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**A Preliminary Survey of the
National Wetlands Inventory
as Mapped for the Idaho National
Engineering Laboratory**

***N. L. Hampton
R. C. Rope
J. M. Glennon
K. S. Moor***

MASTER

Lockheed
Idaho Technologies Company

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**A PRELIMINARY SURVEY OF
THE NATIONAL WETLANDS INVENTORY
AS MAPPED FOR THE
IDAHO NATIONAL ENGINEERING LABORATORY**

N. L. Hampton
R. C. Rope
J. M. Glennon
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February 1995

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MASTER

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ABSTRACT

Approximately 135 areas within the boundaries of the Idaho National Engineering Laboratory (INEL) have been mapped as wetland habitat as part of the United States Fish and Wildlife Service (FWS) National Wetlands Inventory (NWI). A preliminary survey of these wetlands was conducted to examine their general characteristics and status, to provide an estimation of relative ecological importance, to identify additional information needed to complete ecological characterization of important INEL wetlands, and to identify high priority wetland areas on the INEL. The purpose of the survey was to provide information to support the preparation of the Environmental Restoration and Waste Management (ER&WM) Environmental Impact Statement (EIS). Information characterizing general vegetation, hydrology, wildlife use, and archaeology was collected at 105 sample sites on the INEL. Sites representing NWI palustrine, lacustrine, and riverine wetlands (including manmade), and areas unmapped or unclassified by the NWI were included in the sample. The field information was used to develop a preliminary ranking of relative ecological importance for each wetland visited during this survey. Survey limitations are identified.

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ACRONYMS AND ABBREVIATIONS

COE	U.S. Army Corps of Engineers
DOE	U.S. Department of Energy
EIS	Environmental Impact Statement
ER&WM	Environmental Restoration and Waste Management
FWS	U.S. Fish and Wildlife Service
GIS	geographic information system
GPS	global positioning system
INEL	Idaho National Engineering Laboratory
IRC	INEL Research Center
NEPA	National Environmental Policy Act
NWI	National Wetlands Inventory
PTI	Protection Technology Inc.
NRCS	Natural Resources Conservation Service
USGS	U.S. Geological Survey

A PRELIMINARY SURVEY OF NWI WETLANDS ON THE IDAHO NATIONAL ENGINEERING LABORATORY

1. INTRODUCTION

A preliminary survey of wetland habitats located on the Idaho National Engineering Laboratory (INEL) was conducted in the Fall of 1992 to: (a) examine the general characteristics of INEL wetlands, (b) assess the current status of those wetlands, (c) provide a preliminary evaluation of the relative ecological importance of wetlands on the INEL, (d) identify information needed for further ecological characterization of important INEL wetlands, and (e) identify high priority wetland areas on the INEL. The purpose of the survey was to provide preliminary information to support the preparation of the Environmental Restoration and Waste Management (ER&WM) Environmental Impact Statement (EIS) and to provide initial screening information to identify favorable and unfavorable locations for new facilities (i.e., roads, buildings, etc.). The survey was not intended to delineate wetland areas or serve as an accuracy assessment of the wetlands that have been mapped by the National Wetlands Inventory.

Approximately 135 areas within the boundaries of the INEL have been identified and mapped as part of the United States Fish and Wildlife Service (FWS) National Wetlands Inventory (NWI)¹. The NWI is a program instituted to characterize and map the nation's wetland resources. NWI wetlands are delineated using the FWS official wetlands classification system (Cowardin, et al., 1979). To develop the NWI wetland maps, hydrological, vegetative, and soil characteristics are analyzed using high altitude aerial photography, Natural Resources Conservation Service (NRCS) soil surveys, and United States Geological Survey (USGS) topographical maps (FWS, 1990). Draft maps are distributed to interested parties in federal and state agencies and the public for further verification. The finalized maps provide information and guidelines for wetland management. Lands assigned wetland status under the NWI may be subject to regulation and management by a number of federal, state, and local governmental agencies, however, NWI maps are not intended to define agency jurisdiction (Wilen, 1988).

¹ Total was determined by counting the number of polygons or linear segments mapped by the NWI.

A brief overview of NWI mapping conventions and FWS classification definitions are presented in Section 2. The considerations used to select the INEL wetlands sampled for this survey are also discussed in Section 2. Section 3 describes the methodology for field data collection. A completed example of the Wetland/GIS Field Documentation Form is included in Appendix A. Wetland characteristics based on survey data are summarized in Section 4.

For ease of discussion, INEL wetlands have been grouped into five categories: palustrine and lacustrine (Section 4.1), riverine (Section 4.2), manmade (Section 4.3), unmapped (Section 4.4) and unclassified (Section 4.5). The general characteristics discussed for each category include size, vegetative and hydrological characteristics, wildlife presence and archaeological evidence. The survey data for individual sites are numbered and summarized in Appendix B, Table B-1. Site numbers associated with Table B-1 may be used to identify individual wetlands on the map in Appendix D. Section 5 contains a discussion of survey limitations in relation to FWS classification and characterization of particular INEL wetlands. Survey findings are summarized in Section 6.

The information from this survey can be used to: (a) locate NWI mapped wetlands and other surveyed areas using the GIS generated map included in Appendix D, (b) determine basic characteristics associated with a wetland class (Section 5), or (c) review survey results, characteristics, and relative importance for specific wetlands in either summarized form (Table B-1) or from field data collection forms and photographs (available from Environmental Assessment Technologies).

INEL activities involving facility siting, mitigation, remediation, and environmental restoration should use this map and survey information to determine the following for the areas where these activities are taking place:

1. If there are NWI classified wetlands in the area
2. If there is survey information for these areas
3. If the physical/biological characteristics where the activities are taking place are similar to the wetlands that were surveyed
4. If the wetlands surveyed have potential ecological significance

5. The additional information necessary to fully characterize the surveyed sites as wetlands, their potential ecological significance, and possible mitigation needs if degradation of the area occurs.

1.1 Background

The NWI maps used for this survey were finalized prior to adoption of the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (Federal Interagency Committee for Wetlands Delineation, 1989) (referred to as the Federal Manual). This manual was developed in a cooperative effort between the Environmental Protection Agency (EPA), Army Corps of Engineers (COE), NRCS and FWS to provide "mandatory technical criteria, field indicators, and recommended methods for identifying and delineating jurisdictional wetlands".

Under Department of Energy (DOE) General Provisions, 10 CFR 1022.4(v), 1992, (DOE, 1992) wetlands are defined as:

"..areas that are inundated by surface or groundwater with a frequency sufficient to support and under normal circumstances does or would support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes and bogs, and similar areas such as sloughs, potholes, wet meadows, river overflow, mudflats, and natural ponds."

The definition is similar to EPA, COE, NRCS and FWS wetlands definitions and although wording may vary among agencies, all address three primary criteria [as summarized from the federal manual (Federal Interagency Committee for Wetlands Delineation, 1989)]. These criteria include:

1. Hydrophytic Vegetation - Hydrophytic vegetation is defined as "macrophytic plant life growing in water, soil or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content." Wetland plant species have been assigned indicator status based on the frequency with which the species is found in wetlands (Reed, 1988). *Obligate Wetland* plants occur almost always in natural wetlands (estimated probability >99%). *Obligate Upland* plants include those species that occur in non-wetlands (estimated probability

> 99%). *Facultative Wetland* plants usually occur in wetlands (estimated probability 67 to 99%), but are occasionally found in non-wetlands. Plants equally likely to occur in non-wetlands as in wetlands (estimated probability 34 to 66%) are designated *Facultative*. *Facultative Upland* plants generally occur in non-wetlands (estimated probability 67%-99%), however are occasionally found in wetlands (1 to 33%).

2. Hydric Soils - Hydric soils are saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions in the upper part. These soils generally support hydrophytic vegetation.
3. Wetland Hydrology - Wetland hydrology is indicated by permanent or periodic inundation or soil saturation to the surface, at least seasonally.

Two primary differences exist between the FWS wetlands definition and those of the EPA and COE. The first is the "recognition by FWS of both vegetated and non-vegetated areas (e.g., mudflats, sand flats, rocky shores, gravel beaches and sand bars)" (Federal Interagency Committee for Wetland Delineation, 1989). The EPA/COE definition includes the statement "wetlands generally include swamps, marshes, bogs, and similar areas" (Federal Interagency Committee for Wetland Delineation, 1989). The DOE definition is phrased the same as the EPA/COE definition except that the concluding line states that "wetlands generally include swamps, marshes, bogs, sloughs, potholes, wet meadows, river overflow, mudflats, and natural ponds" [10 CFR 1022.4(v), 1992]. The FWS recognizes the existence of wetlands that lack vegetation and or soil, especially in arid and semiarid regions (Tiner, 1989). Inclusion of mudflats in the DOE definition conflicts with the three criteria requirement because these areas are considered non-vegetated wetlands by the FWS.

The second difference is the way in which the technical criteria (hydrophytic vegetation, hydric soils and wetland hydrology) are applied for wetland delineation. All three criteria must be met under the EPA/COE definition, whereas the FWS delineation is based primarily on hydrological indicators and habitat features. A more detailed interpretation of the DOE definition is required before verification of INEL wetland characteristics based on the technical criteria in the federal manual can be considered conclusive.

The use of NWI, USGS and NRCS maps, as well as other state and agency wetland program information for wetland characterization is prescribed under DOE General Provisions [10 CFR 1022.11(c)] (DOE, 1992). However, technical criteria to be applied in assessing vegetation, soils and hydrology are not specified. Consequently, technical criteria drawn from the 1989 federal manual were used to develop data collection requirements and field methodology for this survey. NWI wetlands maps, USGS 7.5' topographic maps and aerial photographs (1991, 1:40,000) were the primary sources of information for the survey.

It is unclear whether the DOE definition requires application of mandatory technical criteria conforming to the EPA/COE definitions. The NWI sites for which wetland vegetation and/or wetland hydrologic criteria were confirmed satisfy the FWS wetland criteria requirements. However, no verification with regard to the EPA/COE three criteria requirement can be made for these sites without confirmation of hydric soils. Collection of soils data was beyond the scope of this preliminary survey.

Since the completion of the INEL survey (November, 1992), proposed revisions to the 1989 manual (EPA, 1991) have been challenged. Environmental organizations, scientific groups, and some state and local officials have been concerned that proposed changes may adversely affect millions of acres of wetlands. Pending resolution of questions regarding wetland delineation criteria, the EPA and COE have adopted the Corps of Engineers Wetlands Delineation Manual (1987). It is unclear whether the FWS will also use the 1987 manual.

2. WETLAND SITE SELECTION

The geographic coverage of the INEL includes thirty, 7.5' USGS topographic quadrangles. Finalized or draft NWI maps have been generated for twenty-five of these quadrangles (Figure 1). Designated wetlands from the completed NWI inventory maps were digitized and entered into a geographic information system (GIS) at the INEL. A map of INEL wetlands was created and combined with other coverages already available in the GIS database.

FWS NWI classification and mapping procedures are well documented (Cowardin, 1979; FWS, 1990). Sixteen separate classifications are represented by approximately 135 wetland areas and stream segments within INEL boundaries. These NWI classifications are denoted by a descriptive acronym assigned by the FWS and are defined on Table 1. Two additional classes were created for this survey to include investigation of: (a) potential wetlands that exist in the five quadrangles not yet mapped by the FWS NWI (UNMAP) and (b) areas within the mapped quadrangles that have characteristics similar to mapped wetlands, but were not classified as wetlands (UNCLASS).

INEL wetland areas classified as palustrine and lacustrine by the NWI are generally delineated as polygons on USGS 7.5' topographical maps. For this survey, each polygon representing homogeneous characteristics was defined as a single site. Riverine features mapped by the NWI are represented by line segments. Several short segments (approximately 100 m) along the length of these features were visited and described. Each of these shorter segments was defined as a single site. Examples of site definition for polygons and linear features are shown on Figure 2. These conventions were also applied to unmapped and unclassified wetlands included in the survey.

2.1 Considerations for Site Selection

Approximately 100 sites representing wetlands for all classifications on the INEL were selected for the survey (Table 1). The following considerations were used to select a sample that would provide a good representation of the wetlands distributed across the INEL and meet the objectives of this survey:

* - Quadrangles not yet mapped by NWI
W - Quadrangles with mapped wetlands

Figure 1. USGS 7.5' quadrangle coverage for the INEL.

Table 1. Definition of INEL NWI mapped wetlands survey site classifications.

