Lummi Nation Silver Reef Casino Mitigation Project
Wetland Delineation Report

USACE Reference: 1999-4-01575

Prepared for:

Chad Sherfey
Silver Reef Casino
4876 Haxton Way
Ferndale, WA 98248

and

Jeremy Freimund
Lummi Nation
Natural Resources
2616 Kwina Road
Bellingham, WA 98226

Prepared by:

Otak, Inc.
10230 NE Points Drive, Suite 400
Kirkland, WA 98033

Otak Project No. 30908D

November 30, 2011

Table of Contents

Introduction and Summary

The Silver Reef Hotel, Casino, and Spa and associated parking lots were constructed in 2001/2002 on the Lummi Indian Reservation, at the southeast corner of the intersection of Haxton Way and Slater Road, Whatcom County, WA. The project resulted in filling 10.7 acres of degraded palustrine emergent wetlands that were dominated by non-native invasive reed canarygrass (*Phalaris arundinacea*). To compensate for wetland impacts, approximately 17.1 acres of predominately upland grassland on the mitigation site were graded to allow passive restoration of saltmarsh conditions. Permit Conditions require monitoring of the mitigation site for ten years, and delineation of the mitigation wetland in the final year of monitoring (2011). The wetland mitigation property is held in trust by the United States for the exclusive use of the Lummi Indian Business Council. The Lummi Indian Business Council, acting through the Lummi Natural Resources Department, authorized the wetland delineation. This report describes the results of the required delineation; Year ten monitoring results are documented in a separate report (Otak, 2011).

Delineation of the Silver Reef Casino Wetland Mitigation site was conducted on June 1 and 2, 2011 by Otak, Inc. and staff members of the Lummi Natural Resources Department (LNR). One 14.2 acre wetland, Wetland A, was delineated on the mitigation site, and it includes 1.1 acres of vegetated mud flats (see the wetland delineation map, Figure 2 in Appendix B). Wetland A is rated as Category 1 with a 100-foot buffer [Lummi Administrative Regulation Title 17 Wetland Management Regulations (17 LAR 06.030)]. The delineation also designated 3.9 acres of unvegetated mud flats on the mitigation site. Although the unvegetated portions of the mud flats do not satisfy wetland criteria, they do satisfy requirements for other Waters of the United States. In total, 18.1 acres of Waters of the United States were delineated on the mitigation site.

In the ten years since the mitigation plan was installed (it was completed in August 2001), the site has developed into a thriving estuarine ecosystem with a mosaic of high saltmarsh, low saltmarsh, and mudflat habitats, as well as salt-sensitive wetland areas and limited upland areas. Consequently, the mitigation site provides significant uplift of the functions previously provided by the wetland areas impacted by construction of the Silver Reef Hotel-Casino complex, and the limited wetland areas on the mitigation site prior to installation of the mitigation plan.

Site Location

The mitigation site is located on the Lummi Indian Reservation, adjacent to the dike access road, southwest of the intersection of Kwina Road and Hillaire Road, Section 14, Township 38 North, Range 1 East, at Latitude North 48.7897, Longitude West -122.6608 (at the western end of the mitigation site) (see Figures 1a and 1b in Appendix B).

Section 2— Approach and Site Descriptions

Approach

On June 1 and 2, 2011, the Silver Reef Casino Wetland Mitigation site was assessed for presence of wetlands and other natural habitats. In compliance with Federal and Lummi Nation guidance and regulations, wetlands were delineated using the Routine Methodology as specified in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (USACE, 2010). While only the portion of the wetland located on the mitigation site was delineated, Wetland A extends offsite to the east, with one small lobe to the north.

Delineation was conducted by Otak, Inc. wetland biologists Suzanne Anderson and Stephanie Smith, and LNR staff members Frank Lawrence III and Monika Lange. A complete description of methods used to conduct the wetland delineation is included in Appendix A. Following routine methodology, data on vegetation, soils, and hydrology were collected in areas that appeared to have wetland characteristics. In addition, plots were located in a transect across the site, and upland plots were generally paired with wetland plots to determine the location of the wetland boundary. Data for wetland and upland plots were recorded on USACE field data sheets (see Appendix C). Data plots and points along the wetland edges were marked with sequentially numbered pink-and-black-striped flagging or pink pin-flags. Subsequently, LNR staff field surveyed the flags using a hand-held GPS unit (Trimble GeoXT), and downloaded the information into ArcMap10 GIS software. Horizontal accuracy of the Trimble GeoXT is +/- 2 feet with post-processing. Wetland locations and features are described in Section 3—Results, and are shown on the wetland delineation map (see Figure 2 in Appendix B). Wetland determinations were informed by information from the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) map (USFWS, 2011), the Soil Survey for Whatcom County (United States Department of Agriculture (USDA, 2011)), and aerial photos (historic and recent) provided by the Lummi Nation (see Appendix F). Site photos taken during the wetland delineation are located in Appendix D.

The condition of wetland buffers was qualitatively assessed using the following criteria:

- Dominant land use (e.g., agriculture, residential, commercial, industrial)
- Dominant buffer vegetation type (tree, shrub, herb, vine, un-vegetated)
- Estimated percent cover of invasive plants by species

Weather Conditions

Although total monthly precipitation for the three months prior to the wetland delineation (March through May) was greater than the 25-year average, there were no major rain events in the two weeks immediately preceding the delineation (Utah State University Climate

Center, 2011; Western Regional Climate Center, 2011). Weather conditions during the delineation were cloudy on June 1, 2011, and cloudy with occasional light rain showers on June 2, 2011.

Description of the Impacted Site

Construction of the Silver Reef Hotel, Casino, and Spa and associated parking facilities resulted in impacting approximately 10.7 acres of degraded, palustrine emergent wetlands. The impact site is located near the southeast corner of Haxton Way and Slater Road. Before construction of the Hotel-Casino complex, baseball fields were located at the southern end of the site, and fast food and mini-mart businesses were located at the northwest corner of the site (see before and after aerial photographs in Appendix F). The Lummi Nation purchased the site in 1991, and prior to the purchase, the majority of the 40-acre site had been used for agricultural purposes for many years. LNR staff conducted a wetland delineation in 1998, and delineated two emergent (wet pasture) wetlands with a total area of 11.4 acres: one wetland was 10.7 acres; and the second was 0.7 acres. Due to past agricultural practices, the site had mixed elevations, and the wetlands included a mosaic of upland nodes. The wetland pasture areas were dominated by reed canarygrass, with some meadow foxtail (*Alopecurus pratensis*) and creeping buttercup (*Ranunculus repens*). Upland vegetation was dominated by Canada thistle (*Cirsium arvense*) and Himalayan blackberry (*Rubus armeniacus*). The property is located within the 100-year flood plain of the Nooksack River, and Schell Creek flows southward in the eastern portion of the site.

Description of the Mitigation Site, Pre- and Post-installation

To compensate for wetland impacts associated with construction of the Silver Reef Hotel-Casino complex, approximately 17.1 acres of predominately upland grassland were graded to allow passive restoration of saltmarsh conditions and establish a mosaic of estuarine habitats. The mitigation site is located adjacent to a brackish slough that outlets to Lummi Bay (see Figures 1 and 2 in Appendix B). Prior to grading, the site was used for agricultural purposes, and it consisted of upland grassland, a freshwater wet pasture (approximately 0.6 acres), and a swale vegetated with saltmarsh species (approximately 0.2 acres) (Sheldon & Associates, 2000) (see historic aerial photos in Appendix F). Except for the swale, prior to installation of the mitigation plan, the site was dominated by non-native grass species.

As designed, installation of the mitigation plan in 2001 resulted in creation of three channels that connect the mitigation area to the brackish slough, which is hydrologically connected to Lummi Bay via culverts and tide-gates (see Figures 1b and 2 in Appendix B). Because of the tide gates, there is an approximate two-hour time delay between the low/high tides in Lummi Bay and the low/high tides at the mitigation site. The location of the inundation line

was mapped in December 2010, and it provides a qualitative assessment of tidal amplitude on the site (see Figure 3 in Appendix B). The site is relatively flat with small elevation changes that resulted from site grading; however, the elevation changes have been sufficient to establish a variety of vegetation communities and habitats (see Figure 4 in Appendix B).

In the ten years since the mitigation site was installed, the site has developed into a thriving estuarine ecosystem with a mosaic of high saltmarsh, low saltmarsh, and mudflat habitats, as well as salt-sensitive wetland areas and limited upland areas. The majority of the vegetation on the mitigation site is herbaceous. All vegetation in the mitigation area established naturally – no herbaceous or woody species were installed or planted. The location and extent of the current vegetation communities/habitats is primarily determined by elevation and proximity to the slough and channels (see Figures 2 and 4 in Appendix B). As designed, the three channels consist of mud flat, much of which is covered by filamentous green algae, with large patches of widgeongrass (*Ruppia maritima*). The low saltmarsh communities are located in a band along the channels and slough – the width of the community is determined by topography. High saltmarsh communities are located above the low saltmarsh communities. The Baltic rush (*Juncus balticus*)/Pacific silverweed (*Argentina anserina*) community is the most common high saltmarsh community, and it is located in a band around the site. The salt-sensitive wetland areas are located at higher elevations around the outer perimeter of the site (mostly on the north and east sides), and upland areas are located where elevation is highest. Refer to the Year 10 (2011) monitoring report (Otak, 2011) for a detailed listing of plant species observed on site.

The dominant non-native invasive species found on site include reed canarygrass, Himalayan blackberry, and Canada thistle. There is an extensive fallow field on the north side of the mitigation site that is a monoculture of reed canarygrass. Despite that, invasive species mapping that was conducted as part of the annual monitoring calculated that only 3.4 percent of the 17.1-acre mitigation site has coverage by reed canarygrass and Himalayan blackberry (Otak, 2011).

Soils on site are listed by the Natural Resource Conservation Service (NRCS) as Eliza silt loam, drained, 0 to 1 percent slopes (USDA, 2011). The soils on site are generally very sandy or loamy sand. Due to grading, there are some areas where it appears that soil layers have been mixed and in many locations throughout the site there is a compacted layer at approximately six inches.

