



T·O ENGINEERS

BEAR LAKE COUNTY AIRPORT MASTER PLAN

ENVIRONMENTAL APPENDICES
DRAFT



1. ENVIRONMENTAL OVERVIEW

1.1 INTRODUCTION

Airport improvement projects that are considered to be Federal actions or receive Federal funding must be assessed from an environmental standpoint in order to comply with the National Environmental Protection Act of 1969, the Airport and Airport and Airway Improvement Act of 1982, the 40 Code of Federal Regulations parts 1500-1508, the Department of Transportation Order DOT 5610.1C as well as other pertinent laws, statutes and directives.

The National Environmental Protection Act (NEPA) ensures that environmental considerations are accounted for. For airport projects, the FAA Order 1050.1E Change 1, Environmental Impacts: Policies and Procedures, the FAA Order 5050.4b, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects, and the Environmental Desk Reference for Airport Actions provide guidance for compliance with NEPA regulations.

For any proposed airport action, the FAA performs an initial environmental review, which considers the type of action as well as its potential effect on the environment. Then, typically one of the three following methods of analysis is conducted:

- ✦ Categorical Exclusion (CATEX), for the actions which do not result in significant environmental impacts and for which no Environmental Assessment or Impact Statement is required,
- ✦ Environmental Assessment (EA), for proposed actions with minor or uncertain environmental impact,
- ✦ Environmental Impact Statement (EIS): for major federal actions and actions known to have potential for significant environmental impact.

The Environmental Overview section of this Airport Master Plan describes the environmental setting of Bear Lake County Airport, as well as areas that may potentially be impacted by proposed development at the airport necessitating further environmental study before the project implementation. The overview of the impact categories summarized below are based on the Order 1050.1E, including the new climate change category.

1.2 AIR QUALITY

Detailed air quality analysis is needed, under the guidance of the NEPA and the Clean Air Act, for airport development projects that, due to their size, scope or location, have the potential to affect the attainment and maintenance of established air quality standards.

Air Quality standards are known as the “National Ambient Air Quality Standards” (NAAQS) and are present for six criteria air pollutants, which include: carbon monoxide (CO), lead (Pb), nitrogen

dioxide (NO₂), ozone (O₃), particulate matter (PM) for both PM₁₀ and PM_{2.5}, and sulfur dioxide (SO₂). For each of these pollutants, the NAAQS include a maximum concentration above which adverse effects on human health and the environment may occur.

States are responsible for designating areas that are attainment, nonattainment or maintenance for each of the criteria pollutants. An attainment area is an area where the levels of all criteria air pollutants meets the NAAQS; and thus is safe for human health, public welfare and the environment. A nonattainment area is an area where the concentration of one or more of the criteria is higher than the NAAQS; while a maintenance area is an area previously designated nonattainment, but where the air pollution levels have improved.

The state of Idaho has a network of air monitoring stations to evaluate selected air pollutants. The closest stations to Bear Lake County Airport are located in Franklin and Soda Springs, approximately 30 miles from the airport. In addition, the Idaho Air Quality Planning Areas Map published by the Idaho Department of Environmental Quality shows nonattainment areas, areas of concern and Class I areas (which include all national parks greater than 6,000 acres, wilderness areas and national memorial park greater than 5,000 acres). **Figure X-1** depicts the Idaho Air Quality Planning Areas Map.

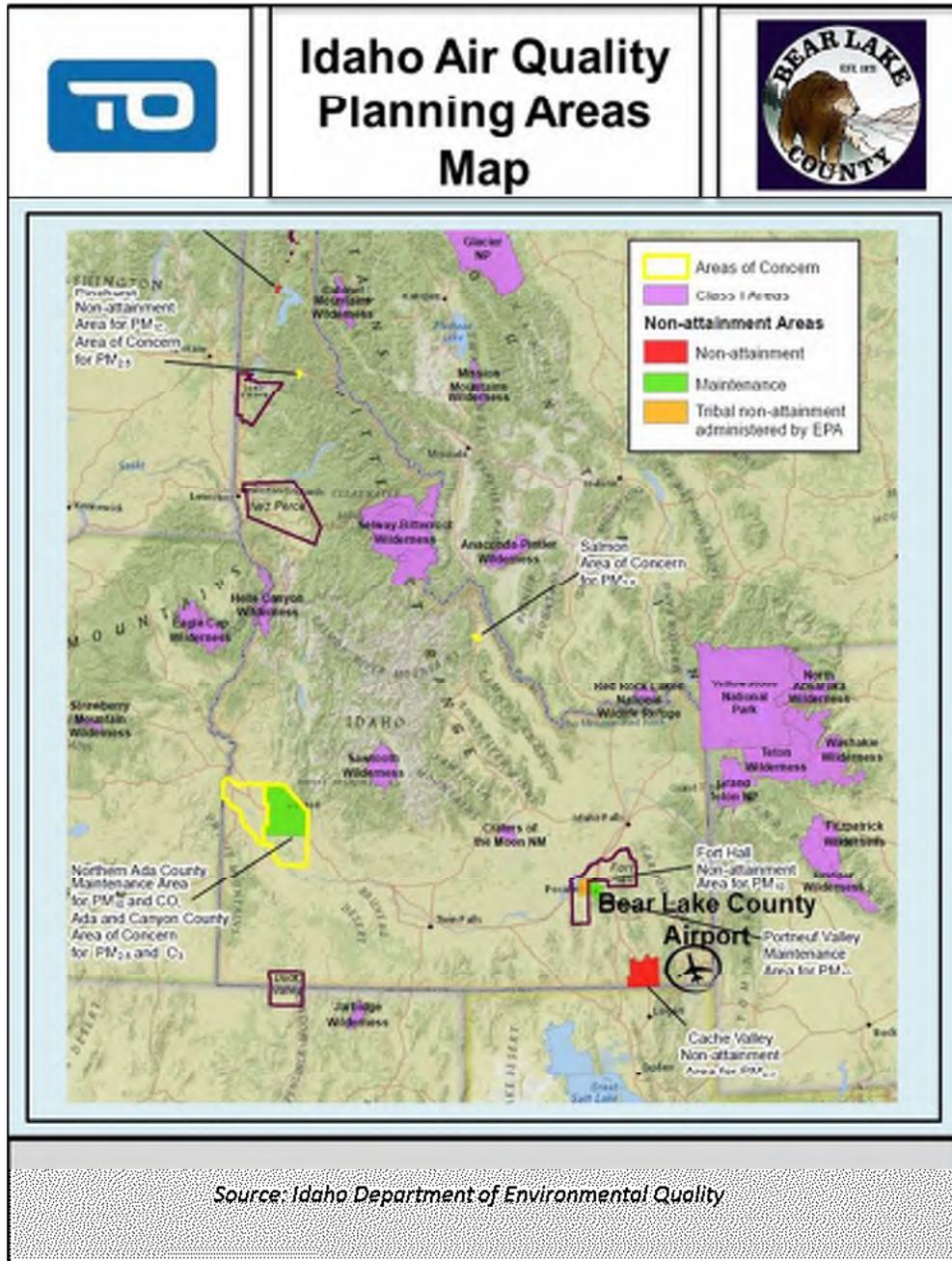
This map was reviewed and shows that Bear Lake County Airport is located in an attainment area. The closest nonattainment area is located in the Cache Valley, and is nonattainment area for the criteria air pollutant PM_{2.5}. The closest Class I areas include Bridger and Fitzpatrick Wilderness areas, located in Wyoming approximately 100 miles northeast of the airport, as well as Craters of the Moon National Monument, located in Idaho approximately 150 miles to the northwest of the airport.

For NEPA purpose, an air quality analysis must be conducted when the airport has a proposed action that will cause a reasonable foreseeable emission increase. As Bear Lake County Airport is not located in a nonattainment or maintenance area, an Emissions Inventory will need to be prepared and the results of this emission inventory will need to be disclosed if an action is expected to cause an emission increase. Dispersion modeling might also be necessary if it has been called for in agency scoping and or public involvement. If the proposed action is not expected to cause a reasonable foreseeable emission increase, only a Qualitative Air Quality Assessment will be necessary.

Sources of Emissions includes Aircraft, Auxiliary Power Units (APUs), Ground Support Equipment (GSE), Ground Access Vehicles, Stationary and Area Sources and Construction. At Bear Lake County Airport, only Aircraft, Ground Access Vehicles and Construction have been identified as potential sources of Emissions. The types of emissions include Criteria Pollutants (and their precursors, Hazardous Air Pollutants (HAPs) and Greenhouse Gases (GHGs).

Construction can degrade air quality, mainly due to dust or burning debris. Therefore, when needed, the air quality analysis undertaken to comply with requirements of the NEPA and the Clean Air Act must include construction impacts on air quality.

FIGURE X-1 – AIR QUALITY PLANNING AREAS MAP



1.3 COASTAL RESOURCES

Bear Lake County Airport is located in Idaho, which does not border a coastline. The airport is situated approximately 650 miles inland from the nearest point on the west coast. This impact category is not applicable at the airport.

1.4 CLIMATE CHANGE

According to the FAA Order 1050.1E, Change 1, Guidance Memo #3, climate change and evaluation of Green House Gases (GHGs) should be explicitly identified and included as an impact category in the FAA environmental documentations, such as Environmental Assessments (EA) and Environmental Impact Statements (EIS).

Green House Gases (GHGs) include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF₆). GHGs result primarily from fuel combustion and there is a direct relationship between the fuel combustion and the metric tons of CO₂ equivalent. To convert fuel quantities to CO₂ the following equation factors can be used:

- ✦ 1 gallon of jet fuel = 9.7438 kg of CO₂
- ✦ 1 gallon of avGas = 8.3182 kg of CO₂

There are currently no federal standards or significance thresholds for GHGs emissions applicable to aviation. Therefore, the consideration of the environmental impacts of a proposed action regarding GHGs can be either qualitative or quantitative.

It is recommended the County monitor potential new standards and/or thresholds and address them as necessary when appropriate.

1.5 COMPATIBLE LAND USE

The compatibility of existing and planned land uses in the vicinity of an airport is usually associated with the extent of the airport's noise impacts. Activities that may alter aviation-related noise impacts and affect land uses subjected to those impacts typically involve: airport development actions to accommodate fleet mix changes or changes in the number of aircraft operations, air traffic changes or new approaches to the airport made possible by new navigational aids. If a noise analysis concludes that there is no significant noise impact, a similar conclusion may usually be made about compatible land uses.

An assessment of the compatibility of land uses in the vicinity of the airport must also be conducted to ensure that the land uses do not adversely affect safe aircraft operations. Examples of uses that may adversely affect aircraft operations include municipal landfills or wetland mitigation that attracts wildlife species hazardous to aviation.

As previously mentioned in the Inventory Chapter, Bear Lake County Comprehensive Plan and Zoning Ordinance, the airport and surrounding areas are outlined in the Bear Lake County Comprehensive Plan as Light Industry & Manufacturing land use. In addition, with the exception of the airport manager office, there appeared to be no residential buildings in the immediate vicinity of the airport. With respect to noise, there is no incompatible land use.

The surrounding land uses include agricultural, rangeland, forests and wetlands. Most of the land is privately owned while the remaining parcels are federally or state-owned by the U.S Forest Service, Bureau of Land Management, U.S Fish and Wildlife Service (USFWS) and the state of Idaho.

The northernmost limit of the Bear Lake National Wildlife Refuge (NWR) is located approximately 1,400 feet south of the runway 34 threshold. **Figure X-2** depicts the refuge boundary limits as well as land ownership in the vicinity of Bear Lake County Airport.

The land within the limits of Bear Lake NWR close to the airport is currently used for haying, which allow keeping the areas open and not overgrown with emergent. Small grains and legume crops are cultivated within the refuge for waterfowls and other key wildlife species on Bear Lake NWR. However, since 2003, the refuge management has begun to retire hay units and is planning to continue retiring more hay units in the future. Previously hayed habitats will be restored or rehabilitated. Incremental reductions will occur every five years, over three five-year cycles: 2013-2017; 2018-2022; 2023-2027, as depicted in **Figure X-3**. The aim is to provide more natural wet meadow adjacent to short stature vegetation, dense nesting cover and open pools. This change in the use of the land is likely to change the waterfowls' patterns and it might attract more birds and wildlife in the vicinity of the airport.

From a compatible land use standpoint, there are few residential developments in the vicinity of the airport. Noise impacts resulting from reasonably foreseeable development are not anticipated. Additional information on the Bear Lake NWR and migratory birds species is provided in Section 1.9.3, Migratory Birds Species.

FIGURE X-2 – REFUGE BOUNDARY AND LAND OWNERSHIP

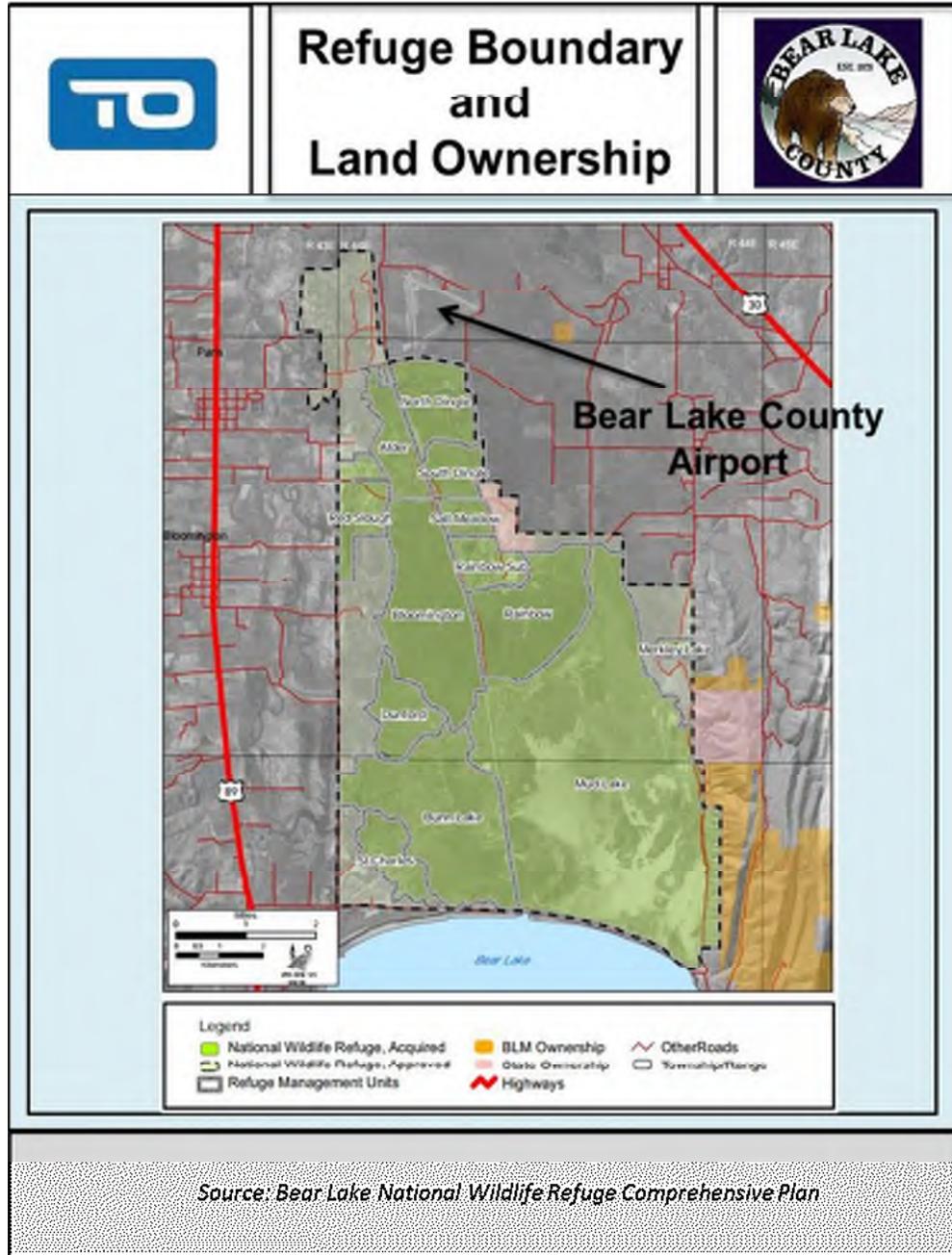
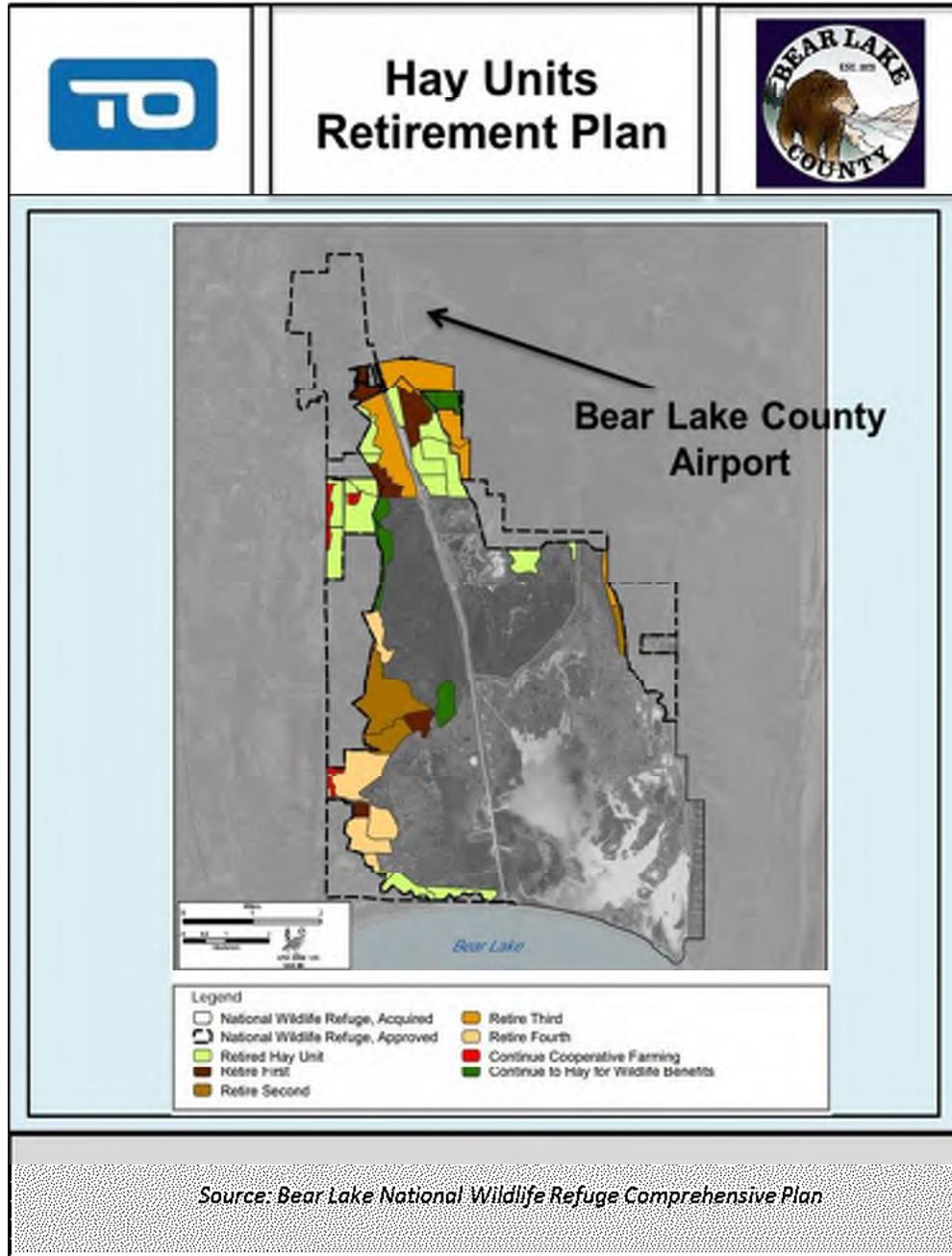


FIGURE X-3 – HAY UNITS RETIREMENT PLAN



1.6 CONSTRUCTION IMPACTS

Construction impacts are temporary in nature. However, airport construction may cause various environmental effects primarily due to dust, aircraft and heavy equipment emissions, storm water runoff, spilled or leaking petroleum products and noise.

In order to minimize and mitigate for potential temporary impacts, future construction activities will comply with FAA Advisory Circular 150/5370-10A, Standards for Specifying Construction of Airports and National Pollutant Discharge Elimination System (NPDES).

1.7 DEPARTMENT OF TRANSPORTATION ACT – SECTION 4F COMPLIANCE

Section 4(f) of the Department of Transportation Act (section 303 (c) of 49 U.S.C.) states that if a project requires the use of a publicly owned park, recreation area, wildlife or waterfowl refuge, or historic site of national, state, or local significance, the project will not be approved unless:

- ✦ It has a *de minimis* impact exception,
- ✦ Or there is no prudent and feasible alternative,
- ✦ Or the project includes all possible planning to minimize harm.

As previously mentioned, the nearest wildlife refuge is the Bear Lake NWR, located approximately 1,400 feet south of the runway 34 threshold. The Bear Lake NWR is a 18,000 acre refuge used by multiple species of waterfowl and which provides nesting habitats.

Other parks include the Allinger Park located in Montpelier, approximately 6 miles north of the airport, equipped with restrooms, playground, picnic areas, baseball fields, concessions stands and skateboard/rollerblade area. The Minnetonka Cave, a limestone rock cave, is situated approximately 15 miles to the southwest of the airport. This Cave harbors five different species of bats, including the Townsend's Big-eared Bat which is listed by the Forest Service as a species of concern and has an Idaho State ranking of S3, rare or uncommon.

Furthermore, Bear Lake State Park is located approximately 10 miles to the south of the airport. Lastly, the Caribou-Targhee National Forest, which encompasses 18 trail heads located within Bear Lake County and many point of interest such as Meade Peak, Montpelier Reservoir, Paris Ice Caves, Bloomington Lake, Shoshone Indian Trail, and Crow Creek Road, surrounds Bear Lake Valley, as depicted with **Figure X-4**.

FIGURE X-4 – NATIONAL FOREST



As there are no parks, recreation areas or refuges within the existing airport property limits, this impact category is not applicable for projects remaining within the airport property limits.

1.8 FARMLANDS

According to the FAA Environmental Desk Reference for Airport Actions, important farmlands include all pasturelands, croplands, and forests considered to be prime, unique, statewide or locally important lands. Prime farmland has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops; while unique farmland is a land other than prime farmland that has a special combination of unique characteristics needed to economically produce sustained high yields of a specific crop.

According to the Farmland Protection Policy Act, lands already committed to “urban development or water storage”, such as airport developed areas, do not meet the definition of prime or unique farmlands, regardless of their importance as defined in the Natural Resource Conservation Service (NRCS).

Soils in the vicinity of the airport are depicted in **Figure X-5**, based on the USDA Web Soil Survey.

FIGURE X-5 – SOIL MAP

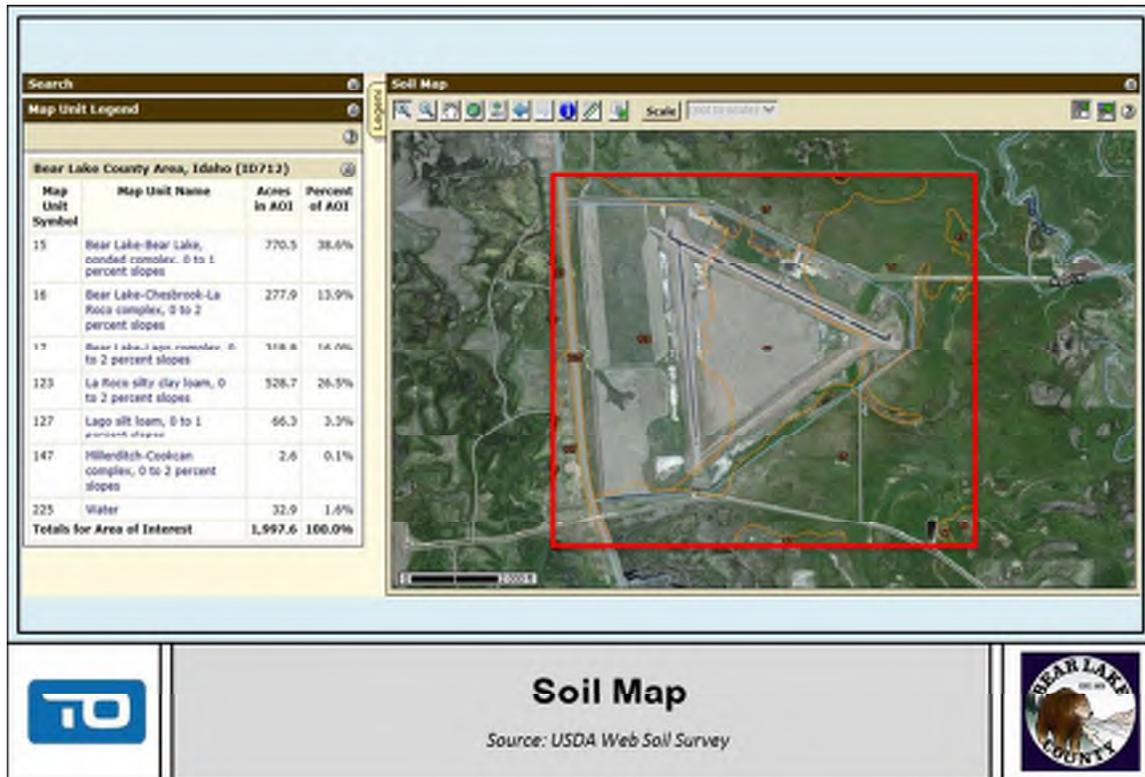


Table X-1 lists the soils in the vicinity of the airport.

TABLE X-1: SOIL TYPES IN THE VICINITY OF BEAR LAKE COUNTY AIRPORT

Soil	Type	Approximate Acreage	Farmland Classification
15	Bear Lake – Bear Lake ponded complex, 0 to 1% slopes	770.5	Prime farmland if irrigated and drained
16	Bear Lake – Chesbrook – La Roca complex, 0 to 2% slopes	277.9	Prime farmland if irrigated and drained
17	Bear Lake – Lago complex, 0 to 2% slopes	318.8	Prime farmland if irrigated and drained
123	La Roca silty clay loam, 0 to 2% slopes	528.7	Prime farmland if irrigated
127	Lago silt loam, 0 to 1% slopes	66.3	Prime farmland if irrigated and drained
147	Millerditch – Cookcan complex, 0 to 2% slopes	2.6	Prime farmland if irrigated and drained
225	Water	32.9	-

Source: USDA Web Soil Survey, T-O Engineers

Some soils in the immediately vicinity of the airport are classified as prime farmland if irrigated and drained. Soils within the airport property limits are already disturbed and do not meet the definition of prime or unique farmlands. Airport development projects that would convert important farmlands must be coordinated with the local NRCS field office and additional analysis must be conducted.

1.9 FISH, WILDLIFE, AND PLANTS

This section provides an overview of fish, wildlife and plants on or near Bear Lake County Airport.

1.9.1 FEDERALLY-LISTED ENDANGERED AND THREATENED SPECIES

To satisfy the Endangered Species Act of 1973, the Federal Aviation Administration (FAA) must determine if a proposed action would affect a Federally-listed species or habitat critical to that species.

Prior to an airport action that may affect Federally-listed endangered or threatened species or their critical habitats, the U.S Fish and Wildlife Service (USFWS) should be contacted to determine the depth of analysis required to assess potential impacts of the airport project. Additional analysis and research, including field surveys, are often necessary prior to future development activities, to determine the presence of Federally-listed endangered and threatened species.

The USFWS lists one species that have a Threatened species designation and may be found in Bear Lake County: the Canada Lynx (*Lynx Canadensis*). In addition, the USFWS lists one candidate species that may be found in Bear Lake County: the Greater Sage-Grouse (*Centrocercus urophasianus*). In August 2014, the USFWS has withdrawn the proposal to list the North American Wolverine (*Gulo gulo luscus*) as a threatened species.

Bear Lake County Airport is surrounded by wetlands and cultivated field, therefore the Canada Lynx is not likely to be found within the vicinity of the airport. According to the Bear Lake NWR Comprehensive Plan of 2013, there are no known threatened or endangered species occurring on Bear Lake NWR, located in the vicinity of Bear Lake County Airport.

In addition, the FWS Critical Habitat Portal was consulted. This mapping tool indicates no designated critical habitat in the immediate vicinity of the airport.

1.9.2 STATE-LISTED RARE OR UNIQUE SPECIES

State status of plants, animals, and plant communities are ranked with the state rank indicator on a scale of 1 to 5. This indicator denotes the rank based on the status within the State of Idaho. S1 is the most critical, it indicates critically imperiled species, at very high risk of extinction due to extreme rarity, often 5 or few populations; S2 indicates imperiled species, at high risk of extinction or elimination due to very restricted range, or very few populations; while S5 indicates secure specie, common, widespread and abundant. According to the Idaho Fish and Wildlife Information System (IFWIS), there are 109 sensitive species observed in Bear Lake County. Among these

109 sensitive species: 16 are ranked S1, 30 are ranked S2, 16 are ranked S3, 12 are ranked S4 and 29 are ranked S5.

1.9.3 MIGRATORY BIRD SPECIES

The Migratory Bird Treaty Act, as amended, prohibits actions that may take a migratory bird species or affect its breeding habitat. The Bear Lake NWR is located approximately 1,400 feet south of the runway 34 threshold, as previously depicted in Section 1.5, Compatible Land Use, **Figure X-2**. Bear Lake NWR is a 18,000 acre refuge, which has historically always provided goose nesting habitats. Currently, priorities of the refuge management have shifted towards the preservation of redhead and canvasback duck, trumpeter swans, and white-faced ibis.

