The following is a general description for rating the structurally/spatially aspect of habitat diversity:

High – Wetlands that contain 3 or more wetland types and appear to have a lot of structure.

High/Moderate- Wetlands bordering between High and Moderate.

Moderate- Wetlands that contain 2 or 3 wetland types and appear to have moderate structure.

Moderate/Low- Wetlands bordering between Moderate and Low.

Low – Wetlands that contain only 1 wetland type and appear to have low structure.

Habitat Diversity (plant species)

The following is a general description for rating the plant species aspect of habitat diversity:

High - Wetlands where the bulk of vegetation is composed of about 15 or more species.

High/Moderate -Wetlands bordering between High and Moderate.

Moderate - Wetlands where the bulk of vegetation is composed of about 8 to 12 species.

Moderate/Low - Wetlands bordering between Moderate and Low

Low - Wetlands where the bulk of vegetation is composed of 5 or less species.

These values are subject to the time of year the data is collected. Wetlands inventoried during winter month yield only remnant vegetation. Under these circumstances, wetland vegetation was compared on a wetland to wetland bases.

Qualitative Assessment

The following is a general description to determining the qualitative assessment:

Good - Wetland appears to have minimal impacts or impacts don't appear damaging.

Good/Fair - Wetland appears somewhere between Good and Fair.

Fair - Wetland has some impacts and appears damaged, but is still in descent condition.

Fair/Poor - Wetland appears somewhere between Fair and Poor.

Poor - Wetland appears to have many impacts or is damaged severely.

Appendix E - Functional Assessment classifications for the Box Elder County Comprehensive Wetlands Plan

(By Russ Lawrence, Utah Division of Wildlife Resources)

The Utah Division of Wildlife was responsible for the inventory, classification, and mapping of wetlands in Box Elder County for use in this Plan. A wetlands technician surveyed areas that were thought to have wetlands present based on the National Wetland Inventory (NWI), which was conducted in the early 1980s. The technician's responsibility was to ground-truth these areas and document wetlands information that has and will be useful for wetland scientists, biologists, planners, and the general public. A data sheet that was used can be referenced in Appendix D. The technician also used Global Position System (GPS) to map wetland complexes. A discussion of this work can be found in Appendix D.

Some of the information found on the data sheet was used to calculate wetland values using Functional Assessment models. As with HGM models, the Functional Assessment models evaluate wetlands based on four primary functions of these ecosystems: hydrology, biogeochemical, vegetation, and habitat. The Functional Assessment (and HGM) models only address functional value of wetlands, not the value of wetlands to society.

HGM was developed by Mark M. Brinson from the U.S. Corps of Engineers (Corps), which oversees wetland regulations. The models were developed because it was felt that many of the methodologies used to classify wetlands did not adequately address wetland functions as required by statute.

The initial HGM model developed was broad and simple to allow differences in wetlands found across the country. It was hoped that geographic regions would adapt the model to fit the wetlands that are present. Utah has been involved in the development of models that can be used for assessments of wetlands unique to Utah. An Interdisciplinary Team for Utah has developed a draft Riverine wetland model. In addition, the Team is in the process of developing a Groundwater slope wetland model and a Depressional wetland model. Scaled-down versions of these models, referred to as "HGM lite," were used in conjunction with analysis of wetland impacts projected from the Legacy Parkway/West Davis Highway (see UDOT, 1998 for model descriptions) to generate the Functional Assessment models for Box Elder County.

The Division of Wildlife Resources adapted the HGM lite models, based on conditions found in Box Elder County, and used them as a Functional Assessment to quantify functions for the wetlands UDWR surveyed. It must be noted that the Functional Assessment and HGM Lite models do not involve as much complexity as full HGM models, but still look at the four functions listed above. The Functional Assessments were modeled after HGM models, however, to allow the Corps to experimentally apply the models to new geographic areas and because the Corps may use HGM models if the County decides to pursue a Special Area Management Permit (SAMP).

The Functional Assessment models used by UDWR in Box Elder County are very similar to those used for the Legacy Parkway studies with a couple of exceptions. In the Slope Model, UDWR eliminated one variable in Item 4 (Maintain Characteristic Fish and Wildlife Populations) and added two new variables in its place. The variable we replaced was V_{water} , or the relative proportion and interspersion of vegetation to open water. It gave the highest value to wetlands that had the highest proportions of open water. In Box Elder County, most of the slope wetlands are wet fields that have very little open water. UDWR felt that the model needed to be changed to reflect these types of slope wetlands. Two variables were added called Habitat Diversity and Vegetation Diversity. Both of these variables were given a rating of high, medium, and low and then assigned numeric values based on these qualitative measures. These values come directly from the data sheet used in the field. Habitat Diversity is a measure of the different habitats that might be able to support an array of wildlife species. Vegetation Diversity is similar, except that it measures if a wetland has a monoculture plant community or if there is a large variety of plants. Invariably, a large variety of plant species is more likely to invite more wildlife species to occupy a particular habitat.

The other change was the elimination of V_{herp} , or the Distribution and abundance of amphibians and reptiles. This was eliminated because the sampling techniques needed to conduct this survey would have taken too long. The variable V_{bird} , or Distribution and abundance of avian was used. However, it must be noted that this was just a snapshot in time and applies only to the time and season that the site visit was made.