The mitigation site is providing wildlife habitat. Birds are the most frequently observed and reported animals – numerous species of shorebirds, waterfowl, songbirds, and birds of prey were observed on or over the mitigation site in 2011. Mammals, including coyotes, deer, and

river otters regularly use the mitigation site, and shrimp and Sticklebacks have been observed at high tide. For a detailed listing of animal species observed on site refer to the Year 10 (2011) monitoring report (Otak, 2011).

Additional Information

In addition to the previously mentioned information sources (e.g. USFWS, USDA), several other sources were researched to aid in determining the wetland rating and assessing functions. Below is a summary of the information.

- The wetland mitigation site is not included on the National Wetlands Inventory (NWI) (USFWS, 2011). However, the NWI maps several wetlands near the mitigation site, including the estuary.
- The mitigation site section/township/range is not included on the Washington State Department of Natural Resources (DNR) Natural Heritage Features Associated with Wetlands list (Washington State Department of Natural Resources, 2011).
- The Lummi Indian Reservation is a federal reserve, and only federal or tribal laws apply to wildlife management on the Reservation. Information regarding priority habitats and species were provided by the Lummi Nation Natural Resources Department.

  No known priority or endangered species are present in Wetland A, however, there are numerous species that are known to be present nearby, or have a high likelihood of being present near the mitigation site, and potentially using Wetland A. Such uses may include nesting, foraging, and refugia. There is a high likelihood that Marbled Murrelets, Bald Eagles, and Peregrine Falcons are present near Wetland A during some portions of the year. There are several known Bald Eagle nesting sites within two miles of Wetland A. There are also known Peregrine Falcon nesting sites near Wetland A, and a significant portion of the land surrounding (and including) Wetland A is listed by WDFW as Peregrine Falcon Use Area. Both Bald Eagles and Peregrine Falcons have been observed flying over the mitigation site.

Wetland A

The wetland delineation map (Figure 2 in Appendix B) depicts Wetland A and the data points used to determine the wetland boundary. Data sheets are included in Appendix C. While only the portion of the wetland located on the mitigation site was delineated, Wetland A extends offsite to the east, with one small lobe to the north. Wetland A is the only wetland located within the mitigation area, and it includes portions of the mud flats that are vegetated by macrophytic species (widgeongrass) with greater than 5 percent cover (*Corps of Engineers Delineation Manual*, Environmental Laboratory, 1987). The filamentous green algae covering much of the remainder of the mud flats was not considered to be a macrophytic species for delineation purposes. Wetland A is predominately an Estuarine Emergent wetland, dominated by salt-tolerant species including Baltic rush, Pacific silverweed, alkali bulrush (*Scirpus maritimus*), salt-grass (*Distichlis spicata*), and creeping bentgrass (*Agrostis stolonifera*) (see Figure 4 in Appendix B). At higher elevations, a narrow band of Palustrine Emergent wetland is located adjacent to the north and east sides of the Estuarine Emergent wetland. The Palustrine Emergent wetland is dominated by salt-sensitive hydrophytic herbaceous species such as quackgrass (*Elytrigia repens*) and velvet grass (*Holcus lanatus*), with a strip of red alders (*Alnus rubra*) and willows (*Salix* sp.) on and adjacent to the berm that forms the northern boundary of the mitigation site.

The primary hydrology source for Wetland A is the twice-daily tidal inundation - see Figure 3 in Appendix B for the extent of tidal inundation. Soils in the wetland are generally characterized as gleyed clay/silty sand in the lower portions of the wetland, or sand with prominent redox concentrations (Sandy Redox S5) in slightly higher portions of the wetland. See data sheets in Appendix C for details.

Non-wetland areas include several small islands of upland 'carved' out of Wetland A, upland areas adjacent to the north side of Wetland A, and unvegetated mudflat. As mentioned previously, the filamentous green algae covering much of the mud flats was not considered to be a macrophytic species for delineation purposes. Upland areas are dominated by non-native grass species including soft brome (*Bromus hordeaceus*) and orchardgrass (*Dactylis glomerata*).

Wetland Category

The Lummi Administrative Regulation (LAR) Title 17 Wetland Management Regulations (17 LAR 06.030), requires wetlands to be rated according to the *Washington State Wetland Rating System for Western Washington-Revised, 2004 Edition* (Hruby, 2004). Wetland A was categorized based on special characteristics because it is an estuarine wetland, and it rates as Category I because: it is relatively undisturbed; has less than 10-percent cover by non-native invasive

species; and it is contiguous with tidal channels, depressions with open water, and freshwater wetlands. See Appendix E for the Ecology Rating Form.

Buffers

Buffers are assigned according to LAR Title 17 Water Resources Protection Code (17.06.070). Category 1 wetlands require a 100-foot buffer width to protect wetland functions. The majority of Wetland A buffer is located offsite, and most of the buffer consists of former agricultural fields that have not been worked in the recent years (see Figure 1 in Appendix B). The fields are dominated by non-native grasses, and there is some presence of non-native invasive species including Himalayan blackberry, reed canarygrass, and tansy (*Tanacetum vulgare*). The buffer to the north of Wetland A consists of fallow agricultural fields that are dominated by reed canarygrass. The slough runs along the east side of the mitigation area, with fallow agricultural fields beyond that. The slough also forms the southern boundary of the mitigation area, with a tall berm (sea wall) (dominated by Himalayan blackberry) and the fish rearing embayment and Lummi Bay further to the south. The dike access road is located in the western portion of the buffer, with fallow agricultural fields beyond.

Functions

Information regarding the functions provided by the impacted wetlands at the Casino site was gathered from the *Wetland Delineation for Haxton/Slater 40 acres site* report, which was prepared by LNR staff, and dated July 30, 1998. The delineation report was included as Attachment 6 in the complete JARPA application submitted to the U.S. Army Corps of Engineers, Seattle District on October 29, 1999 by the Lummi Indian Business Council (Lummi Indian Business Council, 1999). The report assessed the functions of the wetlands at the Casino site using qualitative methods as well as the Washington Department of Ecology *Methods for Assessing Wetland Functions* (Hruby et al., 1999).

The functions of the two limited wetland areas at the mitigation site were qualitatively assessed in 2000, prior to installation of the mitigation project, and the wetland functions generally rated low (Sheldon and Associates, 2000). To be consistent with the pre-construction assessment of the mitigation site wetland areas, the same functions were qualitatively assessed in 2011 to determine the functions ten years post-construction. Additionally, the functions for Wetland A were assessed using the Washington State Department of Transportation Best Professional Judgment (BPJ) Characterization Tool (Null et al, 2000) (see Appendix E).

Table 1 below provides a summary of assessed functions for: the wetlands impacted by construction of the Silver Reef Hotel-Casino complex; the limited wetlands on the mitigation site before installation of the mitigation plan; and Wetland A on the mitigation site ten years after installation. The results demonstrate that the mitigation site provides significant uplift of the functions previously provided by the impacted Casino wetlands and the wetlands on the mitigation site prior to installation of the mitigation plan. Functions provided by the individual wetlands are discussed below.

Table 1—Wetland Function Summary

	Wetland Functions							
Wetland Location	Flood/ Stormwater Control	Groundwater Support	Erosion/ Shoreline Protection	Water Quality Improvement	Natural Biological Support	Overall Habitat Functions	Specific Habitat Functions	Cultural/ Socio-economic
Casino Impact Site	Medium	Low	Low	High	Low	Low	Low	Low
Mitigation Site (pre-installation)	Low	Low	Low	Low-Med	Low	Low	Low	Low
Mitigation Site (10 years post-installation)	Low	Low	Medium	Med-High	High	High	High	High

Functions of the Impacted Wetlands on the Casino Site

The two impacted wetlands on the Casino site consisted of fallow agricultural fields where depressional emergent wetlands developed. The wetlands were dominated by non-native invasive reed canarygrass, and remained shallowly inundated with rainwater through the winter and into the growing season. The wetlands received surface runoff from the surrounding fields and nearby roads, and had the potential to receive some floodwater from the nearby Nooksack River. Given the dense vegetation, the topographic depressions with seasonally ponded water, proximity to pollutant sources (roads), and the nearby river, the wetlands provided medium stormwater control and high water quality improvement functions. The report rated the function to recharge groundwater as low. Since the Casino wetlands were depressions without flowing water or significant wave action, they had no opportunity to provide shoreline protection, and provided a low level of erosion control function. The general habitat function was rated as low since the wetlands were dominated by reed canarygrass, had disturbed buffers, and were located near a busy intersection. The wetlands were rated as low for providing anadromous fish habitat since they had only shallow seasonal inundation and the constricted culvert would have hindered or precluded fish access. While the delineation report did not specifically assess the Cultural/Socio-Economic functions, they probably would have been rated as low, although the wetlands had

likely provided some economic function in the past when they were used as pasture land. However, prior to being filled, the wetlands were fallow and no longer provided economic function, and would not have provided educational or cultural opportunities.

In summary, the impacted wetlands on the Casino site were low quality emergent wetlands that were dominated by non-native invasive species, and only provided water quality improvement and stormwater control functions.

Functions of the Small Wetlands on the Mitigation Site—Pre-Installation

Before installation of the mitigation plan, the mitigation site predominately consisted of upland grasslands, with an approximate 0.6-acre wet pasture and a small saltmarsh swale (approximately 0.2 acres). The wet pasture wetland was located in a slight depression that entrapped surface water, and it was dominated by bluegrass (*Poa* sp.). The swale (approximately 10 feet wide) was dominated by salt-tolerant salt-grass and spear saltbush (*Atriplex patula*), and it outletted to the adjacent slough. Its apparent primary hydrology source was backflow from the slough during sufficiently high tides. The position of the mitigation area in the landscape (low point in the Nooksack River basin) provided the opportunity for the pre-installation wetlands to provide flood storage, however, their small size relative to the size of Lummi Bay and the Nooksack River basin precluded their potential to provide measurable flood water storage. The pre-installation wetlands provided low groundwater recharge functions – they were not inundated for long periods of time and the site had a shallow groundwater table (Sheldon & Associates, 2000). The pre-installation wetlands had little or no opportunity to provide erosion/shoreline protection. Due to the herbaceous vegetation, the pre-installation wetlands had the potential to improve water quality, but the short residence time and general lack of nearby pollutant sources diminished the opportunity for the wetland to perform this function to low/medium. The pre-installation wetlands and buffers provided low biological support and overall habitat functions due to the limited plant species diversity, lack of structural complexity, and prior land uses. The pre-installation wetlands lacked fish habitat. The mitigation site may have provided some economic functions when it was used for agricultural purposes, but prior to installation of the mitigation plan, the fields were fallow.