Aerial surveys and ground based surveys are made to monitor bird populations within the Bear Lake NWR. According to the Bear Lake NWR Comprehensive Plan of 2013, numerous species of migratory waterfowls use the Refuge during spring, summer and fall months. The most abundant species include Great Basin Canada geese, Mallard, green-winged teal, canvasback, redhead, and ruddy ducks. Gadwall, northern pintail, cinnamon teal, and lesser scaup also occur in lower numbers. Some snow geese, trumpeter swans and tundra swans also migrate through the refuge.

Several species of ducks nest on the refuge; the most common nesting species include mallard, canvasback, redhead, and ruddy duck. Trumpeter swans, lesser scaup, northern shoveler, cinnamon teal, green-winged teal, northern pintail, gadwall, and American wigeon also nest in lesser numbers. In addition, Peregrine Falcon as well as various hawk species are known to breed in the area.

A wildlife hazard site visit was completed during two days at Bear Lake County Airport in August 2014. The Wildlife Hazard Site Visit Report reports that the refuge provides shelter for at least 214 bird species; a typical breeding season on the refuge will produce 4500 ducks and 1800 geese. In the spring up to 5,000 adult White Faced Ibis may be present; in late September, flocks of 200-500 Sandhill Cranes feed in refuge grain fields, and in the fall, American White Pelicans are present in the area. During the survey conducted at the airport sixty species of birds were observed. However, it should be noted that many more species and much larger numbers of birds would be expected to be present during the spring and fall migrations.

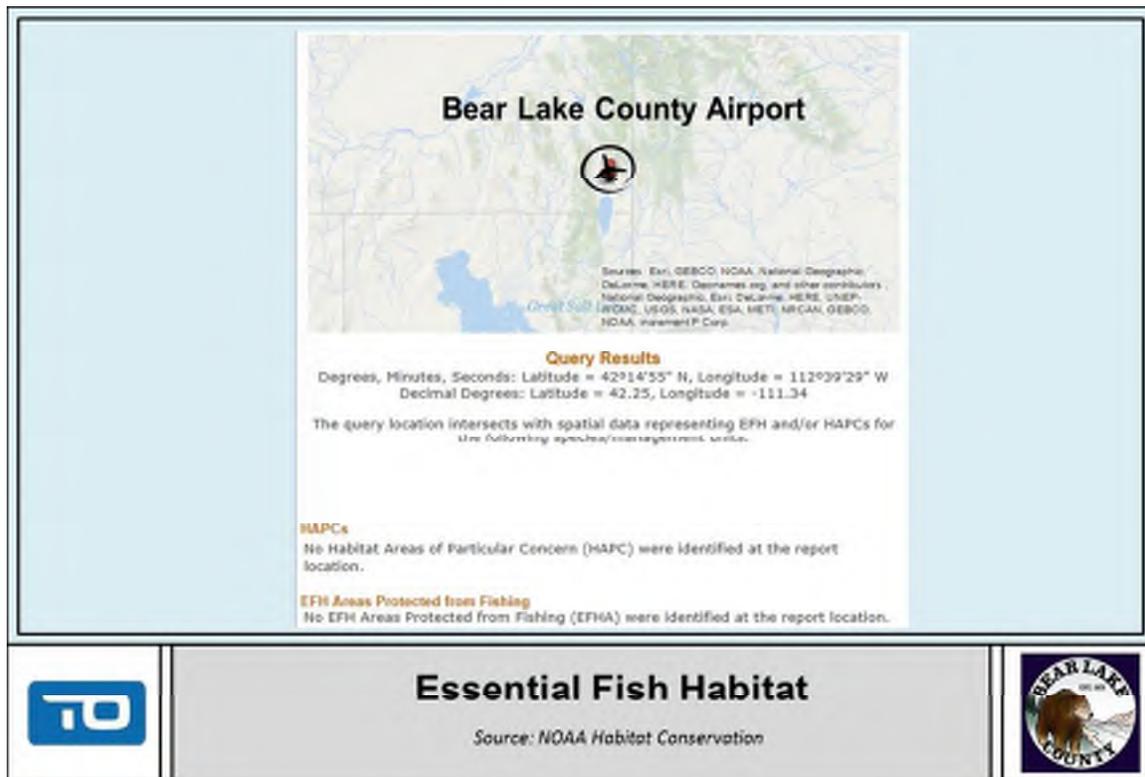
Further bald eagles, protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act are present in the Bear Lake NWR and in the vicinity of the airport. The wildlife hazard site visit reported that Bald Eagles and Rough-Legged hawks are known to winter in the area and an active Bald Eagle Nest is situated in the vicinity of Bear Lake County Airport.

A summary of the consequences of the Migratory Bird Treaty Act and the presence of migratory birds in the vicinity of the airport is provided in Section 1.9.5, Summary.

1.9.4 ESSENTIAL FISH HABITAT

The National Oceanic and Atmospheric Administration (NOAA) Essential Fish Habitat (EFH) mapper tool indicates that No Habitat Areas of Particular Concern (HAPC) are identified in the vicinity of Bear Lake County Airport. In addition, no Essential Fish Habitat Areas Protected from Fishing (EFHA) are identified near the airport, as depicted in **Figure X-6**.

FIGURE X-6 – ESSENTIAL FISH HABITAT



1.9.5 SUMMARY

Actions that have the potential to affect migratory birds, fish, Federally-listed endangered and threatened species, or state-listed rare and unique species may require special permits. Impacts on undisturbed wildlife habitats require more analyses than that needed for already disturbed areas, such as previously disturbed airport property, populated areas or farmland.

Additional analysis and research, including field surveys, is often necessary prior to future airport development activities, to evaluate the presence of state-listed rare and unique species as well as migratory birds or their habitats. In general, coordination with USFWS and the Idaho Department of Fish and Game (IFG) is also often necessary prior to airport development projects to determine if any areas at the airport, or in the vicinity, could be considered significant biotic resources.

The wildlife hazard site visit completed at Bear Lake County Airport in August 2014 reported sixty different species of birds as well as direct observations of moose, mule deer, striped skunk badger and coyotes in the immediate vicinity of the airport. During this survey, no Federally-Listed Endangered and Threatened Species were observed at the airport. However, the Greater Sage-Grouse, a candidate species, is known to use the Bear Lake NWR.

The close proximity of the Bear Lake NWR attracts migratory birds and various mammals. These migratory birds and mammals can be found in the vicinity of the airport. Bear Lake County Airport and the airport property have been previously disturbed. However, if projects were to impact areas not previously disturbed it is anticipated that additional environmental analysis, such as an environmental assessment, might be necessary to assess the impact on wildlife and wildlife habitat.

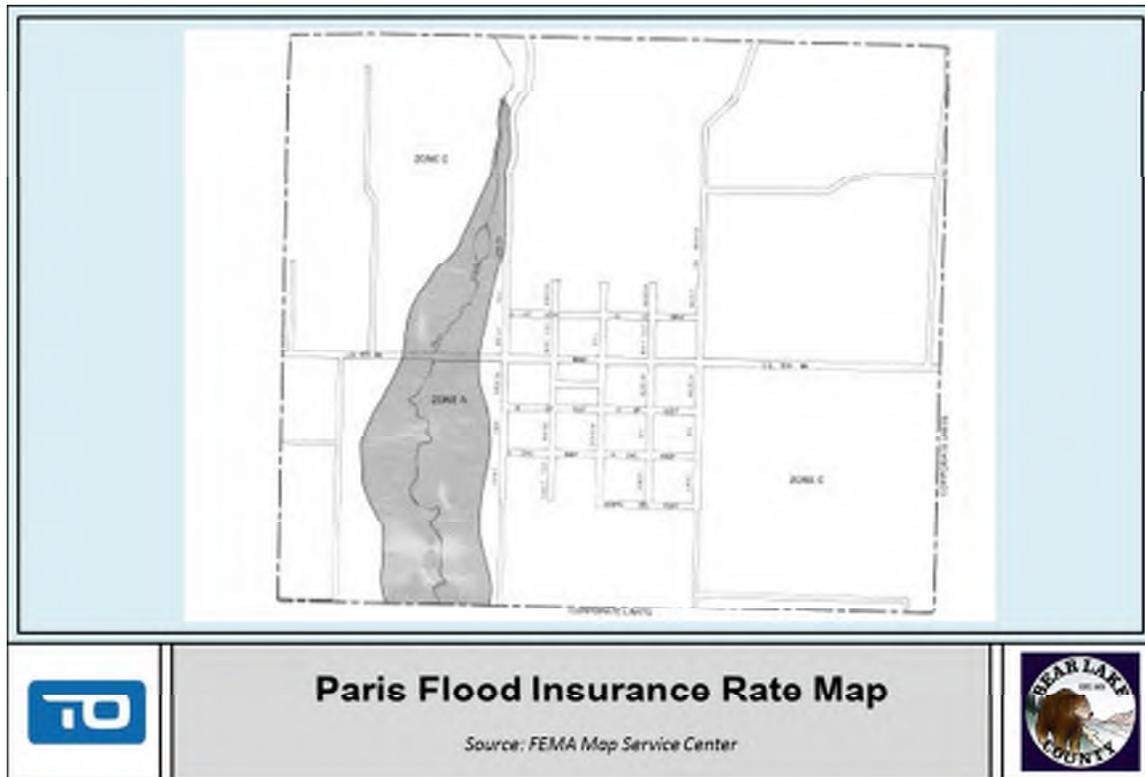
1.10 FLOODPLAINS

Executive Order 11988, Floodplains and U.S Department of Transportation (DOT) Order 5650.2, Floodplain Management and Protection, requires all airport development actions to avoid floodplain if a practical alternative exists. If no practical alternative exists, actions in a floodplain must be designed to minimize adverse impact to the floodplain's natural and beneficial values. In addition, the design must also minimize the potential risks for flood-related property loss and impacts on human safety, health and welfare.

An examination of the Flood Insurance Rate Maps (FIRM) shows that Bear Lake County Airport is in an unmapped area and that there is no FEMA Floods Maps for this area. The only flowing water in close proximity to the airport is the Bear Lake Outlet Canal, which is a controlled channel.

The closest mapped area is the city of Paris, Idaho, located approximately three miles east of the airport and depicted in **Figure X-7**. An examination of the map of Paris shows that there is a Zone A flood zone, associated with the Paris Creek, within the city center. A Zone A flood zone is a zone that has the potential to flood in a 100-year storm or a zone where a flood has 1 percent change of occurring in any given year. The remaining parts of the city are Zone C, which are areas of minimal flooding.

FIGURE X-7 – PARIS, IDAHO, FLOOD INSURANCE MAP



Actions within a base floodplain may require authorization for the U.S. Army Corps of Engineers, Federal Emergency Management Agency (FEMA) and state or local agencies. In addition, consultation with these agencies may be needed.

1.11 HAZARDOUS MATERIALS, POLLUTION PREVENTION, AND SOLID WASTE

1.11.1 HAZARDOUS MATERIALS AND POLLUTION PREVENTION

The terms hazardous materials, hazardous waste and hazardous substances are associated with industrial wastes, petroleum products, dangerous goods or other contaminants. Hazardous wastes are solid wastes that are ignitable, corrosive, reactive or toxic. Hazardous substances are substances that pose substantial harm to human health and environment resources, but do not include any petroleum or natural gas substances and materials. Hazardous materials are any substances or materials commercially transported that pose unreasonable risk to public health, safety and property. They include hazardous waste and hazardous substances as well as petroleum, natural gas substances and materials.

The predominant laws related to hazardous materials in Federal Aviation Administration (FAA) actions, projects, and decisions are mainly contained in the Resource Conservation and Recovery

Act (RCRA), the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), and the Community Environmental Response Facilitation Act (CERFA).

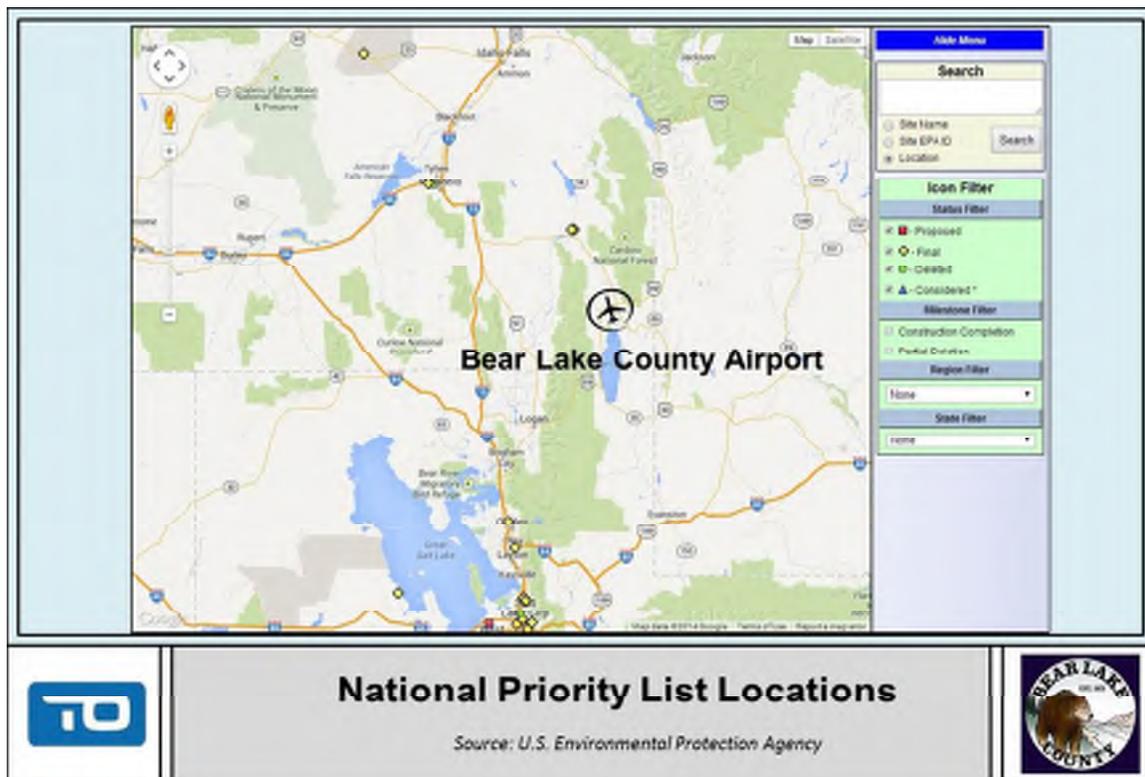
In order to evaluate the impact significance of the project, the following guidelines must be taken into consideration:

- ✦ The action involves a property on or eligible for the National Priority List (NPL),
- ✦ The sponsor would have difficulty meeting applicable local, state or Federal laws and regulations on hazardous materials,
- ✦ Or there is an unresolved issue regarding hazardous materials (for instance the action would affect a site known or suspected to be contaminated).

National Priority List (NPL)

The National Priority List (NPL) is used to identify properties at risk of releases of hazardous substances, pollutants or contaminants. Its primary intent is to guide the U.S. Environmental Protection Agency (EPA) in determining which sites warrant further investigation. The NPL was consulted and properties listed were evaluated in relation to the airport’s location. There are no properties listed on the NPL in the immediate vicinity of the airport, as depicted in **Figure X-8**. The closest one is in Soda Springs, ID, approximately 30 miles northwest of the airport.

FIGURE X-8 – NATIONAL PRIORITY LIST



Underground Storage Tanks

Storage tanks are used to store petroleum or certain other hazardous liquids. Leaking underground storage tanks can pose a serious environmental threat to soil and ground water. The Idaho Department of Environmental Quality maintains a database, the Idaho Underground Storage Tank Database, of active and closed Underground Storage Tank sites across the state.

Bear Lake County Airport is identified in the Idaho Underground Storage Tank Database as facility number 5-040036. In the past, the airport had 4 underground storage tanks, which are now permanently out of use. These tanks and associated pipes are no longer used and may have been extracted from the ground. In addition, an underground tank is currently in use at the airport to store Aviation Gas. This tank has a capacity of 4,000 gallons and is made of Fiberglass Reinforced Plastic. It was installed on September 29, 1997.

In 1993, a leaking underground storage tank (LUST) was identified and the site cleanup was initiated. The cleanup was completed in 2005. The site was last inspected on June 21, 2012 and records indicate that no leaking events have occurred.

Summary

There are no National Priority List properties in the vicinity of the airport and no unresolved issues regarding hazardous materials at the airport. There is no reason to believe nor is there any evidence to suggest that foreseeable future improvement projects at Bear Lake County Airport will be developed in area(s) that contains hazardous materials. Should unexpected encounters occur during project construction, all applicable local, State and Federal regulations and standards for the handling and disposal of hazardous materials will be followed.

1.11.2 SOLID WASTE

Development and construction on airports typically produces construction debris. In addition, solid waste also occurs because of on-airport activities. Refuse can result from construction workers, but also from passengers and airport workers using the terminal building. Activities needed to maintain airside and landside facilities produce other sources of solid waste.

Additional analyses have to be conducted when a proposed airport project would cause or change a solid waste stream. This should include a discussion on how the potential solid waste would be handled and disposed properly to minimize environmental effects. In addition, the analysis should also determine whether local disposal facilities have the capacities to handle the solid waste volumes the proposed airport facilities would produce during their construction or operations. State and local agencies should be consulted as they are often responsible and have the most knowledge about solid waste issues in an airport area.

A significant impact occurs when the potential generated solid waste would exceed available landfill or incineration capacities, or require extraordinary effort to meet applicable solid waste

permit conditions and regulations or when Local, State or Federal agencies determine that substantial unresolved waste disposal issues exist and may require more analyses.

Bear Lake County operates a solid waste landfill located two miles east of Montpelier, in Montpelier Canyon, which accept construction debris, household waste, as well as metal, household appliances, oil disposal, old battery disposal and tire disposal with a fee.

1.12 HISTORICAL, ARCHITECTURAL, ARCHEOLOGICAL, AND CULTURAL RESOURCES

An historic property is defined as “any prehistoric or historic district, site, building, structure or object included in, or eligible for inclusion in the National Register of Historic Places (NRHP).” Typical actions that could affect historic, architectural, archeological and cultural resources include building or expanding terminal and hangar facilities, runways, taxiways, installing NAVAIDS, building or moving access roadways, parking facilities, or other types of activities requiring any other construction.

1.12.1 NATIONAL REGISTER OF HISTORIC PLACES (NRHP)

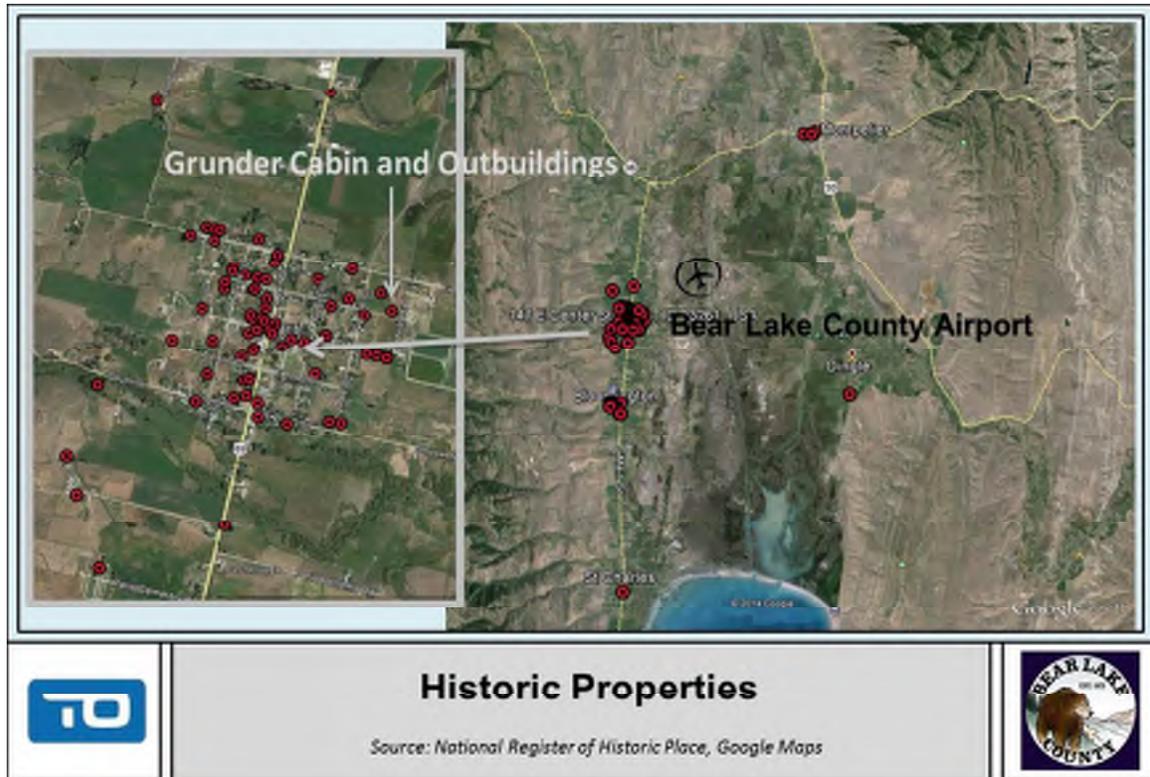
The National Register of Historic Places (NRHP) lists 92 properties in Bear Lake County. Among these 92 properties:

- ✦ 1 is located in the city of Dingle,
- ✦ 1 is located in the city of Fish Haven,
- ✦ 1 is located in the city of Georgetown,
- ✦ 1 is located in the city of St. Charles,
- ✦ 3 are located in the city of Montpelier,
- ✦ And 85 are located in the city of Paris.

Two historic districts are listed: Montpelier Historic District located approximately 5 miles to the north of the airport and the Wives of Charles C. Rich Historic District located in Paris, approximately 3 miles southwest of the airport. Further, the National Register of Historic Places lists 1 site, the Paris Cemetery, and 89 individual buildings.

The closest individual building is the Grunder Cabin and Outbuildings, located approximately 3 miles west of the airport. The cabin is estimated to have been built in the 1880s in the Southern mountain cabins style of architecture and is recognized as an example of a rare, previously undocumented house type in Idaho. **Figure X-9** depicts the historic properties in the vicinity of Bear Lake County Airport.

FIGURE X-9 – HISTORIC PROPERTIES



1.12.2 OREGON-CALIFORNIA TRAIL

In addition, the Oregon-California Trail is routed parallel to U.S Route 30. Several trail sites are located in the vicinity of the airport; the closest one, known as Pegleg Smith's Trading Post Site, is approximately 4 miles northeast of the airport. The Oregon Trail is a 2,200 miles wagon route connecting Missouri to Oregon, traveled by emigrants and pioneers in search of new homes in the west. The California Trail follows the first half of the Oregon Trail, before turning off to reach California. The Oregon Trail was designated a National Historic Trail in 1978 and the National Oregon-California Trail Center is located in Montpelier, Idaho. The trail center was built to preserve and promote the pioneer history and the heritage of the Oregon-California Trail and Bear Lake Valley. **Figure X-10** depicts the location of the trail as well as trail sites in relation to the airport location.

FIGURE X-10 – OREGON TRAIL SITES



1.12.3 SHOSHONE BANNOCK TRIBES

Artifacts found in the Bear Lake National Refuge, along creek channels and within the marsh, tell us that the Shoshone Indians used Bear Lake Valley for grazing horses and hunting and that the Bannock Indians may have visited the valley. Buffalo bones and skulls have also been found in the marsh. Nowadays, the tribal government offices and most tribal business enterprises are located eight miles north of Pocatello in Fort Hall.

As part of the construction of the partial parallel taxiway, a cultural resource field survey was completed at Bear Lake County Airport in August 2012 to examine the proposed taxiway site. It was concluded that the project did not have the potential to affect historic properties.

1.12.4 SUMMARY

Section 106 of the National Historic Preservation Act (NHPA) requires that Federal agencies consider the effects of their undertakings on historic properties. Coordination and consultation with the State Historic Preservation Officer (SHPO) or the Tribal Historic Preservation Officer (THPO) if one exists, is necessary before any airport actions. It may also be necessary to identify

historic sites recorded by the Idaho SHPO, but not currently included in the National Register of Historic Places. Section 106 does not require formal permits, certification or approval. However, demonstration of appropriate consultation and coordination with the various parties having critical roles in the Section 106 process must be made.

There are no known historical or archaeological sites within the airport property limits.

A cultural resource survey assessing approximately 150 acres was conducted at Bear Lake County Airport as part of the Airport Master Plan. Due to the substantial cost of completing the survey on all the 1,180 acres of the airport property, only those areas most likely to be impacted by future potential development were surveyed.

During the cultural resource survey, four areas were assessed. These areas are located at each runway end as well as north of Runway 10-28, along the runway from the apron area to the airport property limit. The extents of the areas assessed are depicted in the Archaeological and Historical Survey Report included as Appendix X.

According to the survey report, two sites, recommended eligible for the NRHP under Criterion A, are within one mile of the project areas: the Bear Lake Outlet Canal and the William H. Smith Homestead. The William H. Smith Homestead is a building while the Bear Lake Outlet Canal consists of one historical canal built in 1915, which diverts water out of Bear Lake for irrigation. The canal is located approximately 2,200 feet west of the airport runways. These sites were previously known.

Four new sites were recorded within the assessed areas and are described in the Archaeological and Historical Survey Report. These sites are not recommended eligible to the NRHP as they are not associated with important events or people, they are not unique nor do they add to the history of the nation, region or site area.

1.13 LIGHT EMISSIONS AND VISUAL IMPACTS

According to the FAA Airports Desk Reference, lighting facilities on airports can visually affect surrounding residents and other nearby light-sensitive areas such as homes, parks, or recreational areas. There are not Federal statutory or regulatory requirements for adverse effects. However, the FAA considers potential effects to properties and people's use of properties.

Impacts due to light emissions effects may include: an annoyance to people in the vicinity of the airport, interference with normal activities, or proposed development that contrasts with the existing environment to an objectionable level.

Bear Lake County Airport primary sources of lightning include runway lights (Medium Intensity Runway Lights (MIRL) on Runway 10/28) and the airport beacon, which is a rotating light used to locate the airport. Additional sources consist of the pilot/passengers vehicles and aircraft lights.

The runway lights are activated by the pilot when required and the runway is not lit in permanence, which reduces light pollution.

The level of light intensity at Bear Lake County Airport is not great enough to have the adverse impacts listed above. Should future projects have significant light emissions or visual effects, additional environmental analysis, including purpose of the lighting, description of potential impacts, location of light-sensitive sites, as well as any proposed mitigation measures, will be needed.

Per the size and environment of Bear Lake County Airport, no reasonably foreseeable development project is expected to have adverse effects due to light emissions or visual impacts.

1.14 NATURAL RESOURCES AND ENERGY SUPPLY

Certain airport improvement projects may have the potential to impact energy requirements or use consumable resources. For future projects, the County should be considerate of projects and construction methods that conserve resources, use pollution prevention, minimize aesthetic effects, and address public sensitivity.

1.15 NOISE

Airport noise is among the most controversial environmental impact at airports. The FAA examines airport development actions that would change airport runway configurations, aircraft operations and/or movements, aircraft types using the airport or aircraft flight characteristics. The noise analysis conducted by the FAA primarily focuses on how proposed airports actions would change the cumulative noise exposure of individuals to aircraft noise in areas surrounding the airport.

According to the FAA Order 1050.1E, Appendix A, section 14.6a, the FAA must conduct a noise analysis for the general aviation-related projects that would involve more than 90,000 annual operations piston-powered operations in Approach Categories A through D or 700 annual jet-powered aircraft operations during the period the environmental document covers. In addition a noise analysis is needed at the existing heliports or airports when forecasted helicopter operations would exceed 10 operations per day on an annual basis and hover times exceed 2 minutes.

Bear Lake County Airport is not expected to meet these levels of operations over the planning period and is therefore exempt from the noise analysis requirement.

1.16 SECONDARY (INDUCED) IMPACTS

Induced socioeconomic impacts are linked to impacts to other resource categories through cause-and-effect relationship.

Factors to address when considering induced, or secondary, socioeconomic impacts includes:

- ✦ Shifts in patterns of population movement and growth,
- ✦ Public service demands,
- ✦ Changes in business and economic activities,
- ✦ Or other factors identified by the public.

The FAA does not require any formal Federal permits, certifications or approvals. However, an environmental analysis should identify the direct social impacts as well as the induced, secondary, impacts and contain evidence that the airport sponsor has coordinated with the appropriate parties and jurisdiction potentially-affected by the airport action.

The area surrounding the Bear Lake County Airport is largely agricultural and sparsely populated, as previously mentioned in the Inventory section. No reasonably foreseeable actions at the airport will lead to shifts in patterns of population movement and growth, negative changes in business and economic activities or affect public service demand.

1.17 SOCIOECONOMIC IMPACTS, ENVIRONMENTAL JUSTICE, AND CHILDREN'S ENVIRONMENTAL HEALTH AND SAFETY RISKS

1.17.1 SOCIOECONOMIC IMPACTS AND CHILDREN'S HEALTH AND SAFETY RISKS

Social impacts must be evaluated by the FAA and include the effects on health and safety risks to children and socioeconomic impacts. Social impacts encompass:

- ✦ Moving home or businesses,
- ✦ Dividing or disrupting established communities,
- ✦ Disrupting orderly, planned development,
- ✦ Or creating a notable change in employment.

The area surrounding the Bear Lake County Airport is sparsely populated, as previously mentioned in the Inventory Section. No reasonably foreseeable actions at the airport will require moving home or business, dividing established communities, disrupting orderly or planned development or will create a notable negative change in employment.