The tables and equations that follow should be self explanatory with a few exceptions. The first exception is V_{vegind} which is the indicator status of wetland vegetation. This is measured by the percent of Obligate (OBL) and Facultative wet (FACW) plant species found in wetlands. Obligate plant species almost always (99% probability) occur under natural conditions in wetlands. Facultative wet usually occur in wetlands (67%-99% probability), but are occasionally found in non-wetlands (USFWS 1988).

Another two variables that are not self explanatory are V_{OC} , organic carbon in soil, and V_k , conductivity of unconsolidated material (permeability). Both of these measures were taken from the soil survey for Box Elder County (SCS 1975).

Key to Box Elder Wetlands Functional Assessment

Corresponds with Values in Functional Assessment Equations

Depressional

A-Gps_file_	This number corresponds with each polygon the DWR collected with GPS. The Functional Assessment tables correspond with the Polygon coverages with this field.
B- 1.Vvegind	Indicator Status of Wetland Vegetation. Based on % of OBL/FACW .
C- 1.Vmod	Human Modifications in Wetland have created artificial conditions. (Range of conditions are possible)
D- 1.Vedge	Land use of Outermost Wetland Zone (wildlife, range cultivate, urban)
E- FC1	Hydrology FCI $(Vvegind + Vmod + Vedge)/3$
F- 2. Vsubin	Hydrological Regime (groundwater, surface flow, precip.)
G- 3. Vwetuse	Wetland Land Use
H- 3. Vedge	Land use of Outermost Wetland Zone (wildlife, range cultivate, urban)
I- FC3	$(Vwetuse + Vedge)/2$
J- FCHB	Biogeochemical FCI $((Vwetuse + Vedge) * VFC1 Hydro)sq. root$
K-4. Vedge	Land use of Outermost Wetland Zone (wildlife, range cultivate, urban)
L- 4. Vmod	Human Modifications in Wetland have created artificial conditions. (Range)
— FC4	Biogeochemical FCI 2 $(Vedge + Vmod)/2$
– 5. Vwetuse	Wetland Land Use
O- 5. Vedge	Land use of Outermost Wetland Zone (wildlife, range cultivate, urban)
P- FC5	Vegetation and Habitat FCI $(Vwetuse + Vedge)/2$
Q- 6. Vbird	Qualitative assessment of bird use the day and time of site visit.
R- 6. Vbird	Numeric value given to Q
S- FCITotal-6	FCI totals minus FCI 6 $(E + I + M + P)/4$
T- FCITotalw6	FCI totals including FCI 6 $(E + I + M + P + R)/5$
U- Gps_file_	GPS file name added for convenience. Same as column A
V- Wildlife	Wildlife Value from model. $(P + R)/2$

Slope

A- Gps_file_	This number corresponds with each polygon The DWR collected with GPS. You can import this table into ARCVIEW using this column as the common field.
B- 1.Vvegcvr	Aerial cover of Vegetation (% aerial cover used as value)
C- 1.Vsurfslope	Slope of Wetland surface
D- FCI1	Hydrology FCI1 (Vvegcvr * Vsurfslope)sq. root
E- 2.Vk	Conductivity of unconsolidated material (Permeability)
F- 2.Vsurfslope	Slope of Wetland surface
G- FCI2	Hydrology FCI2 (Vk * Vsurfslope)sq. root
H- 3.Vedge	Land use of Outermost Wetland Zone (wildlife, range cultivate, urban)
I- 3. Vwetuse	Wetland land use
J- 3. Vvegind	Indicator Status of Wetland Vegetation. Based on % of OBL/FACW
K- FCI3	Vegetation and Habitat Functions FCI3 (Vedge + Vwetuse +Vvegind)/3
L- 4.Vhabdiv	Habitat Diversity
— 4.Vplntdiv	Plant Diversity
– 4.Vedge	Land use of Outermost Wetland Zone (wildlife, range cultivate, urban)
O- 4.Vwetuse	Wetland land use
P- FCI4	Vegetation and Habitat Functions FCI4 (Vhabdiv +Vplntdiv + Vedge + Vwetuse)/4
Q- 5.Vvegcvr	Aerial cover of Vegetation (% aerial cover used as value)
R- 5.Vwetuse	Wetland land use
S- 5.Vedge	Land use of Outermost Wetland Zone (wildlife, range cultivate, urban)
T- FCI5	Biogeochemical FCI5 (Vvegcvr + Vwetuse + Vedge)/3
U- 6.Voc	Organic Carbon in soil (Range)
V- 6.Vvegcvr	Aerial cover of Vegetation (% aerial cover used as value)
W- 6.Vk	Conductivity of unconsolidated material (Permeability)
X- FCI6	Biogeochemical FCI6 (Voc + Vvegcvr + Vk)/3

Y- 6-Voc	This is the FCI for FCI6 minus organic carbon (data was not readily available when we initially put together the model, but we have the data now.
Z- 7.Vbird	Qualitative assessment based on site visit. Varied according to season and time. Birds may use areas even if they were not observed. Requires longer study time.
AA- VBIRD	Numeric values based on Z
AB- Gps_file_	GPS file names for convenience of reading results
AC- FCITOTAL	Total of all FCI values excluding AA $(D + G + K + P + T + X)/6$
DD- FCIT-Voc	Total of all FCI's excluding AA and U(Voc) $(D + G + K + P + T + Y)/6$
AE- FCITw7.V	Total of all FCI including AA $(D + G + K + P + T + X + AA)/7$
AF- FCITw7-VOC	Total of all FCI including AA minus U (Voc) $(D + G + K + P + T + Y + AA)/7$
AG- Wildlife	Wildlife values $(P + AA)/2$