WETLAND ACRONYM (Type)	WETLAND CLASSIFICATION WITH MODIFIERS	TOTAL NWI MAPPED WETLANDS ON THE INEL	NUMBER OF WETLAND SITES SURVEYED
NWI Classifications			
PAB4Hx	P=Palustrine, AB=Aquatic Bed, 4=Floating Vascular, H=Permanently Flooded, x=Excavated	1	1
PEM1A	P=Palustrine, EM=Emergent (Vegetation), 1=Persistent, A=Temporarily Flooded	5	1
PEM1C	P=Palustrine, EM=Emergent (Vegetation), 1=Persistent, C=Seasonally Flooded	2	2
PEM1J	P=Palustrine, EM=Emergent (Vegetation), 1=Persistent, J=Intermittently Flooded	2	2
PEMJ	P=Palustrine, EM=Emergent (Vegetation), J=Intermittently Flooded	2	2
POWHx	P=Palustrine, OW=Open Water, H=Permanently Flooded, x=Excavated	14	11
PUSC	P=Palustrine, US=Unconsolidated Shore, C=Seasonally Flooded	1	1
PUSCrX	P=Palustrine, US=Unconsolidated Shore, C=Seasonally Flooded, r=Artificial Substrate, x=Excavated	2	2
PUSCx	P=Palustrine, US=Unconsolidated Shore, C=Seasonally Flooded, x=Excavated	1	1
PUSJ	P=Palustrine, US=Unconsolidated Shore, J=Intermittently Flooded	88	45
L2USJ	L=Lacustrine, 2=Littoral, US=Unconsolidated Shore, J=Intermittently Flooded	5	4
R2OWHx	R=Riverine, 2=Lower Perennial, OW=Open Water, H=Permanently Flooded, x=Excavated	1	1
R4SBA	R=Riverine, 4=Intermittent, SB=Streambed, A=Temporarily Flooded	2	1
R4SBC	R=Riverine, 4=Intermittent, SB=Streambed, C=Seasonally Flooded	2	1
R4SBKcX	R=Riverine, 4=Intermittent, SB=Streambed, K=Artificially Flooded, C=Seasonally Flooded, x=Excavated	2	0
R4SBJ	R=Riverine, 4=Intermittent, SB=Streambed, J=Intermittently Flooded	3	1
R4SBJx	R=Riverine, 4=Intermittent, SB=Streambed, J=Intermittently Flooded, x=Excavated	2	2
TOTAL NWI CLASSIFICATIONS		135	78
Special Survey Classifications			
UNCLASS	UNCLASS=Area not classified as a wetland by NWI	Unknown	29
UNMAP	UNMAP=NWI maps not complete	Unknown	14
TOTALS		Unknown	121

- 1) Each polygon represents one site:

EXAMPLE: 3 sites classified as PUSJ

- 2) Each polygon represents a separate site

EXAMPLE: 2 sites classified as PEM1C and 1 site classified as R4SBJ

- 3) Polygon intersected by linear map features and labeled on either side was treated as a single site

EXAMPLE: One site classified as PEM1C

- 4) Segments along mapped riverine features were each designated as a single sample site

EXAMPLE: 2 sites classified as R4SBJ

Figure 2. Examples of site definition for polygons and linear features.

1. Location with respect to existing or proposed facilities - Wetlands located in the immediate vicinity of proposed or existing facilities were included to provide additional information for facility planning, design, and environmental monitoring. Because of logistic problems associated with facility security, three sites inside existing facility fences were excluded from the survey.
2. Schedule and Budget - The number of sites selected was based on an estimate of what could be surveyed within the limits of schedule and budget. Constraints on time were increased by the possible onset of winter weather conditions that would impact helicopter and ground transportation.
3. Total number of sites within each FWS classification - One goal of the survey was to obtain information for each wetland classification found on the INEL, therefore a minimal number of sample sites from each type was desirable to describe the range in variability. Generally, all sites for wetland types having six or fewer mapped wetlands were included in the survey. Approximately 50% of the wetlands in each of the remaining classifications were selected for the survey. The resulting number of sample sites for each type is shown on Table 1.
4. Distribution over the entire INEL - Another goal for the survey was to obtain information on wetlands distributed throughout the INEL, therefore site selection included sample sites from each of the quadrangles with mapped wetlands. Sites were selected from the 13 topographical quadrangles in which NWI wetlands were mapped and four unmapped quadrangles. Information provided by NWI maps, USGS 7.5' topographical maps and high altitude aerial photographs was used to select samples from all 16 FWS and the two special classes. Where separate wetlands of the same classification were grouped in close proximity, one or two sites were subjectively chosen.
5. Distribution of unmapped and unclassified areas - NWI maps for five quadrangles covering the INEL, but drafts were unavailable for this survey. Some areas shown on these quadrangles that appeared to fit the profile of other NWI mapped wetlands on the INEL were included in the survey. A number of potential, but unclassified wetland areas, were identified through review of topographic maps, aerial photographs, and aerial survey. These areas were

not classified as wetlands by NWI, but have similar characteristics and locations to mapped wetlands. A small sample of these unclassified sites was included to compare with areas that were mapped by the NWI. This effort was included to provide a better understanding of the wetland delineation criteria and characteristics specific to INEL mapped wetlands and the consistency of the NWI maps.

3. FIELD SURVEY METHODS

Wetland characteristics within the perimeters delineated on NWI maps were described in detail for this survey. General information was collected for areas beyond most mapped wetland perimeters (approximately 100 m) to obtain a more complete profile of habitat, wildlife use and potential importance. Channel segments with cottonwood (*Populus angustifolia*), willow (*Salix exigua*) or other unique habitat along the banks were selected as sampling sites for riverine features (see Figure 2). However, because information collected for riverine wetlands applies primarily to the stream channel, habitats along the banks were described independently. Where NWI maps were unavailable (unclassified and unmapped areas), wetland perimeters were approximated by comparison to similar classified wetlands.

An example of the Wetlands/GIS Field Documentation Form used for this survey and instructions for its completion are given in Appendix A. The form includes primary components of the NWI wetlands assessment forms (Federal Interagency Committee for Wetland Delineation, 1989) combined with information necessary for validation of a vegetation map being developed for the INEL.

A field form was completed for each site. These documentation forms were completed in conjunction with an intuitive controlled intensity level survey (U.S. Forest Service, 1991). This survey is utilized by the U.S. Forest Service to conduct vegetation inventories, identify plant associations, and develop habitat descriptions for threatened and endangered species. The survey consisted of walking areas within wetland perimeters and in the general area to ensure that all vegetation and/or unique habitats were located. This survey methodology is a more detailed adaptation of the NWI routine plant community assessment procedure (Federal Interagency Committee for Wetland Delineation, 1989). It was applied during the field investigation of INEL wetlands to address both routine assessment and EIS requirements. Copies of the data forms completed for this survey are on file with Environmental Assessment Technologies.

A routine survey of vegetative characteristics including abundance, species (Plummer, et al., 1977), wetland indicator status (Reed, 1986), and areal extent of vegetation was conducted for areas inside mapped wetland perimeters and most surrounding areas. The abundance of each vascular plant

species occurring on the site was ranked using a four-point scale (4 = dominant to 1 = rare). The scale is a simplification of cover/abundance scales (Mueller-Dombois and Ellenberg, 1974) based on intuitive abundance categories (plant basal coverage) rather than cover-class estimates.

Hydrological information including evidence of past and present water activity, drainage patterns, water marks, drift lines, and vegetation damage due to inundation were collected as part of the routine survey for each site. Information was recorded for both areas inside mapped perimeters and features in the general vicinity that may be important to hydrological characterization, e.g. stream channels.

Information required for extensive soil analyses is also addressed by the field documentation form. However, for this survey, only soil color and a field estimate of soil texture were recorded.

Animal observations, tracks, scat, nests, burrowing, and browsed vegetation were used as indicators of wildlife use. As part of the routine survey, all indicators observed inside wetland perimeters and surrounding areas were recorded. When a positive identification could be made, the species was noted. Relative abundance of sign for each species identified was rated high, moderate or low. Consideration was given to size of the survey area and individual species habit to make a subjective estimate of use.

Presence of archaeological evidence was also used to rate each site as high, moderate, low, or none depending on relative abundance of prehistoric archaeological objects or structures. For this survey, archaeological objects included artifacts (objects with definable shape and characteristics of tools, for instance spear points or scrapers) and flakes (pieces of lithic waste created during the manufacture of stone tools). As part of the routine survey, archaeological evidence observed inside wetland perimeters and surrounding areas was recorded. The size of the area covered by the survey and the density of artifacts and flakes were considered to make a subjective estimate of relative abundance. Each wetland area was ranked as high, moderate, or low with respect to both artifacts and flakes.

Position coordinates for most sites were obtained using a Trimble Navigation Pathfinder Professional Global Positioning System (GPS). To maximize accuracy, field coordinates were

differentially corrected using files collected by the Community Base Station located at the INEL Research Center (IRC). Where possible, GPS positions at each site were obtained from easily identifiable locations, for instance, the approximate site center, corner or permanent landmark. Separate GPS data forms were completed for each site and site identifiers associated with the wetland field documentation forms were used as filenames for GPS data. The GPS field data collection collection forms are on file with Environmental Assessment Technologies.

Color slides were obtained at each site using a 35 mm camera fitted with a 50 mm lens and ASA 64 Kodachrome film. Views facing north, west, south, east and down were taken from the same point as the GPS data. For fenced or water filled areas, GPS readings and photographs were obtained at fence corners, access road intersections, or outlets. Film roll identification and frame numbers for each site were recorded on the field documentation forms. Photographs for each site visited during the survey are archived with Environmental Assessment Technologies.

Access to INEL wetland sites was gained primarily through use of the Department of Energy (DOE) helicopter operated by Protection Technology Idaho (PTI) personnel. Only a few primitive access roads exist through extensive sage and lava areas of the INEL and in many areas, lack of topographical relief and/or landmarks make navigation from the ground difficult. NWI wetland maps, topographical maps and color aerial photos were used extensively to locate and distinguish sites, especially in rough terrain. Without the benefit of helicopter transportation, this survey would have taken substantially more time and funding to complete.

4. WETLAND CHARACTERISTICS AND DISTRIBUTION

A total of 121 sites in 16 NWI and two special categories were surveyed. Field descriptions were completed for 105 of the 121 sites. In addition to the 100 sites planned for the survey, 20 sites were inspected as part of the verification of grouped wetland sites. Where separate wetlands of the same classification were grouped in close proximity, a single site was surveyed and several or all adjacent sites were visited to verify similarity. Mapped NWI wetlands and survey sites are shown in Figure 3.

Permanent and temporary water sources are important components of desert ecosystems (Jones, 1986). Based on this assumption, a subjective ranking of individual sites was compiled to prioritize INEL wetlands with regard to potential ecological importance. A qualitative importance ranking for each site was based on unique habitats or vegetation observed, areal extent, hydrology, observation or signs of wildlife use, plant and animal diversity, disturbance, historical record and archaeological evidence. Sites having vegetation communities dominated by species other than sagebrush (*Artemisia* spp.) are generally less common on the INEL. As a result, the wetland sites having large areas dominated by basin wildrye (*Elymus cinereus*), greasewood (*Sarcobatus vermiculatus*) or winterfat (*Ceratoides lanata*), for instance, were ranked higher in ecological importance because of their unique characteristics. Sites in close proximity to other mapped wetlands that appeared to be linked as a network were given a higher ranking. Overall evidence of wildlife use was estimated as high, moderate or low based on sign for all species combined. Sites having greater diversity of plant and animal species, and those with substantial archaeological evidence, were ranked higher in ecological importance. Highly disturbed areas (human activities, grazing, etc.) were rated lower than sites retaining apparent natural characteristics. For some areas (e.g. Big Lost River Sinks), wetland attributes including hydrology, vegetation, and soils described in prior INEL studies were used to augment field data for determination of the overall ranking. Each site was individually assessed and assigned a number between 1 and 4, where 1 represents wetlands ranked highest in potential importance and 4 represents sites having no apparent wetland characteristics.

Conditions associated with extended drought and the season in which field investigations were conducted limited the collection of important vegetative and hydrological information, and other information such as wildlife use is not available. This ranking procedure can only be considered a

WETLANDS OF THE INEL

(As mapped by the USFWS National Wetlands Inventory)

+

Sites Surveyed
Number references
Table B-1

Produced as part of the "Preliminary
Survey of NWI Wetlands on the Idaho
National Engineering Laboratory" by:
N. L. Hampton
R. C. Rope
J. M. Glennon
R. D. Lee

Note: This map does not address omission and
commission errors and is not field
verified.

0 5 10 15 Miles

CENTER FOR
INTEGRATED
ENVIRONMENTAL
TECHNOLOGIES

Figure 3. Mapped NWI wetlands and surveyed sites.

subjective estimate of potential importance of each wetland relative to the conditions **present during the survey**.

Summarized information and rankings for each of the 105 surveyed sites are presented in Appendix B, Table B-1. General characteristics including vegetation, wildlife use, archaeological evidence and rankings for the sixteen NWI wetlands and two special classifications are discussed below. Definitions of the NWI and special classifications are given on Table 1.

4.1 Palustrine and Lacustrine Wetlands

4.1.1 PUSJ Classified Wetlands

Approximately 70% of the individual NWI wetlands within INEL boundaries are classified as PUSJ. The distribution of surveyed PUSJ sites is shown on Figure 4. Total area encompassed by PUSJ wetlands is just under 20-ha (50 acres). The smallest PUSJ site is approximately .04-ha (.1 acre) and the largest about 3-ha (7 acres).

Thirty-seven of the 44 surveyed PUSJ wetlands are dry, bare playas with scattered halogeton (*Halogeton glomeratus*) plants established in mud cracks. Four sites (Figure 4, sites 9, 23-25) are basins containing primarily basin wildrye (*Elymus cinereus*). Other established vegetation at PUSJ sites was rare. Nearly all sites are surrounded by sagebrush (*Artemisia* spp.) in some combination with other species including weeds, grasses, greasewood (*Sarcobatus vermiculatus*), rabbitbrush (*Chrysothamnus* spp.), or winterfat (*Ceratoides lanata*). Plant species identified at PUSJ wetlands are listed on Table 2.

Although no water was present at any PUSJ site, their characteristics indicate that water is present during some parts of the year. No obligate or facultative wetland vegetation was observed. Playa soil texture was generally fine (silty clay or silty clay loam) and compacted, with surfaces broken by mud cracks. Many of the sites are surrounded by large areas of dead and dying sagebrush (*Artemisia* spp.). No rare or endangered species were observed.

Figure 4. Surveyed PUSJ wetlands of the INEL.

Table 2. Summary of vegetation observed at sampled PUSJ wetland sites.

WETLAND CLASSIFICATION	ON-SITE VEGETATION	INDICATOR STATUS ^a
PUSJ	<i>Agropyron dasystachyum</i>	FACU
	<i>Artemisia tridentata wyomingensis</i>	
	<i>Atriplex nuttallii</i>	
	<i>Chrysothamnus viscidiflorus</i>	
	<i>Elymus cinereus</i>	FACU
	<i>Halogeton glomeratus</i>	
	<i>Machaeranthera canescens</i>	
	<i>Opuntia polyacantha</i>	
	<i>Oryzopsis hymenoides</i>	UPL
	<i>Phlox hoodii</i>	
	<i>Poa nevadensis</i>	FACU
	<i>Salsola kali</i>	FACU

^a Region 9 wetland indicator status (Reed, 1988)

UPL - upland

FACU - facultative upland

FAC - facultative

FACW - facultative wetland

OBL - obligate wetland

A blank indicates that species is not included on the Region 9 list and is therefore considered UPL (Reed, 1988).