1.17.2 ENVIRONMENTAL JUSTICE

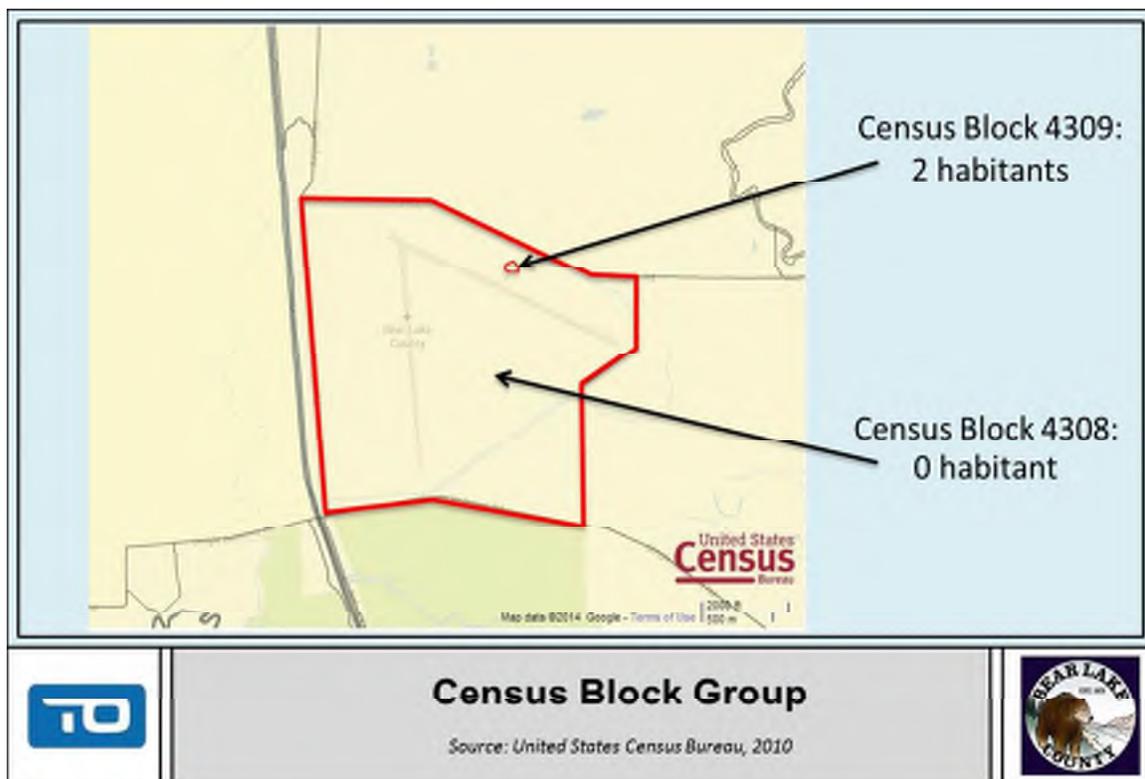
Environmental justice considers the potential to cause disproportionate and adverse effects on low-income or minority populations. Environmental justice is described by the U.S Environmental Protection Agency (EPA) Office of Environmental Justice as “the fair treatment and meaningful involvement of all people, regardless of race, color, national origin or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies.

Fair treatment means that no group of people including racial ethnic, or socioeconomic group should bear disproportionate share of the negative environmental effects resulting from industrial, municipal and commercial operations or the execution of Federal, State, local, and tribal programs and policies.”

Timely consultation with human resources agencies regarding locations of low-income or minority populations is crucial to ensure identification of resources the airport action would adversely affect, to help determine if low-income or minority populations sustain adverse effects and if mitigation or offsetting benefits would avoid or reduce disproportionate effects. The FAA typically does not need any formal Federal permits, certifications or approvals. However, environmental justice must be carefully considered in an environmental analysis.

According to the U.S. Census Bureau (2010), Bear Lake County airport is within census tract 9501, census block 4308 and 4309, as depicted in **Figure X-11**. Census data from 2010 for census block 4309 indicated 2 inhabitants, the airport’s manager and his wife, and census data for census block 4308 indicated 0 inhabitants. According to data from the U.S Census Bureau (2010), the census blocks in the immediate vicinity of the airport were not inhabited. Further, according to Indicators Idaho, the overall poverty rate of Bear Lake County was 14.0 percent in 2012, compared to the 16.0 percent of Idaho and of the United States. The minority population in Bear Lake County Airport is 2.3 percent, compared to the 6.2 percent in Idaho and 22.3 percent in the United States.

FIGURE X-11 – CENSUS BLOCK GROUP



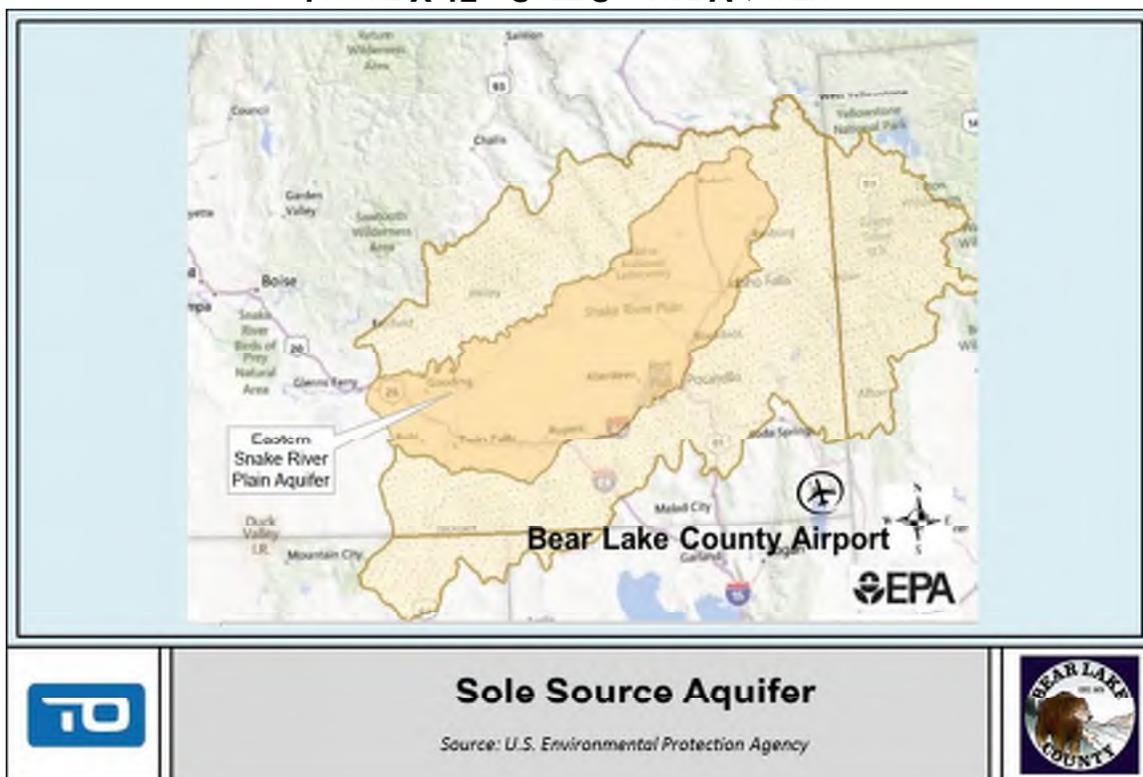
No reasonably foreseeable actions at the airport will cause disproportionate and adverse effects on low-income or minority populations.

1.18 WATER QUALITY

Airports’ activities, especially construction activities, seasonal airport anti-icing/deicing, airport operations or maintenance may cause water quality impact due to their proximity to waterways. When an airport sponsor requests FAA action to support an airport development project, the FAA must evaluate the proposed project’s potential water quality impacts. Construction activities that disturb one acre or more of land (including clearing, grading, and excavating) or airport actions that have a point source discharge to a navigable waterway require coverage by a National Pollutant Discharge Elimination System (NPDES) stormwater permit. In addition, an airport action may not be funded by the FAA if it has the potential to affect a public drinking water supply, a sole source aquifer or a Comprehensive State Groundwater Protection Program (CSGWPP).

Sole source aquifers is a tool of the U.S. Environmental Protection Agency to protect drinking water supplies in areas with few or no alternative sources to the ground water resource, and where if contamination occurred using an alternative source would be extremely expensive. There is no sole source aquifer in the immediate vicinity of Bear Lake County airport, as the closest sole source aquifer is the Eastern Snake River Plain Aquifer located to the north of the airport, as depicted in **Figure X-12**.

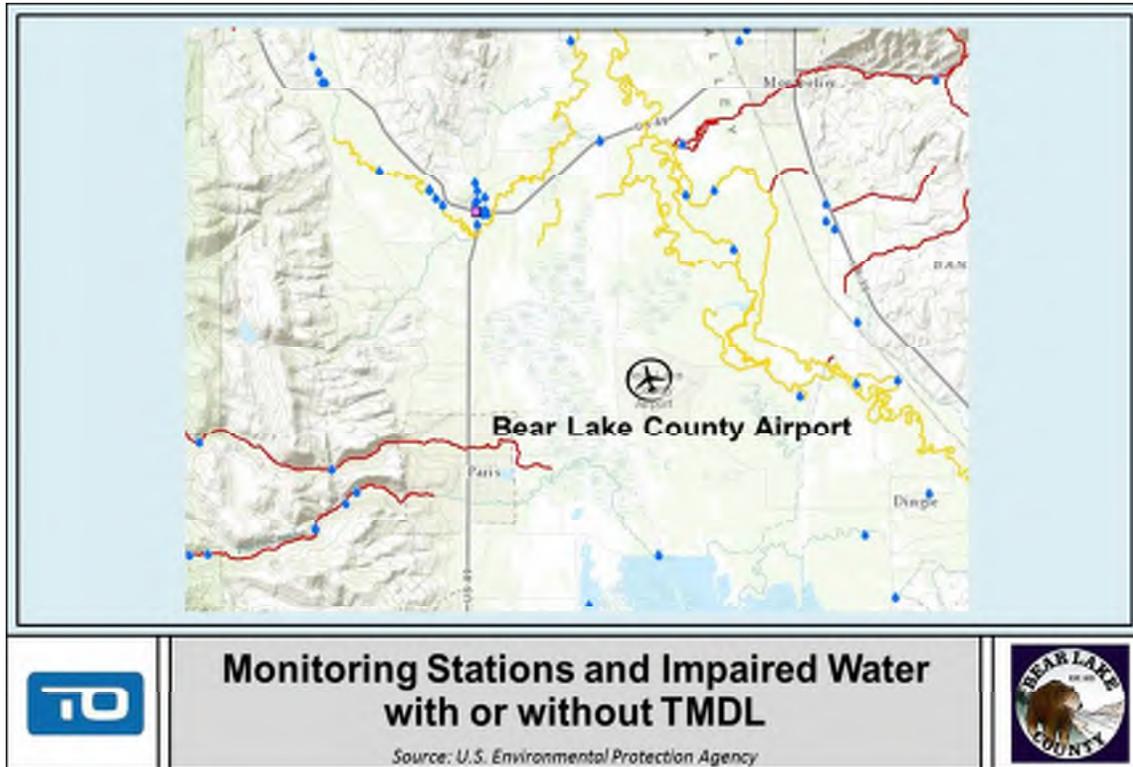
FIGURE X-12 – SOLE SOURCE AQUIFER



Section 305(b) of the Clean Water Act requires States to use monitoring data and other information to report bi-annually the status of their waters. In addition, section 303(d) of the Clean Water Act requires States to use monitoring data and other information to develop a list of waters that will not meet water quality standards for a particular pollutant. States must submit this list every two years and must then develop Total Maximum Daily Loads to restore these waters.

Figure X-13 depicts the water monitoring stations as well as the impaired waters with or without a Total Maximum Daily Loads (TMDL), in the vicinity of Bear Lake County Airport.

FIGURE X-13 – MONITORING STATIONS AND IMPAIRED WATER WITH OR WITHOUT TMDL



Should future projects at Bear Lake County Airport impacts more than 1 acre or land or involve a point source discharge or a point source storm water discharge, a NPDES permit will have to be obtained. In addition, a Storm Water Pollution Prevention Plan (SWPPP) will be required by the Idaho Panhandle Health Department to describe the site controls.

1.19 WETLANDS

The U.S. Department of Transportation (DOT) Order 5660.1A, Preservation of the Nation's Wetlands, provides guidance regarding actions in wetlands. This order defines wetlands as "lowlands covered with shallow and sometimes temporary or intermittent water. (...) Areas covered with water for such a short time there is no effect on moist-soil vegetation are not included in the definition, nor are the permanent waters of streams, reservoirs and deep lakes.

(...) An activity may affect the wetlands indirectly by impacting regions up or down stream from the wetland or by disturbing the water table of the area in which the wetland lies.”

Federal agencies are required to avoid wetlands when a practical alternative avoiding the wetlands exists. The National Wetlands Inventory online mapper tool indicates that several wetlands exist in the vicinity of Bear Lake County Airport, as depicted in **Figure X-14**. The types of wetlands present are Freshwater Emergent wetlands, Freshwater pond and Riverine. Freshwater Emergent wetlands are described as wetlands dominated by erected, rooted, herbaceous fen, marsh, swale and wet meadow, and excluding mosses and lichens. Riverine are river or stream channel while Freshwater ponds are simply local ponds of standing water.

FIGURE X-14 – WETLANDS



Distinction is made between nonjurisdictional wetlands and jurisdictional wetlands. Nonjurisdictional wetlands are wetlands which do not involve navigable waters and do not require U.S. Army Corps of Engineers approvals, but do require assessment by the FAA as natural resources. Section 404 of the Clean Water Act (CWA) governs the dredging and filling of wetlands connected or adjacent to the navigable waters of the United States. The U.S. Army Corps of Engineers must issue a permit authorizing dredge or fill in the waters under their jurisdiction.

In addition, wetlands under the jurisdiction of the U.S. Army Corps of Engineers are: “areas that surface or groundwater inundate or saturate at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include swamps, marshes, bogs and similar areas.” Specific conditions of hydrology, vegetation and soil

type must be met for the area to be considered a wetland. Thus, a qualified wetland delineation specialist should evaluate the proposed site's characteristics to determine if an airport development action affects an area meeting either of the above definitions, in accordance with the U.S Corps of Engineers Wetland Delineation Manual.

Wetlands areas depicted in **Figure X-14** are not necessarily confirmed to meet all three wetland conditions of hydrology, vegetation and soil type. Should future projects be considered in areas identified as wetlands, additional environmental analysis will be needed, a Section 404 permit might need to be obtained through the U.S. Army Corps of Engineers and mitigation measures might be necessary. For new construction projects, which do not include routine repairs and maintenance of existing facilities, affecting wetlands, the FAA should provide the public and agencies with special interest in wetlands appropriate opportunity for early review of the proposal.

A wetland assessment and delineation was conducted at Bear Lake County Airport as part of the Airport Master Plan to assess the potential presence and size of wetlands on site as well as their function, value and whether future potential development would require mitigation. Due to the substantial cost of completing the survey on all the 1,180 acres of the airport property, only those areas most likely to be impacted by future potential development were assessed.

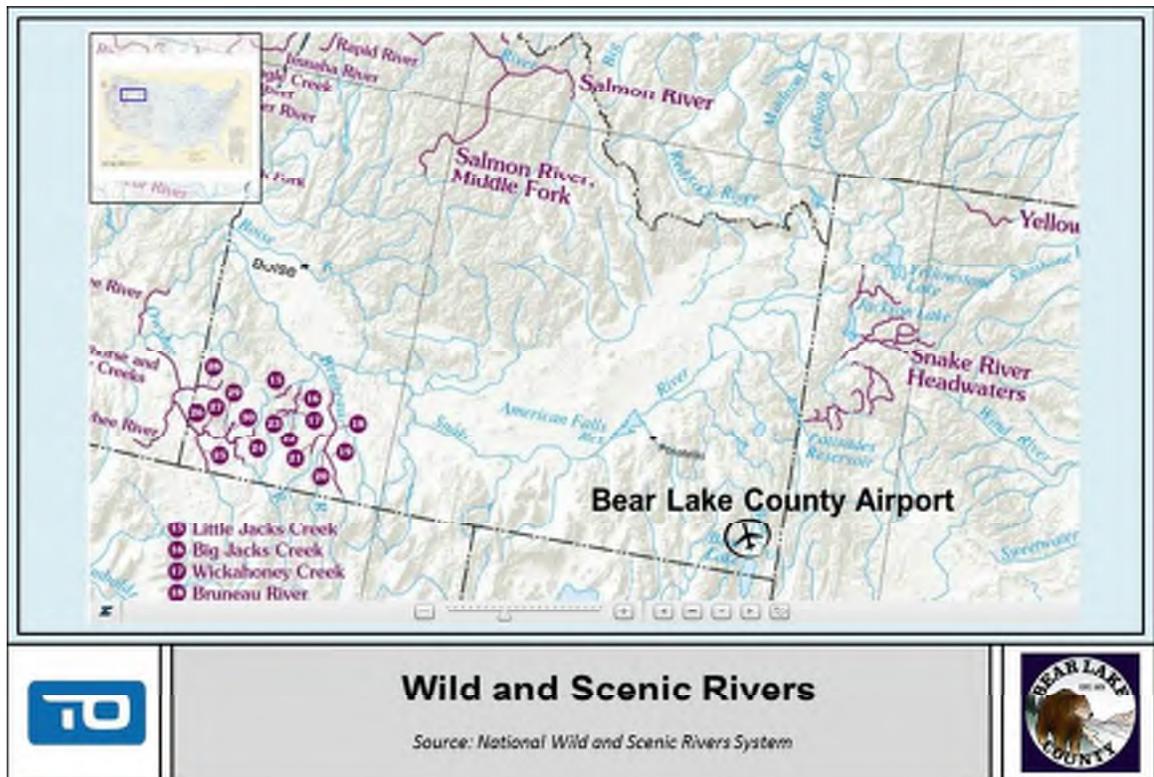
During the wetlands survey, four areas were assessed for potential wetlands. These areas are located at each runway end as well as north of Runway 10-28, along the runway from the apron area to the airport property limit, and are depicted in the Wetland Determination Report included as Appendix X. Two depressions and three wet meadows as well as the banks of the ditch surrounding the airport property contain the necessary wetland characteristics. The wetlands delineated encompass an area of 0.48 acres and are depicted in the Wetland Determination Report. In addition, according to the Wetland Determination Report, these wetlands are presumed jurisdictional under Section 404 of the Clean Water Act. Further, the ditch is connected to the Bear Lake Outlet and Bear Lake, considered Waters of the U.S. Therefore, any disturbance to these wetland areas will require a Section 404 permit.

1.20 WILD AND SCENIC RIVERS

The Federal Wild and Scenic Rivers Act of 1968, as amended, describes areas eligible to be included in the National Wild and Scenic Rivers System (WSRS). The WSRS was created to preserve certain rivers with outstanding natural, cultural and recreational values and to protect the river's free-flowing characteristics. Federal agencies, such as the FAA, may not assist actions that would have a direct or adverse effect on the values for which the river was designed.

According to the National Wild and Scenic Rivers System and the National Rivers Inventory websites, there are no designated or eligible Wild and Scenic River in the immediate vicinity of Bear Lake County Airport. The closest Wild and Scenic River is located near the Palisades Reservoir in Wyoming, approximately 70 miles northeast of Bear Lake County Airport.

FIGURE X-15 – WILD AND SCENIC RIVERS



This impact category is not applicable at Bear Lake County Airport.

1.21 CUMULATIVE IMPACTS

Cumulative impacts are impacts the proposed action would have on a particular resource when added to impacts on that resource due to past, present and reasonably foreseeable actions within a defined time and geographical area. Individually minor impacts due to actions occurring over time may cause significant impacts when those impacts are collectively evaluated and both FAA and non-FAA actions should be considered.

Table X-2 lists the past, present and foreseeable actions, as described in the FAA Grant History and Airport Capital Improvement Program (CIP). In addition to these projects partially funded by the FAA, one hangar was funded with private funds and built during the fall 2013.

TABLE X-2: BEAR LAKE COUNTY AIRPORT PROJECTS

Year	Projects
1984	Rehabilitate the Apron, Taxiway and Runway Acquire Land for Approaches
2003	Rehabilitate Taxiway and Runway
2004	-
2005	Construction Taxiway
2006	Construction Building
2007	Construction Building
2008	Improve Fuel Farm
2009	Rehabilitate the Apron, Taxiway and Runway Install Miscellaneous NAVAIDS
2010	-
2011	-
2012	Construction Taxiway
2013	Construction Taxiway Rehabilitation of Runway
2014	Update the Airport Master Plan
2015	RSA Grading and Taxiway Improvement (Phase 2)
2016	Rehabilitate the Apron, Taxiway and Runway New Runway Lights (MIRLs)
2017	Install Automated Weather Observation System
2018	Carry Over Funds
2019	Carry Over Funds
2020	Snow Removal Equipment

Source: T-O Engineers, Inc.

The area surrounding the Bear Lake County Airport is largely agricultural and sparsely populated. Structural development and infrastructure development in Bear Lake County are not expected to be affected by the reasonably foreseeable actions.

Most of the past projects were rehabilitation projects, to renovate existing runways, taxiways and aprons. None of these past projects had a significant impact on the environmental categories previously discussed. In addition, none of the reasonably foreseeable actions are predicted to affect any of the environmental impact categories discussed above. Lastly, there are no projects that are connected, cumulative, or similar.

1. RECYCLING PLAN

1.1 INTRODUCTION

Public Law 112-95, also known as the Federal Aviation Administration (FAA) Modernization and Reform Act of 2012, requires airport planning projects to include the development of a plan for recycling and minimizing the generation of airport solid waste. This recycling plan at airports must be consistent with applicable State and local recycling laws. In addition, it must include the following elements:

- ✦ A waste audit,
- ✦ The feasibility of solid waste recycling at the airport,
- ✦ Minimizing the generation of solid waste at the airport,
- ✦ Operation and maintenance requirements,
- ✦ The review of waste management contracts, and
- ✦ The potential for cost savings or the generation of revenue.

The following sections describe the current solid waste management process of Bear Lake County Airport. It also contains suggestions to improve the current conditions at the airport.

1.2 WASTE AUDIT

To fulfill the requirements of the waste audit, an interview and walkthrough was conducted with the airport manager on July 30, 2014. During this interview and walkthrough with the airport manager the following topics were mentioned:

- ✦ Sources of waste and waste streams,
- ✦ Fate of waste,
- ✦ Collection of waste and waste pickup practices,
- ✦ Feasibility of recycling at the airport,
- ✦ Operation and maintenance requirements, and
- ✦ Existing waste management contracts and services.

1.2.1 SOURCES OF AIRPORT WASTE

According to the FAA Recycling, Reuse and Waste Reduction at Airports: A Synthesis Document (FAA Synthesis), the types of waste generally encountered at airports are:

- ✦ Municipal Solid Waste,
- ✦ Construction and Demolition Waste,
- ✦ Green Waste,
- ✦ Food Waste,
- ✦ Deplaned Waste,
- ✦ Lavatory Waste,
- ✦ Spill cleanup and remediation waste, and
- ✦ Hazardous waste.

In addition, the potential sources of waste, as described in the FAA Synthesis, are included hereafter. The type of waste generated at each of these facilities is slightly different and implementing a recycling program requires considering all of the activities and waste streams.

- ✦ Terminals,
- ✦ Airfields,
- ✦ Aircraft Maintenance Hangars,
- ✦ Cargo Hangars,
- ✦ Flight Kitchens,
- ✦ Administrative offices, and
- ✦ Airport construction projects.

Bear Lake County Airport does not accommodate air cargo operations and therefore does not have cargo hangars. In addition, the aircraft using the airport are not large enough to have inflight food service or lavatories; thus there is no waste from flight kitchens and Bear Lake County is not equipped to empty aircraft lavatory tanks.

Further, the airport's only staff is the airport manager and Bear Lake County Airport does not have formal administrative offices. The most recent construction project is the construction of a parallel taxiway in 2014. The solid waste generated during this project was appropriately disposed and a Storm Water Pollution Prevention Plan was enforced.

Bear Lake County Airport does have an airfield, a small pilot's lounge, storage hangars for based aircraft and an airport manager's residence. Each of these waste sources is described in additional details, based on information obtained during the waste audit, in the subsequent sections.

Aircraft

The airport is typically used by single-engine and small multi-engine aircraft. Those aircraft do not have substantial inflight services such as food services or lavatories. The airport is not equipped to provide flight kitchen services or to empty lavatories. Waste deplaned from transient or based aircraft is sometimes disposed at Bear Lake County Airport, into on site trash receptacles. The most common waste deplaned from single-engine aircraft or small multi-engine is plastic bottles and food wrappers.

Pilot's Lounge

The pilot's lounge consists of restrooms, a general meeting/rest area as well as a small kitchenette equipped with a fridge and a microwave. It does not have gift shops, security checkpoints or restaurants commonly found at larger airports. Bottled water is available in the pilot's lounge as well as a soft drink machine. Trash receptacles in the pilot's lounge receive municipal solid waste.

Airfield

According to the FAA Synthesis, the airfield portion of airports generally accommodates limited and transient activities. Therefore, the waste produced at the airfield is limited and consists mostly of rubber from aircraft tires and green waste.

At Bear Lake County Airport, the waste generated on the airfield consists mainly of green waste, when the grounds are maintained and mowed, as well as plowed snow during the winter months. When necessary, the airport manager plows runway 10/28 and piles up the snow. However, no sand, gravel or deicer is available or used at Bear Lake County Airport.

Storage Hangars

There are 6 hangars on site, used for based aircraft storage. As there is no maintenance service at the airport, the amount of waste generated in the hangars is limited. At general aviation airports, waste from the hangars usually includes batteries, fluids, tires, aluminum or metal scrap, as well as municipal solid waste. However, the only kind of waste received at Bear Lake County Airport at the moment is municipal solid waste. There are small individual trash receptacles in the storage hangars and hangars' owners dispose of this waste into two large waste bins located near the airport entrance.

Airport Manager's residence

The airport manager's residence, which is located near the entrance of the airport, adjacent to the apron, also generates municipal solid waste. The waste generated in the airport manager's residence is disposed of in a similar manner as the waste of the pilot's lounge.

1.2.2 FATE OF AIRPORT WASTE

The municipal solid waste generated at Bear Lake County Airport, and described in Section 1.2.1 Sources of Airport Waste, is disposed of in two large waste bins located outside the airport manager's residence, near the airport entrance. The municipal solid waste pickup service is owned and operated by Bear Lake County. Waste is picked up weekly and hauled into a landfill located near Montpelier. The only type of waste that is picked up is household trash; hazardous waste or construction debris is not picked up and have to be brought to the landfill.

If other types of waste were generated at the airport, such as batteries, tire or paint, they would be appropriately disposed of by the airport manager at the Bear Lake County landfill, which accepts oil, old battery and tire.

1.3 FEASIBILITY OF SOLID WASTE RECYCLING

According to the FAA Synthesis, the feasibility and effectiveness of an airport recycling and waste minimization plan is influenced by the airport's unique set of factors, such as the region, geography or society. While some general practices are applicable to all airports, some solutions may only apply to a particular airport or region.

Opportunities to recycle solid waste at Bear Lake County Airport are limited by the types of materials that can be recycled at the Bear Lake County landfill, as well as by the logistics for transporting materials to recycling facilities.

The Bear Lake County landfill in Montpelier only accepts the following items:

- ✦ Construction debris,
- ✦ Household waste,
- ✦ Household appliances,
- ✦ Oil disposal,
- ✦ Old battery disposal, and
- ✦ Tire disposal.

Local recycling curbside pick-up services are not currently offered in Bear Lake County. In addition, materials such as plastic bottles and milk jugs, aluminum cans, newspaper, magazines and cardboard are not currently recycled at the Bear Lake County landfill.

The closest landfills offering recycling services are located in Lincoln County, Wyoming, and Franklin County, Idaho. Recycled materials including cardboard, glass and plastics are accepted at the Cokeville landfill, approximately 33 miles from the airport with an estimated driving time of 40 minutes. In addition, recycle and cardboards bins are available throughout Franklin County and

at the Franklin County Landfill, which is situated in Preston, approximately 50 miles from Bear Lake County Airport with an estimated driving time over 1 hour.

The airport manager is the only staff member at Bear Lake County Airport and the logistics necessary to haul recyclable materials to a recycling center in the vicinity of the airport may limit the success of implementing separate stream recycling and separate bins for various recyclable materials.

1.4 MINIMIZING THE GENERATION OF SOLID WASTE

An airport recycling program should not only focus on maximizing the amount of recyclable materials removed from the waste stream, but also on overall waste reduction strategies. According to the FAA Synthesis, reduction of waste can come in different forms including waste redirection, repurposing, reuse, separation or other means to lessen the volume of the waste stream.

Options to minimize the amount of solid waste generated at Bear Lake County Airport are described hereafter.

Municipal Solid Waste

Per the waste audit, the ultimate fate of the solid waste originating from Bear Lake County Airport is currently a landfill located two miles east of Montpelier. Although the logistics to implement a separate stream recycling program seems complex, based on the items currently accepted at the local landfill, recycling cardboard, glass or plastic used at Bear Lake County Airport could reduce the amount of waste generated at the airport that goes to a landfill.

Green Waste

Reducing the amount of green waste generated on airports depends on various local conditions such as local climate and physical environment. Per the FAA Synthesis, options to minimize the amount of green waste produced at airports are described below.

- ✦ Appropriate planning for plant selection: based on the amount of rainfall, soil type, temperature range, sunlight, etc.
- ✦ Xeriscaping: using slow-growing, drought-tolerant plants.
- ✦ Grasscycling: leaving the grass clippings on the lawn.
- ✦ Mulching: breaking up the landscaping trimming, or
- ✦ Using green waste as daily cover at municipal solid waste landfills.

At Bear Lake County Airport, the only identified source of green waste occurs when the grass is mowed on the airport property. The grass clippings are let on the ground after mowing. Therefore, no green waste is carried off site. It is recommended that any additional sources of green waste at Bear Lake County Airport be identified and minimized in the future.