In summary, the pre-installation emergent wetlands rated low for the majority of the assessed functions. The overall low rating was due to the wetlands' small sizes, limited species diversity, and lack of structural/topographic complexity.

Functions of Wetland A—10 Years Post-Installation

As previously described, the site has developed into a thriving estuarine ecosystem with a mosaic of high saltmarsh, low saltmarsh, and mudflat habitats, as well as salt-sensitive wetland areas and limited upland areas. As was the case prior to mitigation installation, the position of Wetland A in the landscape provides the opportunity for it to provide flood storage, however, its size relative to the size of Lummi Bay and the Nooksack River basin precludes its potential to provide measurable flood water storage. The mitigation plan anticipated that this function would not be enhanced over previous conditions (Sheldon & Associates, 2000). Likewise, the mitigation plan anticipated that groundwater recharge functions would not be improved over the previous conditions due to the lack of long term ponding in Wetland A and the site's relatively high groundwater table. Wetland A provides medium erosion/shoreline protection - the created channels are protected from the bi-daily tidal flows by dense vegetation. Wetland A rates medium-high for water quality improvement - the relatively still water at the peak of high tide provides the opportunity for sediment to drop out, and nutrients to be taken up and debris to be filtered by the dense established vegetation, before water flows back out to Lummi Bay. The topographic variety and complex hydrologic regime in Wetland A and the resultant high diversity of plant species and intricate edges between vegetative communities (salt- and freshwater) have increased the biological support and overall habitat functions to high. Numerous shorebirds, wading birds, waterfowl, songbirds, and birds of prey have been seen in or around the wetland during site visits, and coyotes, deer, and river otters use the mitigation site on a regular basis. The connection of the created channels to the slough allow fish and shellfish the opportunity to use the mitigation area as refugia and foraging habitat, resulting in a high rating for specific habitat functions. This high rating in turn helps support the cultural and socio-economic functions of the mitigation site for the Lummi Nation, as fish and shellfish are very important to their culture and their economy. The success of the site as a passive saltmarsh restoration project may provide educational opportunities if the Lummi Nation wishes to pursue them.

In summary, Wetland A and the established mitigation site provide significant uplift of the functions previously provided by the Casino-impacted wetlands and the limited wetland areas on the mitigation site prior to installation of the mitigation plan.

Conclusion

To satisfy permit conditions, the wetland at the Silver Reef Casino compensatory mitigation site was delineated by Otak biologists and Lummi Natural Resources staff. A single, 14.2 acre wetland, Wetland A, was delineated on the mitigation site. Wetland A is predominately an estuarine emergent wetland with high- and low-saltmarsh communities, and 1.1 acres of vegetated mud flats (see the wetland delineation map, Figure 2 in Appendix B). It also includes limited areas of salt-sensitive, palustrine emergent communities. Wetland A is rated as Category 1 with a 100-foot buffer. The delineation also designated 3.9 acres of unvegetated mud flats on the mitigation site - the filamentous green algae covering much of the mud flats was not considered to be a macrophytic species for delineation purposes. Although the unvegetated portions of the mud flats do not satisfy wetland criteria, they do satisfy requirements for other Waters of the United States. In total, 18.1 acres of Waters of the United States were delineated on the mitigation site.

The created and enhanced estuarine wetlands that have become established on the mitigation site in the ten years since the mitigation plan was installed now provide numerous functions either de novo or at a higher level than previously provided by the wetlands impacted by construction of the Silver Reef Hotel-Casino complex, and the limited wetland areas on the mitigation site prior to installation of the mitigation plan. The net result is a significant uplift of the functions over previous conditions.

Section 4—References

Aerial photos provided by Lummi Indian Business Council Natural Resources Department, Water Resources Division.

Cooke, S.S., ed. 1997. *A Field Guide to the Common Wetland Plants of Western Washington and Northwestern Oregon*. Seattle Audubon Society, Seattle Washington.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*, Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss.

Google Earth. 2011.

Hitchcock, C.L. and A. Cronquist. 1973. *Flora of the Pacific Northwest*. University of Washington Press, Seattle, Washington.

Hruby, T. 2004. *Washington State wetland rating system for Western Washington – Revised*. Washington State Department of Ecology Publication # 04-06-25. http://www.ecy.wa.gov/pubs/0406025.pdf

Hruby, T., T. Granger, K. Brunner, S. Cooke, K. Dublanica, R. Gersib, L. Reinelt, K. Richter, D. Sheldon, E. Teachout, A. Wald, and F. Weinmann. 1999. *Methods for Assessing Wetland Functions, Volume I: Riverine and Depressional Wetlands in the Lowlands of Western Washington, Parts 1 and 2*. Washington State Department of Ecology Publications #99-115 and #99-116.

Lummi Administrative Regulation. 2010. Wetland Management Regulations. Adopted by the Lummi Indian Business Council June 15, 2010

Lummi Indian Business Council. October 29, 1999. JARPA application package submitted to the U.S. Army Corps of Engineers, Seattle District.

Lummi Nation Code of Laws. Enacted: Resolution 2004-012 (1/19/04). Title 17 Water Resources Protection Code (2008).

Null, W.S.; G. Skinner, and W. Leonard. 2000. *Wetland functions characterization tool for linear projects*. Washington State Department of Transportation, Environmental Affairs Office. Olympia.

Otak, Inc. 2011. *Lummi Nation Silver Reef Casino Mitigation Project Year 10 (2011) Monitoring Report*. December 2011.

Reed, P.B., Jr. 1988. National list of plant species that occur in wetlands: Northwest (Region 9). U.S. Fish and Wildlife Service Biological Report. 88 (26.9). U.S. Fish and Wildlife Service, Washington, D.C.

Reed, P.B., Jr., D. Peters, J. Goudzwaard, I. Lines, and F. Weinmann, 1993. Supplement to List of Plant Species that Occur in Wetlands: Northwest (Region 9). Supplement to

Biological Report 88 (26.9), May 1988. U.S. Fish and Wildlife Service, U.S. Fish and Wildlife Service, Washington, D.C.

Sheldon & Associates. 2000. *Lummi Nation Casino Project Final Wetland Compensation Plan*. November 28, 2000

U.S. Army Corps of Engineers. 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0),* ed. J .S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-10-3, Vicksburg, MS: U.S. Army Engineer Research and Development Center. http://www.ecy.wa.gov/programs/sea/wetlands/pdf/WestMt_April2008.pdf

U.S. Department of Agriculture, Natural Resources Conservation Service. 2010. *Field Indicators of Hydric Soils in the United States*, Version 7.0. L.M. Vasilas, G.W. Hurt, and C.V. Noble (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.

U.S. Department of Agriculture. 2011. Whatcom County Soil Survey. Accessed from: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

U.S. Department of Agriculture, Natural Resources Conservation Service. 2011. PLANTS Database Accessed from: http://plants.usda.gov/

U.S. Fish and Wildlife Service National Wetland Inventory (NWI). 2011. Accessed from: http://www.fws.gov/wetlands/

Utah State University Climate Center. 2011 Bellingham 3 SWW, Washington, 2011-1-01 to 2011-06-30 precipitation. Accessed from: http://climate.usurf.usu.edu/products/download.php

Washington State Department of Ecology. 2008. *Using the Wetland Rating System in Compensatory Mitigation.* Shorelands and Environmental Assistance Focus Sheet, March 2008.

Washington State Department of Natural Resources. 2011. Washington National Heritage Program accessed from:
http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf
http://www1.dnr.wa.gov/nhp/refdesk/lists/plantsxco/whatcom.html

Western Regional Climate Center. 2011. Bellingham 3 SWW, Washington, Monthly Climate Summary, August 1, 1985 to December 31, 2010. Accessed from: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?wa0587

Appendix A—Methods

Wetland Delineation Method

After completing the background research, Stephanie Smith and Suzanne Anderson of Otak, Inc. and Frank Lawrence III and Monika Lange of Lummi Natural Resources conducted the wetland delineation June 1 and June 2, 2011. In compliance with Federal and Lummi Nation guidance and regulations, the wetland delineation followed the Routine Methodology as required by the US Army Corps of Engineers, wetlands were delineated according to methodology specified in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (US Army Corps of Engineers, 2010), with reference to the 1987 *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987). The manuals define wetlands as follows:

> *"Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."*

In determining whether an area meets this definition, both methodologies require examination of three parameters: vegetation, soils, and hydrology. For an area to be classified as wetland, hydrophytic vegetation, hydric soils, and wetland hydrology must be exhibited. These three parameters, and the methods used to assess them, are discussed in the following sections.

Procedure: During the site visits, the areas were walked to gain an overview of site conditions. Following routine methodology, data on vegetation, soils, and hydrology were collected in areas that appeared to have wetland characteristics. In addition, plots were located in a transect across the site, and upland plots were generally paired with wetland plots to determine the location of the wetland boundary. Data for wetland and upland plots were recorded on field data sheets. Additional data plots were informally evaluated to determine the location of the wetland edges. Data plots and points along the wetland edges were marked with sequentially numbered pink-and-black-striped flagging or pink pin-flags. The wetland flags were field surveyed using a hand-held GPS unit (Trimble GeoXT), and the information was downloaded into ArcMap10 GIS software. Horizontal accuracy of the Trimble GeoXT is +/- 2 feet with post-processing.

Vegetation

Hydrophytic vegetation is defined as the community of macrophytes that occurs in areas where inundation or soil saturation is either permanent or of sufficient frequency and duration to exert a controlling influence on the plant species present (Environmental Laboratory, 1987; US Army Corps of Engineers, 2010). The manuals concur that hydrophytic vegetation determinations should be based on the assemblage of plant species in the community, rather than on the presence or absence of particular indicator species.