Evidence of wildlife was present at all PUSJ sites, and, nearly one third of the sites had signs of heavy use. Archaeological evidence was moderate overall, but substantial quantities of material were noted at several individual sites. Ten of 15 PUSJ sites located in the Little Butte NW quadrangle and all three sites in Antelope Butte Quadrangle were ranked high with respect to potential ecological importance (Table B-1). Unique features of these areas include uncommon vegetative composition, interconnected networks of playas, and high evidence of wildlife use. More information would be required to assess wildlife use. Sites of interest should be visited during the growing season and during years with normal precipitation for better information on plant and animal communities. An assessment of seasonal water retention would be required and should include soil data for definitive characterization of these wetlands. More detailed surveys would have to be made to determine the nature and complete extent of the observed archaeological materials.

4.1.2 L2USJ, PEM1A, PEM1C, PEM1J, and PEMJ Classified Wetlands

Lacustrine (L2USJ) and palustrine (PEMJ, PEM1J, PEM1A, and PEM1C) classifications cover large portions of the Big Lost River spreading areas and the outflow areas from the Big Lost River sinks. The distribution of these wetlands and location of surveyed sites are shown in Figure 5.

Figure 5. Surveyed palustrine and lacustrine wetland sites of the INEL.

The largest single area encompassed by L2USJ wetlands is approximately 325-ha (800 acres). Area totals for PEMJ, PEM1J, PEM1A and PEM1C wetlands are between 160-ha (400 acres) and 290-ha (700 acres). INEL wetlands included in these classifications cover approximately 1417-ha (3500 acres) total.

Wetlands for these five classifications are expansive, with large areas of bare ground and perennial weed cover. Most areas are heavily grazed by cattle. Native perennials are present in small numbers for both PEM1J sites (Figure 5, sites 34, 35) and some native grasses were found among many weed species at the PEM1A site (Figure 5, Site 31). Sagebrush (*Artemisia spp.*) dominated communities surround both lacustrine and palustrine wetlands for all five classifications. Plant species identified for L2USJ, PEM1A, PEM1C, PEMJ, and PEM1J wetlands are listed on Table 3.

Remains of obligate wetland vegetation [bulrush (*Scirpus acutus*)] were observed at an outflow area north of NRF (PEM1C) (Figure 5, Site 33), and remains of cattails (*Typha latifolia*) were found in areas of the Big Lost sinks (PEM1C)(Figure 5, Site 32). However, a combination of extended drought, upstream water diversion and heavy cattle grazing have reduced vegetation in the Big Lost sinks to bare ground and weed cover. Gray sandbar willow (*Salix exigua*), an obligate wetland species, was identified in the L2USJ areas east of the Big lost sinks (Figure 5, Sites 55, 56), and several facultative wetland species curly dock (*Rumex crispus*), doorweed (*Polygonum aviculare*) were also identified at L2USJ, PEM1J and PEM1C sites (Figure 5, Sites 55, 34 and 32, respectively). Soils were generally loose, disturbed and fine (sandy silt). No rare or endangered species were observed.

Low to moderate evidence of wildlife use was observed for all eleven of these sites. Three sites had substantial archaeological evidence (one L2USJ [Figure 5, Site 55], one PEMJ [Figure 5, Site 37] and one PEM1J [Figure 5, Site 34]). Overall, potential ecological importance for wetlands included in these classifications is moderate, however four individual areas demonstrating potential for providing unique habitat have been ranked high.

These areas should be examined under normal moisture conditions. Historical photographs show that extensive areas of obligate wetland vegetation existed in the Big Lost sinks as recently as

Table 3. Summary of vegetation observed at sampled palustrine and lacustrine wetland sites.

WETLAND CLASSIFICATION	ON-SITE VEGETATION	INDICATOR STATUS ^a
L2USJ	<i>Agropyron cristatum</i>	
	<i>Agropyron dasystachyum</i>	FACU
	<i>Artemisia tridentata wyomingensis</i>	
	<i>Astragalus calycosus</i>	
	<i>Descurainia pinnata</i>	
	<i>Halogeton glomeratus</i>	
	<i>Hordeum jubatum</i>	FAC
	<i>Iva axillaris</i>	FAC
	<i>Kochia scoparia</i>	FAC
	<i>Lupinus argenteus</i>	
	<i>Oenothera tanacetifolia</i>	
	<i>Oryzopsis hymenoides</i>	UPL
	<i>Polygonum douglasii</i>	FACU
	<i>Rumex crispus</i>	FACW
	<i>Salix exigua</i>	OBL
	<i>Salsola kali</i>	FACU
PEM1A	<i>Agropyron dasystachyum</i>	FACU
	<i>Artemisia tridentata wyomingensis</i>	
	<i>Chenopodium fremontii</i>	
	<i>Halogeton glomeratus</i>	
	<i>Rumex crispus</i>	FACW
	<i>Salsola kali</i>	FACU
PEM1C	<i>Sisymbrium altissimum</i>	FACU
	<i>Agropyron dasystachyum</i>	FACU
	<i>Cirsium arvense</i>	FACU
	<i>Distichlis stricta</i>	FAC+
	<i>Hordeum jubatum</i>	FAC
	<i>Iva axillaris</i>	FAC
	<i>Kochia scoparia</i>	FAC
	<i>Salsola kali</i>	FACU
PEM1J	<i>Scirpus acutus</i>	OBL
	<i>Agropyron dasystachyum</i>	FACU
	<i>Chenopodium fremontii</i>	
	<i>Chrysothamnus nauseosus</i>	
	<i>Cryptantha interrupta</i>	
	<i>Kochia scoparia</i>	FAC
	<i>Polygonum aviculare</i>	FACW
	<i>Salsola kali</i>	FACU
PEMJ	<i>Agropyron dasystachyum</i>	FACU
	<i>Artemisia tridentata wyomingensis</i>	
	<i>Bromus tectorum</i>	
	<i>Chrysothamnus nauseosus</i>	
	<i>Cirsium arvense</i>	FACU
	<i>Elymus cinereus</i>	FACU
	<i>Hordeum jubatum</i>	FAC
	<i>Lupinus argenteus</i>	
	<i>Machaeranthera canescens</i>	
	<i>Poa nevadensis</i>	FACU

^a Region 9 wetland indicator status (Reed, 1988)

UPL - upland

FACU - facultative upland

FAC - facultative (A blank indicates that species is not included on the Region 9 list and is therefore considered UPL (Reed, 1988)).

FACW - facultative wetland

OBL - obligate wetland

1984. Patterns of wildlife use and information to assess grazing impacts on vegetation and wildlife may be useful for further characterization. The northernmost PEM1A site (Figure 5, Site 31) located in the Big Lost sinks is the only INEL wetland that has been ground-truthed by the FWS for the NWI

4.2 Riverine Wetlands

Riverine classifications (R4SBJx, R4SBA, R4SBC, R4SBJ, R20WHx) represent channel features associated with the Big Lost River. The main river channel is mapped as a single R4SBA feature. The distribution of these wetlands and the location of surveyed sites are shown on Figure 6.

The river channel features classified as R4SBC (Figure 6, Site 59), R4SBJ (Figure 6, Site 60), and R4SBJx (Figure 6, Sites 61,62) are generally scattered with weeds. Extended drought conditions have allowed establishment of sparse vegetation, including perennials from the riparian and upland vegetation, along the Big Lost River (R4SBA) (Figure 6, Site 58). Cottonwood (*Populus angustifolia*), rose (*Rosa woodsii*), willow (*Salix exigua*), chokecherry (*Prunus virginiana*) and sagebrush (*Artemisia tridentata*) riparian habitats are common along the southern half of the Big Lost River.

All surveyed riverine wetlands were dry with the exception of the R20WHx site (Figure 6, Site 57). This site is one of three areas surveyed on the INEL that supports obligate wetlands vegetation. Bulrush (*Scirpus acutus*) and cattails (*Typha latifolia*) are maintained at this site by water flow from NRF facility operations. Gray sandbar willow (*Salix exigua*) was the only additional obligate wetland species identified in the main Big Lost River channel (R4SBA). All plant species identified at sites investigated for these classifications are listed on Table 4.

Light to moderate evidence of wildlife use was observed for all riverine areas. However, in some sections of the river, raptor nests and a number of owls were observed in habitats along the banks. Some sections of channel (R4SBJ) (Figure 6, Site 60) are heavily disturbed by cattle grazing. The archaeological sensitivity of these channels is also very high as evidenced by dense concentrations of surface materials and the erosion of buried archaeological materials from cutbanks.

Figure 6. Surveyed riverine wetlands of the INEL.

Table 4. Summary of vegetation observed at sampled riverine wetland sites.

WETLAND CLASSIFICATION	ON-SITE VEGETATION	INDICATOR STATUS ^a
R20WHx	<i>Cirsium arvense</i>	FACU
	<i>Scirpus acutus</i>	OBL
	<i>Typha latifolia</i>	OBL
R4SBA	<i>Agropyron caninum</i>	FAC
	<i>Artemisia tridentata wyomingensis</i>	
	<i>Astragalus lentiginosus</i>	
	<i>Chrysothamnus nauseosus</i>	
	<i>Chrysothamnus viscidiflorus</i>	
	<i>Euphorbia glyptosperma</i>	
	<i>Machaeranthera canescens</i>	
	<i>Melilotus officinalis</i>	FACU
	<i>Oryzopsis hymenoides</i>	UPL
	<i>Salix exigua</i>	OBL
R4SBC	<i>Salsola kali</i>	FACU
	<i>Solidago canadensis</i>	FACU
	<i>Artemisia tridentata tridentata</i>	
	<i>Chrysothamnus nauseosus</i>	
	<i>Iva axillaris</i>	FAC
R4SBJ	<i>Kochia scoparia</i>	FAC
	<i>Salsola kali</i>	FACU
	<i>Agropyron dasystachyum</i>	FACU
	<i>Chrysothamnus nauseosus</i>	
R4SBJx	<i>Iva axillaris</i>	FAC
	<i>Salsola kali</i>	FACU
	<i>Agropyron cristatum</i>	
	<i>Agropyron dasystachyum</i>	FACU
	<i>Artemisia tridentata wyomingensis</i>	
	<i>Artemisia tripartita</i>	
	<i>Chaenactis douglasii</i>	
	<i>Chrysothamnus nauseosus</i>	
	<i>Chrysothamnus viscidiflorus</i>	
	<i>Cirsium arvense</i>	FACU
	<i>Descurainia pinnata</i>	
	<i>Eriogonum microthecum</i>	
	<i>Hordeum jubatum</i>	FAC
	<i>Iva axillaris</i>	FAC
	<i>Lupinus argenteus</i>	
	<i>Machaeranthera canescens</i>	
	<i>Medicago sativa</i>	
	<i>Oenothera caespitosa</i>	
	<i>Oryzopsis hymenoides</i>	UPL
	<i>Salsola kali</i>	FACU

^a Region 9 wetland indicator status (Reed, 1988)

UPL - upland

FACU - facultative upland

FAC - facultative

FACW - facultative wetland

OBL - obligate wetland

A blank indicates that species is not included on the Region 9 list and is therefore considered UPL (Reed, 1988).

Potential ecological importance for the Big Lost River (R4SBA) is high, primarily because of the unique and isolated wildlife habitat it provides. Site R2OWHx (Naval Reactor Facility outflow channel) was assigned a moderate ranking because it represents one of three sites on the INEL at which obligate wetland vegetation and water was present.

Because the section of the Big Lost drainage classified as R4SBC is only intermittently flooded, a "J" rather than a "C" designation should be assigned (R4SBJ).

The Birch Creek drainage is a notable riverine area in the northern part of the INEL. Several sites in the drainage were investigated during this survey (Figure 8, Sites 102-105). The creek system contains areas with important riparian communities including of cottonwoods (*Populus spp.*), willow (*Salix spp.*), birch (*Betula occidentalis*), chokecherry (*Prunus virginiana*) and wild rose (*Rosa woodsii*). This is a potentially important area to wildlife, particularly when water is present. Plant species identified at these sites are listed on Table 4.

4.3 Manmade Wetlands

Manmade wetlands on the INEL include industrial waste or sewage treatment ponds (PAB4Hx, POWHx, PUSC_x, PUSC_{rx}), excavated channels (R2OWHx, R4SBJ_x, R4SBKC_x) and borrow or gravel pits (PUSC) associated with INEL facilities. The distribution of the sites visited during this survey is shown in Figure 7. With the exception of several POWHx ponds and channel segments ("R" identifiers), these wetlands are generally less than .8-ha (2 acres) in size and are indistinguishable at the scale shown on Figure 7.

Most waste ponds are surrounded by gravel berms and some are lined. Water sources for these sites are sustained as part of facility operations. Most have only weed species growing around the edges. An exception is the industrial waste pond northwest of Argonne, where water flow maintained by facility operations supports obligate wetland vegetation including bulrush (*Scirpus acutus*) and cattails (*Typha latifolia*). The obligate wetland species, gray sandbar willow (*Salix exigua*) was observed at the waste area south of ARA (PUSC_{rx} [Figure 7, Site 40]). The single PUSC site (Figure 7, Site 38) is an excavated borrow pit with weeds and crested wheatgrass (*Agropyron cristatum*). Minor facultative wetland components observed at POWHx (Figure 7, Site

Figure 7. Surveyed manmade wetlands of the INEL.

48) and PAB4Hx (Figure 7, Site 30) sites include barnyard grass (*Echinochloa crusgalli*), doorweed (*Polygonum aviculare*) and curly dock (*Rumex crispus*). Plant species identified at these sites are listed on Table 5.