Deplaned Waste

As previously mentioned, Bear Lake County Airport accommodates only single-engine or small multi-engine aircraft. Therefore, the airport receives only a limited amount of deplaned waste. Based pilots do not routinely clean their aircraft and do not regularly dispose of waste at the airport. In addition, due to the relative small size of the transient aircraft typically using the airport, the amount of waste deplaned by transient pilots is relatively small and mostly consist of plastic bottles and food wrappers. The deplaned waste is collected either in the pilot's lounge or in the two waste bins located near the airport entrance, outside the airport manager's residence.

The constraints to recycle deplaned waste are the same as for the municipal solid waste. However, recycling signage could be placed in the pilot's lounge and hangars to encourage visiting and based pilots to use recyclable and compostable cups or utensils or to take recyclables to a recycling facility.

1.5 OPERATION AND MAINTENANCE REQUIREMENTS

Implementing a recycling program at Bear Lake County Airport and installing various recycling bins separating recyclables from the waste stream would require an increased maintenance effort by the airport manager. The bins would need to be installed, routinely emptied, and generally maintained. In addition, as there is no recyclable curb pickup in the County, recyclable materials would need to be sorted and periodically transferred to recycling facilities.

The limited volume of waste currently generated on site and the simple airport layout would lead to a fairly straightforward operation with a minimum number of recycling bins. However, as previously mentioned, the closest landfill accepting recyclable materials is located in Cokeville, Wyoming, approximately 33 miles from the airport, which would require a driving time of approximately 40 minutes.

1.6 WASTE MANAGEMENT CONTRACT REVIEW

The solid waste pick up service is owned and operated by Bear Lake County. Bear Lake County Airport is not billed for the waste pickup service or the use of Bear Lake County Landfill for general municipal solid waste. Oils, old batteries and tires can be disposed at Bear Lake County landfill.

1.7 POTENTIAL FOR COST SAVINGS OR GENERATION OF REVENUE

As curbside recycling is not offered in the County at the moment, recycling at Bear Lake County Airport would probably lead to additional expenses to transfer materials to recycling facilities. Further, the solid waste pickup service occurs once a week, which is the minimal frequency offered by the County. There are currently no financial incentives to recycle at Bear Lake County Airport.

In addition, given the limited amount of waste produced at the airport, the potential for revenue generation seems limited. No conclusive elements indicate that the airport could achieve a substantial reduction in solid waste with a separate streams waste recycling program.

1.8 APPLICABLE STATE OF IDAHO WASTE AND RECYCLING LAWS

This recycling plan must be consistent with applicable State and local recycling laws. The Idaho State laws regarding waste disposal and mandatory recycling include:

- ✦ The Sale and Disposal of Batteries (Chapter 70, Title 39, Idaho Code),
- ✦ The Idaho Waste Tire Disposal Act (Chapter 65, Title 39, Idaho Code), and
- ✦ The Idaho Solid Waste Management Rules (IDAPA 58.01.06).

A summary of waste items either banned or regulated in these laws, which may apply to Bear Lake County Airport, is as follows:

- ✦ Regulated hazardous wastes are banned from non-hazardous waste landfills.
- ✦ Lead acid batteries are banned from disposal in landfills and have mandatory recycling, with exemptions.
- ✦ Tires may only be disposed of at permitted municipal solid waste landfills with approved operating plans for volume reduction.
- ✦ Bulk liquids in containers larger than 5 gallons are banned from landfills.
- ✦ Waste oil in containers larger than 5 gallons are banned from landfills.

The waste audit conducted at Bear Lake County Airport indicates that the existing waste disposal process at the airport already follows the Idaho waste disposal and recycling laws mentioned above.

1.9 CONCLUSIONS AND RECOMMENDATIONS

The Bear Lake County Airport produces no more than one 50-gallon bin of solid waste weekly. Based on the items currently recycled at Bear Lake County landfill, implementing separate streams for additional recyclable materials such as plastic or cardboard seems complex and difficult given the logistics necessary. However, it is recommended the County monitor potential evolution of the recycling facilities at Bear Lake County landfill.

If additional materials are recycled at the landfill in the future, the feasibility of implementing a separate stream recycling program should be evaluated. This recycling program could consist of different recycling bins for various items accepted at the landfill. For proper use by the pilots, the recycling bins should be clearly labeled and identified.

However, before the implementation of a potential recycling program, the overall effectiveness and feasibility should be examined, taking into consideration the airport one person staff and the efforts required to transport materials to an appropriate recycling facility.

Bear Lake County Airport could also consider signage to encourage pilots of transient and based aircraft to minimize their waste, use recyclable and compostable items and properly dispose of them.

Wetland Determination Report

Airport Master Plan

Bear Lake County Airport

Bear Lake County Airport near Paris, Idaho

October 2014

Prepared for:

Bear Lake County
P.O. Box 190
Paris, Idaho 83261

Prepared by:

North Wind Resource Consulting, LLC
1425 Higham Street
Idaho Falls, Idaho 83402

TABLE of CONTENTS

INTRODUCTION 1

METHODS 5

RESULTS AND DISCUSSION 5

FINDINGS 6

CONCLUSIONS 9

LITERATURE CITED..... 11

Appendix A Photos A-1

Appendix B Plant List..... B-1

Appendix C Data Forms C-1

Appendix D Maps D-1

INTRODUCTION

Bear Lake County (County) in southeastern Idaho contracted T-O Engineers to update a Master Plan for the Bear Lake County Airport (Airport) to accommodate potential future growth. T-O requested North Wind Resource Consulting, LLC (NWRC) to complete a field assessment of approximately 150 acres of airport property to identify waters of the United States, including wetlands, at the existing airport facilities. The on-going airport master plan will identify future aeronautical development needs at the airport for a 20 year planning horizon (2014 as the base year). Findings in this report will be used to assist in the master plan analysis and the determination of potential impacts of future planned aeronautical development on identified wetlands.

The project area is located in the Bear Lake Valley, 5.1 miles south of Montpelier, Idaho and 9.3 miles north of Bear Lake (Figure 1). The northern extent of the Wasatch Mountain Range bounds the valley to the west and the Pruess Mountain Range to the east. Bear Lake, which is 20 miles long, dominates the landscape. A few farms and ranches are located near the area.

Bear Lake Valley is at nearly 6,000 feet elevation. Summers are typically short and winters long and cold. Soils in the area are partially hydric, moderately well to very poorly drained, very deep silt loam and silty clay loam formed in mixed alluvium. Vegetation within the survey area is made up of a variety of shrubs, grasses, and herb species.

A search for wetlands in the vicinity of the Airport was conducted using the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Wetlands Mapper in conjunction with a field survey completed on July 31, 2014 and August 1, 2014. The NWI revealed the Airport is surrounded by wetlands yet noted no wetlands within the Airport property (USFWS NWI 2014).

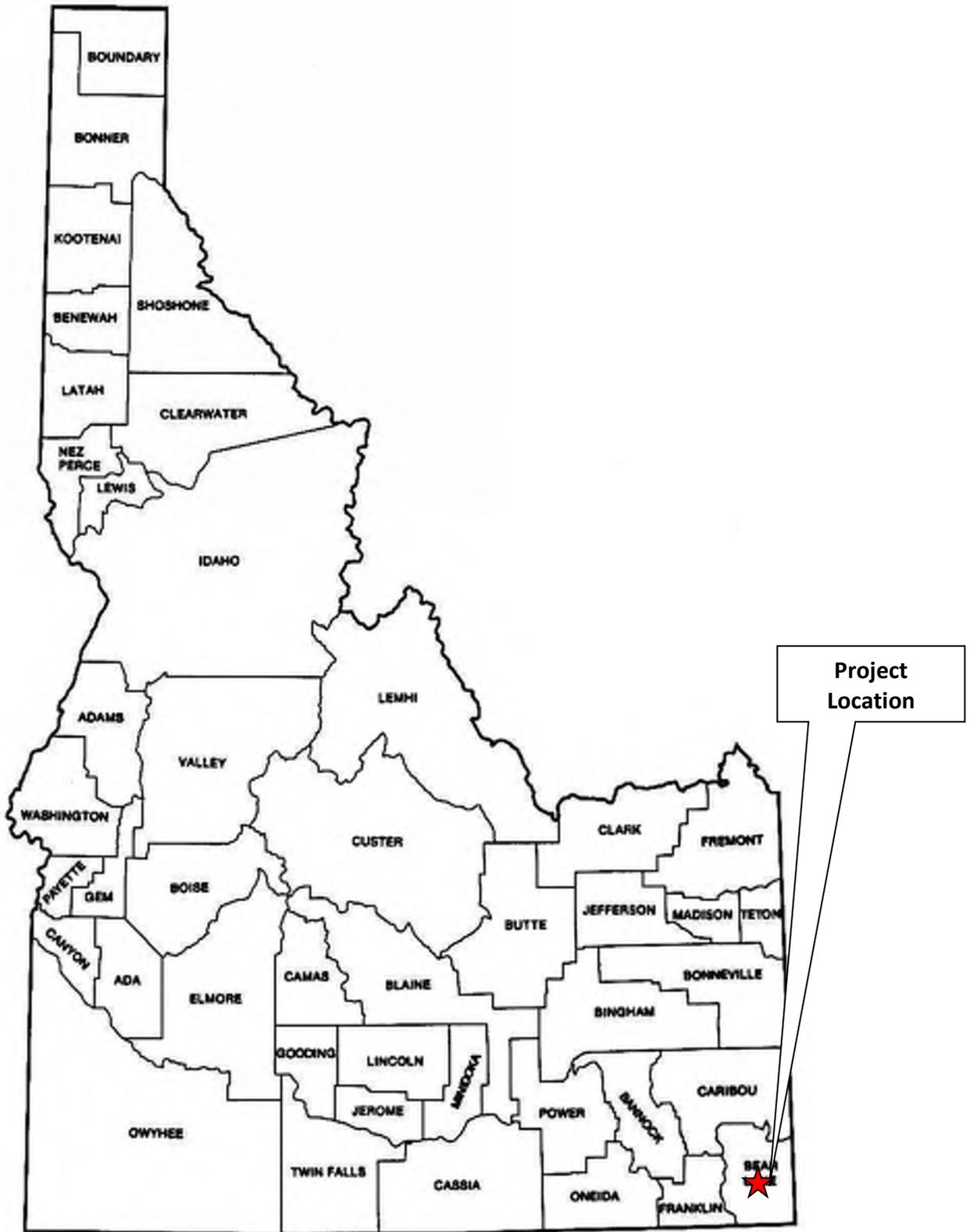


Figure 1. Map of Idaho showing the general location of the project area.

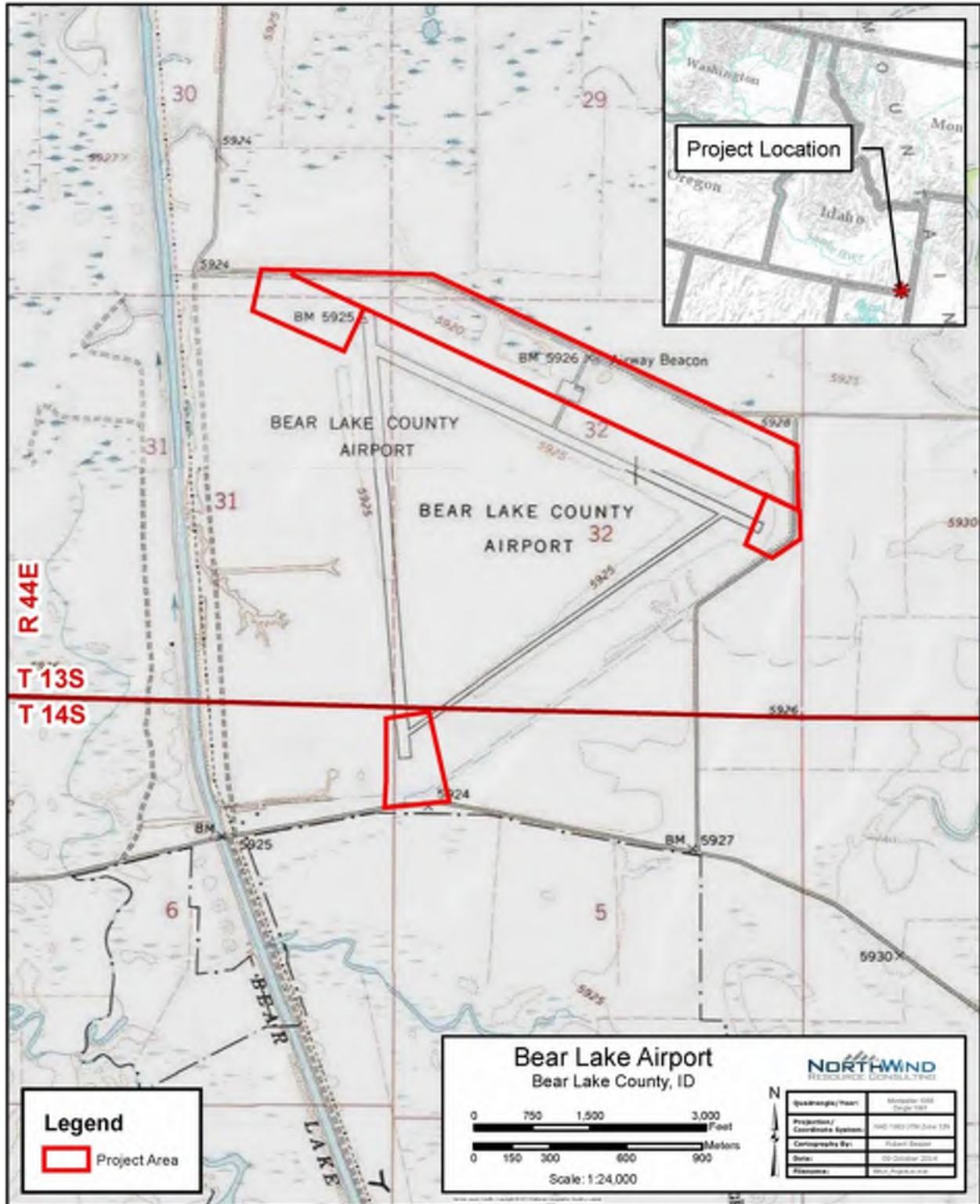


Figure 2. Map showing location of the project area taken from the Montpelier (1967) and Dingle (1967) quadrangles, USGS 7.5' series (1:24,000 scale).

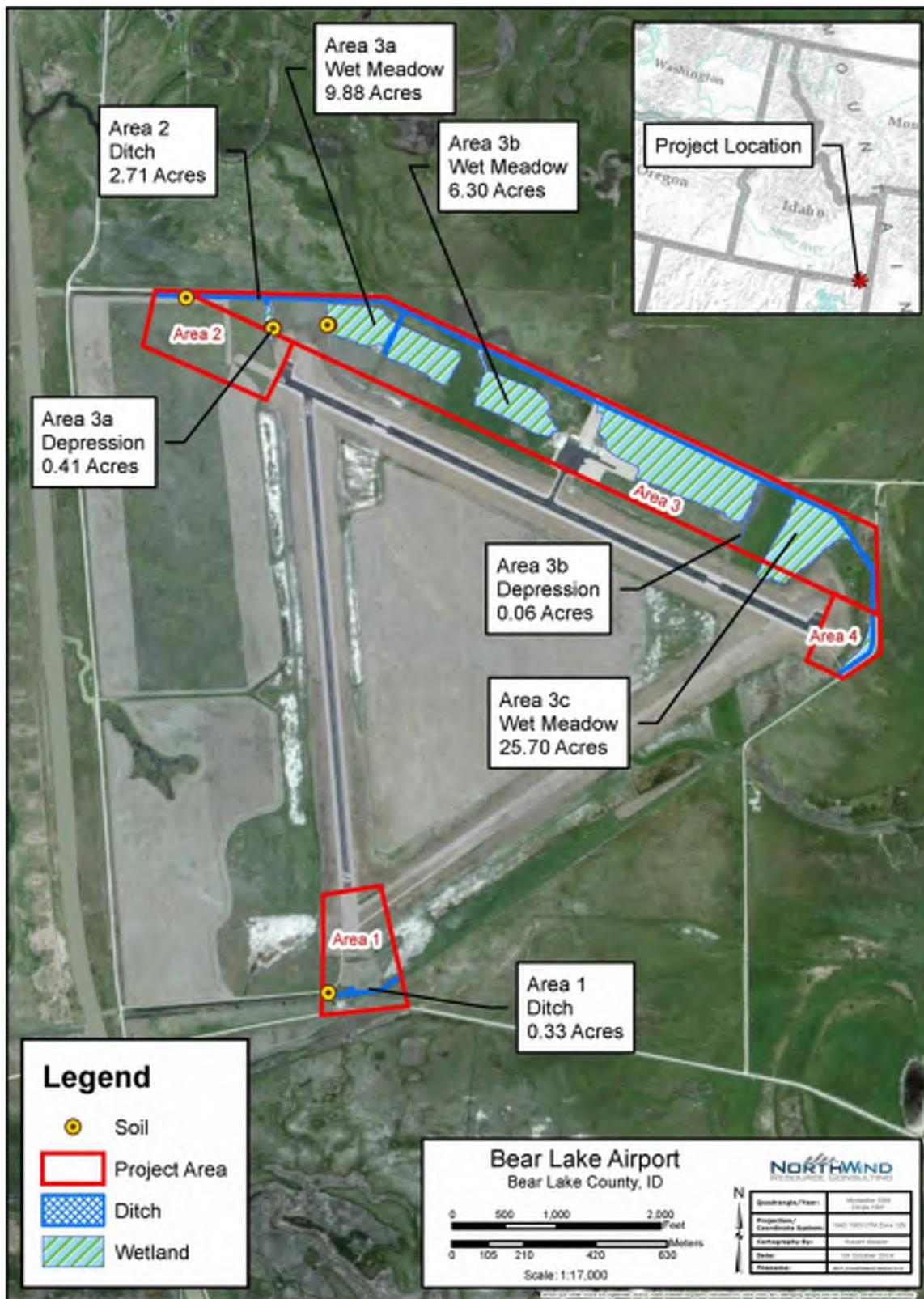


Figure 3. Map showing locations and acreages of the wetlands.

METHODS

The wetland delineations were performed using the Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987) Routine Method for five acres or less with onsite inspection and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0 (USACE 2008). Prior to field visits, the USFWS NWI Digital Data site was accessed to preview wetlands in the project area (USFWS NWI 2014) and the Natural Resources Conservation Service (NRCS) website was reviewed for soil information (USDA NRCS 2014).

The survey area is shown on Figures 2 and 3. This APE was surveyed for the presence of normal circumstances, atypical situations, or problem areas (Environmental Laboratory 1987).

The scientific name of plants used in this report follows the USFWS NWI 2012 Arid West Final Draft Ratings (Lichvar and Kartesz 2009) and are noted in the table in Appendix A. Wetland determination data forms are located in Appendix B and maps showing the NWI and soils information are provided in Appendix C.

Additional sources of existing information used for this delineation include:

- Classification of Wetlands and Deep Water Habitat of the United States (Cowardin et al. 1979)
- Munsell Soil Color Charts (Munsell 2000)
- Plants of the Rocky Mountains (Kershaw et al. 1998)
- Weeds of the West, 9th Ed. (Burrill et al. 2000)

RESULTS AND DISCUSSION

The following sections provide information concerning observations made in the field during the wetland delineation as well as information gathered during the preliminary work. The sampling locations within the survey area contain the necessary wetland characteristics required to be classified as a wetland, as outlined in the wetland delineation manuals (Environmental Laboratory 1987; USACE 2008). Two of these areas are located along the banks of the ditch in Areas 1 and 2, there are two depressions in Area 3, and there are three wet meadows in Area 3 (Figure 3).

Plant species in the project area include common cattail (*Typha latifolia*), Baltic rush (*Juncus balticus*), reed canarygrass (*Phalaris arundinacea*), and hardstem bulrush (*Schoenoplectus acutus*) in the wetlands with yellow rabbitbrush (*Chrysothamnus viscidiflorus*), tall yellow sweet clover (*Melilotus altissimus*), crested wheatgrass (*Agropyron cristatum*), and slender hawkweed (*Hieracium gracile*) in the uplands. The FWS NWI website did not identify the survey area as containing wetlands (USFWS NWI 2012).

The soils in the project area have been officially mapped by the (USDA 2014). Bear Lake-Bear Lake, ponded complex, 0 to 1 percent slopes (Soil Map Unit 15), Bear Lake-Chesbrook-La Roco complex, 0 to 2 percent slopes (Soil Map Unit 16), and La Roco silty clay loam, 0 to 2 percent slopes (soil Map Unit 123) were the three soil map units identified within the project area. The

Bear Lake-Bear Lake soils are poorly drained soil derived from mixed silty and clayey alluvium, rarely flooding with no frequency of ponding, and predominately hydric. The Bear Lake-Chesbrook-La Roco soils are poorly drained soil derived from mixed silty and clayey alluvium, rarely flooding with no frequency of ponding, and predominately hydric. The La Roco soils are somewhat poorly drained soils derived from mixed alluvium over sandy and gravelly alluvium, rarely flooding with no frequency of ponding, and predominately nonhydric.

The hydrology within the project area is derived from a high water table and directed draining of the airport property into the ditch that flows the perimeter of the airport. The ditch drains from and into the Bear Lake Canal Outlet (Figure 2) which flows into Bear Lake, a waters of the United States. Maps showing the NWI, and soils information are provided in Appendix C.

FINDINGS

There were four sample locations within the bounds of the surveyed project area. Three of the four sample locations are associated with the ditch that follows the perimeter of the airport and the fourth is the wet meadow on the northeast side of the airport. All four of the sample locations were found to contain wetland characteristics (i.e., vegetation, soils, and hydrology). Wetland characteristics observed within the ditch and depression areas and the wet meadow area are discussed independently. The locations and boundaries of the delineated wetlands are located in Figure 3. Photos are located in Appendix A. Figure 4 in Appendix A details the photo locations.

Area 1 Ditch

Two sampling points were situated along the ditch in Areas 1 and 2. The ditch in Areas 3 and 4 is the same ditch that runs the perimeter of the airport so is discussed in Area 2 Ditch. Vegetation, soils, and hydrology are the similar in all four areas.

The sampling point discussed in this section is in the southwest corner of the runway triangle (Area 1 Ditch) and encompasses the bed and banks of the ditch (Figure 3; Photos 1 and 2). Upland vegetation adjacent to the wetland vegetation is dominated by grasses and upland shrubs.

Vegetation

Table 1 documents the dominant vegetation observed at Area 1 Ditch. Other species present were Baltic rush (*Juncus balticus* Willd.) and reed canarygrass (*Phalaris arundinacea*). The upland area contained smooth brome (*Bromus inermis*) and yellow rabbitbrush (*Chrysothamnus viscidiflorus*). Because the dominant plants in this area are OBL, the vegetation in the sampling area passed the dominance test for hydrophytic vegetation. See Appendix B for definitions of indicators.

Table 1. Dominant vegetation associated with sampling points on ditch in Area 1

Common Name	Scientific Name	Indicator
Cattail	<i>Typha latifolia</i>	OBL
Hardstem bulrush	<i>Schoenoplectus acutus</i>	OBL

Soils

Due to the steepness of the banks and rapid transition from wetland to upland vegetation at this sampling point associated with the ditch, soil test holes were not completed during the field survey. Following the protocol for Difficult Wetland Situation in Arid West-Problematic hydric soils, Step 4(e), the soils along the banks of the irrigation structures are considered hydric if they contain water for more than 14 consecutive days during the growing season and have done so for more than 5 years.

Hydrology

The hydrology at this sampling point is derived from a high water table and directed draining of the airport property. The ditch drains from and into the Bear Lake Canal Outlet (Figure 2) which flows into Bear Lake, a waters of the United States.

Area 2 Ditch

Two sampling points were situated along the ditch in Areas 1 and 2. The ditch in Areas 3 and 4 is the same ditch that runs the perimeter of the airport so is included in this discussion. Vegetation, soils, and hydrology are the similar in all four areas.

The sampling point discussed in this section is in the northeast side of the runway triangle (Area 2 Ditch) and encompasses the bed and banks of the ditch (Figure 3). See Table 5 for photo information. Upland vegetation adjacent to the wetland vegetation is dominated by grasses forbs, both native and nonnative.

Vegetation

Table 2 documents the dominant vegetation observed at Area 2 Ditch. Since the dominant plants in this area are OBL, the vegetation in the sampling area passed the dominance test for hydrophytic vegetation. See Appendix B for definitions of indicators.

Table 2. Dominant vegetation associated with sampling points on ditch in Area 2

Common Name	Scientific Name	Indicator
Hardstem bulrush	<i>Schoenoplectus acutus</i>	OBL
Water speedwell	<i>Veronica anagallis-aquatica</i>	OBL

Soils

Due to the steepness of the banks and rapid transition from wetland to upland vegetation at this sampling point associated with the ditch, soil test holes were not completed during the field survey. Following the protocol for Difficult Wetland Situation in Arid West-Problematic hydric soils, Step 4(e), the soils along the banks of the irrigation structures are considered hydric if they contain water for more than 14 consecutive days during the growing season and have done so for more than 5 years.

Hydrology

The hydrology at this sampling point is derived from a high water table and directed draining of the airport property. The ditch drains from and into the Bear Lake Canal Outlet (Figure 2) which flows into Bear Lake, a waters of the United States.

Area 3 Depression

Matched sampling points (in and out) were situated along the depression in Area 2. There is a second depression in Area 3 with similar vegetation, soils, and hydrology so a sampling point was not documented. Both depressions connect to the ditch on the northeast side of the runway triangle (Figure 3; Photos 5 and 6).

Vegetation

Table 3 documents the dominant vegetation observed at this sampling point, in order of dominance. The area is sparsely vegetated. Because the dominant species are FACW and FAC species, the vegetation in the sampling locations passed the dominance test for hydrophytic vegetation. The non-wetland sampling point (Data Form Area 3 Depression - out) was vegetated with grasses and forbs, both native and nonnative. See Appendix B for definitions of indicators.

Table 3. Dominant vegetation associated with sampling points in Area 3 Depressions

Common Name	Scientific Name	Indicator
Saltgrass	<i>Distichlis spicata</i>	FAC
Alkali cordgrass	<i>Spartina gracilis</i>	FACW

Soils

This sampling point is located in the Soil Map Unit 123 Bear Lake-Lago complex, 0 to 2 percent slopes that is predominately hydric (USDA NRCS 2014). The texture of the soil was silty clay from 0-10 inches below ground surface (bgs). The soil changed at 4 inches but all layers had depletion redox features in the matrix and the hydric soil indicator is listed as stripped matrix (S6).

Hydrology

The hydrology at this sampling point is derived from a high water table and directed draining of the airport property. The depression gains water from the ditch and runoff from the airport.

Area 3 Wet Meadow

This sampling point is a wet meadow that runs east to west along the north edge of the airport near Airport Road. The acreage is broken into three areas (Figure 3; Photos 7-9) but all have similar vegetation, soils, and hydrology.

Vegetation

Table 4 documents the dominant vegetation observed within each area associated with the sampling point, in order of dominance. Because the dominant species are FACW and FAC

species, the vegetation in the sampling locations passed the dominance test for hydrophytic vegetation.

Table 4. Dominant vegetation associated with sampling points in Area 3 Wet Meadows

Common Name	Scientific Name	Indicator
Quackgrass	<i>Elymus repens</i>	FAC
Reed canarygrass	<i>Phalaris arundinacea</i>	FACW

Soils

This sampling point is located in Soil Map Unit 15 Bear Lake-Bear Lake, ponded complex, 0 to 1 percent slopes and Soil Map Unit 16 Bear Lake-Chesbrook-La Roco complex, 0 to 2 percent slopes that are predominately hydric (USDA NRCS 2014). The texture of the soil was silty clay from 0-10 inches (bgs). The soil changed at 2 inches but all layers had depletion redox features in the matrix and the hydric soil indicator is listed as stripped matrix (S6).

Hydrology

The hydrology at this sampling point is derived from a high water table and directed draining of the airport property. The wet meadow gains water from runoff from the airport.

CONCLUSIONS

Within the survey, all four sampling points were found to contain greater than fifty percent hydrophytic vegetation which is a positive wetland indicator. The soils along the ditch, depression, and wet meadow were determined to be hydric using the hydric soils indicators in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008). Wetland hydrology indicators are present for all four areas, and the connectivity of the ditch to the Bear Lake Outlet makes the waters within the project Waters of the U.S.

All four sampling points delineated within the survey area are determined to be wetlands based on the above findings for hydrophytic vegetation, hydric soil, and wetland hydrology. The wetlands delineated within the project area encompass 0.48 acres and are presumed jurisdictional under Section 404 of the Clean Water Act (See Table 5).

Table 5. Delineated acreage and photo reference for each area assessed.

Delineated Area	Delineated Wetland (Acres)	Photo (Page)
Area 1 Ditch	0.33	Photos 1 and 2 (A-3)
Area 2 Ditch	2.71	Photos 3, 4, 10, and 11 (A-4, A-7, and A-8)
Area 3a Depression	0.41	Photos 5 and 6 (A-5)
Area 3b Depression	0.06	No photo available
Area 3a Wet Meadow	9.88	Photo 7 (A-6)
Area 3b Wet Meadow	6.30	Photo 8 (A-6)
Area 3c Wet Meadow	25.70	Photo 9 (A-7)
TOTAL	45.39	

The connectivity of the areas to Waters of the U.S. provides the Corps jurisdiction over these areas. Any potential disturbance to these areas will require a 404 permit prior to the initiation of any activities.