Plant Identification: Plant species were identified using several standard taxonomic references including: Cooke, 1997; Hitchcock & Cronquist, 1973; and USDA PLANTS Database, 2011.

Cowardin Classes: Plants live in relatively stable and predictable species assemblages called communities. Plant communities on the site were identified according to a classification system

developed by the U.S. Fish and Wildlife Service (Cowardin et al., 1979). The Cowardin Community Classification System is based on vegetation, hydrology, and substrate (soil) characteristics.

Determination of Hydrophytic Vegetation Criterion: Hydrophytic vegetation indicators are specified in the *Corps Western Mountains, Valleys, and Coast Supplement* (U.S. Army Corps of Engineers, 2010). The manual stipulates that the Dominance Test (Indicator 1) is the basic indicator of hydrophytic vegetation. The hydrophytic vegetation criterion is met when more than 50 percent of the dominant species across all vegetation strata are hydrophytic, based on the wetland plant species indicator status from the *Region 9 section of the National List of Plant Species Occurring in Wetlands* (Reed 1988; Reed et al., 1993). The plant list separates vascular plants into five basic groups by their wetland indicator status (WIS), which is based on the frequency of occurrence in a wetland. The indicator status rating system is summarized in Table 1 below.

Table 1. Wetland Plant Indicator Status

Indicator Status	Definition
Obligate Wetland Plants (OBL)	Plants that almost always occur in wetlands under natural conditions - estimated probability of species occurring in wetlands is greater than 99% under natural conditions.
Facultative Wetland Plants (FACW)	Plants that usually occur in wetlands - estimated probability 67%-99%.
Facultative Plants (FAC)	Plants that are equally likely to occur in wetlands or non-wetlands: estimated probability of 34% – 66% to be found in wetlands.
Facultative Upland Plants (FACU)	Plants that usually occur in non-wetlands: estimated probability of 1% - 33% to be found in wetlands.
Obligate Upland (UPL)	Plants that almost always occur in non-wetlands - estimated probability of occurring in wetlands is <1%.

The *Corps Western Mountains, Valleys, and Coast Supplement* (US Army Corps of Engineers, 2010) defines all OBL, FACW, and FAC species (FAC+, FAC, and FAC-) as hydrophytic.

Dominant species were independently chosen from each stratum of the community (tree, shrub, woody vine, herb), and selected according to the 50/20 rule (US Army Corps of Engineers, 2010). Dominants are those species in each stratum that when ranked in descending order of absolute percent aerial coverage and cumulatively totaled, immediately exceed 50 percent of the total coverage of vegetation in the stratum, plus any additional plant species comprising 20 percent or more of the total coverage of vegetation in that stratum.

Some wetland plant communities may not satisfy the Dominance Test. In those cases where both hydric soil and wetland hydrology indicators are present, the manual defines other hydrophytic vegetation indicators. The *Corps Western Mountains, Valleys, and Coast Supplement* (U.S. Army Corps of Engineers, 2010) specifies that vegetation can be re-evaluated using the Prevalence Index (Indicator 2). The Prevalence Index takes into consideration all plant species in the community, not just the

limited number of dominant species. In addition, Plant Morphological Adaptations (Indicator 3) can be used to distinguish certain wetland plant communities. As with the Prevalence Index, indicators of hydric soil and wetland hydrology must also be present.

If the methodologies listed above fail to indicate that hydrophytic vegetation is present, the manual outlines how problematic hydrophytic vegetation can be identified and the wetland delineated using a combination of observations made in the field, consulting reference sites, and/or supplemental information from technical literature references and other sources.

Procedure: For each data plot, plant species were identified and their absolute percent aerial coverage was estimated. Relative percent aerial coverage was used to determine dominant species in each stratum using the 50/20 rule, and the Dominance Test was applied. Vegetation was also sampled at regular intervals along, within, and outside the wetland boundaries for delineation purposes.

Soils

The presence of hydric soils is the second parameter required for wetland determination. Hydric soil is defined as *"... a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part"* (U.S. Army Corps of Engineers, 2010). Generally, saturation or inundation for more than a few days combined with microbial activity in the soil causes a depletion of oxygen. Anaerobic conditions promote biogeochemical processes such as the accumulation of organic matter, and the reduction, translocation, and/or accumulation of iron and other reducible elements. These processes result in characteristic morphologies, such as redoximorphic features and gleying, that persist in the soil during both wet and dry periods (USDA-NRCS, 2010). Redoximorphic features are spots or blotches of color occurring within a soil matrix of contrasting color, and they usually result from alternating anaerobic and aerobic soil conditions. When the soil is saturated, microbes reduce iron and manganese. Then when the soil dries and oxygen is available, the minerals are oxidized (iron appears rust-colored). Translocation of reduced iron and manganese when the soil is saturated can result in both accumulation (producing redoximorphic features when oxidized) and depletion (iron is removed which results in low chroma). Gleying occurs under long term anaerobic conditions when reduced iron is leached out of the soil layer leaving the matrix depleted of color. As a result, gleyed soils are predominantly neutral gray in color, although they are sometimes greenish- or blue-gray. Anaerobic conditions can result in the accumulation of organic matter and sulfur; the latter is apparent as hydrogen sulfide gas (rotten egg odor).

Hydric Soil Indicators include, but are not limited to: high organic content; hydrogen sulfide odor; soils with a depleted layer below a dark surface; soils with thick dark surfaces; sandy mucky mineral soils; sandy gleyed soils in the upper six inches; soils with a matrix chroma of 3 or less and distinct or prominent redoximorphic features; and soils with a depleted matrix (U.S. Army Corps of Engineers, 2010). The manual also provides guidance for problematic hydric soils.

Procedure: Soils were sampled in each data plot to a depth of at least 20 inches where possible. Test holes were also dug at regular intervals along, within, and outside the wetland boundaries for delineation purposes. The soil was characterized and examined for hydric indicators. Soil colors (hue, value, and chroma) were determined using a Munsell color chart (Gretag Macbeth, 2000). Soil characteristics were compared to Natural Resource Conservation Service (NRCS) descriptions of mapped soils to either confirm the mapping or determine if an inclusion of another soil type was present.

Hydrology

Wetland hydrology, or the presence of water during the growing season, is the third parameter required for wetland determination (U.S. Army Corps of Engineers, 2010). The Corps standard requires 14 or more consecutive days of flooding or ponding, or a water table 12 inches (30 centimeters) or less below the soil surface, during the growing season at a minimum frequency of 5 years in 10 (U.S. Army Corps of Engineers, 2010). Based on the typical growing season for the lowlands of Puget Sound, the project area should have at least 21 days of continuous inundation or saturation within 12 inches of the surface during the growing season to satisfy the criteria for wetland hydrology.

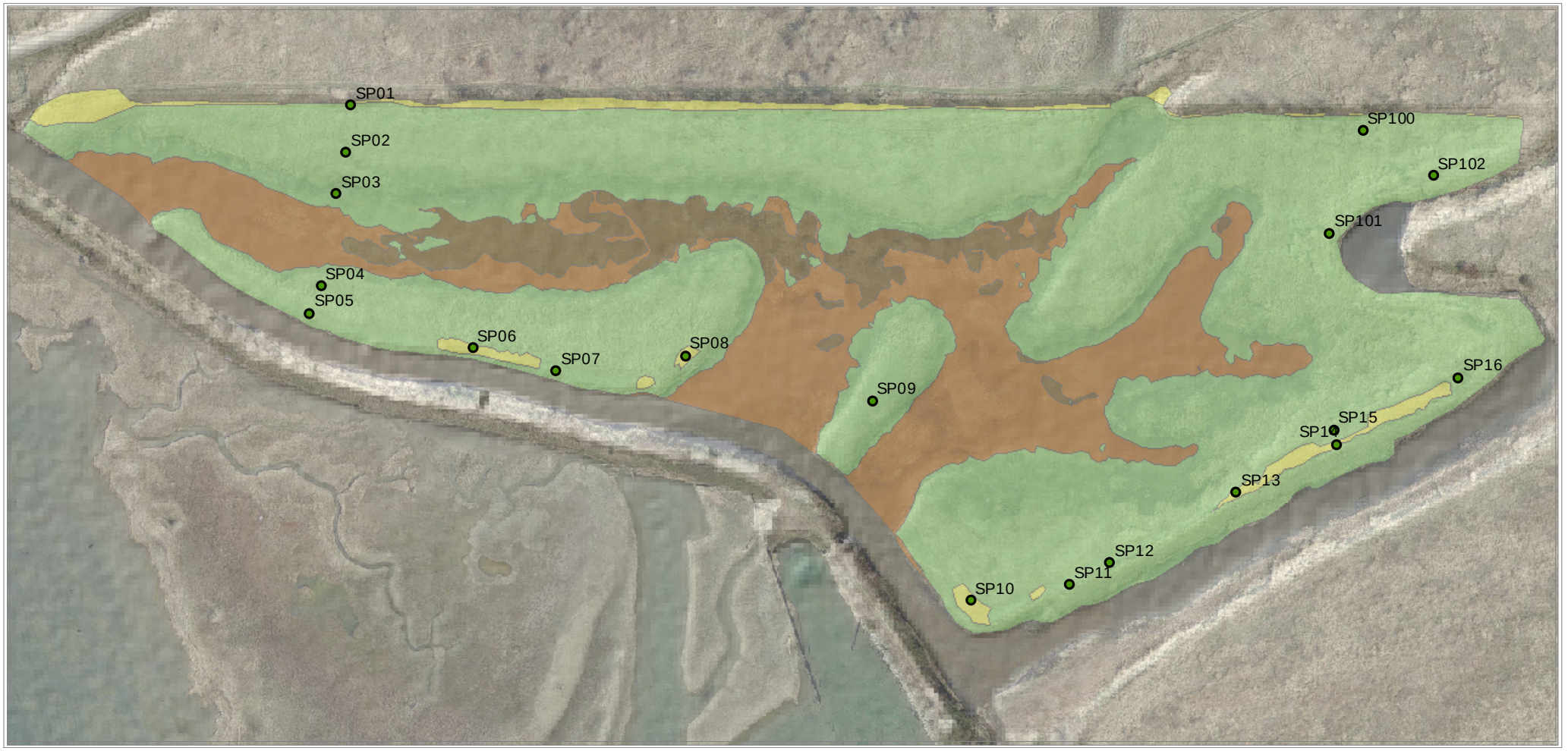
Growing Season: The *Corps Western Mountains, Valleys, and Coast Supplement* (U.S. Army Corps of Engineers, 2010) stipulates that the growing season has begun when two or more non-evergreen vascular plant species onsite show above-ground evidence of growth and development; or when the soil temperature at 12 inches (30 centimeters) deep is a minimum of 41° F (5° C). In addition, the beginning and end of the growing season can be established by using recorded meteorological data to estimate the median dates of 28º F (-2.2º C) air temperatures in spring and fall (U.S. Army Corps of Engineers, 2010).