Depressional - Marsh Functional Equations

Hydrology

1. Surface Water Storage	Range	Value Assigned
Vvegind = Indicator Status of Wetland Vegetation	100%OBL/FACW	1.00
	90%OBL/FACW	0.90
	80%OBL/FACW	0.80
	70%OBL/FACW	0.70
	60%OBL/FACW	0.60
	50%OBL/FACW	0.50
	40%OBL/FACW	0.40
	30%OBL/FACW	0.30
	20%OBL/FACW	0.20
	10%OBL/FACW	0.10
	>5%OBL/FACW	0.05
Vmod = Human Modification in Wetland have created artificial conditions. (i.e. Culverts, Irrigation ditches)	High modification = .10 No modification = 1.0	Range of Conditions Between .10 and 1
		0.10 1.00
Vvedge = Land Use of Outermost Wetland Zone (Range is possible)	W-Wildlife R-Range CA - Cultivate U - Urban	1.00 0.50 0.20 0.10

$$\text{EQUATION FC1: } (Vvegind + Vmod + Vvedge) / 3$$

2. Interception of Groundwater Flow	Range	Value Assigned
Vsubin = Hydrological regime	subclass/divide	none

Biogeochemical

3. Removal of dissolved Elements and Compounds	Range	Value Assigned
Vwetuse = Wet land Use (Range is possible)	W-Wildlife R-Range CA - Cultivate U - Urban	1.00 0.50 0.20 0.10
Vvedge = Land use of Outermost Wetland Zone (Range is possible)	W-Wildlife R-Range CA - Cultivate U - Urban	1.00 0.50 0.20 0.10

$$\text{EQUATION FC3: } (Vwetuse + Vvedge) / 2$$

$$\text{EQUATION FCHB: } [(Vwetsue _ Vvedge) * VFC1Hydro]^{sq. \text{ Root}}$$

4. Particulate Retention	Range	Value
Vvedge = Land use of Outermost Wetland Zone (Range is possible)	W-Wildlife R-Range CA - Cultivate U - Urban	1.00 0.50 0.20 0.10
Vmod = Human Modification in Wetland have created artificial conditions. (i.e. Culverts, Irrigation ditches)	High modification = .10 No modification = 1.0	Range of Conditions Between .10 and 1
		0.10 1.00

Depressional - Marsh Functional Equations

$$FC4: [Vedge+Vmod]/2$$

Vegetation and Habitat Functions

5. Maintain Plant and Wildlife Habitat: Maintian food Web: Wetland Habitat Connectivity	Range	Value Assigned
Vwetuse = Wet land Use	W-Wildlife	1.00
(Range is possible)	R-Range	0.50
	CA - Cultivate	0.20
	U - Urban	0.10
Vedge = Land use of Outermost Wetland Zone	W-Wildlife	1.00
(Range is possible)	R-Range	0.50
	CA - Cultivate	0.20
	U - Urban	0.10

$$FC5: [Vwetuse + Vedge]/2$$

6. Maintain Distribution and Abundance of Vertebrates	Range	Value Assigned
Vbird= Qualitative Assessment of bird use based only on site visit. (Has limitations)	Stand alone Column	by expert
Vbird= Distribution and abundance of avian species (Quantitative)	Stand alone Column	by expert

FCITotal - 6 (minus Vbird): $(FC1 + FC3 + FC4 + FC5)/4$

FCITotal6 (with Vbird): $(FC1 + FC# + FC4 + FC5 + Vbird)/5$

Wildlife Value from Model: $FC5 + Vbird)/2$

Appendix F - Federal Programs Addressing Wetland and Aquatic Habitats

Program	Eligibility	Financial Assistance	Local Contact
<p>Bring Back the Natives</p> <p>Collaborative effort by the National Fish and Wildlife Foundation, Bureau of Land Management, USDA Forest Service, Bureau of Reclamation, and Trout Unlimited to restore the health of riverine systems and their native species. The program funds projects that directly benefit native species through revised land management practices and habitat restoration.</p>	<p>Federal, state, and local governments and private landowners in conjunction with any of the above agencies.</p>	<p>Through grants.</p>	<p>National Fish and Wildlife Foundation Pam McClelland Washington D.C. (202) 857-0166</p>
<p>Challenge Cost Share Program</p> <p>Program is a partnership between the U.S. Fish and Wildlife Service (USFWS) and non-federal public and private institutions, organizations, and individuals that promote the management, restoration, and enhancement of fish and wildlife resources and natural habitats on public and private lands.</p>	<p>Public and private lands. Funds provided by the USFWS cannot be matched with other federal funds.</p>	<p>Matched 50/50</p>	<p>U.S. Fish and Wildlife Service Karl Fleming Bear River Migratory Bird Refuge, Brigham City, UT (435) 723-5887 ext. 22</p>