LITERATURE CITED

- Burrill, L.C., et al. 2000. *Weeds of the West*, 9th edition. Western Society of Weed Science, Newark, CA.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRae. 1979. *Classification of Wetlands and Deep Water Habitat of the United States*, U.S. Fish and Wildlife Service. FWS/OBS-79/31, 103 pp.
- Environmental Laboratory. 1987. *Corps of Engineers Wetland Delineation Manual*. Technical Report Y-87-1, U.S. Army Engineer Waterway Experiment Station, Vicksburg, MS.
- Lichvar, Robert W. and John T. Kartesz. 2009. North American Digital Flora: National Wetland Plant List, version 2.4.0 (https://wetland_plants.usace.army.mil). U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH, and BONAP, Chapel Hill, NC.
- Munsell Color. 2000. *Munsell Soil Color Charts*. Year 2000 Revised Washable Edition. GretagMacbeth, New Windsor, NY.
- USACE. 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* Ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-0616. U.S. Army Corps of Engineers. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
- USDA NRCS. 2014. Web Soil Survey. U.S. Department of Agriculture – Natural Resources Conservation Service website. <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>. (Site accessed July 30, 2014)
- USFWS NWI. 2014. Wetlands Digital Data Wetlands Mapper. U.S. Fish and Wildlife Service's National Wetlands Inventory website. <http://wetlandsfws.er.usgs.gov/NWI/index.html>. (Site accessed July 30, 2014)

Appendix A

Photos



Figure 4. Map showing locations and directions of photos.



Photo 1 Overview Area 1 Ditch; facing west.



Photo 2 Overview Area 1 Ditch; facing east.



Photo 3 Overview Area 2 Ditch; facing east.



Photo 4 Overview Area 2 Banks; facing west.



Photo 5 Overview Area 3a Depression confluence with Area 2 Ditch; facing northeast.



Photo 6 Overview Area 3a Depression; facing north.



Photo 7 Overview Area 3a Wet Meadow; facing north.



Photo 8 Overview Area 3b Wet Meadow; facing east.



Photo 9 Area 3c Wet Meadow north of hangars; facing northwest.



Photo 10 Area 2 Ditch at east end of airport in Area 4; facing northeast.



Photo 11 Area 2 Ditch at east end of airport in Area 4; facing southwest toward Area 1.

Appendix B Plant List

Scientific Name	Common Name	Indicator Status*
<i>Achillea millefolium</i>	Common yarrow	FACU
<i>Agropyron cristatum</i>	Crested wheatgrass	UPL
<i>Bromus inermis</i>	Smooth brome	FACU
<i>Chrysothamnus viscidiflorus</i>	Yellow rabbitbrush	UPL
<i>Distichlis spicata</i>	Saltgrass	FAC
<i>Cirsium arvense</i>	Canada thistle	FACU
<i>Elymus glaucus</i>	Blue wildrye	FACU
<i>Elymus repens</i>	Quackgrass	FAC
<i>Elymus trachycaulus</i>	Slender wheatgrass	FACU
<i>Eurybia conspicua</i>	Western showy aster	UPL
<i>Grindelia squarrosa</i>	Curlycup gumweed	FACU
<i>Hieracium gracile</i>	Slender hawkweed	UPL
<i>Hordeum jubatum</i>	Foxtail barley	FAC
<i>Juncus balticus Willd.</i>	Baltic rush, wirerush	FACW
<i>Melilotus altissimus</i>	Tall yellow sweetclover	UPL
<i>Phalaris arundinacea</i>	Reed canarygrass	FACW
<i>Potentilla glandulosa</i>	Varileaf cinquefoil	FACU
<i>Schoenoplectus acutus</i>	Hardstem bulrush	OBL
<i>Spartina gracilis</i>	Alkali cordgrass	FACW
<i>Tragopogon dubius</i>	Yellow salsify	UPL
<i>Typha latifolia</i>	Common cattail	OBL
<i>Veronica anagallis-aquatica</i>	Water speedwell	OBL

*Categories were originally developed and defined by the USFWS NWI and subsequently modified by the National Plant List Panel.

OBL - Obligate Wetland Plants: Plants that occur almost always (estimated probability >99 percent) in wetlands under natural conditions, but which may also occur rarely (estimated probability <1 percent) in nonwetlands.

FACW - Facultative Wetland Plants: Plants that occur usually (estimated probability >67 percent to 99 percent) in wetlands, but also occur (estimated probability 1 percent to 33 percent) in nonwetlands.

FAC - Facultative Plants: Plants with a similar likelihood (estimated probability 33 percent to 67 percent) of occurring in both wetlands and nonwetlands. This includes FAC+ and FAC- plants.

FACU - Facultative Upland Plants: Plants that occur sometimes (estimated probability 1 percent to <33 percent) in wetlands, but occur more often (estimated probability >67 percent to 99 percent) in nonwetlands.

UPL – Obligate Upland Plants: Plants that occur rarely (estimated probability <1 percent) in wetlands, but occur almost always (estimated probability 99 percent) in nonwetlands under natural conditions.

Appendix C Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Bear Lake County Airport City/County: Bear Lake County Sampling Date: 7/31/14
 Applicant/Owner: Bear Lake County State: Idaho Sampling Point: Area 1
 Investigator(s): D. Stark Section, Township, Range: Sec. 5 & 6, T. 14S, R. 44E
 Landform (hillslope, terrace, etc.): valley Local relief (concave, convex, none): concave Slope (%): 0-2
 Subregion (LRR): LRR B Lat: 42.238449 Long: -111.345929 Datum: NAD 83
 Soil Map Unit Name: Bear Lake-Bear Lake, ponded complex, 0 to 1 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: This sampling point is located in the ditch at the south west side of the airport near the south end of the north-south runway. The ditch runs the perimeter of the airport and carries runoff from the airport. No upland sampling point was completed since the ditch bank is abrupt and the vegetation change is apparent.	
Field defined NWI: PEM1Fx; Palustrine, emergent, persistent, semipermanently flooded, excavated.	

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: _____)	<u>Absolute % Cover</u>	<u>Dominant Species?</u>	<u>Indicator Status</u>	Dominance Test worksheet:																
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
<u>0</u> = Total Cover				Prevalence Index worksheet: <table style="width:100%; border: none;"> <tr> <td style="width:50%;"><u>Total % Cover of:</u></td> <td style="width:50%;"><u>Multiply by:</u></td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = _____</td> </tr> <tr> <td>Column Totals: _____ (A)</td> <td>_____ (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = _____</td> </tr> </table>	<u>Total % Cover of:</u>	<u>Multiply by:</u>	OBL species _____	x 1 = _____	FACW species _____	x 2 = _____	FAC species _____	x 3 = _____	FACU species _____	x 4 = _____	UPL species _____	x 5 = _____	Column Totals: _____ (A)	_____ (B)	Prevalence Index = B/A = _____	
<u>Total % Cover of:</u>	<u>Multiply by:</u>																			
OBL species _____	x 1 = _____																			
FACW species _____	x 2 = _____																			
FAC species _____	x 3 = _____																			
FACU species _____	x 4 = _____																			
UPL species _____	x 5 = _____																			
Column Totals: _____ (A)	_____ (B)																			
Prevalence Index = B/A = _____																				
<u>Sapling/Shrub Stratum</u> (Plot size: _____)	_____	_____	_____																	
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
<u>0</u> = Total Cover																				
<u>Herb Stratum</u> (Plot size: <u>10 x 10</u>)	_____	_____	_____	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
1. <u><i>Typha latifolia</i></u>	<u>40</u>	<u>X</u>	<u>OBL</u>																	
2. <u><i>Schoenoplectus acutus</i></u>	<u>20</u>	<u>X</u>	<u>OBL</u>																	
3. <u><i>Juncus balticus Willd.</i></u>	<u>5</u>	_____	<u>FACW</u>																	
4. <u><i>Phalaris arundinacea</i></u>	<u>2</u>	_____	<u>FACW</u>																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
<u>67</u> = Total Cover																				
<u>Woody Vine Stratum</u> (Plot size: _____)	_____	_____	_____																	
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
<u>0</u> = Total Cover																				
% Bare Ground in Herb Stratum <u>60</u>	% Cover of Biotic Crust <u>0</u>																			
Remarks: Vegetation above this sampling point includes smooth brome, rabbit brush, and thistle.																				

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Bear Lake County Airport City/County: Bear Lake County Sampling Date: 7/31/14
 Applicant/Owner: Bear Lake County State: Idaho Sampling Point: Area 2 Banks
 Investigator(s): D. Stark Section, Township, Range: Sec. 30, T. 13S, R. 43E
 Landform (hillslope, terrace, etc.): valley Local relief (concave, convex, none): convex Slope (%): 4-6
 Subregion (LRR): LRR B Lat: 42.256821 Long: -111.351437 Datum: NAD 83
 Soil Map Unit Name: La Roco silty clay loam, 0 to 2 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: This sampling point is located on the ditch banks of the east-west ditch at the northwest side of the airport near Airport Road. The banks run the perimeter of the airport and contain similar vegetation within the whole project area. The banks are approximately 3-5 feet wide on either side of the ditch (see Area 2 Ditch data sheet). There were frogs on the banks of the ditch. Field defined NWI: PEM1Ax; Palustrine, emergent, persistent, temporarily flooded, excavated.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
0 _____ = Total Cover				Prevalence Index worksheet: _____ Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
0 _____ = Total Cover				
Herb Stratum (Plot size: <u>10 x 10</u>)				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Phalaris arundinacea</u>	<u>70</u>	<u>X</u>	<u>FACW</u>	
2. <u>Hieracium gracile</u>	<u>10</u>		<u>UPL</u>	
3. <u>Juncus balticus Willd.</u>	<u>5</u>		<u>FACW</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
85 _____ = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
0 _____ = Total Cover				
% Bare Ground in Herb Stratum <u>60</u>		% Cover of Biotic Crust <u>0</u>		
Remarks:				

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Bear Lake County Airport City/County: Bear Lake County Sampling Date: 7/31/14
 Applicant/Owner: Bear Lake County State: Idaho Sampling Point: Area 2 ditch
 Investigator(s): D. Stark Section, Township, Range: Sec. 30, T. 13S, R. 43E
 Landform (hillslope, terrace, etc.): valley Local relief (concave, convex, none): concave Slope (%): 0-2
 Subregion (LRR): LRR B Lat: 42.256797 Long: -111.351264 Datum: NAD 83
 Soil Map Unit Name: La Roco silty clay loam, 0 to 2 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: This sampling point is located in the east-west ditch at the northwest side of the airport near Airport Road. The ditch runs the perimeter of the airport and carries runoff from the airport. The ditch is approximately 15 feet wide with 3-5 foot banks on either side (see Area 2 Banks data sheet). The ditch runs the perimeter of the airport (See Area 1 data sheet) and contains similar vegetation throughout the entire project area. There were carp and ducks in the ditch. Field defined NWI: PEM1Fx; Palustrine, emergent, persistent, semipermanently flooded, excavated.	

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status	
<u>Tree Stratum</u> (Plot size: _____)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	<u>0</u>	= Total Cover		Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
	<u>0</u>	= Total Cover		
<u>Herb Stratum</u> (Plot size: <u>10 x 10</u>)				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u><i>Schoenoplectus tabernaemontani</i></u>	<u>5</u>	<u>X</u>	<u>OBL</u>	
2. <u><i>Veronica anagallis-aquatica</i></u>	<u>2</u>	<u>X</u>	<u>OBL</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
	<u>7</u>	= Total Cover		
<u>Woody Vine Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
	<u>0</u>	= Total Cover		
% Bare Ground in Herb Stratum <u>95</u>	% Cover of Biotic Crust <u>0</u>			
Remarks: The ditch was full of moss.				

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Bear Lake County Airport City/County: Bear Lake County Sampling Date: 7/30/14
 Applicant/Owner: Bear Lake County State: Idaho Sampling Point: Area 3 Depression - in
 Investigator(s): D. Stark Section, Township, Range: Sec. 30, T. 13S, R. 43E
 Landform (hillslope, terrace, etc.): valley Local relief (concave, convex, none): concave Slope (%): 0-4
 Subregion (LRR): LRR B Lat: 42.256154 Long: -111.348036 Datum: NAD 83
 Soil Map Unit Name: La Roco silty clay loam, 0 to 2 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: This sampling point is a depressional area located perpendicular to the east-west ditch at the northwest side of the airport near Airport Road. It runs south of the ditch and is more vegetated closer to the ditch. Field defined NWI: PUB3Ex; Palustrine, unconsolidated bottom, mud, seasonally flooded/saturated, excavated.	

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
				0 _____ = Total Cover
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
				0 _____ = Total Cover
<u>Herb Stratum</u> (Plot size: 10 x 10)				
1. <u>Distichlis spicata</u>	20	X	FAC	
2. <u>Spartina gracilis</u>	20	X	FACW	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
				40 _____ = Total Cover
<u>Woody Vine Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
				0 _____ = Total Cover
% Bare Ground in Herb Stratum <u>90</u> % Cover of Biotic Crust <u>2</u>				
Remarks: This sampling point is sparsely vegetated.				

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
 Total Number of Dominant Species Across All Strata: 2 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:
 Total % Cover of: _____ Multiply by: _____
 OBL species _____ x 1 = _____
 FACW species _____ x 2 = _____
 FAC species _____ x 3 = _____
 FACU species _____ x 4 = _____
 UPL species _____ x 5 = _____
 Column Totals: _____ (A) _____ (B)
 Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
 Dominance Test is >50%
 Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

SOIL

Sampling Point: Area 3 Depression - in

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 5/2	80	5YR 6/6	20	D	M	silty clay	
4-10	10YR 8/2	60	5YR 6/6	40	D	M	silty clay	

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Bear Lake County Airport City/County: Bear Lake County Sampling Date: 7/31/14
 Applicant/Owner: Bear Lake County State: Idaho Sampling Point: Area 3 Depression - out
 Investigator(s): D. Stark Section, Township, Range: Sec. 30, T. 13S, R. 43E
 Landform (hillslope, terrace, etc.): valley Local relief (concave, convex, none): concave Slope (%): 0-4
 Subregion (LRR): LRR B Lat: 42.256154 Long: -111.348036 Datum: NAD 83
 Soil Map Unit Name: La Roco silty clay loam, 0 to 2 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: This sampling point is located on the bank above the depressional area (Area 3 Depression - in).	

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: _____)	<u>Absolute % Cover</u>	<u>Dominant Species?</u>	<u>Indicator Status</u>	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	<u>0</u>	= Total Cover		
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
	<u>0</u>	= Total Cover		
<u>Herb Stratum</u> (Plot size: <u>10 x 10</u>)				
1. <u><i>Elymus trachycaulus</i></u>	<u>30</u>	<u>X</u>	<u>FACU</u>	
2. <u><i>Grindelia squarrosa</i></u>	<u>5</u>	_____	<u>FACU</u>	
3. <u><i>Bromus inermis</i></u>	<u>5</u>	_____	<u>FACU</u>	
4. <u><i>Hieracium gracile</i></u>	<u>2</u>	_____	<u>UPL</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
	<u>42</u>	= Total Cover		
<u>Woody Vine Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
	<u>0</u>	= Total Cover		
% Bare Ground in Herb Stratum <u>60</u> % Cover of Biotic Crust <u>0</u>				

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
 Total Number of Dominant Species Across All Strata: 1 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:
 Total % Cover of: _____ Multiply by: _____
 OBL species 0 x 1 = 0
 FACW species 0 x 2 = 0
 FAC species 0 x 3 = 0
 FACU species 40 x 4 = 160
 UPL species 2 x 5 = 10
 Column Totals: 42 (A) 170 (B)
 Prevalence Index = B/A = 4.0

Hydrophytic Vegetation Indicators:
 Dominance Test is >50%
 Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks: This sampling point is sparsely vegetated and very dry. There were no hydrophytic vegetation indicators.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Bear Lake County Airport City/County: Bear Lake County Sampling Date: 7/30/14
 Applicant/Owner: Bear Lake County State: Idaho Sampling Point: Area 3 Wet meadow - in
 Investigator(s): D. Stark Section, Township, Range: Sec. 30, T. 13S, R. 43E
 Landform (hillslope, terrace, etc.): valley Local relief (concave, convex, none): concave Slope (%): 2-4
 Subregion (LRR): LRR B Lat: 42.256111 Long: -111.3485914 Datum: NAD 83
 Soil Map Unit Name: La Roco silty clay loam, 0 to 2 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: This sampling point is a wet meadow that runs east to west along the north edge of the airport near Airport Road. Field defined NWI: PEM1Ed; Palustrine, emergent, persistent, seasonally flooded/saturated, partially drained/ditched.	

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
				0 _____ = Total Cover
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
				0 _____ = Total Cover
<u>Herb Stratum</u> (Plot size: <u>10 x 10</u>)				
1. <u><i>Elymus repens</i></u>	15	X	FAC	
2. <u><i>Phalaris arundinacea</i></u>	10	X	FACW	
3. <u><i>Hordeum jubatum</i></u>	5		FAC	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
				30 _____ = Total Cover
<u>Woody Vine Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
				0 _____ = Total Cover
% Bare Ground in Herb Stratum <u>20</u> % Cover of Biotic Crust <u>2</u>				

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
 Total Number of Dominant Species Across All Strata: 2 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:
 Total % Cover of: _____ Multiply by: _____
 OBL species _____ x 1 = _____
 FACW species _____ x 2 = _____
 FAC species _____ x 3 = _____
 FACU species _____ x 4 = _____
 UPL species _____ x 5 = _____
 Column Totals: _____ (A) _____ (B)
 Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
 Dominance Test is >50%
 Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks: This sampling point is a heavily vegetated wet meadow with cattails and bulrushes interspersed.

SOIL

Sampling Point: Area 3 Wet meadow - in

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 5/2	80	5YR 6/6	20	D	M	silty clay	
2-10	10YR 8/2	60	5YR 6/6	40	D	M	silty clay	

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Bear Lake County Airport City/County: Bear Lake County Sampling Date: 7/31/17
 Applicant/Owner: Bear Lake County State: Idaho Sampling Point: Area 3 Wet meadow - out
 Investigator(s): D. Stark Section, Township, Range: Sec. 30, T. 13S, R. 43E
 Landform (hillslope, terrace, etc.): valley Local relief (concave, convex, none): concave Slope (%): 2-4
 Subregion (LRR): LRR B Lat: 42.256111 Long: -111.3485914 Datum: NAD 83
 Soil Map Unit Name: La Roco silty clay loam, 0 to 2 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: This sampling point is the upland adjacent to the wet meadow detailed in the Area 3 Wet Meadow - in data sheet.	

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
				0 _____ = Total Cover
<u>Sapling/Shrub Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
				0 _____ = Total Cover
<u>Herb Stratum</u> (Plot size: 10 x 10)				
1. <u>Eurybia conspicua</u>	20	X	UPL	
2. <u>Agropyron cristatum</u>	20	X	UPL	
3. <u>Grindelia squarrosa</u>	5		FACU	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
				45 _____ = Total Cover
<u>Woody Vine Stratum</u> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
				0 _____ = Total Cover
% Bare Ground in Herb Stratum <u>20</u> % Cover of Biotic Crust <u>2</u>				

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
 Total Number of Dominant Species Across All Strata: 2 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:
 Total % Cover of: _____ Multiply by: _____
 OBL species _____ x 1 = _____
 FACW species _____ x 2 = _____
 FAC species _____ x 3 = _____
 FACU species _____ x 4 = _____
 UPL species _____ x 5 = _____
 Column Totals: _____ (A) _____ (B)
 Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
 Dominance Test is >50%
 Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks: This sampling point is sparsely vegetated and very dry. There were no hydrophytic vegetation indicators.

SOIL

Sampling Point: Area 3 Wet meadow - out

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 5/2	80	5YR 6/6	20	D	M	silty clay	
4-10	10YR 8/2	60	5YR 6/6	40	D	M	silty clay	

Appendix D Maps

**Bear Lake County
Airport**

Dec 3, 2012

- Wetlands**
- Freshwater Emergent
 - Freshwater Forested/Shrub
 - Estuarine and Marine Deepwater
 - Estuarine and Marine
 - Freshwater Pond
 - Lake
 - Riverine
 - Other
- Riparian**
- Herbaceous
 - Forested/Shrub



**U.S. Fish and Wildlife Service
National Wetlands Inventory**



This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

User Remarks:
FWS NWI Map



Hydric Rating by Map Unit—Bear Lake County Area, Idaho
(Bear Lake County Airport)



MAP LEGEND

- Area of Interest (AOI)**
 Area of Interest (AOI)
- Soils**
- Soil Rating Polygons**
-  Hydric (100%)
 -  Predominantly Hydric (66 to 99%)
 -  Partially hydric (33 to 65%)
 -  Predominantly nonhydric (1 to 32%)
 -  Nonhydric (0%)
 -  Not rated or not available
- Soil Rating Lines**
-  Hydric (100%)
 -  Predominantly Hydric (66 to 99%)
 -  Partially hydric (33 to 65%)
 -  Predominantly nonhydric (1 to 32%)
 -  Nonhydric (0%)
 -  Not rated or not available
- Soil Rating Points**
-  Hydric (100%)

-  Predominantly Hydric (66 to 99%)
 -  Partially hydric (33 to 65%)
 -  Predominantly nonhydric (1 to 32%)
 -  Nonhydric (0%)
 -  Not rated or not available
- Water Features**
-  Streams and Canals
- Transportation**
-  Rails
 -  Interstate Highways
 -  US Routes
 -  Major Roads
 -  Local Roads
- Background**
-  Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000. Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bear Lake County Area, Idaho
 Survey Area Data: Version 3, Dec 10, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 7, 2010—Aug 15, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydric Rating by Map Unit

Hydric Rating by Map Unit— Summary by Map Unit — Bear Lake County Area, Idaho (ID712)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
15	Bear Lake-Bear Lake, ponded complex, 0 to 1 percent slopes	80	814.8	36.3%
16	Bear Lake-Chestbrook-La Roco complex, 0 to 2 percent slopes	70	422.9	18.8%
17	Bear Lake-Lago complex, 0 to 2 percent slopes	55	320.1	14.2%
123	La Roco silty clay loam, 0 to 2 percent slopes	10	594.3	26.4%
127	Lago silt loam, 0 to 1 percent slopes	15	53.2	2.4%
147	Millerditch-Cookcan complex, 0 to 2 percent slopes	30	10.1	0.5%
225	Water	0	31.6	1.4%
Totals for Area of Interest			2,246.9	100.0%

ARCHAEOLOGICAL AND HISTORICAL SURVEY REPORT ARCHAEOLOGICAL SURVEY OF IDAHO

A. KEY INFORMATION

- 1. Project Name:** Bear Lake County Airport Master Plan
- 2. Project Number:**
- 3. Agency Name:** Federal Aviation Administration
- 4. Report Author:** Rusty Smith; North Wind Resource Consulting, LLC.
- 5. Date:** July 17, 2015
- 6. County:** Bear Lake
- 7. Township, Range, Section:** T13S, R44E, Sections 29, 30 31 and 32. T14S, R44E, Sections 5, 6
- 8. Acres Surveyed:** 150 intensive (30 meter or less interval)

B. PROJECT DESCRIPTION

1. Description of project and potential direct and indirect impacts to known or suspected historic properties:

The Bear Lake County Airport in southeastern Idaho has contracted T-O Engineers (T-O) to develop a master plan for the airport. T-O has requested a field assessment of approximately 150 acres of airport property to identify potential cultural resource concerns at the existing airport facilities to accommodate potential future growth.

The on-going airport master plan will identify future aeronautical development needs at the airport for a 20 year planning horizon (2014 as the base year). Findings in this report will be used to assist in the master plan analysis and the determination of potential impacts of future planning aeronautical development on identified wetlands. Based on this NWRC conducted an intensive survey of the 150 acres using the recommended SHPO guidelines to date potential sites. Any archaeological site deemed to be at least 50 years of age was recorded. Potential future impacts to cultural properties may include both surface and subsurface disturbance due to heavy equipment used during construction as well as visual impacts to historic properties up to 1-mile (1.6 km) distant.

2. Description of Area of Potential Effects (APE):

The project area is located at the Bear Lake County Airport in southeastern Idaho in the Bear River Valley (Figure 1). Construction of the airport began in 1943 as a military training base during World War II but was not completed or used by the military. Construction was completed and was turned over to Bear Lake County for public operation in 1947. The APE concerns an area on the south end of the airport, areas at each end of the main runway, and an adjacent portion north of the current taxiway of the Bear Lake County Airport. The area contains lower-lying wetlands. This area has been disturbed by grading and leveling and is slightly lower than the runway (Figure 2). Located at the airport is an airport manager's residence. The residence consists of a manufactured home on a foundation. The residence was constructed in 1972. The hangers

date from 2000, 2007, and 2013. The beacon tower and a structure that contains transformers were constructed in 1957 and will be discussed in Results.

3. Project Acres: 150

4. Owners of land in the project area: Bear Lake County

C. STATEMENT OF OBJECTIVES FOR SURVEY

The objective of this cultural resource inventory is to identify and evaluate cultural properties within the project's APE in accordance with 36 CFR 800. Information pertaining to prehistoric cultures and Euro-American activities was sought.

D. LOCATION AND GENERAL ENVIRONMENTAL SETTING

1. USGS topographic map: Montpelier (1967), and Dingle (1967) Idaho 7.5' Quadrangle.

2. Setting:

The project area is located in the Bear Lake Valley, 5.1 miles south of Montpelier, Idaho and 9.3 miles north of Bear Lake (Figure 1). The Bear Lake Valley is a fault-bounded basin, or graben, with normal faults on both the east and west sides. The northern extent of the Wasatch Mountain Range bounds the valley to the west and the Pruess Mountain Range to the east. The eastern shore of Bear Lake has a prominent fault scarp. Bear Lake, which is 20 miles long, dominates the landscape. A few farms and ranches are located near the area.

Soils in the area are hydric, moderately well to very poorly drained, very deep silt loam and silty clay loam formed in mixed alluvium. Plant species in the project area include hydrophytic vegetation such as sandbar willow, timothy grass, foxtail barley, sweet clover, mayweed chamomile, and halophytic plants such as greasewood. Bear Lake Valley is at nearly 6,000 feet elevation. Summers are short and winters long and cold.

The project area has been previously disturbed by grading and leveling. Vegetation in the area is periodically mowed to maintain a clear line of sight to the runway (Figures 3 and 4).

E. PRE-FIELD RESEARCH

1. Sources of information checked:

- | | |
|---|---|
| <input checked="" type="checkbox"/> Overviews | <input checked="" type="checkbox"/> Historical records/maps (list) |
| <input checked="" type="checkbox"/> National Register | <input type="checkbox"/> Individuals/Groups with special knowledge (list) |
| <input checked="" type="checkbox"/> Archaeological site records/map | <input type="checkbox"/> Other (list) |
| <input checked="" type="checkbox"/> Architectural site records/maps | |
| <input checked="" type="checkbox"/> Survey records | |
| <input type="checkbox"/> Ethnographic studies | |

2. Summary of previous studies in the general area:

A file search conducted on July 30, 2014 at the Idaho State Historic Preservation Office (SHPO) revealed three previous cultural resource inventories near the project area (SHPO Record Search # 14319). Table 1 lists these projects. Two sites have been recorded within 1 mile of the project area (Table 2). Site sensitivity maps of the Idaho SHPO were checked.

Table 1. Previous studies conducted in the area

SHPO Report No.	Report Title	Author	Date	Acres
1996/854	Cultural Resources Investigation Bear Lake NWR Negative Results. US Fish and Wildlife Service, Princeton, Oregon.	Harvey, P. K. & C.D. Burnside	1995	275
2003/544	Bear Lake Outlet Bridge. Prepared for Toothman Orton Engineering, Boise, ID by Frontier Historical Consultants, Grand View, ID.	Gray, D.	2002	10
2013/208	Bear Lake County Airport New Taxiway by North Wind, Inc., Idaho Falls, ID.	Shelton, J.	2012	152

3. Description and evaluation of projects in E.2 with regard to survey design, methods, personnel and results:

The above mentioned projects were conducted using current and standard archaeological methods.

F. EXPECTED HISTORIC AND PREHISTORIC LAND USE AND SITE SENSITIVITY

1. Are cultural properties known in this area? No Yes

Table 2. Previously recorded sites within one mile of the project area.

Field No.	Site No.	Type of Property	Artifacts/Features	NRHP Eligibility	NRHP Criteria
	07017895	Bear Lake Outlet Canal	Channel, headgates, check dams	Eligible	A
	07-17896	William H. Smith Homestead	Buildings	Eligible	A

2. Are cultural properties expected? Yes No

3. What cultural themes/contexts are expected within the survey area? Check at least one theme in the first two columns and at least one time period in the third column.

<u>Theme</u>		<u>Time Period</u>
<input checked="" type="checkbox"/> Prehistoric Archaeology	<input type="checkbox"/> Military	<input checked="" type="checkbox"/> Prehistoric
<input checked="" type="checkbox"/> Agriculture	<input type="checkbox"/> Mining	<input type="checkbox"/> Historic Native American
<input checked="" type="checkbox"/> Architecture	<input type="checkbox"/> Native Americans	<input type="checkbox"/> Exploration: 1805-1860
<input type="checkbox"/> Civilian Conservation Corp	<input type="checkbox"/> Public Land Mngt./Conserv	<input checked="" type="checkbox"/> Settlement: 1855-1890
<input type="checkbox"/> Commerce	<input type="checkbox"/> Recreation/Tourism	<input checked="" type="checkbox"/> Phase I Statehood: 1890-1904
<input type="checkbox"/> Communication	<input type="checkbox"/> Settlement	<input checked="" type="checkbox"/> Phase II Statehood: 1904-1920
<input type="checkbox"/> Culture and Society	<input type="checkbox"/> Timber Industry	<input checked="" type="checkbox"/> Interwar: 1920-1940
<input type="checkbox"/> Ethnic Heritage	<input type="checkbox"/> Transportation	<input checked="" type="checkbox"/> Pre-Modern: 1940-1958
<input type="checkbox"/> Exploration/Fur Trapping	<input type="checkbox"/> Other (list)	<input type="checkbox"/> Modern: 1958-present
<input type="checkbox"/> Industry		

4. Brief description of where cultural properties associated with expected themes might be found with respect to landforms, water, vegetation, slope, fauna, and historical documentation:

The archaeological record shows that prehistoric occupation of southern Idaho goes back at least 11,000 years. Shoshone Indians were the Native American group inhabiting the region at the time of Euro-American contact. The project area is adjacent to marshes. The project area has been developed with paved roads and runways; little likelihood of prehistoric sites exists.