Hydrology Indicators: Although direct observations of hydrology are often limited during the dry season, indicators may be present throughout the year. Primary indicators for wetland hydrology specified in the *Corps Western Mountains, Valleys, and Coast Supplement* (U.S. Army Corps of Engineers, 2010) include: observation of: inundation or saturation; watermarks; drift deposits; sediment deposits; algal mat or crust; iron deposits; surface soil cracks; inundation visible on aerial imagery; a sparsely vegetated concave surface; salt crust; aquatic invertebrates; hydrogen sulfide odor; oxidized rhizospheres along living roots; and presence of reduced iron. There are also secondary indicators such as the presence of a shallow aquitard or a positive FAC-Neutral Test. Whereas the presence of only one primary indicator is necessary to satisfy the criterion for wetland hydrology, the presence of at least two secondary indicators are required. The *Corps Western Mountains, Valleys, and Coast Supplement* (U.S. Army Corps of Engineers, 2010) also provides guidance for identifying wetlands that periodically lack indicators of wetland hydrology.

Procedure: Observations of hydrology indicators were made in and around the soil pit of each plot. Hydrology indicators were also examined at regular intervals along, within, and outside the wetland boundaries for delineation purposes. Observations of plant phenology, to determine whether the investigation was performed during the growing season, were made throughout the site.

Appendix B — Maps

Figures 1a and 1b—Vicinity Maps for the Silver Reef Casino Wetland Mitigation Site.



Casino Mitigation Site Delineataion and Test Pits

6/5/2011 - 8/1/2011

Wetland (13.09 acres)

Vegetated Mudflat (1.13 acres)

Mudflat (3.90 acres)

Upland (0.57acres)

Test Pits

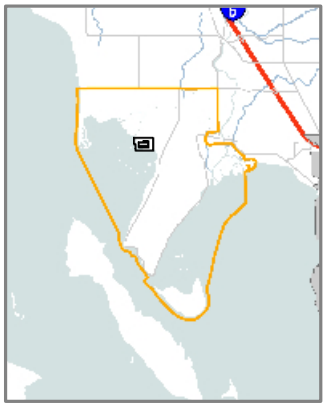
0 100 200

Feet

N

Figure 2

Cartography: Gerry Gabrisch geraldg@lummi-nsn.gov
Datum, Projection, Coordinate System: NAD83 UTM 10 N



Casino Mitigation Site Inundation (12/21/2010)

Extent of Inundation

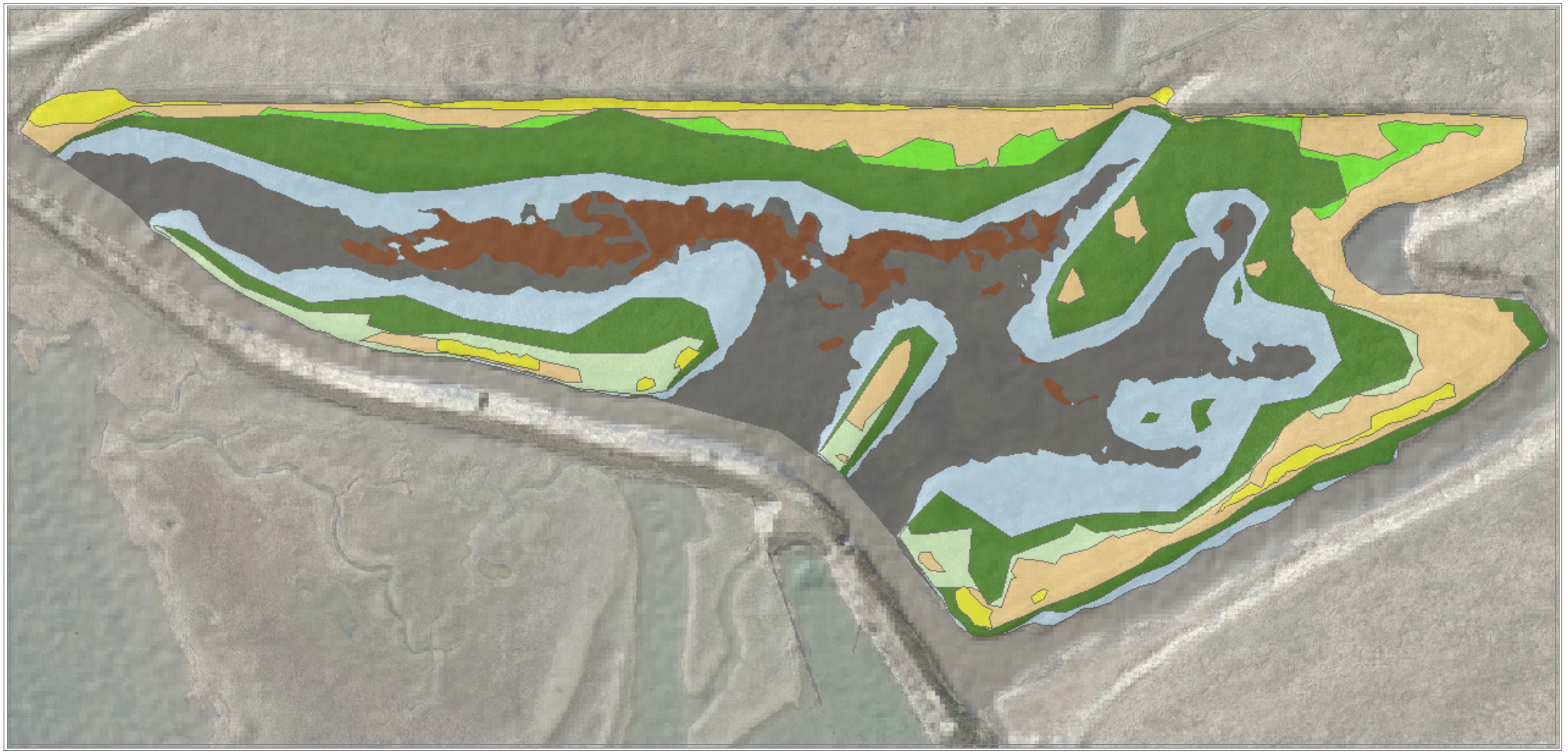
0 100 200
Feet

N

Figure 3

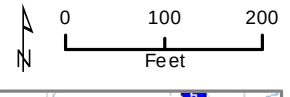
The inundation on the islands was not delineated.

Cartography: Gerry Gabrisch geraldg@lummi-nsn.gov
Datum, Projection, Coordinate System: NAD83 UTM 10 N



Casino Mitigation Site
Vegetation Communities
6/5/2011 - 8/1/2011

	acres
Upland	0.57
High Marsh (mixed/Baltic rush/Pacific silverweed)	0.76
High Marsh (Pacific silverweed/bent grass community)	0.50
High Marsh (Baltic rush/Pacific silverweed community)	4.66
Low Marsh (alkali bulrush/pickle weed community)	4.39
Vegetated Mud Flat	1.13
Mud Flat	3.90
Non-Tidal Wetland	2.78



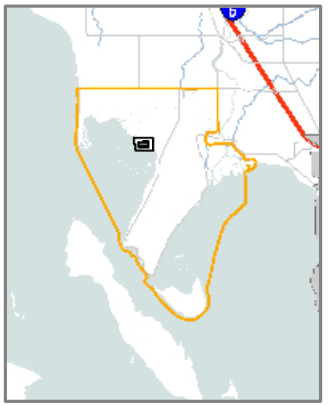


Figure 4

Appendix C—Wetland Data Sheets

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silver Reef Casino Mitigation Site City/County: Whatcom County Sampling Date: 6/1/2011

Applicant/Owner: Silver Reef Casino / Lummi Nation State: WA Sampling Point: SP-1 (upland)

Investigator(s): Suzanne Anderson, Stephanie Smith, Frank Lawrence, Monika Lange Section, Township, Range: Section 14 / T 38 N / R 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: N 48.7897 Long: W -122.6608 Datum: _____

Soil Map Unit Name: Eliza silt loam, drained, 0 to 1 percent slopes NWI classification: Not listed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No 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 _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks: SP-1 is located on north berm on north project boundary & just east of Transect 5

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	10	Y	FAC
2.			
3.			
4.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: —)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Bromus hordeaceus ssp.	30	Y	UPL
2. Festuca arundinacea	10	Y	FAC-
3. Vicia sp.	10	Y	
4. Holcus lanatus	5	N	FAC
5. Cirsium arvense	<5	N	FACU+
6. Lactuca serriola	<5	N	NL
7.			
8.			
9.			
10.			
11.			
	55 = Total Cover		
Woody Vine Stratum (Plot size: 5' radius)			
1. Rubus armeniacus	15	Y	FACU
2.			
	15 = Total Cover		

% Bare Ground in Herb Stratum 35

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (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:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: rectangular plot is 6' x 15' on berm slope.