Program	Eligibility	Financial Assistance	Local Contact
<p>Conservation of Private Grazing Land</p> <p>Program provides technical, educational, and related assistance to private landowners of grazing lands. The program emphasizes better grazing land management, protecting soil from erosive wind and water, conserving water, providing habitat for wildlife, and sustaining forage and grazing plants.</p>	<p>Landowners of private grazing lands.</p>	<p>Technical assistance available. Some financial assistance available.</p>	<p>USDA, Natural Resource Conservation Service Brock Benson Tremonton Field Service Center Tremonton, UT (435) 257-5403 (phone) (435) 257-1930 (fax)</p>
<p>Conservation Reserve Program</p> <p>Major goals include reducing soil erosion and sedimentation, improving water quality, maintaining fish and wildlife habitat, and providing support income to the landowner. Priority areas for the program include: highly erodible lands; water-quality impaired areas; special emphasis watersheds; wellhead protection areas, and filter strip areas. The program encourages farmers to enroll these lands into the Reserve for 10 years. The landowners receive annual rental payments, cost-sharing, and technical assistance.</p>	<p>Lands must be in Reserve for at least 10 years. Limited to land that is highly erodible and land that is contributing to a serious water quality problem. The land must have at least one of the following:</p> <p>1) have been planted as an agricultural commodity grown in rotation for two crop years between 1986-1990; 2) have evidence of scour erosion; 3) contributing to or creating a water quality problem; and 4) a public wellhead area (determined by EPA).</p>	<p>Annual rental payment for land while in the Reserve (not to exceed \$50,00 annually); 50 percent cost-share for establishing vegetation.</p>	<p>USDA, Farm Service Agency James Hall Tremonton Field Service Center Tremonton, UT (435) 257-5402 (phone) (435) 257-1930 (fax)</p>

Program	Eligibility	Financial Assistance	Local Contact
<p>Conservation Reserve Program (Buffers)</p> <p>The initiative is an effort to use grasses and trees to protect and enhance all the resources on a farm. The intent is to utilize conservation buffers to maintain a farmers best land in production and make good use of marginal land. Conservation practices such as filter strips, riparian forest buffers, contour buffer strips, field borders, windbreaks, herbaceous wind barriers, grassed waterways, and streambank protection measures are encouraged through the program. These practices slow water runoff, trap sediment, enhance infiltration and trap fertilizers, pesticides, bacterial and viral pathogens, and heavy metals.</p>	<p>Any farmer is eligible for financial and technical assistance to implement conservation buffers along stream edges, field edges, or within a field. The use of conservation buffers are most effective if they are planned as part of a comprehensive conservation system.</p>	<p>Cost share up to 75 percent of the cost of project; technical assistance.</p>	<p>USDA, Farm Service Agency James Hall Tremonton Field Service Center Tremonton, UT (435) 257-5402 (phone) (435) 257-1930 (fax)</p>
<p>Environmental Quality Incentives Program</p> <p>The program provides a voluntary conservation program to farmers and ranchers who face a serious threat to soil, water, and related natural resources. It provides technical, financial, and educational assistance to designated priority areas (half of it are targeted to livestock-related natural resource concerns and the remainder to other significant conservation priorities). Concern areas include soil erosion, degraded water quality and quantity, wildlife habitat, wetlands, and forest and grazing lands.</p>	<p>Landowners engaged in livestock or agricultural production. Eligible land includes cropland, rangeland, pasture, forestland, and other farm or ranch lands. Owners of large confined livestock operations (> 1000 animal units, although may vary by state) are not eligible for cost-share assistance for animal waste storage facilities or treatment facilities.</p>	<p>Cost-sharing may pay up to 75 percent of the costs of certain conservation practices. Incentive payments (up to three years) may be made to encourage landowners to initiate conservation practices.</p>	<p>USDA, Natural Resource Conservation Service Brock Benson Tremonton Field Service Center Tremonton, UT (435) 257-5403 (phone) (435) 257-1930 (fax)</p>

Program	Eligibility	Financial Assistance	Local Contact
<p>NRCS Conservation Technical Assistance</p> <p>Technical assistance is available for wetland determinations for wetland protection and management programs, developing conservation plans for protecting and managing wetlands, and providing income-producing alternatives for use and management of wetlands. Landowners request technical assistance through local soil and water conservation districts.</p>	<p>Landowners who sign agreements with local soil and water conservation districts.</p>	<p>Technical Assistance</p>	<p>Northern Utah Soil Conservation District Verl Peterson Tremonton Field Service Center Tremonton, UT (435) 257-5403 (phone) (435) 257-1930 (fax)</p>
<p>North American Waterfowl Management Plan</p> <p>Mission is to protect, restore, and enhance wetlands important to waterfowl and other wetland-dependent bird species in North America. The plan is implemented on a local level by partnerships called joint ventures.</p>	<p>Landowners of wetlands significant to waterfowl and other wetland-dependent bird species who desire to restore or enhance their land.</p>	<p>Technical and financial assistance is available through a variety of cooperative programs</p>	<p>Intermountain West Joint Venture Jim Cole, USFWS Ecological Service Center, Salt Lake City, UT (801) 524-5110</p>