The project area is located on a level valley floor, ideal for farming. Settlement of the region dates back to the 1860s by Mormon pioneers. The City of Montpelier was founded in 1863. Historic sites may consist of canals, roads, railroads; can scatters, isolated farm equipment, houses, buildings, or other evidence of farming and settlement.

G. FIELD METHODS

- 1. Areas examined and type of coverage:** The survey area was walked north to south and east to west with transects spaced 30 meters apart.
- 2. Description of ground surface conditions:** Approximately 33 percent of the ground surface was covered with wetlands. The areas surrounding the runways not in wetlands are cut for grass hay. The areas on the ends of the runways have previously been disturbed by prior runway construction.
- 3. Areas not examined and reasons why:** Wetlands with standing water (ca. 49 acres) were not surveyed as the ground surface was not visible (Figure 2).
- 4. Names of personnel participating in the survey in the field:** Rusty Smith and Denise Stark
- 5. Date of survey:** July 31, 2014 and August 26, 2014
- 6. Problems encountered:** Since the project is located in a working airport, the archaeologists had to give advance notice to the airport manager of the field survey.

H. RESULTS

- 1. Listing of all cultural properties (including previously recorded) in the APE:** None

Two previously recorded sites, the Bear Lake Outlet Canal (Site No. 07017895) and the William H. Smith homestead (Site 07-17896) were recorded within one mile of the survey area (Table 3).

Four newly recorded sites, BLA-2 through BLA-5, were recorded as a result of the current inventory.

Table 3. All sites recorded within 1 mile of the survey area.

Field No.	Site No.	Type of Property	Artifacts/Features	NRHP Eligibility	Distance to Project Area
	07-17895	Bear Lake Outlet Canal	Channel, headgates, check dams	Eligible	1,020
	07-17896	William H. Smith Homestead	Buildings	Eligible	1,460
BLA-2		Foundation	Concrete pad	Not Eligible	Within
BLA-3		Ditch	Drainage ditch	Not Eligible	Within
BLA-4		Tower	Beacon tower	Not Eligible	Within
BLA-5		Structure	Concrete structure	Not Eligible	Within

- 2. Summary of important characteristics or properties listed above:**

Previously recorded site No. 07-17895 consists of the canal known as the Bear Lake Outlet Canal. The Bear Lake Outlet Canal was built in 1915. The canal diverts water out of Bear Lake for irrigation.

Previously recorded site No. 07-17896 consists of the William H. Smith homestead.

Newly recorded site BLA-2 consists of a single feature composed of a circular concrete pad. The pad measures 40 feet in diameter and has a raised portion in the middle that measures 5 feet by 5 feet by 6 inches high. There are a total of 13 threaded 5/8-inch bolts that protrude out of the top of the raised portion. Its function is unknown to the current airport manager. It may have been associated with buildings that were previously removed. It is situated on flat land adjacent to a wetland with standing water. Vegetation includes reed canary grass and slender wheatgrass. Soils include silt clay loam.

This site is recommended as not eligible to the NRHP. The site does not retain integrity of workmanship and feeling as the only remaining evidence of a structure is a concrete pad. The site is not associated with important events or people, it is not unique in design or craftsmanship, nor can it add to the history of the nation, region or site area.

Newly recorded site BLA-3 consists of a drainage ditch. It surrounds the airport property and drains excess water off the airport property to the Bear Lake Outlet Canal. It is not maintained nor does it have gates. The exact age is not known but may go back as far as the construction of the airport itself. It is on a 1967 topographic map that was photo-updated in 1980. Local irrigation companies have no knowledge of its date of construction. It is situated on flat land adjacent to a wetland with standing water. Vegetation includes common cattail, hardstem bulrush, reed canary grass, slender wheatgrass, showy aster, and crested wheatgrass. Soils include silt clay loam.

This site is recommended as not eligible to the NRHP as it is not associated with important events or people, it is not unique in design or craftsmanship, nor can it add to the history of the nation, region or site area.

Newly recorded site BLA-4 consists of a 60-ft tall wooden beacon tower. The beacon is part of the Bear Lake County Airport lighting system. The tower was constructed in 1957 of telephone poles and 2 inch by 6 inch dimensional lumber and painted red and white. The poles are set in concrete. The beacon on top and the wooden ladder were replaced in 2009. The tower is periodically repainted. It is situated on flat land adjacent to Airport Road. Vegetation in the area includes common cattail, hardstem bulrush, reed canary grass, slender wheatgrass, showy aster, and crested wheatgrass. Soils include silt clay loam.

This site is recommended as not eligible to the NRHP. The tower beacon was replaced in 2009. The original ladder to access the tower has been replaced at an unknown time. The tower has been repainted multiple times. Though the tower retains integrity of location, setting, feeling, and association the tower no longer retains integrity of design, workmanship, and materials due to the alterations and continued maintenance of the tower since original construction in 1957. The tower is not associated with important events or people, it is not unique in design or craftsmanship, nor can it add to the history of the nation, region or site area.

Newly recorded site BLA-5 consists of a rectangular poured concrete building constructed in 1957 to house transformers. The structure measures 12 feet long by 10 feet wide by 10 feet high. There is a steel door on the west side and a small antenna on the northeast corner of the roof. The PCB transformers were removed and replaced in 2009. The transformers stepped down the power from the power line to the lighting system to the airport beacon and runway lights. The wires, lights,

and beacon (BLA-4) were replaced as the same time as the transformers. Vegetation in the area includes common cattail, hardstem bulrush, reed canary grass, slender wheatgrass, showy aster, and crested wheatgrass. Soils include silt clay loam.

This site is recommended as not eligible to the NRHP. The site does retain integrity of location, setting, workmanship, feeling, and association. The site no longer retains integrity of materials and design as the site has been altered from continued use and maintenance. The site is not unique in design or craftsmanship, it is not associated with important events or people, and it will not provide additional historical information on a local, regional or national level.

3. Recommendations for National Register eligibility of each cultural property:

Site 07-17895, the Bear Lake Outlet Canal, was previously recommended eligible for the NRHP under Criterion A.

Site 07-17896, the William H. Smith homestead, was previously recommended eligible for the NRHP under Criterion A.

Site BLA-2, the concrete pad, is recommended not eligible for the NRHP under any Criteria.

Site BLA-3, the drainage ditch, is recommended not eligible for the NRHP under any Criteria.

Site BLA-4, the tower, is recommended not eligible for the NRHP under any Criteria.

Site BLA-5, the concrete structure, is recommended not eligible for the NRHP under any Criteria.

4. Recommendations for further investigations needed to evaluate cultural properties: None.

5. Cultural Properties noted but not formally recorded: None

I. CONCLUSIONS AND RECOMMENDATIONS

1. Brief summary of relevance of cultural properties to contexts listed under F, discussing potential contributions to these contexts:

Site 07-17895, the Bear Lake Outlet Canal, is recommended eligible for the NRHP. The site is a historical canal located 1,020 feet west of the project area. As there are no plans to physically change the airport or project area in place at this time the sites will not be impacted..

Site 07-17896, the William H. Smith homestead, is recommended eligible for the NRHP under Criterion B. The site is a historic homestead located 1,460 feet west of the project area. As there are no plans to physically change the airport or project area in place at this time the sites will not be impacted.

Newly recorded site BLA-2 consists of a single feature composed of a circular concrete pad. This site is within the project area. This site is recommended as not eligible to the NRHP. The site does not retain integrity of workmanship and feeling as the only remaining evidence of a structure is a

concrete pad. The site is not associated with important events or people, it is not unique in design or craftsmanship, nor can it add to the history of the nation, region or site area.

Newly recorded site BLA-3 consists of a single feature composed of an earthen drainage ditch. This site is within the project area. This site is recommended as not eligible to the NRHP as it is not associated with important events or people, it is not unique in design or craftsmanship, nor can it add to the history of the nation, region or site area.

Newly recorded site BLA-4 consists of a single feature composed of a wooden beacon tower. This site is within the project area. This site is recommended as not eligible to the NRHP. The tower beacon was replaced in 2009. The original ladder to access the tower has been replaced at an unknown time. The tower has been repainted multiple times. Though the tower retains integrity of location, setting, feeling, and association the tower no longer retains integrity of design, workmanship, and materials due to the alterations and continued maintenance of the tower since original construction in 1957. The tower is not associated with important events or people, it is not unique in design or craftsmanship, nor can it add to the history of the nation, region or site area.

Newly recorded site BLA-5 consists of a single feature composed of a poured concrete structure. This site is within the project area. This site is recommended as not eligible to the NRHP. The site does retain integrity of location, setting, workmanship, feeling, and association. The site no longer retains integrity of materials and design as the site has been altered from continued use and maintenance. The site is not unique in design or craftsmanship, it is not associated with important events or people, and it will not provide additional historical information on a local, regional or national level.

2. Discussion of potential threats to the integrity of the cultural properties and recommendations for future investigations or protective actions:

As there are no current plans for construction there is no threat to the integrity of cultural properties located within the APE.

3. For 106-related surveys, discussion of relationship of each cultural property to direct and indirect project impacts. Specifically state project's effect (no effect, no adverse effect, or adverse effect) upon each cultural property:

There will be no direct or indirect impacts to Sites 07-17895 or Site 07-17896. Both NRHP eligible properties are located more than 1,000 feet from the project boundary and the proposed activities will have no effect on them. Site BLA-2 is within the project area but it is not recommended as eligible and there are no current plans that will have an effect on the site. Site BLA-3 is within the project area but it is not recommended as eligible and there are no current plans that will have an effect on the site. Site BLA-4 is within the project area but it is not recommended as eligible and the project will have no effect on the site. Site BLA-5 is within the project area but it is not recommended as eligible and there are no current plans that will have an effect on the site.

4. For 106-related surveys affecting cultural properties, discussion of avoidance or mitigation options for each property:

There will be no affects to any NRHP-eligible or other cultural properties within the APE. No avoidance or mitigation measures are necessary.

5. For 106-related surveys, recommendations for additional information gathering or survey, avoidance measures, mitigation, and future management: None

Two cultural previously recorded properties and four newly recorded sites are within one mile of the project area. As there are no plans to physically change the airport or project area in place at this time the sites will not be impacted.

Cultural resource clearance with no further work is recommended for the Bear Lake County Airport Master Plan project subject to the following stipulations:

- 1) All disturbances will be restricted to within the inventoried areas.
- 2) If evidence of prehistoric or historic sites is discovered during the ground-disturbing activities, all activities within a 100-foot (30-m) radius of the site will cease immediately, and the appropriate personnel within the FAA and SHPO should be notified.
- 3) All construction and maintenance personnel will be instructed of the confidentiality of site locational information and that the collection of cultural material is prohibited.

J. ATTACHMENTS

1. **Appropriate forms attached for each site?** **Yes**
2. **Maps attached?** **Yes**
3. **Other attachments? (List)** **Photos**

K. REPOSITORY

Original survey records, field notes, and photographs are located at North Wind, Inc. Idaho Falls, Idaho office.

L. CERTIFICATION OF RESULTS

I certify that this investigation was conducted and documented according to the Secretary of Interior's Standards and Guidelines and that the report is complete and accurate to the best of my knowledge.



Signature of Reporter

July 17, 2015

Date

Trinity D. Schlegel

Signature of Principal Investigator

July 17, 2015

Date



Figure 1. Map of Idaho showing the general location of the project area.

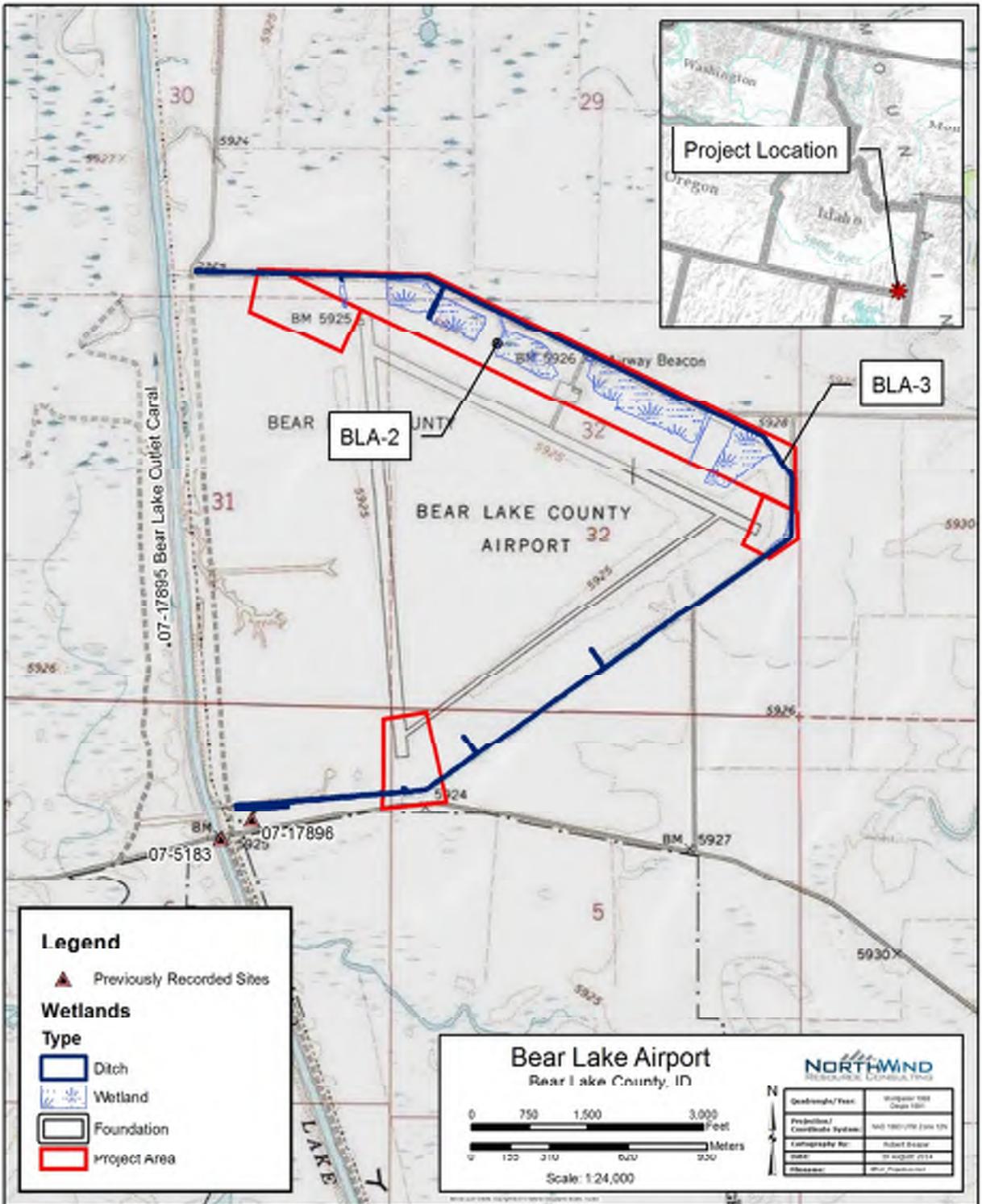


Figure 2. Map showing the location of the project area. Taken from the Montpelier (1967) and Dingle (1967), quadrangles, USGS 7.5' Series (1:24,000 Scale).



Figure 3. View northwest of the proposed project area.



Figure 4. View east of concrete pad at Site BLA-2.



Figure 5. Close-up of the raised portion of the concrete pad at Site BLA-2.



Figure 6. View northeast of ditch (BLA-3) on the east end of the project area.



Figure 7. View west of the ditch (BLA-3) on the northwest end of the project area.

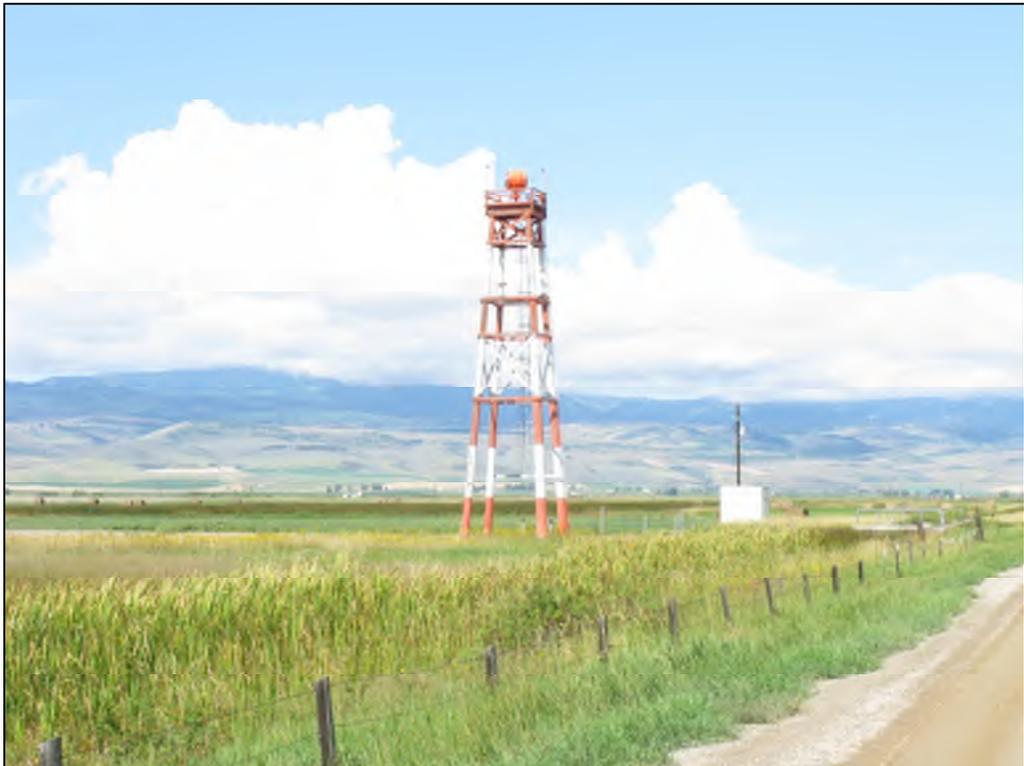


Figure 8. View west of the beacon tower at BLA-4.



Figure 9. View east of the concrete structure at BLA-5.

Wildlife Hazard Site Visit Report

Bear Lake County Airport

Montpelier, Idaho

August 2014



Prepared by:

Katy Bissell, DPT
Kestrel Environmental Services, LLC
3244 E. Boulder Heights Drive
Boise, ID 83712

Russell P. DeFusco, PhD
BASH Incorporated
5010 Lanagan Street
Colorado Springs, CO 80919

**Wildlife Hazard Site Visit Report
Bear Lake County Airport
Montpelier, ID
August 2014**

Introduction

This document will follow the guidelines established in FAA Advisory Circular 150/5200-38 (Draft): "Protocol for the Conduct and Review of Wildlife Hazard Site Visits, Wildlife Hazard Assessments, and Wildlife Hazard Management Plans". Specific requirements pertinent to this Wildlife Hazard Site Visit from the Advisory Circular are detailed below:

- 1. Site Visit Report:** A Qualified Airport Wildlife Biologist must provide the airport manager with a report summarizing field data and any management recommendations following the Wildlife Hazard Site Visit (WHSV). The Federal Aviation Administration (FAA) Regional office should also receive a copy of this report from the Airport Manager. The FAA will review the Wildlife Hazard Site Visit report and determine if a full Wildlife Hazard Assessment (WHA) is required. Copies of the report should be filed and made a part of the historical record for the airport. The Wildlife Hazard Site Visit report should contain:
 - a. List of wildlife species (or wildlife sign- e.g., deer tracks) observed during the visit, with a statement that the list is not a complete record of species using the airport
 - b. Federal and State status of the species observed
 - c. Habitat features that may encourage wildlife to use the airport
 - d. Natural and man-made wildlife attractants on or near the airport
 - e. Strike data analysis
 - f. Recommendations to:
 - (1) Reduce wildlife hazards identified (if data is available to substantiate your conclusions)
 - (2) Conduct an Assessment, if warranted
 - (3) Modify an existing Plan, if warranted
 - (4) Improve communications and hazard advisories between Air Traffic Control, pilots, airlines, airport operations, and other airport users
 - (5) Provide for potential alteration of aircraft operations including locations and scheduling of flights to avoid identified hazardous wildlife concentrations
 - (6) No action required, if applicable

2. Survey Process:

a. Applicable Airport Information: The airport operator shall provide the Qualified Airport Biologist the following information, if available:

- (1) Personnel and departments responsible for airport operations
- (2) Number of aircraft movements per year
- (3) Type of movements (i.e., % private, civil, and military)
- (4) Recent airport improvements or upgrades
- (5) Past and present land management practices
- (6) Records of strikes and damage, flight delays, injuries, and fatalities due to strikes. Wildlife strike data may help determine hazardous species on an airport. Data on reported wildlife strikes are available through the FAA National Wildlife Strike Database (available at <http://faa.gov/go/wildlife>). Airports may maintain their own local database which can be compared with the National Database. A Site Visit should include an analysis of wildlife strike records. If possible, include summaries of strike data by species, time of day, on and off-site airport locations, and weather conditions. A minimum wildlife strike analysis should include, if available:
 - (a) Bird and mammal species involved
 - (b) Frequency distribution by month and year
 - (c) Number per 10,000 aircraft movements
 - (d) Location on the airfield
- (7) Previous wildlife hazard management efforts – Records of past management may be helpful during this initial consultation. Attempts to exclude, deter, or remove wildlife from the airport should be noted. If not already in place, a wildlife log should be created and maintained by airport operations to document all wildlife activity observed on the airport.
- (8) Description of current wildlife hazard threats or concerns
- (9) Any current Federal and State depredation/wildlife control permits and annual permit reports
- (10) Current U.S. Geological Survey (USGS) topographic maps, airport maps, and/or aerial photographs
- (11) Other pertinent information present in airport records.

b. Observations: The Qualified Airport Wildlife Biologist should make observations from a variety of locations to ensure complete visual coverage of the airport. Minimum coverage shall include observations of the Airport Operations Area (AOA). These observations should be brief and are not as rigorous as a full Assessment. At a minimum, the observations should include:

- (1) **Birds** – Record bird species present and note abundance, activity, location, type of habitat used, time and date of observations. Note evidence of bird activity such as fecal material and regurgitated pellets (boluses) under structures used for perching.
- (2) **Mammals** – Document mammals observed and evidence of mammal activity such as scats, tracks, runs, and burrows and include time and date of observations, activity, location, and type of habitat used. Estimate relative abundance, activity, and habitat use.
- (3) **Habitat Attractants** – Assess habitats and man-made attractants on and around airport property. Note potential wildlife attractants. Review maps and aerial photographs, noting waste management facilities, wildlife refuges, water bodies, agriculture, stock yards, picnic areas, restaurants, and other features or habitats that may attract wildlife within a five mile radius around the airport.
- (4) **Wildlife/Habitat Relationship** – Observe and record how the wildlife observed is using the habitat on the airport.
- (5) **Wildlife Interactions with Aircraft Operations** – Assess the potential for wildlife interactions with aircraft operations in the AOA, traffic patterns, approach and departure airspace, and surrounding areas. Evaluate aircraft movements to see if these operations increase the risk of wildlife strikes. Review airport hazard advisories to see if they are specific to the hazards at the airport.

Wildlife and Aircraft

Conflicts arising from wildlife presence and aviation operations remain problematic. The current state of affairs is synopsised below as referenced from ACRP 39. Wildlife biologists and aviation personnel have been aware of aircraft collisions with birds and other wildlife (wildlife strikes) for decades (Solman 1973, Blokpoel 1976). In 2009, the forced landing of US Airways Flight 1549 in the Hudson River renewed public interest in risks to aircraft posed by wildlife (Marra et al. 2009). The following information highlights the real and potential wildlife threat to aviation. Note that the following data are those actually reported and are generally accepted to under represent actual losses from 61% to 89% (Linnell et al. 1999, Cleary et al. 2005). Projected total costs are significantly higher than those that are reported in the FAA National Wildlife Strike Database and are estimated at \$15.787 billion over the period including 1990 to 2011 (Dolbeer et al. 2012):

1. Since the inception of the FAA National Wildlife Strike Database in 1990, 119,917 reported wildlife strikes had projected average costs of \$718 million annually in the United States (Dolbeer et al. 2012). In addition, strikes to civil aircraft worldwide have resulted in at least \$1.2 billion annually in losses (damage to aircraft and associated costs) and more than 250 human lives lost (Allan 2002).
2. The number of wildlife strikes annually reported has increased over 5-fold

- from 1,804 in 1990 to 10,083 in 2011 (Dolbeer et al. 2012).
3. In 2011, 27.6 wildlife strikes per day were reported in the United States (Dolbeer et al. 2012). U.S. airports reporting wildlife strikes increased from 333 in 1990 to a record high of 597 in 2011. In 2011, the 597 airports with wildlife strikes were comprised of 369 airports certificated for passenger service and 228 general aviation airports (Dolbeer et al. 2012).
 4. 97.1% of all aircraft wildlife strikes in the United States involve birds, with terrestrial mammals involved in 2.3%, bats 0.5% (Peurach et al. 2009), and reptiles 0.1% of all reported strikes (Dolbeer et al. 2012).
 5. From 1990 to 2011, 462 species of birds and 38 species of terrestrial mammals were struck by aircraft (Dolbeer et al. 2012) with waterfowl, gulls, and raptors being the species groups with the most damaging strikes. In addition, deer (39%) (DeVault et al. 2008, VerCauteren et al. 2009, VerCauteren et al. 2011) and coyotes (34%) are the most frequently struck terrestrial mammals with deer responsible for 93% of all damaging mammal strikes (Dolbeer et al. 2012).
 6. Gulls (16%), doves/pigeons (15%), raptors (13%), and waterfowl (7%) were the most frequently struck bird groups (Dolbeer et al. 2012).
 7. From 1990 to 2011, Canada Geese were reportedly involved in 1,351 civil aircraft strikes, resulting in 2 fatalities, 19 injuries, and 5 total aircraft lost. Reported Canada Geese strikes caused a minimum of \$2.6 million in damage each year with total reported losses exceeding \$90 million (Dolbeer and Wright 2008, Dove et al. 2009, Dolbeer et al. 2012). Projected costs accounting for under-reporting rates may conservatively total as much \$2.97 billion based on estimates in Dolbeer et al. (2012). In addition, Canada Geese caused the loss of a USAF AWACS aircraft in 1995 that killed 24 aircrew and cost in excess of \$280 million dollars (Gresh 1996).
 8. From 1990 to 2011, 897 white-tailed deer incidents with U.S. civil aircraft were reported resulting in 1 of 24 human deaths and 25 of 256 injuries reported for all wildlife incidents over this period. Although reported deer incidents for all species represent only 0.9% of all wildlife strikes, they account for 5.4% of estimated costs, resulting in a minimum of \$75 million in total reported damages and as much as \$852 million in projected damages (Biondi et al. 2011, Dolbeer et al. 2012).

Aircraft movements have increased about 3% per year with passenger enplanements in the United States increasing from 310 million in 1980 to 715 million in 2011 and 17.8 million aircraft movements in 1980 to 25.2 million in 2011. In addition, many wildlife species have also increased in the same period, including many species that pose the greatest risk to aviation (Dolbeer et al. 2000). As a result, the skies are becoming increasingly crowded with aircraft and hazardous bird species occupying the same space (Dolbeer 2009). In addition, highly successful environmental programs funded by the U.S. Government during the past 40 years (e.g.: pesticide regulation, expansion of the wildlife refuge systems, wetlands restoration), coupled with land-use changes, have resulted in dramatic increases in populations of many larger-bodied bird species in North America (Dolbeer et al. 2000, Dolbeer and Eschenfelder 2003)

as highlighted below:

1. Large bird species that have shown significant population increases from 1980 to 2011 include: Bald Eagles, Wild Turkeys, Canada Geese, American White Pelicans, Double-crested Cormorants, Sandhill Cranes, Osprey, and Red-tailed Hawks (Dolbeer et al. 2012).
2. In the past 40 years, 13 of the 14 largest-bodied bird species in the U.S. (>3.6 kg body mass) have shown significant population increases (Dolbeer and Eschenfelder 2003).
3. Migratory and non-migratory populations of Canada Geese (4.2 kg body mass) have more than quadrupled from 1.2 million to 5.5 million birds in North America from 1970 to 2008. Resident (non-migratory) Canada Geese populations appear to have stabilized at about 3.5 million birds during the last decade (Dolbeer 2011).
4. In addition to these population increases, many birds have adapted to urban environments and have found that airports, with their large areas of grass and pavement, are attractive habitats for feeding, loafing, and resting. Other wildlife such as deer and coyotes, are also attracted to airport environments for similar reasons.
5. White-tailed deer populations have increased from about 350,000 in 1984 to over 28 million in 2010 (McCabe and McCabe 1997, VerCauteren et al. 2006, VerCauteren et al. 2011).
6. Further exacerbating the problem, today's modern jet turbofan-powered aircraft are much faster and relatively quiet compared with their piston-powered predecessors, resulting in dramatic changes in the dynamics of bird and aircraft interactions (Burger 1983, Kelly et al. 2000). In 1965, 90% of the 2,100 USA passenger aircraft had 3 or 4 engines. By 2005, the USA passenger fleet had grown to 8,200 aircraft with only 10% having 3 or more engines.

Wildlife strikes most commonly occur on or in near proximity to airports.