SOIL

Sampling Point: SP - 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 1	2.5Y 3/3						sandy loam w/ roots	
1 - 21	10YR 4/1		5YR 3/4	≥5	C	PL/M	Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Soil is moist, not saturated at 21"
Drift deposits just south of data plot, at bottom of berm

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silver Reef Casino Mitigation Site City/County: Whatcom County Sampling Date: 6/1/2011

Applicant/Owner: Silver Reef Casino / Lummi Nation State: WA Sampling Point: SP - 2

Investigator(s): Suzanne Anderson, Stephanie Smith, Frank Lawrence, Monika Lange Section, Township, Range: Section 14 / T 38 N / R 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: N 48.7897 Long: W -122.6608 Datum: _____

Soil Map Unit Name: Eliza silt loam, drained, 0 to 1 percent slopes NWI classification: Not listed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No 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 X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks: plot located southeast of Transect 5

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: —)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Juncus balticus	55	Y	FACW+
2. Potentilla anserina	45	Y	OBL
3. Bromus hordeaceus ssp.	TR	N	UPL
4. Lactuca serriola	TR	N	NL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: —)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 5

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:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

@10:30am Sampling Point: SP - 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 4/1		7.5YR 4/4	≥5	C	PL/M	sandy clay	
6-20	Gley 1 2.5/N		—				sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes X No ____ Depth (inches): 12"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 3"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silver Reef Casino Mitigation Site City/County: Whatcom County Sampling Date: 6/1/2011

Applicant/Owner: Silver Reef Casino / Lummi Nation State: WA Sampling Point: SP - 3

Investigator(s): Suzanne Anderson, Stephanie Smith, Frank Lawrence, Monika Lange Section, Township, Range: Section 14 / T 38 N / R 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: N 48.7897 Long: W -122.6608 Datum: _____

Soil Map Unit Name: Eliza silt loam, drained, 0 to 1 percent slopes NWI classification: Not listed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No 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 X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: —)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Schoenoplectus maritimus	70	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: —)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 35-40

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (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:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks: filamentous algae is covering most of bare ground

SOIL

@10:54am

Sampling Point: SP - 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	Gley 1 2.5/N						Sandy clay	
1-16	Gley 1 2.5/N						Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- X Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): _____

Water Table Present? Yes X No ___ Depth (inches): surface

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): _____

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: small puddles of standing water ½" – 1" deep all around data plot

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silver Reef Casino Mitigation Site City/County: Whatcom County Sampling Date: 6/1/2011

Applicant/Owner: Silver Reef Casino / Lummi Nation State: WA Sampling Point: SP - 4

Investigator(s): Suzanne Anderson, Stephanie Smith, Frank Lawrence, Monika Lange Section, Township, Range: Section 14 / T 38 N / R 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: N 48. 7897 Long: W -122. 6608 Datum: _____

Soil Map Unit Name: Eliza silt loam, drained, 0 to 1 percent slopes NWI classification: Not listed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No 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 X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks: located in low marsh

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: —)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Distichlis spicata	75	Y	FACW
2. Juncus balticus	15	N	FACW+
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: —)			
1.			
2.			
	_____ = Total Cover		
% Bare Ground in Herb Stratum 0			

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:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

@ 11:32 am Sampling Point: SP - 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	Gley1 2.5/N		—				Clay sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- X Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): surface puddles

Water Table Present? Yes X No ____ Depth (inches): 1"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): surface

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silver Reef Casino Mitigation Site City/County: Whatcom County Sampling Date: 6/1/2011

Applicant/Owner: Silver Reef Casino / Lummi Nation State: WA Sampling Point: SP - 5

Investigator(s): Suzanne Anderson, Stephanie Smith, Frank Lawrence, Monika Lange Section, Township, Range: Section 14 / T 38 N / R 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: N 48. 7897 Long: W -122. 6608 Datum: _____

Soil Map Unit Name: Eliza silt loam, drained, 0 to 1 percent slopes NWI classification: Not listed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No 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 X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 5' radius)			
1. Alnus rubra	5	y	FAC
2.			
3.			
4.			
5.			
	5 = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Aster subspicatus	25	y	FACW
2. Agrostis stolonifera	15	y	FAC
3. Trifolium repens	10	N	FAC
4. Distichlis spicata	5	N	FACW
5. Holcus lanatus	5	N	FAC
6. Juncus balticus	<5	N	FACW
7. Lactuca serriola	<5	N	NI
8. Potentilla anserina	TR	N	OBL
9. Vicia sp.	TR	N	
10. Tanacetum vulgare	(15)	N	NI
11.			
	65 = Total Cover		
Woody Vine Stratum (Plot size: 5' radius)			
1. Rubus armeniacus	5	y	FACU
2.			
	5 = Total Cover		

% Bare Ground in Herb Stratum 5 %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (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:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks: Moss = 35%

SOIL

tide approx. 1/2 way out @ 11:56am Sampling Point: SP - 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	2.5Y 3/1		2.5YR 4/4	7	C	M/PL	Sand	
18-22	Gley 1 2.5/N		—				Sandy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks: Some oxidized rhizospheres along root channels but not as dominant as the concentrations in the matrix.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes X No ____ Depth (inches): 12"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 8"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Standing water at 18"

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silver Reef Casino Mitigation Site City/County: Whatcom County Sampling Date: 6/1/2011

Applicant/Owner: Silver Reef Casino / Lummi Nation State: WA Sampling Point: SP - 6

Investigator(s): Suzanne Anderson, Stephanie Smith, Frank Lawrence, Monika Lange Section, Township, Range: Section 14 / T 38 N / R 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: N 48.7897 Long: W -122.6608 Datum: _____

Soil Map Unit Name: Eliza silt loam, drained, 0 to 1 percent slopes NWI classification: Not listed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No 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 X No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks: located at the highest elevation at the south end of the east berm

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: —)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Trifolium repens	55	Y	FAC
2. Agrostis stolonifera	25	Y	FAC
3. Holcus lanatus	10	N	FAC
4. Epilobium ciliatum	<5	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: —)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum bare ground + moss = 25%

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:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: SP - 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-13	2.5Y 3/1		5YR 4/6	1	C	M	Sand	
13-22	Gley1 2.5/N		5YR 4/6	7	C	M	Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes X No _____ Depth (inches): 19"

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 13"

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silver Reef Casino Mitigation Site City/County: Whatcom County Sampling Date: 6/1/2011

Applicant/Owner: Silver Reef Casino / Lummi Nation State: WA Sampling Point: SP - 7

Investigator(s): Suzanne Anderson, Stephanie Smith, Frank Lawrence, Monika Lange Section, Township, Range: Section 14 / T 38 N / R 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: N. 48.7897 Long: W -122.6608 Datum: _____

Soil Map Unit Name: Eliza silt loam, drained, 0 to 1 percent slopes NWI classification: Not listed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No 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 X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks: located on south berm, east of SP-6 in 10'-15' wide strip.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: —)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Agrostis stolonifera	40	Y	FAC
2. Trifolium repens	30	Y	FAC
3. Agrostis gigantea	5	N	FAC
4. Holcus lanatus	5	N	FAC
5. Tanacetum vulgare	5	N	NI
6. Epilobium ciliatum	<5	N	FACW-
7. Juncus balticus	<5	N	FACW+
8. Potentilla anserina	<5	N	OBL
9.			
10.			
11.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: —)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 10-15%

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:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks: moss = 50%

SOIL

Sampling Point: SP - 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-21	2.5Y 3/2		5YR 4/4	5	C	M	Sand	
21-23	Gley1 2.5/N		—				Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes X No ___ Depth (inches): 19"

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 11"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silver Reef Casino Mitigation Site City/County: Whatcom County Sampling Date: 6/1/2011

Applicant/Owner: Silver Reef Casino / Lummi Nation State: WA Sampling Point: SP-8

Investigator(s): Suzanne Anderson, Stephanie Smith, Frank Lawrence, Monika Lange Section, Township, Range: Section 14 / T 38 N / R 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: N48.7897 Long: W-122.6608 Datum: _____

Soil Map Unit Name: Eliza silt loam, drained, 0 to 1 percent slopes NWI classification: Not listed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No 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 X No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: —)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Agrostis stolonifera	30	Y	FAC
2. Trifolium pratense	20	Y	FACU
3. Trifolium repens	10	N	FAC
4. Tanacetum vulgare	5	N	NI
5. Vicia sp.	<5	N	
6. Holcus lanatus	TR	N	FAC
7.			
8.			
9.			
10.			
11.			
	65 = Total Cover		
Woody Vine Stratum (Plot size: —)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 25%

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:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks: moss = < 5%

SOIL

tide mostly out @ site @ 3pm

Sampling Point: SP - 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 2/1	40	—				Coase sand	
18-20	Gley1 3/N		—				Sandy clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 18-19"

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silver Reef Casino Mitigation Site City/County: Whatcom County Sampling Date: 6/1/2011

Applicant/Owner: Silver Reef Casino / Lummi Nation State: WA Sampling Point: SP - 9

Investigator(s): Suzanne Anderson, Stephanie Smith, Frank Lawrence, Monika Lange Section, Township, Range: Section 14 / T 38 N / R 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: N48.7897 Long: W-122.6608 Datum: _____

Soil Map Unit Name: Eliza silt loam, drained, 0 to 1 percent slopes NWI classification: Not listed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No 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 X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: —)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Bromus hordeaceus ssp.	40	Y	UPL
2. Agrostis capillaris	25	Y	FAC
3. Juncus balticus	25	Y	FACW+
4. Vicia sp.	TR	N	
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: —)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (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:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks: 15% moss

SOIL

tide fully out 3:30pm

Sampling Point: SP - 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2		7.5YR 4/6	5	C	M/PL	loamy clay	
5-20	Gley 1 3/N		7.5YR 4/6	10	C	M/PL	sandy clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks: soil was very compacted at ~6" depth

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes X No ___ Depth (inches): 20"

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 10"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silver Reef Casino Mitigation Site City/County: Whatcom County Sampling Date: 6/1/2011

Applicant/Owner: Silver Reef Casino / Lummi Nation State: WA Sampling Point: SP - 100

Investigator(s): Suzanne Anderson, Stephanie Smith, Frank Lawrence, Monika Lange Section, Township, Range: Section 14 / T 38 N / R 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: N 48.7897 Long: W -122.6608 Datum: _____

Soil Map Unit Name: Eliza silt loam, drained, 0 to 1 percent slopes NWI classification: Not listed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No 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 X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 5' radius)			
1. Salix sitchensis	25	Y	FACW
2. Salix lucida	15	Y	FACW+
3. Spiraea douglasii	15	Y	FACW
4. Populus balsamifera	<5	N	FAC
5. Alnus rubra (edge of plot)	TR	N	FAC
	55 = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Juncus balticus	30	Y	FACW+
2. Potentilla anserina	30	Y	OBL
3. Equisetum arvense	10	N	FAC
4. Veronica americana	10	N	OBL
5. Carex Lyngbyei	5	N	OBL
6.			
7.			
8.			
9.			
10.			
11.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: —)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 30%.