The only standing or running water observed at INEL NWI wetlands during this survey was contained in industrial waste ponds or outflow channels associated with facility operations [POWHx and R2OWHx (see section 4.3)]. Evidence of wildlife use for these wetlands was low, however the open water may be of importance to waterfowl in spring and fall. No archaeological evidence was observed at any of these surveyed sites, probably due to the high degree of localized ground disturbance. No threatened or endangered species were observed. Although these areas rank lower in potential ecological importance, they retain importance in relation to facility planning and operations.

Because the single PUSC wetland is excavated, the classification should include an "x" modifier (PUSCx). Six of the eleven POWHx sites have gravel substrates and should include an "r" modifiers (POWHrx). The single wetland classified as PUSCx is a waste pond. Because the pond has standing water, a gravel bed and a liner, an "OW" designation and "r" modifier should be added (POWHrx). Three sites were apparently mis-classified as POWHx. Two areas of dark rock were mistaken for open water on the aerial photos, and one area of sagebrush near a berm had no observable features to support water collection. Of eleven POWHx sites surveyed, six are waste ponds and have gravel substrates. These should include an "r" modifier (POWHrx). One site is a former waste pond that has been capped with concrete. The former waste pond for the LOFT project is classified as PAB4HX. Because the pond has an artificial gravel substrate, an "r" modifier should be included (PAB4Hrx).

4.4 Wetland Areas in Unmapped Quadrangles

The 14 unmapped sites (UNMAP) included in this survey are located in seven quadrangles for which NWI maps have not been completed by the FWS. These maps cover the westernmost areas of the INEL. The sites visited include riverine classifications along the Big Lost River, as well as sites that are similar to the PUSJ sites that were investigated in other areas of the INEL. Unmapped riverine sites were similar to the R4SBA sites described in Section 4.1.3. The remaining sites were

Table 5. Summary of vegetation observed at sampled manmade wetland sites.

WETLAND CLASSIFICATION	ON-SITE VEGETATION	INDICATOR STATUS ^a
PAB4Hx	<i>Cirsium arvense</i>	FACU
	<i>Halogeton glomeratus</i>	
	<i>Hordeum jubatum</i>	FAC
	<i>Polygonum aviculare</i>	FACW
	<i>Rumex crispus</i>	FACW
	<i>Salsola kali</i>	FACU
PUSC	<i>Agropyron cristatum</i>	
	<i>Agropyron dasystachyum</i>	
	<i>Chrysothamnus viscidiflorus</i>	FACU
	<i>Descurainia pinnata</i>	
	<i>Elymus cinereus</i>	FACU
	<i>Halogeton glomeratus</i>	
	<i>Hordeum jubatum</i>	FAC
	<i>Iva axillaris</i>	FAC
PUSCrX	<i>Agropyron cristatum</i>	
	<i>Artemisia tridentata wyomingensis</i>	
	<i>Chrysothamnus nauseosus</i>	
	<i>Chrysothamnus viscidiflorus</i>	
	<i>Halogeton glomeratus</i>	
	<i>Kochia scoparia</i>	FAC
	<i>Oryzopsis hymenoides</i>	UPL
	<i>Salix exigua</i>	OBL
	<i>Salsola kali</i>	FACU
	<i>Sitanion hystrix</i>	FACU
PUSCx	<i>Artemisia tridentata wyomingensis</i>	
	<i>Chenopodium fremontii</i>	
	<i>Chrysothamnus viscidiflorus</i>	
	<i>Kochia scoparia</i>	FAC
	<i>Oryzopsis hymenoides</i>	UPL
	<i>Salsola kali</i>	FACU
	<i>Stipa comata</i>	
POWHx	<i>Carex species</i>	UN
	<i>Cirsium arvense</i>	FACU
	<i>Echinochloa crusgalli</i>	FACW
	<i>Elymus cinereus</i>	FACU
	<i>Halogeton glomeratus</i>	
	<i>Hordeum jubatum</i>	
	<i>Kochia scoparia</i>	FAC
	<i>Polygonum aviculare</i>	FACW
	<i>Rumex crispus</i>	FACW
	<i>Salsola kali</i>	FACU
	<i>Scirpus acutus</i>	OBL
	<i>Typha latifolia</i>	OBL

^a Region 9 wetland indicator status (Reed, 1988)

UPL - upland

FACU - facultative upland

FAC - facultative

FACW - facultative wetland

OBL - obligate wetland

UN - unknown

A blank indicates that species is not included on the Region 9 list and is therefore considered UPL (Reed, 1988).

similar in most respects to PUSJ sites described in Section 4.1.1, except that playa areas dominated by basin wildrye (*Elymus cinereus*) were more common. Plant species identified at unmapped sites are listed on Table 6. The unmapped sites visited for the survey are included on Figure 8.

Unmapped INEL sites visited during this survey should be compared to what is actually included on the forthcoming NWI maps.

4.5 Unclassified Areas

Twenty-nine unclassified areas (UNCLASS) on the INEL were included as part of this survey. Non-riverine sites in this classification were similar in all respects to those classified as PUSJ (Section 4.1.1). Most sites were bare playas or basins dominated by basin wildrye (*Elymus spp.*), however, disturbed areas with numerous weedy species were also included. Some unclassified areas had substantial signs of wildlife use and archaeological evidence. All areas appeared to retain water for some duration during normal precipitation years. A number of these areas are represented as intermittent water (blue) on the USGS 7.5' topographical maps covered by the NWI, however they were not selected for NWI classification. The unclassified sites surveyed are included on Figure 8. Plant species identified at unclassified sites are listed on Table 7.

The status of these areas should be reviewed in cooperation with the FWS and further studies would be needed to determine their relative ecological importance.

Table 6. Summary of vegetation observed at sampled unmapped wetland sites.

WETLAND CLASSIFICATION	ON-SITE VEGETATION	INDICATOR STATUS ^a
UNMAP	<i>Achillea millefolium</i>	FACU
	<i>Agropyron caninum</i>	FAC
	<i>Agropyron dasystachyum</i>	FACU
	<i>Artemisia dracunculus</i>	
	<i>Artemisia ludoviciana</i>	
	<i>Artemisia tridentata tridentata</i>	
	<i>Artemisia tridentata wyomingensis</i>	
	<i>Artemisia tripartita</i>	
	<i>Bromus tectorum</i>	
	<i>Chrysothamnus nauseosus</i>	
	<i>Chrysothamnus viscidiflorus</i>	
	<i>Cirsium arvense</i>	FACU
	<i>Elymus cinereus</i>	FACU
	<i>Erigeron pumilus</i>	
	<i>Iva axillaris</i>	FAC
	<i>Machaeranthera canescens</i>	
	<i>Medicago lupulina</i>	FAC
	<i>Opuntia polyacantha</i>	
	<i>Orobanche fasciculata</i>	
	<i>Oryzopsis hymenoides</i>	UPL
	<i>Populus angustifolia</i>	FACW
	<i>Prunus virginiana</i>	FACU
	<i>Ribes aureum</i>	FAC
	<i>Rumex crispus</i>	FACW
	<i>Salsola kali</i>	FACU
	<i>Solidago canadensis</i>	FACU
	<i>Sphaeralcea munroana</i>	
	<i>Urtica dioica</i>	FAC+

^a Region 9 wetland indicator status (Reed, 1988)

UPL - upland

FACU - facultative upland

FAC - facultative

FACW - facultative wetland

OBL - obligate wetland

A blank indicates that species is not included on the Region 9 list and is therefore considered UPL (Reed, 1988).

Figure 8. Surveyed unmapped and unclassified areas on the INEL.

Table 7. Summary of vegetation observed at sampled unclassified wetland sites.

WETLAND CLASSIFICATION	ON-SITE VEGETATION	INDICATOR STATUS ^a
UNCLASS	<i>Agropyron spicatum</i>	
	<i>Arctium minus</i>	
	<i>Artemisia ludoviciana</i>	
	<i>Artemisia nova</i>	
	<i>Artemisia tridentata tridentata</i>	
	<i>Artemisia tridentata wyomingensis</i>	
	<i>Asclepias speciosa</i>	FAC
	<i>Atriplex canescens</i>	
	<i>Atriplex nuttallii</i>	
	<i>Betula occidentalis</i>	FACW
	<i>Bromus japonicus</i>	FACU
	<i>Bromus tectorum</i>	
	<i>Carex species</i>	UN
	<i>Chaenactis douglasii</i>	
	<i>Chenopodium fremontii</i>	
	<i>Chrysothamnus nauseosus</i>	
	<i>Chrysothamnus viscidiflorus</i>	
	<i>Cirsium arvense</i>	FACU
	<i>Elymus cinereus</i>	FACU
	<i>Eriogonum microthecum</i>	
	<i>Euphorbia glyptosperma</i>	
	<i>Gutierrezia sarothrae</i>	
	<i>Halogeton glomeratus</i>	
	<i>Hordeum jubatum</i>	FAC
	<i>Hyocymus niger</i>	
	<i>Juncus species</i>	
	<i>Kochia scoparia</i>	FAC
	<i>Lygodesmia spinosa</i>	
	<i>Machaeranthera canescens</i>	
	<i>Oenothera tanacetifolia</i>	
	<i>Opuntia polyacantha</i>	
	<i>Oryzopsis hymenoides</i>	UPL
	<i>Poa sandbergii</i>	
	<i>Populus angustifolia</i>	FACW
	<i>Populus trichocarpa</i>	FAC
	<i>Prunus virginiana</i>	FACU
	<i>Ribes aureum</i>	FAC
	<i>Rosa woodsii</i>	FACU
	<i>Rumex crispus</i>	FACW
	<i>Salix exigua</i>	OBL
	<i>Salsola kali</i>	FACU
	<i>Scirpus maritimus</i>	
	<i>Sisymbrium altissimum</i>	FACU
	<i>Sitanion hystrix</i>	FACU
	<i>Solanum triflorum</i>	
	<i>Sphaeralcea munroana</i>	
	<i>Urtica dioica</i>	FAC+

^a Region 9 wetland indicator status (Reed, 1988)

UPL - upland

FAC - facultative

FACU - facultative upland

FACW - Facultative wetland

OBL - Obligate wetland

UN - Unknown

A blank indicates that species is not listed on the Region 9 list and is therefore considered UPL (Reed, 1988).

5. SURVEY LIMITATIONS

5.1 Vegetative Assessment

Conditions associated with extended drought and the season in which field investigations were conducted significantly limited the analysis of vegetative communities for this survey. General characteristics were identified, but some of the specific vegetative associates necessary for assessing impacts on the site were not present. Historically, the state sensitive species, oxytheca (*Oxytheca dendroidea*) has been observed in habitats near several of the identified wetlands sites (Cholewa and Henderson, 1984). However, this annual species was not observed during this survey. Although common perennial plant species and most of the annual species were found and identified, rarer species generally bloom in spring and early summer. Detection of these species was more difficult because germination for some annual species has been reduced or eliminated by drought. A future survey for oxytheca should be conducted to definitively assess its status and distribution in relation to INEL wetlands. A complete analysis of vegetation communities and their spatial and ecological relationship to INEL wetlands, as well as soil characterization for these sites, would be necessary for a more comprehensive and site-wide perspective of the importance of wetlands to the INEL ecosystem. A list of plant species identified at wetland sites during this survey is given in Appendix C.

5.2 Hydrological Assessment

Investigation of seasonal water cycles for INEL wetlands is crucial to understanding the importance of these areas as wildlife habitat. Precipitation and other weather information should be evaluated to investigate moisture conditions and provide an assessment of how long playas and other INEL wetlands hold water during normal and drought years. Analysis of historic wet cycles, aerial photographs, and existing ecological data for these periods could provide a better understanding of the ecological importance of these wetlands.

Differences exist between aerial photographs used for the NWI classification (1980 or 1984 depending on the USGS quadrangle) and those used for this survey (1991). The NWI photos were

unavailable for use during this survey, but should be obtained to compare to 1991 photos. The time of year when the NWI mapping photos were taken reflects hydrologic conditions of the specific year and season. Photos from periods representing wet and dry cycles are available and could be compared to clarify omission or inclusion of particular sites.

When 7.5' USGS topographic data for the INEL becomes available, GIS analysis of individual basins could be used to determine drainage patterns and areal extent of the basins. This analysis would help to evaluate the hydrologic properties of the wetlands and surrounding areas.

5.3 Wildlife Use

For this survey, wildlife use of wetland habitats was estimated from sign and fauna observed on site. However, use by species leaving no sign is not reflected in this estimate. Waterfowl or amphibians may utilize some areas during periods when standing water is present. Infrequent visits by smaller species (reptiles, for instance) are undetected. Temporal patterns in wildlife use are also not reflected by information gathered during this survey. Some areas may receive heavy use for very short periods and may be of lower importance than wetlands used at a constant, lesser rate. Comprehensive studies of the use of wetland areas by individual animal species is necessary to evaluate the relative importance of these habitats to INEL wildlife.

Substantial multidisciplinary information is required to determine the importance of wetlands to the INEL ecosystem. Definitive studies are needed to determine the areal extent, temporal duration and periodicity of wetlands, seasonal patterns of use, and relative importance of individual sites to particular plant and animal species. These studies should address the distributional aspects associated with INEL wetlands, as well as their long-term importance through varying climatic cycles. Wetlands located on the INEL may also be important in relation to wildlife refuge systems north (Camas, Market Lake, Mud Lake) and south (Salt Lake system, American Falls) of the INEL.

5.4 Archaeological and Paleoecological Assessment

Presence of archaeological evidence at wetland areas is important to INEL planning and facility development and the EIS. However, none of the archaeological resources observed during the

wetlands survey were formally recorded and all will require systematic archaeological survey to determine their historic or prehistoric significance. Further study of the observed archaeological evidence could provide important information on the role of identified wetlands in the economics of prehistoric hunter-gatherers and could thus provide additional clues regarding the ecological importance of these areas.