1. From 1990-2011, 72% and 75% of bird strikes respectively for commercial and general aviation aircraft occur below 3,500 feet AGL (Dolbeer 2006, Dolbeer et al. 2012), effectively 10,000 feet from the airfield based on a 3° glideslope (Blackwell et al. 2009). At that altitude, aircraft would be within about 5 miles of the airfield for the busiest airports (Federal Aviation Administration 2007).
2. Above 500 feet AGL, the number of strikes declined by 33% for each 1,000-ft gain in altitude for commercial aircraft and by 41% for GA aircraft. Strikes above 500 feet were more likely to cause damage than strikes at or below 500 feet (Dolbeer et al. 2012).
3. Dolbeer (2011) reported that bird-strike rates above 500 feet AGL have increased since 1990, whereas strike rates below 500 feet AGL have decreased during that period.
4. After striking wildlife, a precautionary/emergency landing was the most commonly reported negative effect on flight (4,353 incidents), including 46 incidents where pilots dumped fuel to lighten aircraft weight and 76

incidents where an overweight (heavy) landing was made. Aborted takeoff was the second most common negative effect (1,922 incidents) which included 805 aborted takeoffs at greater than 80 knots (Dolbeer et al. 2012).

5. Destroyed aircraft were the result in 57 wildlife strikes with 56% of these occurring at GA airports (Dolbeer et al. 2012).

From 1990-2011, data suggest that recent wildlife management on airports may have contributed to a reduction in wildlife strike rates and damaging wildlife strikes on airports (Dolbeer et al. 2012). Since 1990, wildlife management actions to mitigate wildlife risk have been implemented at many airports and these actions are likely responsible for the general decline in reported wildlife strikes with damage on airports from 2000-2011. Damages to aircraft and accidents remain problematic in the off-airfield environment and it is evident that more needs to be done to address those problems. Future management actions at airports should be prioritized based on the hazard level of species observed in the aircraft operating area (Dolbeer et al. 2012) and in surrounding airspace. Airport sponsors and managers should take proactive steps to make certain the airport environment and areas near the airport are safe, continued and improved integrated wildlife population management remains a necessity.

Wildlife strikes are sometimes unpredictable events. It is difficult to know exactly when/if an animal will or will not encounter an operating aircraft (probability/likelihood of conflict). This is due to numerous dynamic environmental factors that constantly affect an animal's behavior. A WHSV and WHA make it possible to gauge a species' potential for a damaging collision with aircraft. This is done by considering factors such as the body mass of the animal, its frequency on the airfield, its behaviors while on the airfield, and its overall abundance in the local area. Species discussed in a WHSV or WHA rank high in one or more of the above factors and are considered potential hazards (figure 1 below). It is important to keep in mind that the following discussions of wildlife hazards focus on the potential for a damaging wildlife strike, but not necessarily the probability of such a strike.

Matrix 1: General Risk Assessment Matrix				
Probability/Likelihood of Conflict:		Potential Hazard		
High	Moderate	High	Critical	
Moderate	Low	Moderate	High	
Low	Low	Low	Moderate	
		Low	Moderate	High
		Severity of Impact		

Figure 1: General Risk Hazard Matrix (ACRP 39, BASH Inc.)

Wildlife may also create a variety of problems at airports that can affect aircraft operations. For example, rodents may chew on the electrical cables powering runway lights, birds may build bulky nests that are a fire hazard in buildings or hangars, or build nests in engines or other airplane parts. Roosting birds may also leave droppings that damage paint or other surfaces on aircraft and are a potential human public health threat.

It is the imperative that airports exercise due diligence in providing a safe and efficient operating environment for its tenants and patrons. Wildlife hazards on the airfield are a primary safety concern, and therefore, must be addressed in a prompt and continuous manner. However, wildlife hazards may also exist outside the airport property, thus, limiting the manager's ability to control the situation without voluntary cooperation from the adjacent property owner(s).

There are many actions that can be taken to decrease wildlife hazards or problems, depending on the species, time of year, reasons for using the airfield, habitat characteristics on and around the airfield, and a host of other variables. It is therefore a necessity to fully understand an animal's biology, particularly in relation to specific environmental characteristics when establishing a wildlife control program (figure 2 below).

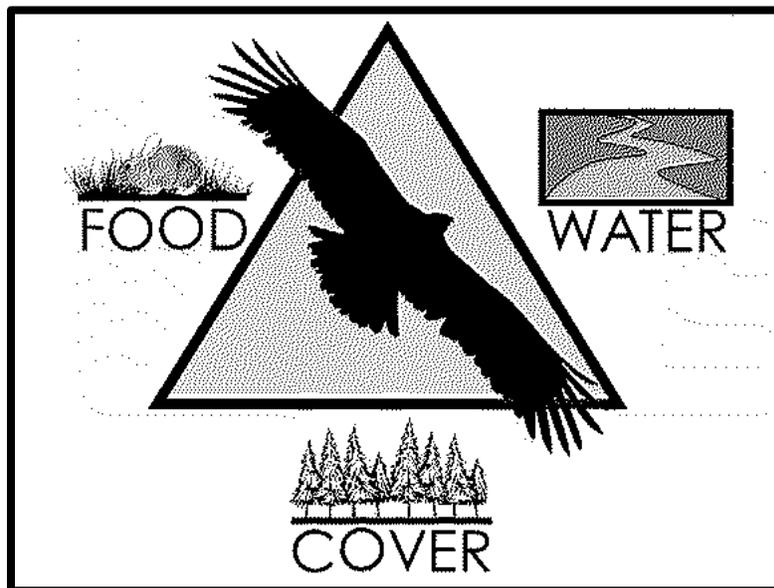


Figure 2: Organism Needs (ACRP 39, BASH Inc.)

Regulatory Considerations and Wildlife Hazards

For the purposes of this WHSV, a wildlife hazard is defined as: A potential for a damaging aircraft collision with wildlife on or near an airport [14 CFR Part 139.337(b) (4)]. The FAA is responsible for enacting and enforcing the Federal Aviation Regulations (FAR) and policies to enhance public safety. To ensure compliance with Code of Federal Regulations (CFR) Part 139.337 (Appendix D), the FAA requires certificated airports to conduct a Wildlife Hazard Assessment or ecological study when any of the following events occur on or near an airport (though triggering events may not be required for future FAA recommendations to complete a Wildlife Hazard Assessment):

1. An air carrier aircraft experiences multiple wildlife strikes;
2. An air carrier aircraft experiences substantial damage from striking wildlife. As used in this paragraph, substantial damage means damage or structural failure incurred by an aircraft that adversely affects the structural strength, performance, or flight characteristics of the aircraft and that would normally require major repair or replacement of the affected component;
3. An air carrier aircraft experiences an engine ingestion of wildlife; or
4. Wildlife of a size, or in numbers, capable of causing an event described in items 1-3 is observed to have access to any airport flight pattern or aircraft movement area.

It is critical to point out that the Bear Lake County Airport is a general aviation airport and is not a certificated airport under CFR Part 139. Because the airport is not certificated under Part 139, it is not regulated in the same manner as those airports that are certificated including requirements associated with wildlife hazards and mitigation. This said, the requirements established for Part 139 as applicable to wildlife hazards at airports represent proactive and recommended best practices and will be used as the basis of recommendations specific to the airport included in later sections of this report.

WHSVs and WHAAs provide the framework through which a more complete and site-specific understanding of wildlife hazards on an airport are developed. This Bear Lake County Airport WHSV report will be based on a site visit conducted August 25 and 26, 2014. Its purpose is to provide recommendations to reduce wildlife hazards based on the data analysis. If it is determined from the data and recommendations that significant wildlife hazards are present, the FAA administrator may require that a Wildlife Hazard Management Plan (WHMP) be developed, though the airport and county may proactively develop a WHMP regardless of FAA recommendations.

Airport Background

This Wildlife Hazard Site Visit occurred on the airport grounds and in the surrounding area. The airport itself borders Bear Lake National Wildlife Refuge, which provides varied habitat including shallow and deep water marshes, meadows, willow thickets, sagebrush and dense cattail and bulrush stands (USGS Northern Prairie Wildlife Research Center Bird Checklist).

Bear Lake National Wildlife Refuge is an 18,000 acre refuge which provides shelter for at least 214 bird species and nesting habitat for White Faced Ibis, Snowy Egret, Black-Crowned Night Heron, Great Blue Heron, Double Crested Cormorant, California Gull, Franklin's Gull, Caspian Tern, Forster's Tern, Black Tern, Western Grebe, Eared Grebe, Trumpeter Swan, Canada Goose, Redhead, Canvasback, Mallard, Gadwall, Cinnamon Teal, Northern Shoveler and Sandhill Crane (USFWS). A typical breeding season on the refuge will produce 4500 ducks and 1800 geese. In the spring, up to 5000 adult White Faced Ibis may be present in one of the largest nesting colonies in North America. In late September, flocks of 200-500 Sandhill Cranes feed in refuge grain fields. In the fall, American White Pelicans are present in the area.

The airport and refuge are located in the Pacific flyway, with highest bird migration activity seen twice yearly, from mid-March to early April for the spring migration, and mid-September through mid-November for the fall migration, with highest activity in early to mid-October. Most birds leave the area after the November freeze. Bald Eagles and Rough-Legged hawks are known to winter in the area. Hundreds of Mule Deer are known to winter along Merkle Mountain (USFWS).

While it appeared that the airport property itself may have a few potential wildlife hazard issues, the area immediately adjacent to the airport property is designed and managed to attract species that could adversely affect safe flying operations. Migratory waterfowl were the major concern, but resident and migratory raptors, swallows, blackbirds, and other species were also considered. Because the Bear Lake County airport is immediately adjacent to the Bear Lake National Wildlife Refuge and lies within the Pacific flyway, one of the country's largest migratory pathways for a wide variety of birds and is a well-known breeding and migratory haven for waterfowl and other bird species, it is impossible to eliminate every potential background bird hazard. There is no doubt that the site itself can be effectively managed to mitigate identified potential hazards through active habitat management and direct and indirect wildlife control techniques.

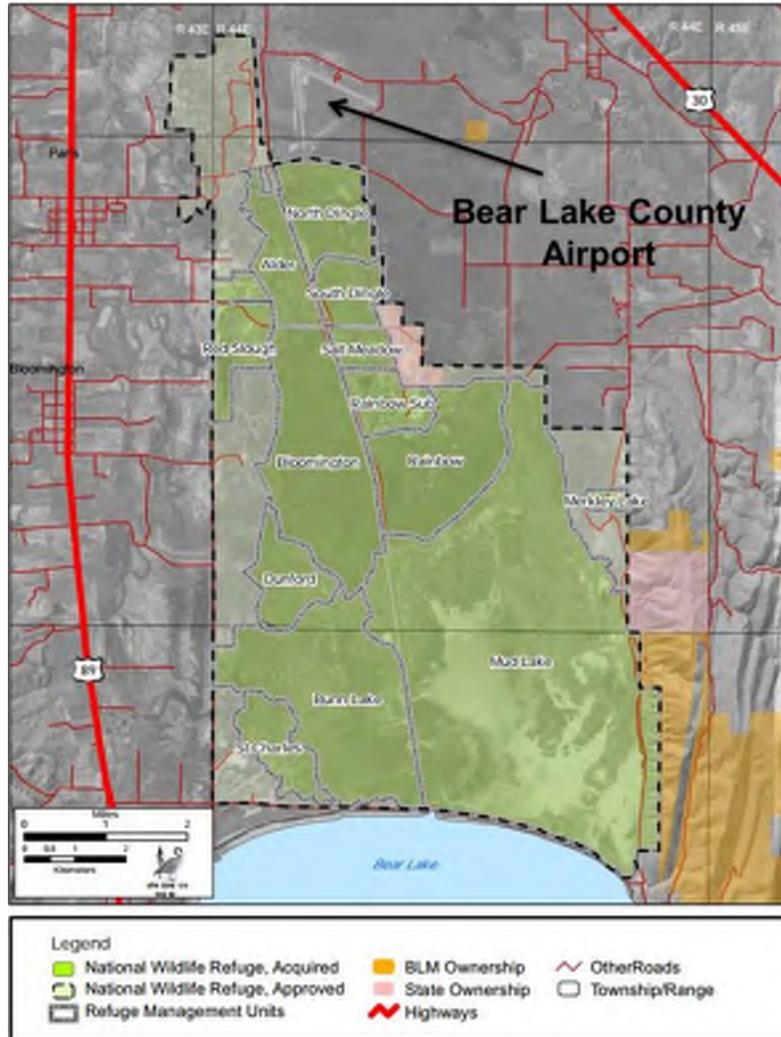


Figure 3: Wildlife Refuge Boundary and Land Ownership (Bear Lake National Wildlife Refuge Comprehensive Plan).

Wildlife Species Observed

The survey conducted at the Bear Lake County Airport and the vicinity was conducted from 12:00 pm to 7:30 pm on August 25 and continued from 8:30 am through 2:00 pm on August 26, 2014. The field protocol used two methods for observations: 1) Road-survey Method - a hybrid variation of the Breeding Bird Survey method; and 2) All Purpose Observation Method – presence or absence, abundance, direction of flight.

During the surveys described above, BASH Inc. and Kestrel Environmental Services, LLC (2014) observed over sixty species of birds. This “snap-shot” view represented only a sub-set sample of those birds that actually occur in the area throughout an annual period. Many more species and much larger numbers of birds would be expected to be present during the spring and fall migration periods. Two hundred and fourteen species of migratory birds are known to use

the area for breeding or migration stopover habitat. Many of the observed species are not considered hazardous to aircraft operations and do not require addressing in a future potential WHMP. However, several species should be addressed and actively managed or avoided due to bird body size or flocking behavior. Species observed during the 2014 visit are included in Appendix A. The purpose of visual observations was to provide additional site-specific analysis of bird distribution and movement in and around the airport.

During this August 2014 WHSV, wildlife observations of birds and mammals were made. Details of observations provided by BASH Inc. (2014), this survey, as well as the possible wildlife that could occur in Bear Lake County (derived from the literature: Idaho Department of Fish and Game, US Fish and Wildlife Services, 2013) are provided in Appendix A. Many species in this listing are included because they are of a size or occur in numbers that may cause damage to aircraft. Some species listed are common occupants of airfields in the region; others may not be expected on the Bear Lake County Airport itself, but resident or migrant populations in the area may be encountered by aircraft in off-airfield environments.

In addition to birds, there are several species of mammals observed that should also be addressed. Direct observations of moose, mule deer, striped skunk, badger and coyotes (outside the AOA) were noted in the immediate vicinity. Defecate from coyotes on the runway was also noted. The airport manager has been shooting skunks on the AOA. He has worked in cooperation with Idaho Fish and Game, who instructed him that a small game license was adequate as a depredation permit for skunks. Potentially hazardous mammals are also listed in Appendix A.



Figure 4: Coyote Defecate on Runway 28 (Kestrel, LLC).

Federal and State-Listed Status

The following bird is currently federally listed:

Common Name

Scientific Name

Greater Sage Grouse (Candidate)

Centrocercus urophasianus

State Listed Species:

Greater Sage Grouse (Candidate)

Centrocercus urophasianus

No observations of the Greater Sage Grouse was noted during the August WHSV, though it is noted in literature as being present in the area.

Habitat Features

The airport site is currently in agricultural production. The entire AOA was planted in grass hay. Large hay bales were present in the safety area as well as throughout the AOA. The bales themselves are hazards in the Runway Object Free Areas (ROFA). These bales also provide food and cover for rodents and serve as perches for multiple raptors, increasing raptor presence on the AOA. Soaring raptors are a potential hazard in the local area, and the study particularly noted many Swainson's and Red-Tailed Hawks perching on hay bales within the AOA.

Current FAA guidance (FAA AC 150/5200-33) recommends against the use of airport property for agricultural production but does not prohibit such activity if certain economic and wildlife mitigation conditions are met. Many general airports, including Bear Lake County Airport, rely on agricultural operations as an important source of revenue. Should Bear Lake County Airport choose to continue agricultural production in the future, adherence to FAA guidance included in both FAA AC 150/5200-33 and AC 150/5300-13A (as amended) should be closely followed. Per the guidance in the ACs, certain crops, such as grains, are less desirable on the airport and the location of crops and machinery are subject to all airport design criteria, including horizontal and vertical clearances associated with runways, taxiways/taxilanes and aprons.

Furthermore, it is recommended that the county coordinate with the FAA Helena Airports District Office (ADO) to obtain approval/concurrence with agricultural production on the airport. It is recommended the approved ALP identify locations and types of agricultural production on the airport and general techniques to mitigate potential wildlife conflicts on airport property as a result of agricultural production.

Lastly, current AC150/5200-33B (to be updated) refers to a no longer valid version of AC150/5300-13. The reference is to Table 3-10 which provides guidance on buffers that should be maintained between the runway and any on-airport crops, While this table is no longer included in current AC 150/5300-13A (change 1 dated 2/26/2014), a copy of the table is included as Appendix E of this report for reference. The table still represents sound best practices related to separation standards and agricultural production on the airport.



Figure 5: Swainson's Hawk Taking Flight from Round Bale Adjacent to Runway (Kestrel, LLC).



Figure 6: Swainson's Hawk Perching on Round Bale Adjacent to Runway (Kestrel, LLC).



Figure 7: Round Bales in Runway Safety Area (BASH, Inc.).

Natural and Man-made Wildlife Attractants

In general, habitat features in the immediate area surrounding and within the AOA



are primarily agriculture. Cattle ranching is present outside the AOA, and hay production is present both outside and inside the AOA. These areas inside the AOA are planted with grass hay and also produce large patches of volunteer alfalfa; crops that may attract rodents which may in turn attract large raptors. Alfalfa and grass hay may also attract large mammals, such as mule deer, onto the airport and conceal animals such as deer and coyotes on the airport property. Mule deer were seen feeding on similar areas 1 mile east of the airport. A large area of volunteer alfalfa was noted near the remote control aircraft building (See Figure 8). The alfalfa should be eliminated to avoid attracting deer and other large mammals.

Figure 8: Doe Mule Deer One Mile East of Airport (Kestrel, LLC).



Figure 9: Round Bales and Alfalfa Patch (Kestrel, LLC).

There were areas of hydrophytic vegetation present just northeast of the terminal building, and the end of Runway 28 and at the end of Runway 34. It is recommended that this vegetation be controlled and not allowed to expand, as it provides good cover for animals. If willows are allowed to grow up, they can



provide cover for moose and deer, and can become jurisdictional wetlands if left unchecked. In addition, there are trees present just across the fence line at the northeast corner of the airport property that provide perches for raptors and corvids.

Figure 10: Hydrophytic Vegetation at End of Runway 28 (Kestrel, LLC).



Figure 11: Bull Moose on Dingle Road, 0.8 miles from Airport (BASH, Inc.).



Figure 12: Water Standing in Irrigation Drain Ditch on Southern Airport Border (Kestrel, LLC).

Standing water was observed in an irrigation drain ditch along the southern boundary of the airport property. This feature will attract waterfowl and encourage tall vegetative growth of bulrushes and cattails. This growth acts as a cover for several species of birds and mammals that pose a threat to airport operations. Water should not be allowed to stand for extensive periods of time on airport property and vegetation should be kept between six and twelve inches in height.

Several small groups of Sandhill Cranes were observed feeding within the AOA during the August 2014 WHSV. These birds were also observed flying across the runway. We recommend harassment of these very large birds when present in the AOA to encourage them to use the adjacent wildlife refuge rather than the airport for feeding, nesting and loafing to avoid impacting flight operations. Great care should be taken to avoid hazing operations that cause them to fly across the runway.



Figure 13: Three Sandhill Cranes Taking Flight. Flight Path Crossed Runway 28 (Kestrel, LLC).



Figure 14: Sandhill Cranes Feeding Adjacent to Runway (Kestrel, LLC).

A dense flock of approximately 75 kettling ravens was observed on the airport. In addition, cliff swallows and magpies were seen in large groups staging for migration on fence posts immediately adjacent to the airport.



Figure 15: Cliff Swallows flocking in preparation for migration on the adjacent Bear Lake National Wildlife Refuge (Kestrel, LLC).

Dispersed rural residential housing, large areas of agricultural production, and various small trees are nearby in the small town of Montpelier. Such terrain and habitat supports a wide variety of birds and other wildlife.



Figure 16: Trees and Brush East of Airport (Kestrel, LLC).

This vegetation provides cover and roosting space for birds and cover for larger mammals. Prominent browse lines in bushes demonstrate that deer have been feeding at this site.

Strike Data Analysis

Specific details are provided in Appendix B (Wildlife Strikes by species and number) and Appendix C (Wildlife Strikes by Aircraft Type).

Despite the high density of wildlife in the area, there was little documentation of actual wildlife strikes at Bear Lake County Airport since 1990. Only one wildlife strike has been reported to the FAA wildlife strike data base, and there was anecdotal evidence of only one other bird strike. One wounded coyote has been seen within the AOA boundaries, but the origin of its injuries is not known. Pilots deny seeing deer on the airport, but have noted American White Pelicans that caused concern during flight operations during the fall migration. Spring and fall migration will be the highest concentration of birds in the area, and time for special caution. At the time of the site visit, Sandhill Cranes were present on the AOA and three of the large birds were observed flying across Runway 28.

Flight Operations

Since Bear Lake County Airport does not have a control tower, actual aircraft operation data is not available. The current Airport Master Plan study for Bear Lake County Airport has taken estimated annual operations for 2011 and projected them by month for 2014. This monthly operational breakdown is presented in Table 1.

These estimates have been categorized by type of operation. It is estimated that of the total aircraft movements/year there have been 2170 itinerant operations and 441 local operations. There are no military or commercial operations; operations are 100% private.

Month	Operations per Month
June	444
July	444
August	339
September	261
October	261
All other Months	123

Table 1: Aircraft Operations by Month (T-O Engineers, Inc.).

Recent upgrades to the airport include: construction of the taxiway in 2005, construction of buildings in 2006 and 2007, improvement of the fuel farm in 2008, rehabilitation of the apron and taxiways, and runway in 2009 as well as installation of NAVAIDS. In 2012, there was construction of a taxiway. In 2013, the runway was rehabilitated and there was construction of a taxiway.

Recommendations

Following are the results from the August 2014 WHSV. In general, we recommend an integrated approach to wildlife management on the AOA that emphasizes habitat modification and maintenance, non-lethal wildlife control (harassment, deterrence, and enclosures), combined with lethal wildlife population control (as necessary) to minimize wildlife attractiveness. Appropriate methods and techniques are detailed in: 1) ACRP Synthesis 23: "Bird harassment, repellent, and deterrent techniques for use on and near airports, a synthesis of airport practice"; 2) ACRP Report 32: "Guidebook for addressing aircraft/wildlife hazards at general aviation airports"; and 3) ACRP Synthesis 39: "Wildlife population management and control on airports".

We emphasize the following recommendations:

- 1. Remove hay bales from primary surface, Runway Safety Areas, Runway Object Free Areas, Runway Protection Zones and at least 250 Feet from runway centerline.** These bales provide cover for small mammals and a hunting perch for raptors and make the Airport an inviting habitat for these large birds. It is recommended to limit agricultural crops located within the limits of the Airport property. The crops provide both food source and cover for wildlife. Currently, AC150/5200-33 recommends restricting airport property for agricultural production within 10,000 feet of runways serving turbine-powered aircraft (or 5,000 feet for airports serving only propeller-powered aircraft) and within 5 statute miles of the AOA. The AC does recognize that eliminating all agriculture activities is not always feasible. In the case of Bear Lake County Airport, agricultural operations are an important source of revenue. Should agricultural practices continue on airport property, it is recommended the county coordinate with the FAA Helena Airports District Office (ADO) to obtain approval/concurrence with agricultural production on the airport. . It is recommended the approved ALP identify locations and types of agricultural production on the airport and general techniques to mitigate potential wildlife conflicts on airport property used for agricultural production. Further, the Airport should maintain the buffer distances between the runway and crops as recommended by the FAA. See Appendix E for reference.
- 2. Maintain drainage and limit wetland expansion.** During the WHSV, there were 3 areas noted on the AOA that had significant vegetative growth that should be removed/maintained at similar height to turf-grass. Do not let wetland areas expand.
- 3. The airport should be commended on its excellent turf management.** Grasses were within the FAA recommended 6-12 inches in height, which limits visibility for birds and makes the area less attractive for hiding and feeding. Most gravel areas were free of weeds. There was some concern about weed regrowth on runway safety area overrun. Mixed weeds and

gravel is attractive to killdeer and horned larks. Killdeer were noted in weedy gravel areas and on the runway. Gravel edging was mixed with asphalt millings, which is an excellent way to deter use of the area by birds. A binding agent such as oil can also be used on gravel edges to deter bird use.

- 4. Effective insect control by the airport manager is currently in place.** Using pesticides in the last two years, the airport has been effective in reducing grasshoppers, which will in turn attract feeding gulls. The airport should continue with this effective chemical pest management strategy which has shown to nearly eliminate gull activity on the airport and can also limit other species such as foraging swallows.

- 5. Upgrade Security Fencing.** Installed properly, fencing can significantly limit wildlife breaches and the requirement for routine monitoring and maintenance. Unfortunately, this 4 strand barbed wire fence is not in compliance with the FAA recommended height of 11-feet (CertAlert # 04-16 “Deer Hazard to Aircraft and Deer Fencing”). This fence design should do an appropriate job of deterring burrowing activity under the fence, but while the fence precludes cattle from entering the AOA, the height may not completely preclude mule deer from jumping over the fence. If this does occur, an extension of the angled barbed wire may be necessary. It is not necessary to fence the entire AOA with the regulation security fencing. For cost containment, fencing a smaller area encompassing only the Runway Safety Areas and Object Free Areas is acceptable. As an alternative to the FAA deer fencing standards, the Airport can also consider a less robust fence using 4” hog wire as is commonly used along highways to limit access by deer and other larger mammals. However, hog wire wildlife fencing will not preclude smaller mammals such as coyotes, foxes, badgers, etc. from accessing the airfield.

Additionally, the fence must be maintained to preclude vegetation growing in proximity to or on the fence. Several areas of vegetation encroachment were observed during the August 2014 WHSV. Stiff brushes should also be added to the bottom of gates where gaps may be exploited by wildlife. Alternately, and more permanently, concrete “speed bumps” can be added to tighten the space between the gates and substrate. The completed fence line must be checked regularly for breaches by wildlife, to ensure all gates are closed, and for security reasons.



Figure 16: Gap Under Gate Will Not Preclude Wildlife Entry onto Airport (Kestrel, LLC).

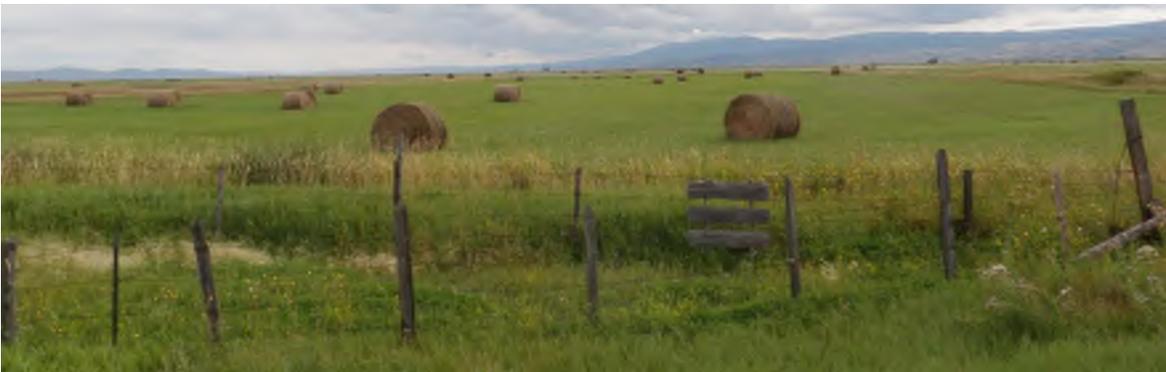


Figure 17: 4 Strand Barbed Wire Fence with Vegetation encroachment (Kestrel, LLC).

- 6. Construct bird-proof airport buildings and hangars.** Buildings and hangars can be designed to significantly limit access by nuisance birds, some of which can also become hazards to safe flight operations. Cliff swallows were observed nesting in and around hangars. Buildings with entirely enclosed superstructures are best. I-beams on the interior of hangars and other buildings should be covered with false ceilings that eliminate roosting and nesting sites. Entry points such as holes and windows should be screened or netted to limit access to closed facilities. Suspended strips of plastic or netting can be hung from doorways to limit access. Anti-perching devices such as spike strips can be applied to limited areas where birds routinely land. Active dispersal techniques may also be used in and around buildings to deal with birds that may habituate to structural deterrents.

7. Coordinate communications and documentation. The Bear Lake County Airport will operate without an ATC tower and be uncontrolled airspace. Refuges, wetlands, agricultural areas, roost sites, landfills, migratory concentrations, and any other known wildlife attractants in the immediate and surrounding areas should be identified and communicated to pilots using the airport on a routine basis. Pilot Reports (PIREPS), Notices to Airmen (NOTAMS), Automatic Terminal Information System (ATIS), Automated Weather Observing System (AWOS), and UNICOM, (if available) should be used to communicate real-time or seasonal bird populations that may pose potential hazards to aviation. Highest bird densities will occur in mid-March through early April for the spring migration. Fall migration will increase local bird populations from mid-September through mid-November. Highest bird activity can be expected in mid-October. Real-time reporting of soaring raptors and migrating waterfowl is particularly important in this regard as they are difficult or impossible to control by other standard means. Education and awareness are keys to successful bird avoidance procedures in the airport's operating areas. In addition, the important aspects of any airport wildlife management program are the communication and documentation of efforts. Maintaining awareness for all pilots operating from the airport can reduce potential hazards, particularly in avoiding off-airfield hazards beyond the control of the airport staff. Communication of observed hazards between pilots and ground staff can activate wildlife control and avoidance efforts. Coordination of dispersal programs is essential to ensure hazards are not inadvertently increased by scaring wildlife into the path of approaching aircraft. Ensure all bird or wildlife strikes are thoroughly reported to the airport staff and FAA using the FAA Wildlife Strike Database website and submitting FAA Form 5200-7. In addition, strike remains should be sent to the Smithsonian Feather Lab per the website instructions found at www.wildlife.faa.gov. Lastly, documentation of bird and other wildlife incidents and all control program efforts is important for monitoring trends. Modification of mitigation efforts can effectively be made based on data that specifically tracks progress of the wildlife control program.