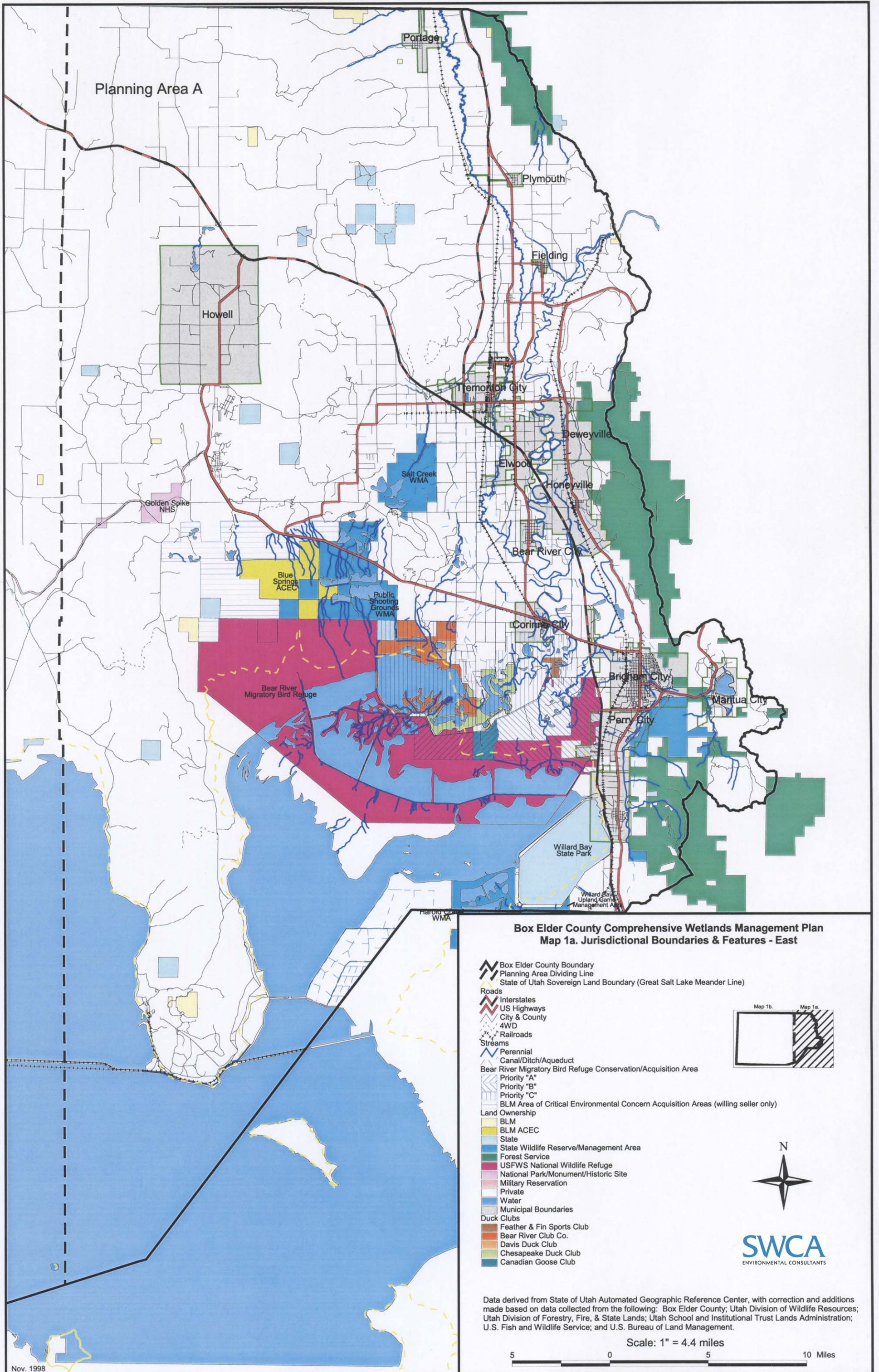
Program	Eligibility	Financial Assistance	Local Contact
<p>North American Wetlands Conservation Act</p> <p>Encourages partnerships among public agencies and other interests within the United States, Canada, and Mexico to 1) protect, enhance, restore, and manage wetland ecosystems and other habitats for migratory birds, fish, and wildlife in North America; 2) maintain current or improved distribution of migratory bird populations; and 3) sustain an abundance of waterfowl and other migratory birds consistent with the goals of the North American Waterfowl Management Plan and international treaty obligations. Funding is provided for wetlands conservation projects involving acquisition, restoration, and enhancement.</p>	<p>Projects involving acquisition, restoration, enhancement, creation, management, and other activities that conserve wetland ecosystems and the fish and wildlife that depend on these habitats are eligible. Areas of special concern and larger areas are usually given priority in grant consideration. Projects must be a minimum of 10 years or a 5 year agreement for demonstration projects.</p>	<p>Matched 50/50 funding (Federal to non-federal funds)</p>	<p>U.S. Fish and Wildlife Service Jim Cole Ecological Service Center, Salt Lake City, UT (801) 524-5110</p>
<p>Partners for Wildlife Program</p> <p>Goals are to restore, enhance, and manage wetlands for fish and wildlife habitat; promote profitable land use for agriculture, industry, and private landowners; and promote a wise and lasting land-use ethic. The program focuses on the reestablishment of natural communities. Technical and financial assistance is given to landowners who wish to restore wildlife habitat, including degraded or converted wetlands and those habitats that meet specific eligibility criteria.</p>	<p>Any wetland is eligible for the program, however, preference is given to sites that meet specific criteria (i.e. contribute to the survival of endangered, threatened, or candidate species, or migratory birds of management concern; sites that contribute to the goals of the North American Waterfowl Management Plan; wetlands located very close to existing habitat; contribute to the restoration of globally or nationally imperiled natural communities). Agreements last at least 10 years, although demonstration projects may be less.</p>	<p>Cost-shared up to 100 percent of total cost. Demonstration projects are cost-shared at 50 percent and are not to exceed \$5,000 if less than 10 years.</p>	<p>U.S. Fish and Wildlife Service Karl Fleming Bear River Migratory Bird Refuge, Brigham City, UT (435) 723-5887 ext. 22</p>