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (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:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

moss = 5%

Some pond scum

SOIL

Sampling Point: SP - 100

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	Gley1 2.5/N		2.5Y 4/4	5	C	M/PL	claysand	
5-20	Gley1 2.5/N		—				sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes X No _____ Depth (inches): 6"

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): surface

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silver Reef Casino Mitigation Site City/County: Whatcom County Sampling Date: 6/1/2011

Applicant/Owner: Silver Reef Casino / Lummi Nation State: WA Sampling Point: SP - 101

Investigator(s): Suzanne Anderson, Stephanie Smith, Frank Lawrence, Monika Lange Section, Township, Range: Section 14 / T 38 N / R 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: N 48.7897 Long: W -122.6608 Datum: _____

Soil Map Unit Name: Eliza silt loam, drained, 0 to 1 percent slopes NWI classification: Not listed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No 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 X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 5' radius)			
1. Alnus rubra	5	Y	FAC
2.			
3.			
4.			
5.			
	5 = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Juncus balticus	30	Y	FACW+
2. Cirsium arvense	25	Y	FACU+
3. Vicia sp.	(25)	N	—
4. Bromus hordeaceus	10	N	UPL
5. Juncus effusus	5	N	FACW
6. Lactuca serriola	5	N	NL
7. Phalaris arundinacea	TR	N	FACW
8.			
9.			
10.			
11.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: —)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (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:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: SP - 101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/1		7.5YR 4/6	5	C	M/PL	Sandy clay loam	
8-15	10YR 3/1		—				Sand	
15-20	Gley1 2.5/N		—				very fine sand w/ slight clay component	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks: upper & middle layers have clay peds

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: moist at 20"

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silver Reef Casino Mitigation Site City/County: Whatcom County Sampling Date: 6/1/2011

Applicant/Owner: Silver Reef Casino / Lummi Nation State: WA Sampling Point: SP - 102

Investigator(s): Suzanne Anderson, Stephanie Smith, Frank Lawrence, Monika Lange Section, Township, Range: Section 14 / T 38 N / R 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: N 48.7897 Long: W -122.6608 Datum: _____

Soil Map Unit Name: Eliza silt loam, drained, 0 to 1 percent slopes NWI classification: Not listed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No 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 X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 5' radius)			
1. Alnus rubra	TR	N	FAC
2.			
3.			
4.			
5.			
	TR = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Holcus lanatus	30	Y	FAC
2. Phalaris arundinacea	30	Y	FACW
3. Agrostis capillaris	25	Y	FAC
4. Festuca arundinacea	15	N	FAC-
5. Bromus hordeaceus ssp.	5	N	UPL
6. Poa pratensis	5	N	FAC
7. Epilobium ciliatum	TR	N	FACW-
8. Vicia sp.	TR	N	—
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: —)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum moss = 50%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (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:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: SP - 102

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1		5YR 4/4	2	C	PL	sand	
12-17	Gley 1 2.5/N		10YR 4/4	5	C	M/PL	silty sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 16"

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silver Reef Casino Mitigation Site City/County: Whatcom County Sampling Date: 6/2/2011

Applicant/Owner: Silver Reef Casino / Lummi Nation State: WA Sampling Point: SP - 10

Investigator(s): Suzanne Anderson, Stephanie Smith, Frank Lawrence, Monika Lange Section, Township, Range: Section 14 / T 38 N / R 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: N 48.7897 Long: W -122.6608 Datum: _____

Soil Map Unit Name: Eliza silt loam, drained, 0 to 1 percent slopes NWI classification: Not listed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No 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 X No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: —)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Agrostis stolonifera	20	Y	FAC
2. Holcus lanatus	10	Y	FAC
3. Bromus hordeaceus ssp.	5	Y	UPL
4. Tanacetum vulgare	(5)	N	NI
5. Epilobium ciliatum	TR	N	FACW-
6. Spergula arvensis	TR	N	NL
7. Trifolium repens	TR	N	FAC
8. Vicia sp.	TR	N	—
9.			
10.			
11.			
	35 = Total Cover		
Woody Vine Stratum (Plot size: —)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 50 %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (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:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks: moss = 20%

SOIL

Sampling Point: SP - 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-24	10YR 3/1		7.5YR 4/4	<1	C	M	sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): 19"

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): 15"

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silver Reef Casino Mitigation Site City/County: Whatcom County Sampling Date: 6/2/2011

Applicant/Owner: Silver Reef Casino / Lummi Nation State: WA Sampling Point: SP - 11

Investigator(s): Suzanne Anderson, Stephanie Smith, Frank Lawrence, Monika Lange Section, Township, Range: Section 14 / T 38 N / R 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: N48.7897 Long: W-122.6608 Datum: _____

Soil Map Unit Name: Eliza silt loam, drained, 0 to 1 percent slopes NWI classification: Not listed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No 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 X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: —)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Poa pratensis	25	Y	FAC
2. Holcus lanatus	15	Y	FAC
3. Trifolium repens	15	Y	FAC
4. Agrostis stolonifera	10	N	FAC
5. Bromus hordeaceus ssp.	10	N	UPL
6. Trifolium pratense	10	N	FACU
7. Tanacetum vulgare	<5	N	NI
8. Epilobium ciliatum	TR	N	FACW-
9. Rumex Crispus	TR	N	FAC+
10. Stellaria media	TR	N	FACU
11.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: —)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 15%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (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:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks: moss = 25%

SOIL

Sampling Point: SP - 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-22	2.5Y 3/1		5YR 4/4	2	C	M/PL	sand	
22-26	2.5Y 3/2		5YR 4/4	2	C	PL	silty fine sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes X No _____ Depth (inches): 26"

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 22"

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silver Reef Casino Mitigation Site City/County: Whatcom County Sampling Date: 6/2/2011

Applicant/Owner: Silver Reef Casino / Lummi Nation State: WA Sampling Point: SP - 12

Investigator(s): Suzanne Anderson, Stephanie Smith, Frank Lawrence, Monika Lange Section, Township, Range: Section 14 / T 38 N / R 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: N 48. 7897 Long: W-122. 6608 Datum: _____

Soil Map Unit Name: Eliza silt loam, drained, 0 to 1 percent slopes NWI classification: Not listed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No 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 X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: —)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Holcus lanatus	20	Y	FAC
2. Trifolium repens	20	Y	FAC
3. Agrostis stolonifera	15	Y	FAC
4. Hypochaeris radicata	10	N	FACU
5. Trifolium pratense	10	N	FACU
6. Bromus hordeaceus ssp. hordeaceus	5	N	UPL
7. Juncus balticus	5	N	FACW+
8. Poa pratensis	5	N	FAC
9. Stellaria media	5	N	FACU
10.			
11.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: —)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 5 %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (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:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks: moss = <5%

SOIL

Sampling Point: SP - 12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	2.5Y 4/2		5YR4/6	1-2	C	PL	fine sand	
9-17	2.5 Y 4/2		5YR 4/6	5	C	M/PL	coarse sand	
17-24	10YR 3/1	50	—				coarse sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks: Color in lower layer is highly variable due to high sand content.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes X No ___ Depth (inches): 22"

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 15"

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silver Reef Casino Mitigation Site City/County: Whatcom County Sampling Date: 6/2/2011

Applicant/Owner: Silver Reef Casino / Lummi Nation State: WA Sampling Point: SP - 13

Investigator(s): Suzanne Anderson, Stephanie Smith, Frank Lawrence, Monika Lange Section, Township, Range: Section 14 / T 38 N / R 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: N 48. 7897 Long: W -122.6608 Datum: _____

Soil Map Unit Name: Eliza silt loam, drained, 0 to 1 percent slopes NWI classification: Not listed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No 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 X No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: —)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Poa pratensis	40	Y	FAC
2. Agropyron repens	15	N	FAC-
3. Trifolium pratense	15	N	FACU
4. Holcus lanatus	10	N	FAC
5. Lactuca serriola	5	N	NL
6. Trifolium repens	5	N	FAC
7. Vicia sp.	TR		—
8.			
9.			
10.			
11.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: —)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 5 %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (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:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks: moss = <5%.

SOIL

Sampling Point: SP - 13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-17	10YR 3/1	60	—				medium fine sand	
17-23	5Y 2.5/1		7.5YR 4/4	2	C	M	coarse sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes X No _____ Depth (inches): 22"

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 18"

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silver Reef Casino Mitigation Site City/County: Whatcom County Sampling Date: 6/2/2011

Applicant/Owner: Silver Reef Casino / Lummi Nation State: WA Sampling Point: SP - 14

Investigator(s): Suzanne Anderson, Stephanie Smith, Frank Lawrence, Monika Lange Section, Township, Range: Section 14 / T 38 N / R 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: N48.7897 Long: W -122.6608 Datum: _____

Soil Map Unit Name: Eliza silt loam, drained, 0 to 1 percent slopes NWI classification: Not listed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No 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 X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: —)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Poa pratensis	40	Y	FAC
2. Agropyron repens	10	N	FAC-
3. Bromus hordeaceus ssp. hordeaceus	10	N	UPL
4. Juncus balticus	5	N	FACW+
5. Trifolium repens	5	N	FAC
6. Cirsium arvense	<5	N	FACU+
7. Trifolium pratense	<5	N	FAC
8.			
9.			
10.			
11.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: 5' radius)			
1. Rubus armemacus	<5	N	FACU
2.			
	<5 = Total Cover		

% Bare Ground in Herb Stratum trace

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (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:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

moss = <5%.

vegetation debris from last year = 30%.