8. Integrate overall wildlife control and management activities. In general, AOA wildlife management and control is best accomplished through an integrated approach that emphasizes habitat modification and maintenance, non-lethal wildlife control (harassment, deterrence, and enclosures), combined with lethal wildlife population control (as necessary) to minimize wildlife attractiveness. Appropriate methods and techniques are detailed in: 1) ACRP Synthesis 23: "Bird harassment, repellent, and deterrent techniques for use on and near airports, a synthesis of airport practice"; 2) ACRP Report 32: "Guidebook for addressing aircraft/wildlife hazards at general aviation airports"; and 3) ACRP Synthesis 39: "Wildlife population management and control on airports".

Conclusion

Overall, results of this August 2014 WHSV were encouraging. The Bear Lake area is well known for very large seasonal populations of migrating and nesting waterfowl and other bird species. It is impossible for any airport to avoid exposure of some degree to potential background wildlife hazards. Despite the proximity of the wildlife refuge as a wildlife attractant, there were few reported incidences of wildlife strikes at the airport. Bear Lake County Airport's great challenge is that it is adjacent to an area of high bird concentrations, the Bear Lake National Wildlife Refuge, an 18,000 acre area managed with the goal of attracting and supporting avian life. The airport will need to take proactive steps to make itself the least attractive space in the area for birds and large mammals. These measures listed in the recommendations will help to encourage birds and other wildlife to use the refuge instead of the airport for hunting, feeding, loafing and breeding. Onsite attractants can be identified and possibly mitigated. The major areas of concern remain with man-made or enhanced attractions in the immediate vicinity of the AOA, specifically the presence of hay bales on the primary surface and within 250 feet of the runway center lines, and the use of airport property for agriculture activities. If these attractants can be eliminated, the overall wildlife risk will be greatly diminished. We believe that the AOA and surrounding area can be effectively managed to mitigate identified potential hazards through an integrated wildlife control program that uses active habitat management, non-lethal wildlife harassment, dispersal, and exclosure techniques, combined with lethal wildlife population control measures as necessary.

Appendix A: Wildlife Observations at Bear Lake County Airport

Red—observed by BASH Inc. and Kestrel Environmental Services during the WHSV (Aug 2014).

Black—reported in vicinity of the Bear Lake County Airport from literature (USFWS, USGS).

*indicates potentially hazardous species that will require mitigation efforts due to size, flocking behavior, or other behaviors on or around airports that threaten safety. Other species not listed here may be using the airport.

Accidental species have been excluded from the species list. In the past, there has been a failed introduction effort with Whooping Cranes in the area. This species is not naturally present in the area at the present time.

Birds:

Gaviformes – Loons

Gaviidae

Common Loon

Gavia immer

Podicipediformes – Grebes

Podicipedidae

Pied-billed Grebe

Horned Grebe

Eared Grebe

Western Grebe

Clark's Grebe

Podilymbus podiceps

Podiceps auritus

Podiceps nigricollis

Aechmophorus occidentalis

Aechmophorus clarkii

Pelicaniformes – Pelicans and Cormorants

Pelicanidae

***American White Pelican**

Pelecanus erythrorhynchos

Phalacrocoracidae

***Double-crested Cormorant**

Phalacrocorax auritus

Threskionithidae

***White Faced Ibis**

Plegadis falcinellus

Anseriformes – Waterfowl

Anatidae

***Trumpeter Swan**

Cygnus buccinator

***Tundra Swan**

Cygnus columbianus

***Canada Goose**

Branta canadensis moffitti

***Snow Goose**

Chen caerulescens

***Greater White-fronted Goose**

Anser albifrons

Wood Duck

Aix sponsa

***Mallard**

Anas platyrhynchos

***Gadwall**

Anas strepera

***Northern Pintail**

Anas acuta

***Blue-winged Teal**

Anas discors

***American Wigeon**

Anas americana

Eurasian Wigeon	<i>Anas penelope</i>
*Northern Shoveler	<i>Anas clypeata</i>
*Green-winged Teal	<i>Anas crecca</i>
Cinnamon Teal	<i>Anas cyanoptera</i>
*Canvasback	<i>Aythya valisineria</i>
*Redhead	<i>Aythya americana</i>
*Ring-necked Duck	<i>Aythya collaris</i>
*Lesser Scaup	<i>Aythya affinis</i>
*Greater Scaup	<i>Aythya marila</i>
Surf Scoter	<i>Melanitta perspicillata</i>
White-winged Scoter	<i>Melanitta fusca</i>
*Common Goldeneye	<i>Bucephala clangula</i>
*Barrow's Goldeneye	<i>Bucephala islandica</i>
Bufflehead	<i>Bucephala albeola</i>
Hooded Merganser	<i>Lophodytes cucullatus</i>
Common Merganser	<i>Mergus merganser</i>
Red-breasted Merganser	<i>Mergus serrator</i>
Ruddy Duck	<i>Oxyura jamaicensis</i>

Falconiformes – Vultures, Hawks, and Falcons

Cathartidae

*Turkey Vulture *Cathartes aura*

Accipitridae

*Osprey *Pandion haliaetus*
 *Northern Harrier *Circus cyaneus*
 *Cooper's Hawk *Accipiter cooperii*
 *Sharp-shinned Hawk *Accipiter striatus*
 *Northern Goshawk *Accipiter gentilis*
 *Swainson's Hawk *Buteo swainsoni*
 *Ferruginous Hawk *Buteo regalis*
 *Rough-legged Hawk *Buteo lagopus*
 *Red-tailed Hawk *Buteo jamaicensis*
 *Bald Eagle *Haliaeetus leucocephalus*
 *Golden Eagle *Aquila chrysaetos*

Falconidae

*American Kestrel *Falco sparverius*
 *Peregrine Falcon *Falco peregrinus*
 *Prairie Falcon *Falco mexicanus*

Galliformes- Upland Game Birds

Phasianidae

Gray Partridge *Perdix perdix*
 Chukar *Alectoris chukar*
 *Ring-necked pheasant *Phasianus colchicus*
 Greater Sage Grouse *Centrocercus urophasianus*
 Sharp-tailed Grouse *Tympanuchus phasianellus*

Ciconiiformes – Herons and Egrets

Ardeidae

*Great Egret
*Great Blue Heron
Black Crowned Night Heron
Snowy Egret
*Cattle Egret
American Bittern

Ardea alba
Ardea herodias
Nycticorax nycticorax
Egretta thula
Bubulcus ibis
Botaurus lentiginosus

Gruiformes - Cranes and Allies

Rallidae

American Coot
Sora
Virginia Rail

Fulica americana
Porzana carolina
Rallus limicola

Gruidae

*Sandhill Crane

Grus canadensis

Charadriiformes – Shorebirds and Gulls

Charadriidae

*Killdeer
Black Bellied Plover
Semipalmated Plover
Stilt Sandpiper

Charadrius vociferus
Pluvialis squatarola
Charadrius semipalmatus
Calidris himantopus

Scolopacidae

Spotted Sandpiper
Pectoral Sandpiper
Solitary Sandpiper
Wilson's Phalarope
Red-necked Phalarope
Common Snipe
Greater Yellowlegs
Lesser Yellowlegs
Willet
Long-billed Curlew
Marbled Godwit
Sanderling
Western Sandpiper
Least Sandpiper
Dunlin (Accidental)
Stilt Sandpiper
Long-billed Dowitcher

Actitis macularius
Calidris melonotos
Tringa solitaria
Phalaropus tricolor
Phalaropus lobatus
Gallinago gallinago
Tringa melanoleuca
Tringa flavipes
Catoptrophorus semipalmatus
Numenius americanus
Limosa fedoa
Calidris alba
Calidris mauri
Calidris minutilla
Calidris alpina
Calidris himantopus
Limnodromus scolopaceus

Recurvirostridae

Black-necked Stilt
American Avocet

Himantopus mexicanus
Recurvirostra americana

Laridae

*Herring Gull
*Ring-billed Gull
*Franklin's Gull
*California Gull
Caspian Tern
Forster's Tern
Black Tern

Larus argentatus
Larus delawarensis
Larus pipixcan
Larus californicus
Sterna caspia
Sterna forsteri
Chilidonias niger

Columbiformes – Pigeons and Doves

Columbidae

*Mourning Dove
*Eurasian Collared Dove
*Rock Pigeon

Zenaida macroura
Streptopelia decaocto
Columba livia

Strigiformes – Owls

Strigidae

Barn Owl
Great Horned Owl
Long-eared Owl
Western Screech Owl
Short-eared Owl

Tyto alba
Bubo virginianus
Asio otus
Otus kennicottii
Asio flammeus

Caprimulgiformes – Nightjars

Caprimulgidae

*Common Nighthawk
Common Poorwill

Chordeiles minor
Phlaenoptilus nuttalli

Apodiformes – Swifts and Hummingbirds

Trochilidae

Black-chinned hummingbird
Calliope hummingbird
Broad-tailed hummingbird
Rufous hummingbird

Archilocus alexandri
Stellula calliope
Selasphorus platycercus
Selasphorus rufus

Coraciformes – Kingfishers

Alcedinidae

Belted Kingfisher

Megaceryle alcyon

Piciformes – Woodpeckers

Picidae

Lewis' Woodpecker
Northern Flicker
Downy Woodpecker
Hairy Woodpecker

Melanerpes lewis
Colaptes auratus
Picoides pubescens
Picoides villosus

Passeriformes – Perching Birds

Tyrannidae

Dusky Flycatcher
Willow Flycatcher
Hammond's Flycatcher
Olive-sided Flycatcher
Western Wood Pewee
Eastern Kingbird
Western Kingbird

Empidonax oberholersi
Empidonax traillii
Empidonax hammondi
Contopus cooperi
Contopus sordidulus
Tyrannus tyrannus
Tyrannus verticalis

Hirundinidae

***Barn Swallow**
***Tree Swallow**
***Violet-green Swallow**
***Bank Swallow**
***Northern Rough-winged Swallow**
***Cliff Swallow**

Hirundo rustica
Tachycineta bicolor
Tachycineta thalassina
Riparia riparia
Stelgidopteryx serripennis
Petrochelidon pyrrhonota

Corvidae

***Common Raven**
***Black-billed Magpie**
***American Crow**

Corvus corax
Pica hudsonia
Corvus brachyrhynchos

Alaudidae

***Horned Lark**

Eremophila alpestris

Troglodytidae

House Wren
Marsh Wren
Rock Wren

Troglodytes aedon
Cistothorus palustris
Salpinctes obsoletus

Sittidae

Red-breasted Nuthatch
White-breasted Nuthatch

Sitta canadensis
Sitta carolinensis

Certhiidae

Brown Creeper

Certhia americana

Paridae

Black-capped Chickadee

Poecile atricapilla

Turdidae

Mountain Bluebird
Townsend's Solitaire
***American Robin**
Swainson's Thrush
Veery

Sialia currucoides
Myadestes townsendi
Turdus migratorius
Catharus ustulatus
Catharus fuscescens

Cinclidae

American Dipper

Cinclus mexicanus

Sturnidae

***European Starling**

Sturnus vulgaris

Mimidae

Sage Thrasher
Gray Catbird

Oreoscoptes montanus
Cumetella carolinensis

Bombycillidae

Cedar Waxwing
Bohemian Waxwing

Bombycilla cedrorum
Bombycilla garrulus

Laniidae

Loggerhead Shrike
Northern Shrike

Lanius ludovicianus
Lanius excubitor

Vireonidae	Warbling Vireo	<i>Vireo gilvus</i>
Parulidae	Yellow Warbler	<i>Setophaga petechia</i>
	Yellow-rumped Warbler	<i>Setophaga coronata</i>
	American Redstart	<i>Setophaga ruticilla</i>
	Orange Crowned Warbler	<i>Vermivora celata</i>
	Yellow –breasted Chat	<i>Icteria virens</i>
	MacGillivray’s Warbler	<i>Oporonis tolmiei</i>
	Common Yellowthroat	<i>Geothlypis trichas</i>
Thraupidae	Western Tanager	<i>Piranga ludoviciana</i>
Paridae	Black-capped Chickadee	<i>Poecile atricapilla</i>
Emberizidae	Green-tailed Towhee	<i>Pipilo chlorurus</i>
	Savannah Sparrow	<i>Passercullus sandwichensis</i>
	Vesper Sparrow	<i>Pooecetes gramineus</i>
	Lark Sparrow	<i>Chondestes grammacus</i>
	Lark Bunting	<i>Calamospiza melanocorys</i>
	Lazuli Bunting	<i>Passerina amoena</i>
	Fox Sparrow	<i>Passerella iliaca</i>
	White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
	Dark-eyed Junco	<i>Junco hyemalis</i>
	Snow Bunting	<i>Plectrophenax nivalis</i>
	Brewer’s Sparrow	<i>Spizella breweri</i>
	American Tree Sparrow	<i>Spizella arborea</i>
	Chipping Sparrow	<i>Spizella passerina</i>
	Sage Sparrow	<i>Amphispiza belli</i>
	Grasshopper Sparrow	<i>Ammodramus savannarum</i>
	Lincoln’s Sparrow	<i>Melospiza lincolni</i>
	Song Sparrow	<i>Melospiza melodia</i>
Passeridae	House Sparrow	<i>Passer domesticus</i>
Icteridae	Bobolink	<i>Dolichonyx oryzivorus</i>
	* Western Meadowlark	<i>Sturnella neglecta</i>
	* Red-winged Blackbird	<i>Agelaius phoeniceus</i>
	* Brewer’s Blackbird	<i>Euphagus cyanocephalus</i>
	* Yellow-headed Blackbird	<i>Xanthocephalus xanthocephalus</i>
	* Brown-headed Cowbird	<i>Molothrus ater</i>
	Bullock’s Oriole	<i>Icterus bullockii</i>
	Common Grackle	<i>Quiscalus quiscula</i>
Motacillidae	American Pipit	<i>Anthus rubescens</i>
Fringillidae	Black Rosy-Finch	<i>Leucosticte atrata</i>
	Purple Finch	<i>Carpodacus purpureus</i>
	American Goldfinch	<i>Carduelis tristis</i>
	Lesser Goldfinch	<i>Carduelis psaltria</i>
	Common Redpoll	<i>Carduelis flammea</i>
	Evening Grosbeak	<i>Coccothraustes vespertinus</i>
	House Finch	<i>Carpodacus mexicanus</i>

Pine Siskin

Carduelis pinus

Mammals:

Bats:

Chiroptera

Vespertilionidae

Townsend's Big-Eared Bat
Little Brown Myotis
Yuma Myotis
Long-legged Myotis
Western Small-footed Myotis
Silver-haired Bat
Big Brown Bat
Pallid Bat

Corynorhinus townsendii
Myotis lucifugus
Myotis yumanensis
Myotis volans
Myotis ciliolabrum
Lasionycteris noctivagans
Eptesicus fuscus
Antrozous pallidus

Terrestrial Mammals:

Artiodactyla

Cervidae

*Mule Deer
*Elk
*Moose

Odocoileus hemionus
Cervus elaphus
Alces alces

Antilocapridae

*Pronghorn

Antilocapra americana

Carnivora

Canidae

*Coyote
*Red Fox

Canis latrans
Vulpes vulpes

Felidae

Puma
Bobcat

Puma concolor
Lynx rufus

Procyonidae

*Raccoon

Procyon lotor

Mephitidae

*Striped Skunk
*Western Spotted Skunk

Mephitis mephitis
Spilogale gracilis

Mustelidae

*Badger
Long-tailed Weasel
Ermine
Mink
*River Otter

Taxidea taxus
Mustela frenata
Mustela ermine
Neovison vison
Lontra canadensis

Lagomorpha

Leporidae

*Mountain Cottontail
*Black-tailed Jackrabbit

Sylvilagus nuttalli
Lepus californicus

Insectivora

Soricidae

Merriam's Shrew
Masked Shrew
Vagrant Shrew
Water Shrew

Sorex merriami
Sorex cinereus
Sorex vagrans
Sorex palustris

Rodentia

Sciuridae

***Yellow-bellied Marmot**
Uinta Ground Squirrel
Wyoming Ground Squirrel
Townsend's Ground Squirrel
Rock Squirrel
Least Chipmunk

Marmota flaviventris
Spermophilus armatus
Spermophilus elegans
Spermophilus townsendii
Spermophilus variegatus
Tamias minimus

Castoridae

***Beaver**

Castor canadensis

Erethizontidae

***Porcupine**

Erithizon dorsatum

Geomyidae

Idaho Pocket Gopher
Northern Pocket Gopher

Thomomys idahoensis
Thomomys talpoides

Cricetidae

***Muskrat**
Great Basin Pocket Mouse
Western Harvest Mouse
Deer Mouse
Northern Grasshopper Mouse
Western Jumping Mouse
Bushy-tailed Wood Rat
Meadow Vole
Long-tailed Vole
Sagebrush Vole

Ondatra zibethicus
Perognathus parvus
Reithrodontomys megalotis
Peromyscus maniculatus
Onychomys leucogaster
Zapus princeps
Neotoma cinerea
Microtus pennsylvanicus
Microtus longicaudus
Lemmiscus curtatus

Appendix B: Wildlife Strikes Reported at Bear Lake County Airport (1990-present)

Wildlife strikes reported at the species level; (#) = number reported strikes:

Birds: None reported at species level

Mammals: None reported

Wildlife strikes not reported at a species level:

1. Gull (1) no damage (Anecdotal report)
2. Unknown bird - small (1) no damage (FAA strike data base)

Appendix C: Aircraft Types Involved in Wildlife Strikes at Bear Lake County Airport (1990- present); (#) = number reported strikes

1. "Falcon" (1) anecdotal report, no damage.
2. DA-20 Falcon, turbofan engine (1), no damage.

Appendix D: Applicable Reference Documents

ACRP Documents

Belant, J. L. and J. A. Martin. 2011. ACRP Synthesis 23: Bird harassment, repellent, and deterrent techniques for use on and near airports, a synthesis of airport practice. Transportation Research Board of the National Academies, Washington, D.C., USA.

Cleary, E. C. and A. Dickey. 2010. ACRP Report 32: Guidebook for addressing aircraft/wildlife hazards at general aviation airports. Transportation Research Board of the National Academies, Washington, D.C., USA.

DeFusco, R. P. and E. T. Unangst. 2013. ACRP Synthesis 39: Wildlife population management and control on airports. Transportation Research Board of the National Academies, Washington, D.C., USA.

Wildlife Hazard Primary Literature

Allan, J. R. 2002. The costs of bird strikes and bird strike prevention. Pages 147-153 *in* Proceedings of the third National Wildlife Research Center symposium, human conflicts with wildlife: economic considerations. U.S. Department of Agriculture, National Wildlife Research Center, 1-3 August 2000, Fort Collins, Colorado, USA.

Biondi, K. M., J. L. Belant, J. A. Martin, T. L. DeVault, and G. Wang. 2011. White-tailed deer incidents with U. S. civil aircraft. *Wildlife Society Bulletin* 35:303-309.

Blackwell, B. F., E. Fernandez-Juricic, T. W. Seamans, and T. Dolans. 2009. Avian visual configuration and behavioral response to object approach. *Animal Behavior* 77:673-684.

Blokpoel, H. 1976. *Bird Hazards to Aircraft: Problems and Prevention of Bird/Aircraft Collisions*. Clarke, Irwin and Company LTD., Toronto, Ontario, Canada.

Bolen, E. G. and W. L. Robinson. 2003. *Wildlife Ecology and Management*. Fifth edition. Pearson Benjamin Cummings, San Francisco, California, USA.

Burger, J. 1983. Jet aircraft noise and bird strikes: why more birds are being hit. *Environmental Pollution* 30:143-152.

Cleary, E. C. and R. A. Dolbeer. 2005. *Wildlife Hazard Management at Airports, A Manual for Airport Personnel*. Second edition. Office of Airport Safety and Standards, Federal Aviation Administration, U.S. Department of Transportation, Washington, D.C., USA.

Code of Federal Regulations (CFRs). Available at www.gpoaccess.gov/cfr/index.html.

DeVault, T. L., J. E. Kubel, D. J. Glista, and O. E. Rhodes. 2008. Mammalian hazards at small airports in Indiana: impact of perimeter fencing. *Human-Wildlife Conflicts* 2:240-247.

Dolbeer, R. A. 2006. Height distribution of birds recorded by collisions with civil aircraft. *Journal of Wildlife Management* 70:1345-1350.

Dolbeer, R. A. 2009. Birds and aircraft - fighting for airspace in ever more crowded skies. *Human-Wildlife Conflicts* 3:165-166.

Dolbeer, R. A. 2011. Increasing trend of damaging bird strikes with aircraft outside the airport boundary: implications for mitigation measures. *Human-Wildlife Interactions* 5:2235-248.

Dolbeer, R. A. and P. Eschenfelder. 2003. Amplified bird-strike risks related to population increases of large birds in North America. Pages 49-67 *in* Proceedings of the 26th International Bird Strike Committee Meeting, 5-9 May 2003, Warsaw, Poland.

Dolbeer, R. A. and S. E. Wright. 2008. Wildlife strikes to civil aircraft in the United States, 1990–2007, Serial Report 14. Office of Airport Safety and Standards, Federal Aviation Administration, U.S. Department of Transportation, Washington, D.C., USA.

Dolbeer, R. A., S. E. Wright, and E. C. Cleary. 2000. Ranking the hazard level of wildlife species to aviation. *Wildlife Society Bulletin* 28:372–378.

Dolbeer, R. A., S. E. Wright, J. Weller, and M. J. Begier. 2012. Wildlife strikes to civil aircraft in the United States, 1990–2011, Serial Report 18. Office of Airport Safety and Standards, Federal Aviation Administration, U.S. Department of Transportation, Washington, D.C., USA.

Dove, C. J., N. F. Dahlan, and M. Heacker. 2009. Forensic bird-strike investigative techniques used in an accident investigation at Wiley Post Airport, Oklahoma, 2008. *Human-Wildlife Conflicts* 3:179-185.

Gresh, T. J. 1996. Aircraft accident investigation report. E-3B Aircraft #77-0345. Assigned to 3rd Wing, Elmendorf AFB, Alaska, 22 Sept. 1995. AFI 51-503, PACAF/CG Hickam AFB, Hawaii, USA.

Kelly, T. A., R. L. Merritt, R. White, A. G. Smith, and M. Howera. 2000. The Avian Hazard Advisory System (AHAS): operational use of weather radar for reducing bird strike risk in North America. Pages 1-7 *in* Proceedings of the 25th

International Bird Strike Committee Meeting, 17-21 April 2000, Amsterdam, Netherlands.

Linnell, M. A., M. R. Conover, and T. J. Ohashi. 1999. Biases in bird strike statistics based on pilot reports. *Journal of Wildlife Management* 63:997-1003.

Marra, P. P., C. J. Dove, R. Dolbeer, N. F. Dahlan, M. Haecker, J. F. Whatton, N.E. Diggs, C. France, and G. A. Henkes. 2009. Migratory Canada geese cause crash of US Airways Flight 1549. *Frontiers in Ecology and the Environment* 7:297-301.

McCabe T. R. and R. E. McCabe. 1997. Recounting whitetails past. Pages 11-26 *in* W. J. McShae, H. B. Underwood, and J. H. Rappole, editors. *The Science of Overabundance: Deer Ecology and Population Management*. Smithsonian Institution, Washington, D.C., USA.

Peurach, S. C., C. J. Dove, and L. Stepko. 2009. A decade of U.S. Air Force bat strikes. *Human-Wildlife Conflicts* 3:199-207.

Solman, V. 1973. Birds and aircraft. *Biological Conservation* 72:79-86.

VerCauteren, K. C., M. J. Lavelle, and S. Hyngstrom. 2006. Fences and deer-damage management: a review of designs and efficacy. *Wildlife Society Bulletin* 34:191-200.

VerCauteren, K. C., N. W. Seward, M. J. Lavelle, J. W. Fisher, and G. E. Phillips. 2009. Deer guards and bump guards for excluding white-tailed deer from fenced resources. *Human-Wildlife Conflicts* 3:145-153.

VerCauteren, K. C., C. W. Anderson, T. R. VanDeelen, D. Drake, W. D. Walter, S. M. VanTassel, and S. E. Hyngstrom. 2011. Regulated commercial harvest to manage overabundant white-tailed deer: an idea to consider. *Wildlife Society Bulletin* 35:185-194.

Additional Wildlife and Wildlife Management References

Caughley, G. 1994. *Analysis of Vertebrate Populations*. John Wiley & Sons, West Sussex, United Kingdom.

Conover, M. R. 2002. *Resolving Wildlife Conflicts: The Science of Wildlife Damage Management*. Lewis, Boca Raton, Florida, USA.

Curtis, K. S., W. C. Pitt, and M. R. Conover. 1996. Overview of techniques for reducing bird predation at aquaculture facilities. Berryman Institute, Utah State University, Logan, Utah, USA.

Decker, D. J., T. B. Lauber, and W. F. Siemer. 2002. Human-wildlife conflict management: a practitioner's guide. Northeast Wildlife Damage Management Research and Outreach Cooperative, Cornell University, Ithaca, New York, USA.

Gosser, A. L., M. R. Conover, and T. A. Messmer. 1997. Managing problems caused by urban Canada geese. Berryman Institute Publication 13, Utah State University, Logan, USA.

Harris, R. E. and R. A. Davis. 1998. Evaluation of the efficacy of products and techniques for airport bird control. Transport Canada, Ottawa, Ontario, Canada.

Hewitt, D. G. 2011. Biology and Management of White-tailed Deer. CRC Press, Boca Raton, Florida, USA.

Hygnstrom, S. E., R. M. Timm and G. E. Larson, editors. 1994. Prevention and Control of Wildlife Damage. University of Nebraska–Lincoln, USA.

Idaho Department of Fish and Game. 2005. Idaho Comprehensive Wildlife Conservation Strategy. Idaho Conservation Data Center, Idaho Department of Fish and Game, Boise, ID.

<<http://fishandgame.idaho.gov/cms/tech/CDC/cwcs.cfm>

Idaho Department of Fish and Game. Idaho Species List. 2014. Idaho Department of Fish and Game, Boise, ID. <www.fws.gov/idaho/species/IdahospeciesList

Krausman, P. R. 2002. Introduction to Wildlife Management. Prentice Hall, Upper Saddle River, New Jersey, USA.

Sinclair, A. R. E., J. M. Fryxell, and G. Caughley. 2006. Wildlife Ecology, Conservation, and Management, Second edition. Blackwell, Malden, Massachusetts, USA.

Smith, A. E., S. R. Craven, and P. D. Smith. 1999. Managing Canada geese in urban environments. Berryman Institute Publication 16, Utah State University, Logan, and Cornell University Cooperative Extension, Ithaca, New York, USA.

Transport Canada. 2002. Wildlife Control Procedures Manual. Transport Canada, Ottawa, Ontario, Canada.

USDA. 2011. Innovative solutions to human-wildlife conflicts. USDA/APHIS Miscellaneous Publication No. 1608, National Wildlife Research Center, Fort Collins, Colorado, USA.

U.S. Fish and Wildlife Service. 1993. Birds of Bear Lake National Wildlife Refuge. Idaho. U.S. Fish and Wildlife Service. Unpaginated. Jamestown, ND: Northern Prairie Wildlife Research Center Online. <http://www.usgs.govbearlake.htm> (version 26 MAY98)

U.S. Fish and Wildlife Service. The Comprehensive Plan of Bear Lake National Wildlife Refuge and Oxford Slough Waterfowl Production Area. June 2013. 16 Sept. 2014 <<http://www.fws.gov/pacific/planning/main/docs/ID/docsbearlake.htm>

Appendix E: Minimum Distances Between Certain Airport Features and Any On-Airport Agriculture Crops

Aircraft Approach Category and Design Group ¹	Distance in Feet From Runway Centerline to Crop		Distance in Feet From Runway End to Crop		Distance in Feet from Centerline of Taxiway to Crop	Distance in Feet from Edge of Apron to Crop
	Visual & ≥ ½ mile	< ½ mile	Visual & ≥ ½ mile	< ½ mile		
Category A & B Aircraft						
Group I	200 ²	400	300 ³	600	45	40
Group II	250	400	400 ³	600	66	58
Group III	400	400	600	800	93	81
Group IV	400	400	1,000	1,000	130	113
Category C, D, & E Aircraft						
Group I	530 ³	575 ³	1,000	1,000	45	40
Group II	530 ³	575 ³	1,000	1,000	66	58
Group III	530 ³	575 ³	1,000	1,000	93	81
Group IV	530 ³	575 ³	1,000	1,000	130	113
Group V	530 ³	575 ³	1,000	1,000	160	138
Group VI	530 ³	575 ³	1,000	1,000	193	167

(FAA Advisory Circular 150/5300-13, Cancelled)

FAA Advisory Circulars, Current Version

150/5200-32B	Reporting Wildlife Strikes
150/5200-33B	Hazardous Wildlife Attractants on or near Airports
150/5200-34A	Construction or Establishment of Landfills near Public Airports
150/5200-36A	Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports
150/5200-38 (Draft)	Protocol for the Conduct and Review of Wildlife Hazard Site Visits, Wildlife Hazard Assessments, and Wildlife Hazard Management Plans
150/5220-25	Airport Avian Radar Systems
150/5300-13A	Airport Design (Reference for agricultural production approval)

FAA CertAlerts

97-09	Wildlife Hazard Management Plan Outline
98-05	Grasses Attractive to Hazardous Wildlife
02-06	Access to the FAA National Wildlife Aircraft Strike Database
03-03	Guidelines for Submitting Bird Strike Feather Remains for Identification
04-09	Relationship between FAA and WS
04-16	Deer Hazard to Aircraft and Deer Fencing
06-07	Requests by State Wildlife Agencies to Facilitate and Encourage Habitat for State-Listed Threatened and Endangered Species and Species of Special Concern on Airports
09-10	Wildlife Hazard Assessments in Accordance with Part 139 Requirements
13-01	Federal and State Depredation Permit Assistance