Program	Eligibility	Financial Assistance	Local Contact
<p>Resource Conservation and Development</p> <p>Purpose is to accelerate the conservation, development, and utilization of natural resources, improve the general level of economic activity, and to enhance the environment and standard living in authorized Resource Conservation and Development areas.</p>	<p>Landowner associations and interest groups are eligible. Grant allocations are made for land conservation, water management, community development, and environmental needs in authorized Resource Conservation and Development areas.</p>	<p>Grants will fund up to 25 percent of construction and vegetative costs.</p>	<p>USDA, Natural Resource Conservation Service Barbara Hoffman Northern Utah Field Service Center Logan, UT (435) 753-3871 (phone) (435) 755-2117 (fax)</p>
<p>Watershed Surveys and Planning</p> <p>Purpose is to assist Federal, State, and local agencies and tribal governments to protect watersheds from damage caused by erosion, floodwater, and sediment to conserve and develop water and land resources. Resource concerns addressed by the program include water quality, opportunities for water conservation, wetland and water storage capacity, agricultural drought problems, rural development, municipal and industrial water needs, upstream flood damages, wetland creation and restoration, and fish and wildlife enhancement.</p>	<p>Federal, state, local, and tribal government agencies.</p>	<p>Technical and financial assistance available.</p>	<p>USDA, Natural Resource Conservation Service Verl Peterson Tremonton Field Service Center Tremonton, UT (435) 257-5403 (phone) (435) 257-1930 (fax)</p>

Program	Eligibility	Financial Assistance	Local Contact
<p>Wetlands Reserve Program</p> <p>Establishes conservation easements for which private landowners receive payments and cost-shared assistance for restoring and protecting wetlands on their property. Provides an excellent financial opportunity for farmers to retire marginal agricultural lands while retaining some agricultural and recreational uses (those that do not diminish or degrade wetland values).</p>	<p>Land between 2 - 1,000 acres that are cropped wetlands, prior-converted wetlands, adjacent functionally related uplands, and riparian areas that link wetlands. Minimum of a 30 year easement. Permanent easements are preferred.</p>	<p>Landowners receive easements payment based on the “agricultural value” of the land after restoration is complete; up to 100 percent cost-shared assistance for restoration.</p>	<p>USDA, Natural Resource Conservation Service Verl Peterson Tremonton Field Service Center Tremonton, UT (435) 257-5403 (phone) (435) 257-1930 (fax)</p>
<p>Wildlife Habitat Incentives Program</p> <p>Voluntary program for people who want to develop and improve wildlife habitat primarily on private lands. A wildlife habitat development plan is prepared with participants and the local Natural Resource Conservation District. The plan describes the landowner’s goals for improving wildlife habitat, includes a list of practices and a schedule for installing them, and details the steps necessary to maintain the habitat for the life of the agreement.</p>	<p>Land that is not Federal land; currently enrolled in the Water Bank Program, Conservation Reserve Program, Wetlands Reserve Program, or similar programs; land subject to Emergency Watershed Protection Program flood plain easement; and land where USDA determines that impacts from onsite or offsite conditions make the success of habitat improvement unlikely.</p>	<p>Technical assistance and up to 75 percent of the cost of installing the wildlife habitat practices.</p>	<p>USDA, Natural Resource Conservation Service Jeff Barnes Logan Field Service Center Logan, UT (435) 753-5616 (phone) (435) 755-2117 (fax)</p>

Appendix G - Box Elder County Natural Resource Maps





Planning Area A

Howell

Portage

Plymouth

Fielding

Tremonton City

Deweyville

Elwood

Horseville

Bear River City

Corinne City

Brigham City

Mantua City

Parry City

Bear River Migratory Bird Refuge

Blue Springs ACEC

Public Shooting Grounds WMA

Salt Creek WMA

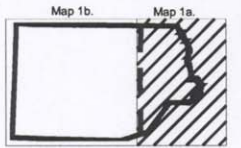
Golden Spike NHS

Willard Bay State Park

Willard Bay Upland Game Management Area

**Box Elder County Comprehensive Wetlands Management Plan
Map 1a. Jurisdictional Boundaries & Features - East**

- Box Elder County Boundary
- Planning Area Dividing Line
- State of Utah Sovereign Land Boundary (Great Salt Lake Meander Line)
- Roads**
- Interstates
- US Highways
- City & County
- 4WD
- Railroads
- Streams**
- Perennial
- Canal/Ditch/Aqueduct
- Bear River Migratory Bird Refuge Conservation/Acquisition Area**
- Priority "A"
- Priority "B"
- Priority "C"
- BLM Area of Critical Environmental Concern Acquisition Areas (willing seller only)
- Land Ownership**
- BLM
- BLM ACEC
- State
- State Wildlife Reserve/Management Area
- Forest Service
- USFWS National Wildlife Refuge
- National Park/Monument/Historic Site
- Military Reservation
- Private
- Water
- Municipal Boundaries
- Duck Clubs**
- Feather & Fin Sports Club
- Bear River Club Co.
- Davis Duck Club
- Chesapeake Duck Club
- Canadian Goose Club






















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Data derived from State of Utah Automated Geographic Reference Center, with correction and additions made based on data collected from the following: Box Elder County; Utah Division of Wildlife Resources; Utah Division of Forestry, Fire, & State Lands; Utah School and Institutional Trust Lands Administration; U.S. Fish and Wildlife Service; and U.S. Bureau of Land Management.