Sedimentological and geochemical analyses in combination with microplaeontological studies could provide information on the historic, spatial and temporal characteristics of wetlands on the INEL. Aquatic microfossils (diatoms, ostracodes, algal spores), especially from the larger palustrine and lacustrine areas, together with terrestrial pollen and phytoliths could serve as paleoenvironmental indicators (effective moisture regimes, presence, persistence, water depths, and temperatures). Organic materials, such as bones and plant fossils, from sediments, archaeological and paleontological sites, could help provide a chronological framework (e.g., ^{14}C dating) and information about past ecological conditions at and near the wetlands (Miller, 1993).

Given the current concerns about climate change, areas with the potential to support wetland species if average precipitation increases in this area should be considered a potential, valuable resource. These areas should be identified, mapped, and evaluated regarding their wetter potential.

5.5 Soil Assessment

Two of the three primary components of wetland characterization (hydrology and vegetation) were addressed during this survey. Soil color and texture were obtained for each site, however soil sampling and analysis was beyond the scope of this survey. Although some sites meet criteria for vegetation and/or hydrology as applied by the FWS, others would require soil analyses for definitive wetland characterization (Federal Interagency Committee for Wetland Delineation, 1989). NRCS soil survey maps for the INEL are incomplete. A map of INEL soils, produced by McBride et al., 1968, is of insufficient detail to be utilized for the wetland survey. Since the completion of this survey, an updated soil map for the INEL has been produced (Olson and Jeppeson, 1993), however, this map is also too coarse to provide the resolution necessary for the wetland survey. A comprehensive evaluation to assess potential impacts should include soil characterization.

5.6 Wetland Classification

Minor discrepancies in NWI classification were identified and 3 sites were apparently mis-identified as open water (see classification POWHx, section 4.1.2). Problems associated with inconsistent classification dealt primarily with modifiers differentiating natural and manmade features. Because of the margin of error inherent in the interpretation of high altitude aerial photographs, the NWI states that maps should not necessarily be considered conclusive and solicits additions or corrections (FWS, 1990). INEL and FWS NWI personnel should work closely together to address these inconsistencies and to review classification status of INEL wetlands. A process to address these issues should be established. This will improve National Environmental Policy Act (NEPA) documentation, land use planning and facility development on the INEL.

In a number of cases, areas with nearly identical characteristics and located in close proximity to classified sites were excluded by the NWI. USGS topographical maps are consulted during the development of NWI maps (FWS 1990). However, a number of areas on the INEL represented as intermittent water (blue) on the topographical maps were not selected for NWI classification (this is addressed on page 10 of USFWS 1990). All topographical maps for the INEL were reviewed and these areas identified. Several of the areas were added to the UNCLASS category to be investigated as part of this survey. Ultimately, one of the sites excluded from NWI classification was one of only three sites on the INEL in which wetland vegetation was present. In contrast, a number of tiny playas with no proximity to drainages or vegetation other than sagebrush were mapped as wetlands. Because of these inconsistencies, NWI maps should be used in conjunction with aerial photos and current topographical maps.

Wetlands classified as PUSJ are the most common on the INEL. In some cases as many as seven sites have been classified within a 500 square meter area. In several areas where numerous sites have been delineated on NWI maps, ground inspection has shown a series of sites connected by small channels and can be interpreted as a large, interconnected unit. These channels are on the same elevational grade and have the same soil and vegetative characteristics. High altitude photo resolution is not fine enough to recognize small (1 to 10 m) channels and interspaces between vegetation. Incorporation of individual sites into a single, larger network may be warranted for some areas.

NWI maps for the unmapped quadrangles on the INEL will be completed in the future. Unmapped INEL sites visited during this survey should be compared to what is actually included on the forthcoming NWI maps.

6. CONCLUSIONS

A preliminary survey of NWI wetlands on the INEL was conducted to a) examine their general characteristics and status, b) to provide an evaluation of relative ecological importance, c) identify additional information needed to complete ecological characterization of important INEL wetlands, and d) to identify high priority wetland areas on the INEL. The purpose of the survey was to provide information to support the preparation of the Environmental Restoration and Waste Management (ER&WM) Environmental Impact Statement (EIS). The survey was not meant to delineate wetland areas or serve as an accuracy assessment of NWI wetland maps.

INEL wetlands investigated during this survey were identified and delineated by the FWS NWI prior to implementation of the Federal Manual for Identifying and Delineating Wetlands (1989). INEL sites for which wetland vegetation and/or wetland hydrology criteria can be confirmed fulfill the FWS wetland criteria requirement. However, assessment with regard to EPA/COE three wetland criteria requirement can not be made for these sites without confirmation of hydric soils. Conditions associated with extended drought and the season in which field investigations were conducted limited the analysis of hydrological characteristics and vegetative communities, making verification of wetland status for most surveyed sites unfeasible.

Two NWI classified sites on the INEL, the Argonne industrial waste pond (POWHx, Table B-1 site 50), and the outflow channel north of NRF (R2WOHx, Table B-1 site 57), were found to have obligate wetland vegetation growing in areas of standing water. Both sites are under one acre in size and water is sustained by facility operations. The Argonne industrial waste pond is an unlined, excavated depression north of the main facility. The pond is dominated by cattails (*Typha latifolia*) and bulrush (*Scirpus acutus*). The NRF outflow channel contains dominant obligate vegetation including bulrush (*Scirpus acutus*) and cattails (*Typha latifolia*). These and other facility sustained ponds represent the only water sources maintained nearly year-round, and are not significantly affected by drought.

The role of permanent water sources in an arid environment such as the INEL is unclear, however, it can be speculated to be significant to wildlife. A study by Howe (1986) showed the

Argonne pond was more heavily used by mourning doves (*Zenaida macroura*) than were other sites in the study. Halford et al., 1976, and Halford and Millard 1978 report the use of the TRA leaching pond complex by migrating waterfowl and numerous other birds, mammals and reptiles. Mule deer (*Odocoileus hemionus*) were observed at the pond during the survey and bats are known to utilize manmade open-water impoundments on the INEL, especially in dry seasons. Threats and stresses associated with these sites include the possibility of the spread of contamination to wildlife and humans and reduced or discontinued water discharges. These wetlands meet the FWS criteria for both vegetation and hydrology, however, their artificial nature may make them subject to additional interpretive criteria (Federal Committee for Delineating Wetlands, 1989). These wetlands provide important wetland habitat for INEL flora and fauna and should be considered in any INEL activities that may impact them.

The most prominent INEL feature exhibiting wetland characteristics is the Big Lost River drainage. Although dry, the Big Lost River channel and sinks display relict wetland characteristics and sufficient historical evidence is available to support acceptance of NWI classification status. However, because of their intermittent nature, historic disturbance and upstream water management activities, sections of the Big Lost River drainage may be subject to additional interpretative criteria for hydrologic characterization (Federal Committee for Wetlands Delineation, 1989).

The main river channel has been classified by the FWS as a riverine, intermittent, temporarily flooded streambed (R4SBA) from north of Highway 26 to where the channel becomes braided and widens into the sinks area (see Figure 8). Survey data for sections of the Big Lost River are summarized on Table B-1, sites 58, 60, and 70. The mapped channel section is characterized by riparian features and obligate wetland vegetation including cottonwood (*Populus* spp.) and willow (*Salix* spp.). The streambed was dry when this survey was conducted, however, streamflows for the Big Lost drainage within INEL boundaries are gauged have been summarized for the years 1965 - 1987 (Bennett, 1990).

NWI Maps for the river channel from the west INEL boundary to where it crosses Highway 26 have not been completed by the FWS, however attributes of this section were surveyed and found to be similar to NWI mapped channel segments (see Table B-1, sites 71-74). A narrow basalt canyon at the west boundary of this river section is unique to the INEL. The entire river section south of

Highway 26 supports more dense and diverse vegetation than do northern sections of the river. The river provides important wildlife habitat along most of its length. The habitat is enhanced by its isolation from development and agricultural activity. Aquatic communities including rainbow trout (*Salmo gairdneri*) and brook trout (*Salvelinus fontinalis*), are supported when flow is sustained (Overton, 1977). Cottonwoods (*Populus* spp.) along the banks are prime raptor nesting sites. Numerous nests were observed during survey, and several owls (great horned [*Bubo virginianus*], long eared [*Asio otus*]) were sighted. Riparian habitats are also important to other species including birds, rabbits, mule deer (*Odocoiles hemionus*), pronghorn (*Antilocapra americana*), coyotes (*Canis latrans*), bobcats (*Lynx rufus*), and other species. The river has higher potential than most INEL wetland areas for presence of endangered bird species including bald eagles (*Haliaeetus leucocephalus*). Archaeological evidence is common along the entire length of the Big Lost River. Stressors resulting from both INEL and offsite activities include dewatering of the river channel through diversion of flows for INEL flood control, agricultural demand and upstream dam operations. Erosion of channel banks from grazing and vehicle traffic on roads crossing the empty channel is evident near the spreading area and several sections north of Highway 26. Siting of future INEL facilities or other construction projects (except roads) in close proximity to the river is unlikely due to the potential for flooding. This area of the river provides important habitat and archaeological evidence and may be sensitive for INEL activities.

The terminus of the Big Lost drainage is formed by four large NWI mapped wetland areas (Figure 9). The PEM1A, PEM1C, and PEM1J classifications represent 75 percent of the total NWI mapped acreage on the INEL. These are classified by the NWI as palustrine areas exhibiting persistent emergent vegetation and temporary flooding (A), seasonal flooding (C) or intermittent flooding (J). The classification of the PEM1A site just northwest of the sinks (Table B-1, site 31) has been field verified by the FWS as part of the NWI. The existence of hydric soils in this area is confirmed by a paleological investigation conducted by Bright and Davis (1982) on peat deposits in the eastern edge of this area, and presence of Blackfoot soils having hydric characteristics (Olson and Jeppeson, 1993). A second PEM1A site further south was not investigated during this survey. All areas in and around the sinks were dry when surveyed, however remains of one obligate wetland species (cattails [*Typha latifolia*]), as well as snail shells (species unknown) were observed in the large PEM1C area (Table B-1, site 32) south of the ponds (see Figure 9).

The easternmost pond area (playa 1) was also surveyed (Table B-1, site 34). Historical streamflow records collected at USGS gauging stations show that between 1921 and 1965, water reached the ponds 12 times in 45 years and 11 of 22 years between 1965 and 1987 (Bennett, 1990). These areas also accumulate spring runoff from surrounding areas of higher elevation, however the duration and extent of saturation is unavailable. Historic INEL photographs show expansive areas dominated by cattails (*Typha latifolia*) in and around the ponds. These wetland areas are disturbed by intensive grazing and aggravated by drought. As a result, extensive invasion by exotic weed species has occurred.

Drought conditions and upstream water diversions result in periodic dewatering of the Big Lost River in summer and winter and prevent sustained flow from reaching these areas. These areas are primarily used by cattle, however elk (*Cervus canadensis*), sage grouse (*Centrocercus urophasianus*) and black-tailed jack rabbit (*Lepus californicus*) sign were observed. The sinks represent one of two areas on the INEL in which the presence of the Great Basin spadefoot toad (*Scaphiopus intermontanus*) has been recorded. The proximity of this area to the mountains north of the sinks provides a corridor to and from summer range for larger animals. However, the area currently provides little cover for small animals due to grazing activities.

Archaeological evidence was observed in the east pond (Table B-1, site 34), however none was found at other surveyed sites. These areas are vast in comparison to other wetlands included in this survey and it is likely that searches over larger sections of the sinks would reveal further archaeological indicators. The Big Lost sink areas have high potential ecological importance based on their ability to sustain large expanses of wetland vegetation. The presence of this type of habitat is unique on the INEL and can provide important habitat for birds and mammals, including those less common to the dominant INEL vegetation communities. The function of these wetland areas is greatly influenced by human activities, primarily through control of surface water and cattle grazing. The PEM1A area south of playas 1 and 2 (see Figure 9) provide a unique opportunity for wetland enhancement. Reduction in grazing and/or permanent exclosures for portions of these areas would improve habitat conditions and attract native species to the area. Such a restoration would enhance an extremely unique system. The likelihood of future INEL facility siting or construction projects other than roads in these areas is small because of the potential for flooding.

Figure 9. NWI mapped areas of the Big Lost River and Birch Creek drainages on the INEL.

Approximately seventy percent of the individual NWI wetland sites within INEL boundaries are classified as palustrine areas having unconsolidated shores and intermittent flooding (PUSJ, Table B-1 sites 1-29). Total area encompassed by PUSJ wetlands is just under 20-ha (50 acres). These wetlands have unique value in that the hydrology of most PUSJ wetlands is not subject to human controls. In addition, they possess unique features such as wide distribution, uncommon vegetative composition, interconnected networks of playas, and high evidence of wildlife use. Examples of these unique characteristics are demonstrated by three wetlands in Antelope Butte and 10 of 15 sites in Little Butte quadrangles (Table B-1 sites 11, 13-20, 24). Extended drought and the season in which this survey was conducted limited vegetative and hydrological assessment of these sites was incomplete. Although no water was present at any PUSJ site, the lack of vegetation and landscape characteristics indicate that water is present during some parts of the year when normal precipitation is available, no information exists on the frequency or duration of the standing water. No information exists for soil composition of these areas. Isolation, unique vegetation, varied topography, and presence of water at certain times during the season, provide conditions for increased probability for presence of threatened and/or endangered plant and animal species. *Oxytheca* (*Oxytheca dendroidea*) has been observed near some wetlands visited during this survey. The pygmy rabbit (*Brachylagus idahoensis* [*Sylvilagus idahoensis*]) is an inhabitant of these areas and is "under consideration for threatened or endangered listing, but conclusive data are presently lacking to support the final decision" (Reynolds, 1992). Evidence of wildlife use was observed at all PUSJ sites, and nearly one third of the sites had signs of heavy use. Use patterns are not documented for these sites, however, antelope (*Antilocapra americana*) appear to frequent nearly every area and several receive concentrated use by elk (*Cervus canadensis*). Many of these sites also appear to support large communities of burrowing rodents, rabbits, and woodrats (*Neotoma cinereus*). This concentrated prey source may be speculated to attract carnivores and evidence gathered during the survey indicates that coyotes (*Canis latrans*) visit these areas. Other predators including bobcats (*Lynx rufus*), weasles, skunks, foxes, badgers, and raptors also frequent PUSJ sites in search of prey, however their use relative to other areas is unknown. Importance of PUSJ sites to insects, amphibians and reptiles is unknown. Observations or evidence recorded at PUSJ sites during this survey includes elk (*Cervus canadensis*), antelope (*Antilocapra americana*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), blacktailed jackrabbit (*Lepus californicus*), cottontail (*Sylvilagus nuttallii*), pygmy rabbit (*Brachylagus idahoensis* [*Sylvilagus idahoensis*]), woodrat (*Neotoma cinereus*), sage grouse (*Centrocercus urophasianus*), mule deer (*Odocoileus hemionus*), and various burrowing rodents. Archaeological

evidence for these areas was moderate overall, but substantial quantities of material were noted at several individual sites.

Stressors to these areas include sedimentation and altered drainage (e.g., road building), invasion by exotic species, potential disruption to hydrological network through disturbance of an associated playa, and alteration of playa surfaces which may affect infiltration rates and alter periodicity.

Potential problems affecting facility siting in these areas include saturated soils, inappropriate drainage, and standing water that may exist in some areas. Many PUSJ sites are located in upland areas that may be considered for siting because of the unsuitability of locations closer to the Big Lost River.

A number of unclassified and unmapped sites (including the Birch Creek drainage and TRA waste treatment pond) investigated for the survey may meet wetlands criteria, however, were not included by the NWI. These areas are discussed in Section 4.5.

An important factor affecting the delineation of INEL wetlands is their intermittent nature. As a result of temporal variability in precipitation patterns and available snowmelt, INEL wetlands have unique characteristics relative to "classic" wetland habitats. There is an apparent need to address this uniqueness with criteria that address the local characteristics of the INEL ecosystem. Before these criteria can be developed, additional characterization of the ecological significance, temporal, and spatial relationships of these areas should be conducted. These criteria would not necessarily redefine a wetland, but would address the concern to protect unique areas that have ecological significance on the INEL. These areas include wetlands and wetland-like habitats and their associated communities.

The results of this survey represent a first step toward a definitive characterization of INEL wetlands. An overview of wetland habitats that exist on the INEL was produced and general characteristics for each NWI classification were described. Preliminary mapping of INEL wetlands information has been completed using a GIS (ARC/INFO) and plans are underway for creating a database to manage information from this and future ecological surveys.

The information compiled for this survey can be used to locate mapped wetlands (wetland maps, GIS automated map), determine basic characteristics associated with a wetland class (Section 4.1), review survey results, characteristics, and relative importance for a specific wetland (Table B-1, survey field forms, archived 35 mm slides), and identify additional information needs (Section 5).

The information gathered from this survey can be used for general discussion about the identified wetlands on the INEL as discussed above. However, if a specific location is to be evaluated for potential impacts from INEL activities, a more comprehensive investigation should be initiated. This investigation should include gathering additional information on soil characteristics, geological/geomorphological features, plant community composition, abundance, cover, habitat use, and archaeological and paleontological evidence. This information should be used to assess the importance of the area from a sitewide perspective, i.e. how ecologically important is the area relative to other communities on the INEL and how can potential impacts to the native community be minimized.

The conclusions from this survey are summarized below:

1. There are numerous areas with wetland characteristics distributed throughout the INEL. Most of the INEL wetland areal extent is associated with the Big Lost River system (includes river channel(s), spreading areas, and playas). Significant numbers of small wetlands are also distributed across the INEL (see map). The Birch Creek was not included on the NWI maps, however, the survey sites indicated that important riparian habitat exists along this channel.
2. The areas surveyed range from high ecological importance to no ecological importance (as a wetland). This "relative" ranking scale is based on observations made and/or historical documentation.
3. The surveyed areas would need additional characterization and ecological studies to determine their ecological significance to the INEL ecosystem. The wetlands on the INEL are generally not what one would consider a "classic" wetlands, consequently determining typical wetland ecological significance is difficult. Though these areas appear primarily as playas or dried-up

stream beds, they may provide important habitat during periods with above average precipitation and snowfall. Though periodic, such situations may play an important role for the resident community and migratory organisms.

4. The NWI wetland mapping completed for the INEL thus far has some errors and inconsistencies, and additional discussions with the FWS regarding verification and reclassification could improve the accuracy of the NWI wetland maps.
5. INEL activities that might impact identified wetlands or areas with wetland characteristics should initially include an assessment of the information generated for this report, and possibly conduct more detailed studies of the areas in question. Soils characteristics would be necessary, at a minimum, to verify wetland criteria for the areas surveyed.
6. The temporal characteristics of the INEL wetlands are such that they are difficult to delineate as wetlands in many cases. New delineation criteria may or may not address these difficulties. In the interim, the intent of preserving wetland habitats should be considered when determining how areas with wetland characteristics should be addressed.

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APPENDIX A

WETLAND GIS FIELD DOCUMENTATION FORMS

WETLAND/GIS FIELD DOCUMENTATION FORM

GENERAL:

Field Investigator(s) J. Glennon, N. Hampton
Date 12 October 1992 Time of Day 0945
Weather Mostly cloudy, 50's
Plot No. ANTBU1 Veg. Map Classification Saltbush/
Approximate Size of Site 100 m diameter - circular outline
GPS File No. ANTBU1 GPS Documentation Form No. _____
Location (UTM, Lat.Long.) _____
General Location Description S. side of T-9 just west of junction of T-9 and T-22

Photographs? (Y , N) Roll # 1 Frame #'s 2 through 8
Subject(s) and/or Directions of Photos Site #, N,W,S,E, down, edge
Video? (Y , N) Tape # _____ Counter # _____
General Description of Site Typical playa appearance - mud cracks, some scattered lava pebbles, edge looks like it is flooded periodically - has dead vegetation - some flaking of the surface of the mud and litter

ARCHAEOLOGY:

Archaeological Finds? (Y , N) Description, Location and Density:
1 midsection of a point on the north edge of the playa in the sage border 1 1/4" long and 1" wide

WILDLIFE:

Wildlife Observations/Signs of Habitat Use? (Y , N)
General Description: Elk scat (heavy) and tracks, grouse scat (heavy), jackrabbit scat, and coyote scat
Sensitive Species or Habitat Present or Nearby? (Y , N)
Description: _____

WETLAND DETERMINATION:

Determination Method (Circle): Routine, Intermediate, Comprehensive
Do normal environmental conditions exist at the Plant Community?
Yes , No (If No, explain below)
Has the vegetation, soils, and/or hydrology been significantly disturbed?
Yes , No (if Yes, explain below)

GENERAL FIELD INDICATORS:

Hydrology _____
Drainage _____
Vegetation _____

SOILS:

Soil File No(s). _____
Soil Sample? (Y , N) Sample No(s). _____
Archived? (Y , N) Location _____
Soil Analysis Planned? (Y , N) _____
Slope Flat Aspect _____ Soil Surface Silt/Clay
Rock Color: Wet _____ / Dry _____
Soil Color: Wet 10 YR 5/3 / Dry 10 YR 7/2
Series/Phase _____ Subgroup _____
Is the soil on the hydric soils list? Y , N , Undetermined
Is the soil a Histosol? Y , N Histic epipedon present? Y , N
Is the soil: Mottled? Y , N Gleyed? Y , N
Matrix Color: _____ Mottle Colors: _____
Other Hydric Soil Indicators: _____

Comments: _____

HYDROLOGY:

Is the ground surface inundated? Y , N Surface water depth: _____
Is the soil saturated? Y , N
Depth to free-standing water in pit/soil probe hole: _____
Mark other field indicators of surface inundation or soil saturation below:

_____ Oxidized root zones	_____ Water-borne sediment deposits
_____ Water marks	_____ Surface scoured areas
_____ Drift lines	_____ Wetland drainage patterns
_____ Water-stained leaves	_____ Morphological plant adaptations

Additional hydrologic indicators: _____

Comments: Animal tracks are sunken in the mud showing water was present here earlier in the year - also there are numerous mud cracks.

WETLAND CLASSIFICATION:

Wetland Criteria Met?: _____
Hydrology: (Y , N , UNK) Soils: (Y , N , UNK)
Vegetation: (Y , N , UNK)
Revisit (Y , N): _____
What Time of Year? _____
What Type of Year? _____
Present FW Classification PUSJ
Field Determination of Classification _____

Comments: _____

Vegetation Documentation Sheet

Plot No. ANTBU1 Date 12 Oct 93

SPECIES CODE	SPECIES	PLANT HABIT	DOMINANCE RANK (1-4)	% AREAL COVER	INDICATOR STATUS	RANK
<u>CELA</u>		<u>PS</u>		<u>3</u>		
<u>SAKA</u>		<u>AF</u>		<u>2</u>		
<u>HAGL</u>		<u>AP</u>		<u>30</u>		
<u>ARTRW</u>		<u>PS</u>		<u><1</u>		
<u>SIAL</u>		<u>AF</u>		<u><1</u>		
<u>SIHY</u>		<u>PG</u>		<u><1</u>		
<u>CANU</u>		<u>PF</u>		<u><1</u>		
<u>OPPO</u>		<u>PF</u>		<u><1</u>		
M	MOSS			<u>10</u>		
L	LITTER					
R	ROCK					
BG	BARE GROUND					
DS	DEAD SHRUB		<u>3</u>	<u>25</u>		
LN	LICHEN					

PLANT HABIT:

A=Annual, B=Biennial, P=Perennial
F=Forb, S=Shrub, T=Tree, G=Graminoid

DOMINANCE RANK:

4=Dominant (or co-dominant)
3=Common, but not dominant
2=Present, not common
1=Rare, one to a few

INDICATOR STATUS AND RANK:

Obligate Wetland	= OBL = 1.0
Facultative Wetland	= FACW = 2.0
Facultative	= FAC = 3.0
Facultative Upland	= FACU = 4.0
Obligate Upland	= UPL = 5.0

Comments: Playa currently has no vegetation - some dead halogeton
winterfat plants occur at the edge of the playa - vegetation
surrounding the playa is listed above.

ARCHAEOLOGY:

Archaeological Finds? (Y , N) Description and Location: If any archaeological objects or structures (rock rings, rock walls) are found, circle Y and give their description and where they were found relative to GPS location fix, otherwise circle N. When found estimate highest density of material (maximum: number of objects/square meter)

WILDLIFE:

Wildlife Observations/Signs of Habitat Use? (Y , N)

General Description: If any wildlife, or signs of any (such as tracks, scat, owl pellets, etc.), are observed in the area circle Y and make a note of it here. Otherwise circle N.

Sensitive Species or Habitat Present or Nearby? (Y , N)

Description: If any species which are threatened, endangered or sensitive are found or if any possible habitat is available for their use (e.g. crevices/cave for bats, juniper tree among the sagebrush for nesting, specific food resource available) make a note of the species or habitat or resource present and its location.

WETLAND DETERMINATION:

Onsite Determination Method: Mark the method used in the field check for wetland determination (routine, intermediate or comprehensive) as given in the Federal Manual. (When comprehensive method is necessary vegetation must be checked with line intercept method - see Federal Manual)

Do normal environmental conditions exist at the Plant Community? Yes, No (If No, explain below):
If any abnormal conditions (e.g. drought, flood, etc.) exist at the site make a note of them here.

Has the vegetation, soils, and/or hydrology been significantly disturbed? Yes, No (if Yes, explain below): If any signs of disturbance are seen they should be noted and described here.

GENERAL FIELD INDICATORS:

Hydrology, Soils, Vegetation: Give a general description of any obvious characteristics showing wetland conditions (i.e. signs of past water, drainage patterns, vegetation die-off from inundation, specific obligate wetland species, playa soil and appearance, etc.) These will help later investigators if these characteristics are missing when revisited.

SOILS:

Soil File No(s): Give the file number/name of any soil data or form filled out.

Soil Sample? (Y , N) Sample No(s): If any soil samples are taken circle here and give the sample number(s).

Archived? (Y , N) Location: If soil samples are taken, circle and give the location of where they have been archived.

Soil Analysis Planned? (Y , N): Circle if the collected soil samples are going to be analyzed further or not.

Slope: Give the slope of the study plot (in degrees or per cent).

Aspect: Give the direction the plot is facing in compass degrees (using magnetic readings) or a general compass direction (e.g. NNE, E, SW, etc.).

Soil Surface: Give the texture of the soil surface (e.g. sandy, silt/clay, pebbles, etc.).

Rock Color: Give the wet and dry color of the prevailing rocks on the plot present using the Munsell color chart.

Soil Color: Give the wet and dry color of the soil present on the plot using the Munsell Color Chart.

Series/Phase: Give the proper series/phase name of the soil.

Subgroup: Give the soil subgroup according to USDA, Soil Conservation Service Agriculture Handbook: "Soil Taxonomy."

Is the soil on the hydric soils list? Y, N, Undetermined: Mark whether the soil on the plot is listed as a hydric soil.

Is the soil a Histosol? Y, N: Circle whether the soil is a histosol or not.

Histic epipedon present? Y, N: Circle if a histic epipedon is present.

Is the soil: Mottled? Y, N: Circle the correct answer.
Gleyed? Y, N: Circle the correct answer.

Matrix Color: Give the matrix color of the soil.

Mottle Colors: Give the color(s) of any mottling present.

Other Hydric Soil Indicators: List any other indicators that the soil is hydric.

Comments: Give any final comments on the soil properties here.

HYDROLOGY:

Is the ground surface inundated? Y, N Surface water depth: Circle the appropriate response and, if yes, give the water depth.