Scale: 1" = 4.4 miles

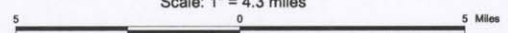


Box Elder County Comprehensive Wetlands Management Plan
 Map 10a. Wetland Planning Classes - East

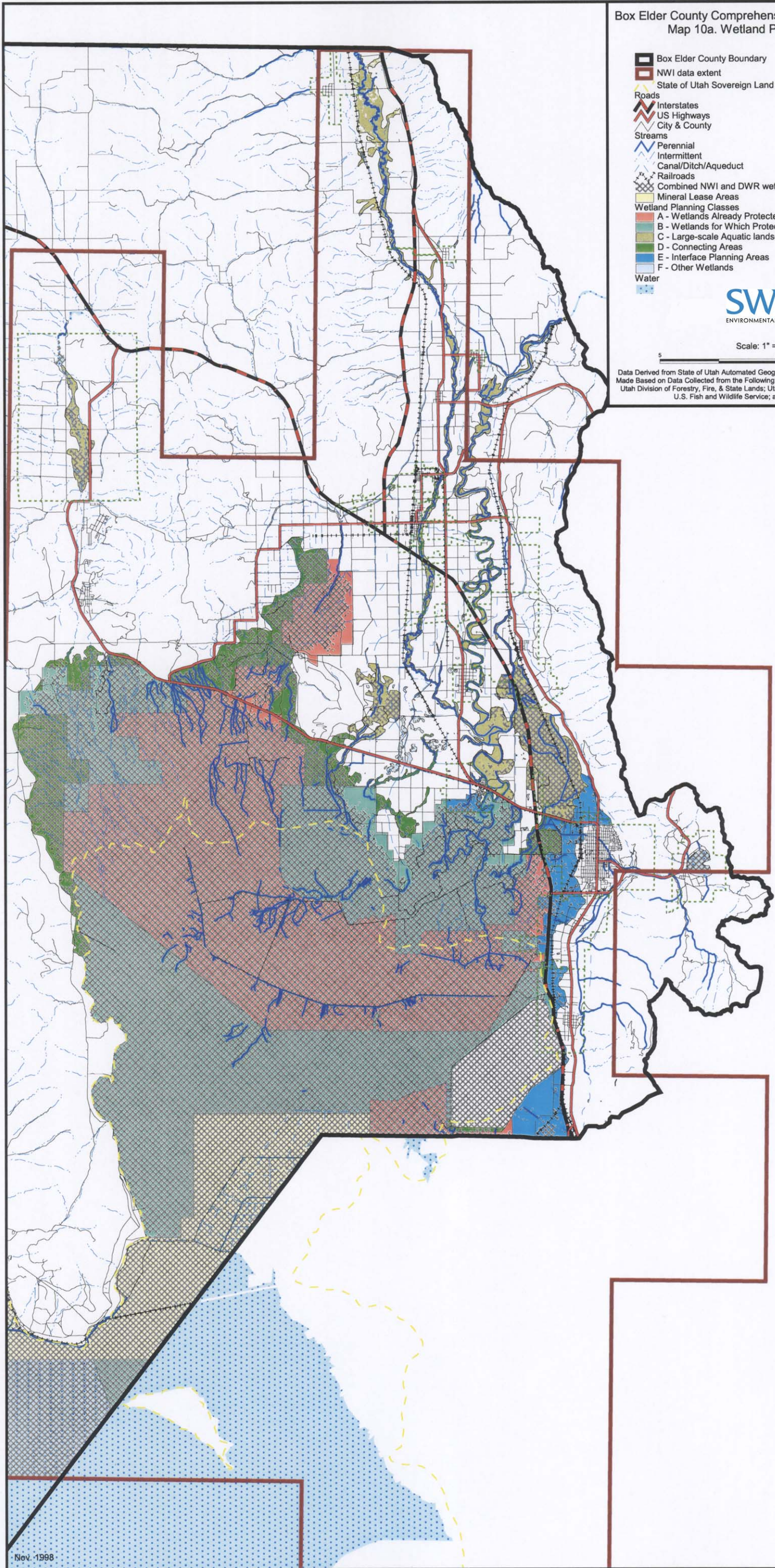
-  Box Elder County Boundary
-  NWI data extent
-  State of Utah Sovereign Land Boundary (Great Salt Lake Meander Line)
- Roads**
-  Interstates
-  US Highways
-  City & County
- Streams**
-  Perennial
-  Intermittent
-  Canal/Ditch/Aqueduct
-  Railroads
-  Combined NWI and DWR wetlands
-  Mineral Lease Areas
- Wetland Planning Classes**
-  A - Wetlands Already Protected
-  B - Wetlands for Which Protection Plans Are Being Developed
-  C - Large-scale Aquatic landscape Features
-  D - Connecting Areas
-  E - Interface Planning Areas
-  F - Other Wetlands
- Water**
- 