Is the soil saturated? Y, N: Check with soil pit or soil probe to see if the soil is saturated with water. Check to see if any water can be squeezed or shaken from the soil at the surface.

Depth to free-standing water in pit/soil probe hole: If any free-standing water is present in the soil pit or soil probe hole measure its depth.

Mark other field indicators of surface inundation or soil saturation below: If any of the following indications of the past presence of water are visible then check the appropriate blank:

☐ Oxidized root zones	☐ Water-borne sediment deposits
☐ Water marks	☐ Surface scoured areas
☐ Drift lines	☐ Wetland drainage patterns
☐ Water-stained leaves	☐ Morphological plant adaptations

Additional hydrologic indicators: If any other visible sign of past water is present in the plot or surrounding area then list and describe it here.

Comments: List any other notes or comments about the presence or absence of water or any future check that should be conducted.

WETLAND CLASSIFICATION:

Wetland Criteria Met?: After conducting the field survey decide whether the definitions for the following categories have been met and circle the proper response. If unknown or further study is necessary then decide what further needs to be done and note it below or in the above sections.

Hydrology: (Y, N, UNK), Soils: (Y, N, UNK)

Vegetation: (Y, N, UNK)

Revisit (Y, N): Decide if the study site needs revisiting in order to complete the field determination, circle the correct choice and answer the next questions. This could be for checks in the spring for the presence of water, in the winter for snowpack data, for the presence of ephemeral vegetation, etc. The area could be flooded annually or only with a significant snowpack in the winter. All possibilities must be examined if in doubt.

What Time of Year? If a certain time of the year will dictate when to visited the site, note it here. This could be spring, winter, after runoff, throughout the growing season, etc.

What Type of Year? Give the type of year necessary for a revisit. This could be a typical year, a wet year, a drought year, several wet years in succession, etc.

Present FWS Classification: Give the present classification by the U.S. Fish and Wildlife Service for this site.

Field Determination of Classification: Classify this site as to whether it is a wetland or not, or any of the difficult to classify areas by using the "Federal Manual for Identifying and Delineating Jurisdictional Wetlands" and give the classification as determined by the FWS Publication "Classification of Wetlands and Deepwater Habitats of the United States."

Comments: Give any final notes and comments on the determination and classification of the study area.

VEGETATION DOCUMENTATION SHEET

Species Code: Give the 4 - 5 digit alphanumeric code for Intermountain Plant Names as used by the Forest Service.

(e.g. ARTRW = Artemisia tridentata, subspecies wyomingensis)

Species: Write out the plant species name.

Plant Habit: Using the code listed at the bottom of the form give the normal form of this plant. (e.g. AF = Annual Forb)

Dominance Rank: Using the number ranking at the bottom of the form list the abundance of each species present.

% Areal Cover: Give an approximation of the cover for each species present.

Indicator Status: Using the "National List of Plant Species That Occur in Wetlands" for this region place the code listed at the bottom of the form in this column.

Rank: From the status column give the numerical code in this column as shown at the bottom of the field form.

Comments: Use this space for any comments about the vegetation or absence of expected vegetation here. This could be because of the time of year, dry conditions, etc.

APPENDIX B

INEL WETLANDS SURVEY DATA

Table B-1. INEL Wetlands Survey Data

SITE #	CLASS	SITE NAME*	AREA	VEGETATION SITE	VEGETATION AREA	1990 INEL VEGETATION MAP CLASSIFICATION (Preliminary)	WILDLIFE*	ARCHAEOLOGY*	RANK ^c	COMMENTS
1	PUS1	ANTBU1	100m x 100m	None	Sage/ Halogecion	Saltbush/Winterfat	H	L	1	
2		ANTBU2	150m x 50m	Halogecion	Halogecion/ Sitanion	Burn/ Unk 2/ Unk gen/ Edge	H	F/L	1	Series of connected playas 2 associated slices
3		ANTBU3	200m x 50m	Halogecion	Halogecion/ Sage	Sage	H	F/H	1	Wildlife/ Archaeology
4		ANTBU4	200m x 60 m	Salisolia	Salisolia/ Dead Shrubs/ Grasses	Unk gen	M	F/M	2	
5		ATMCIT1	80m x 40 m	Saltbush	Sage	Winterfat	L	F/M	3	Artificial Impoundment
6		CIRBUSE1	25m x 30m	None	Low sage/ Elymus	Sage/ Edge/ Playa	L	None	3	
7		CIRBUSE3	40m x 8m	None	Sage/ Elymus	Native Grass	M	F/H	2	
8		CIRBUSE4	70m x 50m	Halogecion	Sage/ Grass	Dune/ Grass/ Winterfat/ Unk 6	L	F/L	3	
9		KETBU2	125m x 50m	Salisolia/Elymus	Elymus	Unk Gen/ Sage	H	None	1	Unique Veg
10		KETBU3	30m x 15m	Halogecion	Elymus/ Sage/ Halogecion	Burn/ Grass	M	None	2	
11		LITBUNW1	200m x 100m	None	Sage/ Greasewood	Saltbush	H	None	1	
12		LITBUNW2	200m x 50m	None	Sage/ Rabbitbrush	Winterfat/Saltbush	L	F/L	3	
13		LITBUNW3	200m x 30m	None	Sage/ Winterfat	Winterfat/ Edge	H	None	1	2 Adjoining slices
14		LITBUNW4	50m x 10m	Halogecion	Sage/ Winterfat	Winterfat/ Unk Gen	H	None	1	1 adjacent site
15		LITBUNW5	25m x 5m	Halogecion	Sage/ Halogecion	Sage/ Edge	H	A/L	1	7 Total slices in area
16		LITBUNW6	20m x 20m	None	Sage/ Horsebrush	Sage/ Edge	H	None	1	Sec also LITBUNW5
17		LITBUNW7	75m x 15m	None	Halogecion/ Sage	Unk 2/ Burn	H	F/L	1	1 adjacent site
18		LITBUNW8	75m x 15m	Halogecion	Sage/ Halogecion	Sage/Edge/ Burn	H	M	1	
19		LITBUNW9	60m x 5m	None	Sage/ Halogecion	Dune/ Edge	H	None	1	2 Adjoining slices

Table B-1. (Continued)

SITE #	CLASS	SITE NAME*	AREA	VEGETATION SITE	VEGETATION AREA	1990 INEL VEGETATION MAP CLASSIFICATION (Preliminary)	WILDLIFE*	ARCHAEOLOGY*	RANK ^c	COMMENTS
20	PUSJ (cont)	LITBUNWA	50m x 30m	None	Sage/ Halogeton	Winterfat/ Edge/ Burn	H	None	1	1 Adjacent site
21		LITBUNWB	15m x 10m	Sage/Grass	Sage/Grass	Sage	L	L	3	Disturbed borrow pit
22		LITBUNWC	40m x 20m	Halogeton	Sage/ Winterfat	Unk 2/ Edge	H	None	2	
23		LITBUNWD	10m x 10m	Elymus	Elymus	Native grass/ Crested wheat	L	None	3	
24		LITBUNWE	15m x 10m	Elymus	Elymus/ Grass	Native grass	H	None	1	Large basin
25		LITBUNWF	150m x 100m	Elymus	Sage	Edge/ Crestedwheat	L	None	2	
26		LITBUSW1	20m x 15m	Halogeton	Sage/ Grass	Sage	L	None	3	
27		LITBUSW3	50m x 30m	None	Sage	Sage	M	F/M	2	
28		LITBUSW5	40m x 20m	Halogeton	Halogeton/ Sage	Native Grass/ Edge	L	None	3	
29		LITBUSW6	40m x 15m	Halogeton	Sage/ Rabbitbrush	Edge	L	None	3	
30	PAB4Hx	CIRBUTAN	30m x 15m	Dock/ Thistle	Sage	Unk 2	L	None	3	Waste pond
31	PEM1A	BIGLOST2	500m x 200m	Grass/ Salsola	Grass/ Sage	Native Grass/ Crested wheat/ Edge	M	None	1	Sinks- Heavily Disturbed
32	PEM1C	BIGLOST4	1000m x 1500m	Grass	Grass	Wetland	L	None	1	Visit in wet years
33		CIRBUNWA	3m wide x 1m deep	Bulrush	Sage	Edge	M	None	2	Outflow channel
34	PEM1J	BIGLOST1	3/4 mile x 1/2 mile	Weedy annuals	Sage	Unk 6/ Unk Gen/ Playa	M	F/H	1	Sinks- Visit when wet
35		BIGLOST5	200m x 300m	Grass	Sage	Wetland/ Grass	L	None	1	Visit in Wet years
36	PEMJ	BSBU3	40m x 30m	Elymus/ Grass	Sage	Crested Wheat/ grass	L	None	3	
37		BSBU6	30m x 20m	Lupine/ Grass	Sage	Native grass/ Edge	M	F/H A/M	3	Heavily Disturbed
38	PUSC	CIRBUSW3	80m x 60m	Crested wheat	Sage	Unk gen/ Unk 2	L	None	3	Seeding in Borrow pit

Table B-1. (Continued)

SITE #	CLASS	SITE NAME*	AREA	VEGETATION SITE	VEGETATION AREA	1990 INEL VEGETATION MAP CLASSIFICATION (Preliminary)	WILDLIFE*	ARCHAEOLOGY*	RANK ^c	COMMENTS
39	PUSCrx	CIRBUSE7	15m x 20m	Rabbitbrush	Sage	Edge	L	None	3	Excavated
40		CIRBUSE8	20m x 50m	Crested wheat/ Willow	Sage	Facility	L	None	3	Old waste area Rad contaminated
41	PUSCx	CIRBUSE6	20m x 20m	Weedy annuals	Sage	Unk gen	L	None	3	Lined waste pond
42	POWHx	CIRBUNWC	200m x 100m	Weedy annuals	Sage	Edge/ Unk 6	L	None	3	Waste pond - 1 adjacent site
43		CIRBUNWD	15m x 15m	Weedy annuals	Sage	Sage- grass	L	None	4	Cement-covered waste pond
44		CIRBUNWE	150m x 100m	Weedy annuals	Sage	Unk gen	L	None	3	See CIRBUNWC
45		CIRBUSEA	30m x 30m	Weedy annuals	Sage	Unk 2	L	None	4	Rubble pit
46		CIRBUSW1	5m x 40m	None	Sage	Juniper- sage/ facility	L	None	4	Manganese pile
47		CIRBUSW2	10m x 10m	Sage	Sage	Sage- grass	L	None	4	Firing range
48		CIRBUTAN	120m x 50m	Dock/ Thistle	Sage	Unk 2	L	None	3	Waste pond
49		CIRBUSW6	15m x 20m	None	Sage	Facility	L	None	3	Waste pond/ Gravel pit
50		LITBUSW9	150 x 100m	Cattail/ Bulrush	Sage	Edge/ Unk 2	M	None	2	Industrial waste pond
51		LITBUSWA	150 x 100m	Weedy annuals	Sage	Unk gen/ Unk 2	L	None	3	Waste pond
52		LITBUSWB	40m x 40m	Weedy annuals	Sage	Dune	L	None	3	Waste pond
53	L2USJ	BSBU1	1 mile x 1/2 mile	Grass/ Weeds	Sage	Unk 6	L	None	2	Spreading area
54		BSBU4	800m x 200m	Grass/ Weeds	Sage	Dune	L	None	2	Spreading area
55		BIGLOST8	300m x 150m	Milkvetch	Sage	Saltbush/ Winterfat	L	F/H A/L	2	Revisit in wet years
56		BIGLOST9	3/4 mile x 1/2 mile	Grass/ Weeds	Sage	Saltbush/ Winterfat	M	F/L	2	Revisit in wet years
57	R2OWHx	CIRBUNWB	3m wide x 2m deep	Cattail/ Bulrush	Sage	Sage/ Edge	L	None	2	Outflow channel

Table B-1. (Continued)

SITE #	CLASS	SITE NAME ^a	AREA	VEGETATION SITE	VEGETATION AREA	1990 INEL VEGETATION MAP CLASSIFICATION (Preliminary)	WILDLIFE ^b	ARCHAEOLOGY ^a	RANK ^c	COMMENTS
58	R4SBA	CIRBUNW7	15m wide x 2m deep	Sparse	Willow/ Rose	Sage/ Edge	L	None	2	River- visit in wet year
59	R4SBC	BIGLOST3	8m wide x 1m deep	Weedy annuals	Sage	Wetland	L	None	2	Visit in wet year
60	R4SBJ	BIGLOST6	1m wide x 1m deep	Weedy annuals	Grass/ Weedy annuals	Saltbush/ Winterfat	L	None	2	Visit in wet year
61	R4SBJx	BSBU2	15m wide x 800m long x 3m deep	Annual weeds	Sage	Bare/ Unk Gen	L	None	3	Visit in wet year
62		BSBU5	5m wide x 250m long x 2m deep	Annual weeds	Sage	Dune/ Edge	L	None	3	Visit in wet year
63	UNMAP	ARCHIL1	150 x 100m	Elymus	Sage	Native grass/ Crested wheat	M	F/H A/M	1	Visit in wet year
64		ARCHIL2	50m x 30m	Elymus	Sage	Native grass/ Crested wheat	L	F/L	2	
65		ARCHIL3	75m x 75m	Elymus	Sage	Native grass	M	F/L	2	
66		ARCHIL4	50m x 30m	Elymus	Sage	Native grass/ Crested wheat	L	F/L	3	
67		ARCHIL5	15mx 20m	None	Sage	Sage	L	F/L	3	
68		ARCHIL6	15m x 10m	None	Sage	Sage	L	F/L	3	
69		ARCHIL7	5m wide x 2m deep	Annual Weeds	Cottonwood	Edge/ Sage	L	None	3	Visit in wet year
70		ARCHIL8	5m wide x 2m deep	Annual weeds	Sage	Sage/ Native grass	L	None	3	Visit in wet year
71		BUTCIT1	15m wide x 4m deep	Sage/ Weeds	Chokecherry	Edge/ Unk Gen	L	None	2	River- Visit in wet year
72		BUTCIT2	15m wide x 4m deep	Sage/ Weeds	Rose	Edge/ Unk Gen	L	None	2	River- Visit in wet year
73		BUTCIT3	15 m wide x 4m deep	Sage/ Weeds	Currant	Edge/ Unk Gen	L	None	2	River- Visit in wet year
74		BUTCIT4	15m wide x 4m deep	Sage/ Weeds	Sage	Edge/ Unk Gen	L	None	2	River- Visit in wet year