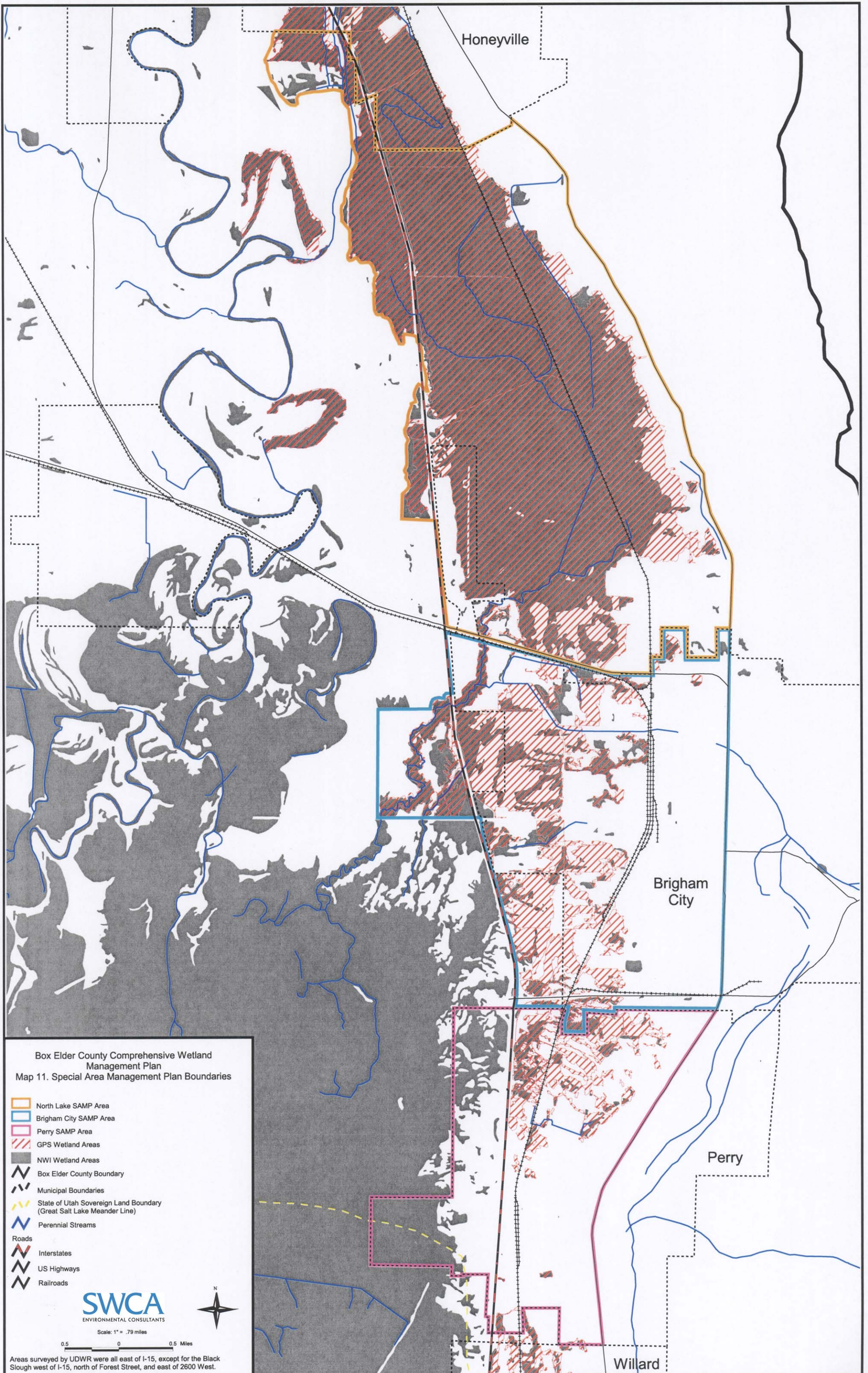


Scale: 1" = 4.3 miles



Data Derived from State of Utah Automated Geographic Reference Center, with Correction and Additions Made Based on Data Collected from the Following: Box Elder County; Utah Division of Wildlife Resources; Utah Division of Forestry, Fire, & State Lands; Utah School and Institutional Trust Lands Administration; U.S. Fish and Wildlife Service; and U.S. Bureau of Land Management.





Box Elder County Comprehensive Wetland Management Plan
 Map 11. Special Area Management Plan Boundaries

- North Lake SAMP Area
- Brigham City SAMP Area
- Perry SAMP Area
- GPS Wetland Areas
- NWI Wetland Areas
- Box Elder County Boundary
- Municipal Boundaries
- State of Utah Sovereign Land Boundary (Great Salt Lake Meander Line)
- Perennial Streams
- Roads
- Interstates
- US Highways
- Railroads

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Scale: 1" = .79 miles

0.5 0 0.5 Miles

Areas surveyed by UDWR were all east of I-15, except for the Black Slough west of I-15, north of Forest Street, and east of 2600 West.