Table B-1. (Continued)

SITE #	CLASS	SITE NAME*	AREA	VEGETATION SITE	VEGETATION AREA	1990 INEL VEGETATION MAP CLASSIFICATION (Preliminary)	WILDLIFE*	ARCHAEOLOGY*	RANK ^c	COMMENTS
75		HOWPK1	20m x 15m	Elymus	Sage	Sage- Grass	L	A/L	3	
76		HOWPK2	50m x 75m	Elymus	Sage	Sage/ Sage- grass	L	F/L	3	
77	UNC	ANTBU5	1 mile x 1/2 mile	Salsola	Sage	Playa	M	F/L	3	
78		BIGLOST7	200m x 80m	None	Saltbush	Dune/ Edge	L	None	3	
79		CIRBU1	300m x 600m	None	Rabbitbrush/ Sage/ Winterfat	Unk 2/ Burn	L	None	3	
80		CIRBUNE1	300m x 150m	None	Sage/ Grass	Saltbush/ Winterfat	L	None	3	
81		CIRBUNE2	170m x 60m	None	Sage/ Halogeton	Saltbush/ Winterfat	M	F/M	2	
82		CIRBUNE3	25m x 30m	None	Rabbitbrush	Sage	M	F/M A/L	2	
83		CIRBUNE4	15m x 60m	None	Sage/ Horsebrush	Edge/ Unk 2	L	F/M	3	
84		CIRBUNE5	80m x 40m	Salsola/ Sage	Sage	Edge	L	None	3	
85		CIRBUNW1	40m x 300m	None	Elymus/ Greasewood	Bare/ Edge/ Unk gen	M	F/M	2	
86		CIRBUNW2	300m x 30m	None	Sage	Saltbush/ Winterfat	L	None	3	
87		CIRBUNW3	100m x 100m	Saltbush	Sage/ Elymus	Saltbush/ Winterfat	L	A/M F/M	3	
88		CIRBUNW4	100m x 15m	None	Sage/ Saltbush	Saltbush/ Edge	L	None	3	
89		CIRBUNW5	150m x 75m	None	Sage/ Grass	Winterfat/ Edge	L	A/L	3	
90		CIRBUSE2	15m x 10m	None	Low sage	Dune/ Grass	L	None	3	
91		CIRBUSE5	40m x 30m	Halogeton	Sage/ Grass	Native grass/ Burn/ Unk 2	M	F/M	3	Man-made Catchment
92		CIRBUSW4	100m x 30m	Sedge/ Rush/ Weeds	Sage	Native grass/ Crested wheat	M	None	2	TRA Outflow
93		CIRBUSW5	150m x 200m	Dock	Sage	Bare ground/ Unk 2	L	None	3	CPP Waste pond

Table B-1. (Continued)

SITE #	CLASS	SITE NAME ^a	AREA	VEGETATION SITE	VEGETATION AREA	1990 INEL VEGETATION MAP CLASSIFICATION (Preliminary)	WILDLIFE ^b	ARCHAEOLOGY ^a	RANK ^c	COMMENTS
94		KETBU1	250m x 75m	Saltbush/ Grass	Sage	Sage/ Native grass	H	None	2	Elymus stand nearby
95		LITBUNE1	1 mile x 1/2 mile	Elymus	Elymus/ Sage	Grass/ Crested wheat	H	A/L	1	Revisit in wet year
96		LITBUNE2	60m x 50m	Halogeton	Elymus/ Sage	Crested wheat/ Unk 2	H	F/H	2	
97		LITBUNE3	15m x 10m	Halogeton	Sage/ Grass	Sage	L	None	3	
98		LITBUSW2	10m x 10m	None	Grass/ Sage	Sage	M	F/L	3	
99		LITBUSW4	100m x 40m	Halogeton	Elymus/ Grass/ Sage	Sage	L	F/L	3	
100		LITBUSW7	1/2 mile x 1/2 mile	Elymus	Elymus/ Sage		L	F/L	3	
101		LITBUSW8	40m x 20m	Halogeton	Sage/ Grass		M	None	3	
102		RICHBUT1	20m wide x 2m deep	Elymus/ Birch/ Willow/ Rose	Sage	Edge	L	None	2	Visit in wet year
103		RICHBUT2	5m wide x 1 m deep	Cottonwood/ Elymus/ Currant	Sage	Edge	L	None	2	Visit in wet year
104		RICHBUT3	2m wide x 1m deep	Elymus/ Rose	Sage	Sage	L	None	2	Visit in wet year
105		RICHBUT4	2m wide x 1m deep	Sage/ Elymus/ Rose	Sage	Edge	M	None	2	Visit in wet year

^a Each site was assigned an identifier comprised of the abbreviated quadrangle in which they were located and an ascending number representing the order in which the sites within the quadrangle were visited. Identifiers were limited to 8 characters. For numbering past 9, alpha characters were used, for example, CIRBUNW3 represents the third site visited in the Circular Butte 3 NW quadrangle and LITBUNWA the tenth site visited in the Little Butte NW quadrangle.

^b H - high; M - moderate; L - low; F - flakes; A - artifacts

^c 1 - wetland appears to have high potential ecological importance
 2 - wetland appears to have moderate potential ecological importance
 3 - wetland appears to have lower potential ecological importance
 4 - no apparent wetlands characteristics
 See Section 4 for a discussion of ranking procedure

APPENDIX C

INEL WETLAND SURVEY

PLANT SPECIES LIST

Table C-1. INEL Wetland Survey - Plant Species List

SCIENTIFIC NAME	COMMON NAME
<i>Achillea millefolium</i> L. <i>Agropyron caninum</i> (L.) Beauv. <i>Agropyron cristatum</i> (L.) Gaerth. <i>Agropyron dasystachyum</i> (Hook.) Scribn. <i>Agropyron spicatum</i> (Pursh) Scribn. & Smith <i>Arctium minus</i> (Hill) Bernh. <i>Artemisia dracunculus</i> L. <i>Artemisia ludoviciana</i> Nutt. <i>Artemisia nova</i> A. Nels. <i>Artemisia tridentata</i> Nutt. ssp. <i>tridentata</i> <i>Artemisia tridentata</i> Nutt. ssp. <i>wyomingensis</i> Beetle & Young <i>Artemisia tripartita</i> Rydb. <i>Asclepias speciosa</i> Torr. <i>Astragalus calycosus</i> Torr. <i>Astragalus lentiginosus</i> Dougl. <i>Atriplex canescens</i> (Pursh) Nutt. <i>Atriplex nuttallii</i> Wats.	Common Yarrow Bearded Wheatgrass Crested Wheatgrass Thickspike Wheatgrass Bluebunch Wheatgrass Common Burdock Dragon Sage Silver Sage Low Sagebrush Basin Big Sagebrush Wyoming Big Sagebrush Threetip sage Showy Milkweed Matted Milkvetch Freckled Milkvetch Fourwing Saltbush Saltsage
<i>Betula occidentalis</i> Hook. <i>Bromus japonicus</i> Thunb. <i>Bromus tectorum</i> L.	Water Birch Japanese Brome Cheatgrass
<i>Carex</i> spp. <i>Chaenactis douglasii</i> (Hook.) H. & A. <i>Chenopodium fremontii</i> Wats. <i>Chrysothamnus nauseosus</i> (Pall.) Britt. <i>Chrysothamnus viscidiflorus</i> (Hook.) Nutt. <i>Cirsium arvense</i> (L.) Scop. <i>Cryptantha interrupta</i> (Greene) Pays.	Sedge Desert Dusty Maiden Fremont's Goosefoot Gray Rabbitbrush Green Rabbitbrush Canada Thistle Bristly Cryptantha
<i>Descurainia pinnata</i> (Walt.) Britt. <i>Distichlis stricta</i> (Torr.) Rydb.	Western Tansy Mustard Desert Saltgrass
<i>Echinochloa crusgalli</i> (L.) Beauv. <i>Elymus cinereus</i> Scribn. & Merr. <i>Erigeron pumilus</i> Nutt. <i>Eriogonum microthecum</i> Nutt. <i>Euphorbia glyptosperma</i> Engelm.	Barnyard Grass Great Basin Wildrye Shaggy Fleabane Shrubby Buckwheat Corrugate-seeded Spurge
<i>Gutierrezia sarothrae</i> (Pursh) Britt. & Rusby	Matchbrush
<i>Halogeton glomeratus</i> Meyer <i>Hordeum jubatum</i> L. <i>Hyocymus niger</i> L.	Halogeton Foxtail Barley Black Henbane
<i>Iva axillaris</i> Pursh <i>Juncus</i> spp. <i>Kochia scoparia</i> (L.) Schrad. <i>Lupinus argenteus</i> Pursh <i>Lygodesmia spinosa</i> Nutt.	Poverty weed Rush Kochia Silvery Lupine Spiny Skeleton Weed

SCIENTIFIC NAME	COMMON NAME
<i>Machaeranthera canescens</i> (Pursh) Gray <i>Medicago lupulina</i> L. <i>Medicago sativa</i> L. <i>Melilotus officinalis</i> (L.) Lam.	Hoary Aster Black Medic Alfalfa Yellow Sweet-clover
<i>Oenothera caespitosa</i> Nutt. <i>Oenothera tanacetifolia</i> T. & G. <i>Opuntia polyacantha</i> Haw. <i>Orobancha fasciculata</i> Nutt. <i>Oryzopsis hymenoides</i> (R. & S.) Ricker	Desert Evening Primrose Tansy-ldv Evening Primrose Prickly Pear Clustered Broomrape Indian Ricegrass
<i>Phlox hoodii</i> Rich. <i>Poa nevadensis</i> Vasey <i>Poa sandbergii</i> Vasey <i>Polygonum aviculare</i> L. <i>Polygonum douglasii</i> Greene <i>Populus angustifolia</i> James <i>Populus trichocarpa</i> T. & G. <i>Prunus virginiana</i> L.	Hood's Phlox Nevada Bluegrass Sandberg's Bluegrass Doorweed Douglas' Knotweed Narrow-leaved Cottonwood Black Cottonwood Common Chokecherry
<i>Ribes aureum</i> Pursh <i>Rosa woodsii</i> Lindl. <i>Rumex crispus</i> L.	Golden Currant Wood's Rose Curly Dock
<i>Salix exigua</i> Nutt. <i>Salsola kali</i> L. <i>Scirpus acutus</i> Muhl. <i>Scirpus</i> spp. <i>Sisymbrium altissimum</i> L. <i>Sitanion hystrix</i> (Nutt.) Smith <i>Solanum triflorum</i> Nutt. <i>Solidago canadensis</i> L. <i>Sphaeralcea munroana</i> (Dougl.) Spach. <i>Stipa comata</i> Trin. & Rupr.	Gray Sandbar Willow Russian Thistle Hardstem Bulrush Bulrush Jim Hill Mustard Bottlebrush Squirreltail Cut-leaved Nightshade Canada Goldenrod Orange Globemallow Needle-and-thread Grass
<i>Typha latifolia</i> L. <i>Urtica dioica</i> L.	Common Cattail Stinging Nettle

APPENDIX D

1992 Preliminary Survey Of The National Wetlands Inventory As Mapped For The Idaho National Engineering Laboratory

(Reference: INEL-95/0101)

LEGEND

- L2USJ : L = Lacustrine, 2 = Littoral,
US = Unconsolidated Shore,
J = Intermittently Flooded
 PAB4Hx : P = Palustrine, AB = Aquatic Bed,
4 = Floating Vascular, H = Permanently Flooded,
x = Excavated
 PEMJ : P = Palustrine, EM = Emergent,
J = Intermittently Flooded
 PEM1A : P = Palustrine, EM = Emergent, 1 = Persistent,
A = Temporarily Flooded
 PEM1C : P = Palustrine, EM = Emergent, 1 = Persistent,
C = Seasonally Flooded
 PEM1J : P = Palustrine, EM = Emergent, 1 = Persistent,
J = Intermittently Flooded
 POWHx : P = Palustrine, OW = Open Water,
H = Permanently Flooded, x = Excavated
 PUSC : P = Palustrine, US = Unconsolidated Shore,
C = Seasonally Flooded
 PUSCr : P = Palustrine, US = Unconsolidated Shore,
C = Seasonally Flooded, r = Artificial Substrate,
x = Excavated
 PUSCx : P = Palustrine, US = Unconsolidated Shore,
C = Seasonally Flooded, x = Excavated
 PUSJ : P = Palustrine, US = Unconsolidated Shore,
J = Intermittently Flooded
 UPLAND : Non Wetland

R2OWHx : R = Riverine, 2 = Lower Perennial,
OW = Open Water, H = Permanently Flooded,
x = Excavated

R4SBA : R = Riverine, 4 = Intermittent, SB = Streambed,
A = Temporarily Flooded

R4SBC : R = Riverine, 4 = Intermittent, SB = Streambed,
C = Seasonally Flooded

R4SBJ : R = Riverine, 4 = Intermittent, SB = Streambed,
J = Intermittently Flooded

R4SBJx : R = Riverine, 4 = Intermittent, SB = Streambed,
J = Intermittently Flooded, x = Excavated

R4SBKx : R = Riverine, 4 = Intermittent, SB = Streambed,
K = Artificially Flooded, C = Seasonally Flooded,
x = Excavated

+ Sites Surveyed
 Number references
 Table B-1

**ENVIRONMENTAL
ASSESSMENT
TECHNOLOGIES**

Date Drawn : March 07, 1995