SOIL

Sampling Point: SP - 14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10yr 3/2		—				loamy sand w/ roots	
9-13	2.5Y 3/1		5yr 4/6	2	C	M/PL	medium sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes X No _____ Depth (inches): 23"

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 13"

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silver Reef Casino Mitigation Site City/County: Whatcom County Sampling Date: 6/2/2011

Applicant/Owner: Silver Reef Casino / Lummi Nation State: WA Sampling Point: SP - 15

Investigator(s): Suzanne Anderson, Stephanie Smith, Frank Lawrence, Monika Lange Section, Township, Range: Section 14 / T 38 N / R 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: N 48.7897 Long: W -122.6608 Datum: _____

Soil Map Unit Name: Eliza silt loam, drained, 0 to 1 percent slopes NWI classification: Not listed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No 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 X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: —)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Poa pratensis	60	Y	FAC
2. Juncus balticus	15	N	FACW+
3. Lactuca serriola	5	N	NL
4. Phalaris arundinacea	<5	N	FACW
5. Potentilla anserina	<5	N	OBL
6. Epilobium ciliatum	TR	N	FACW-
7. Festuca arundinacea	TR	N	FAC-
8. Holcus lanatus	TR	N	FAC
9. Trifolium pratense	TR	N	FACU
10. Vicia sp	TR	N	–
11.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: 5' radius)			
1. Rubus armeniacus	<5	N	FACU
2.			
	<5 = Total Cover		

% Bare Ground in Herb Stratum trace

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (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:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

moss = trace

vegetation debris from last year = 30%

SOIL

Sampling Point: SP - 15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	2.5Y 2.5/1		5YR 4/4	2-5	C	M/PL	medium sand	
12-24	Varied color		—				course sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes X No ___ Depth (inches): 19"

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 10"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silver Reef Casino Mitigation Site City/County: Whatcom County Sampling Date: 6/2/2011

Applicant/Owner: Silver Reef Casino / Lummi Nation State: WA Sampling Point: SP - 16

Investigator(s): Suzanne Anderson, Stephanie Smith, Frank Lawrence, Monika Lange Section, Township, Range: Section 14 / T 38 N / R 1E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): A Lat: N48.7897 Long: W-122.6608 Datum: _____

Soil Map Unit Name: Eliza silt loam, drained, 0 to 1 percent slopes NWI classification: Not listed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No 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 X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: —)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: —)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Poa pratensis	40	Y	FAC
2. Festuca arundinacea	15	Y	FAC-
3. Holcus lanatus	15	Y	FAC
4. Agrostis gigantea	10	N	FAC
5. Hypochaeris radicata	10	N	FACU
6. Agrostis stolonifera	5	N	FAC
7. Rumex crispus	5	N	FAC+
8. Epilobium ciliatum	TR	N	FACW-
9. Phalaris arundinacea	TR	N	FACW
10. Trifolium pratense	TR	N	FACU
11. Vicia sp.	TR	N	—
	100 = Total Cover		
Woody Vine Stratum (Plot size: —)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 5%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (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:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks: vegetation debris (dead) = 35%

SOIL

Sampling Point: SP - 16

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10yR 4/1		7.5yR 4/4	2	C	M/PL	Silty Fine Sand	
8-26	Varied color						coarse sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___

Water Table Present? Yes X No ___ Depth (inches): 30"

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 13"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix D—Photolog

Appendix D—Photolog

Looking west from eastern end of the mitigation area at the high saltmarsh community.

Looking east from central portion of the mitigation area – note the Baltic rush/Pacific silver weed high saltmarsh community

Appendix D—Photolog

Looking east/southeast from central/eastern end of the mitigation area. Note the low saltmarsh community dominated by alkali bulrush in the foreground, and the mudflat behind.

Looking east/northeast from central portion of the mitigation area. Note the transition from the low saltmarsh (lighter green alkali bulrush) to the high saltmarsh (darker green Baltic rush) community

Appendix D—Photolog

Looking east/southeast from western end of the mitigation area, with a high saltmarsh community in the foreground.

Looking west/southwest from southeast corner of the mitigation area. Note the vegetated mud flat in the center of the photo.

Appendix D—Photolog

Looking south from eastern end of the mitigation area. Interior of flags (in the center of the photo) is upland (in the vicinity of SP 15), likely caused by former access/construction road.

Looking east from northwest corner of the mitigation area. The central portion of photo is the wrack/debris line deposited during winter storms, near the former access road that delimits the northern project and wetland boundary .

Appendix D—Photolog

Looking east/southeast from northwest corner of the mitigation area. Note the transition from the high salt marsh (dark green Baltic rush), to the low salt marsh (lighter green alkali bulrush), to the mud flat.

Looking east from the southwest corner of the mitigation area.

Looking west along the dike (sea wall) and slough along the southeast corner of the mitigation area - the mitigation area is in the center and right side of the photo.

Appendix E—Wetland Rating Form and WSDOT BPJ

Wetland name or number: A

WETLAND RATING FORM - WESTERN WASHINGTON

Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): Silver Reef Casino Wetland Mitigation Area Date of site visit: 6/1/11

Rated by : S. Anderson & S. Smith Trained by Ecology? Yes ☑ No ☐ Date: 11/1/06

SEC: 14 TWNSHP: 38N RNGE: 1E Is S/T/R in Appendix D? Yes ☐ No ☑

Map of wetland unit: Figure 2 **Estimated size: 14.2 acres**

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I ☐ **II** ☐ **III** ☐ **IV** ☐

Category I = Score >=70	Score for Water Quality Functions	
Category II = Score 51-69	Score for Hydrologic Functions	
Category III = Score 30-50	Score for Habitat Functions	
Category IV = Score <30	**TOTAL score for functions**	

Category based on SPECIAL CHARACTERISTICS of wetland

I ☑ **II** ☐ **Does not Apply** ☐

Final Category **(choose the "highest" category from above)** **I**

Check the appropriate type and class of wetland being rated.

Wetland Type	
Estuarine	☑
Natural Heritage Wetland	☐
Bog	☐
Mature Forest	☐
Old Growth Forest	☐
Coastal Lagoon	☐
Interdunal	☐
None of the above	☐

Wetland Class	
Depressional	☐
Riverine	☐
Lake-fringe	☐
Slope	☐
Flats	☐
Freshwater Tidal	☐
Check if multiple HGM classes are present	☐

Comments:

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below, you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Special Protection (in addition to the protection recommended for its category)		YES	NO
SP1.	*Has the wetland unit been documented as a habitat for any federally listed Threatened or Endangered (T/E)* ***plant or animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.	☐	☑
SP2.	*Has the wetland unit been documented as habitat for any state listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands.	☐	☑
SP3.	*Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*	☐	☑
SP4.	*Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.	☐	☑

To complete the next part of the data sheet, you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Vegetated Wetlands in Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, indentify which hydrologic criteria in questions 1-7 apply and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e., except during floods)?

☐ NO - go to 2 ☑ YES - the wetland class is **Tidal Fringe**

If YES, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

☐ YES - **Freshwater Tidal Fringe** ☑ NO - **Saltwater Tidal Fringe (Estuarine)**

If your wetland can be classified as a Freshwater Tidal Fringe, use the forms for Riverine wetlands. If it is Saltwater Tidal Fringe, it is rated as an Estuarine wetland. Wetlands that were called estuarine in the first and second editions of the rating system are called Saltwater Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is being kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. xx).

2. The entire wetland unit is flat and precipitation is only source (>90%) of water to it. Groundwater and surface

☐ NO - go to 3 ☐ YES - the wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?

☐ The vegetated part of the wetland is on the shores of a body of open water (without any vegetation on the surface) where at least 20 acres (8 ha) are permanently inundated (ponded or flooded);

☐ At least 30% of the open water area is deeper than 6.6 feet (2 m)?

☐ NO - go to 4 ☐ YES - the wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland unit **meet all** of the following criteria?

☐ The wetland is on a slope (*slope can be very gradual*).

☐ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.

☐ The water leaves the wetland **without being impounded.**

NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 feet in diameter and less than 1 foot deep).*

☐ NO - go to 5 ☐ YES - the wetland class is **Slope**

5. Does the entire wetland unit **meet all** of the following criteria?

☐ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river.

☐ The overbank flooding occurs once every two years.

☐ NO - go to 6 ☐ YES - the wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time of the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

☐ NO - go to 7 ☐ YES - the wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no stream or river running through it and providing water? The wetland seems to be maintained by higher ground water in the area. The wetland may be ditched, but has no obvious natural outlet.

☐ NO - go to 8 ☐ YES - the wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide.) Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the second class is less than 10% of the unit, classify the wetland using the class that represents more than 90% of the total area.

HGM Classes Within a Delineated Wetland Boundary	***Class to Use in Rating***	
Slope + Riverine	Riverine	☐
Slope + Depressional	Depressional	☐
Slope + Lake-fringe	Lake-fringe	☐
Depressional + Riverine along stream within boundary	Depressional	☐
Depressional + Lake-fringe	Depressional	☐
Saltwater Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics	☑

If you are unable still to determine which of the above criteria apply to your wetland, or you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and choose the appropriate answers and

Wetland Type *Check off any criteria that apply to the wetland. Check the appropriate Category when the appropriate*	**Category**
SC 1.0 **<u>Estuarine Wetlands</u>** ***(see p. 86)*** Does the wetland unit meet the following criteria for Estuarine wetlands? ☑ The dominant water regime is tidal, ☑ Vegetated, and ☑ With a salinity greater than 0.5 ppt. ☑ YES - *Go to SC 1.1* ☐ NO - not an estuarine wetland	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary ☐ YES = **Category I** ☑ NO = *Go to SC 1.2*	
SC 1.2 Is the wetland unit at least 1 acre in size and meeting at least two of the following three ☑ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, ☐ At least 3/4 of the landward edge of the wetland has a 100 foot buffer of shrub, forest, ☑ The wetland has at least two of the following features: tidal channels, depressions ☑ YES = **Category I** ☐ NO = **Category II**	**I**

		Category
SC 2.0	**<u>Natural Heritage Wetlands</u>** ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage	
SC 2.1	Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? (This question is used to screen out most sites before you need to contact WNHP/DNR.) S/T/R information from Appendix D ☐ or accessed from WNHP/DNR web site ☐ ☐ YES - contact WNHP/DNR *(see p. 79)* and *go to SC 3.2* ☐ NO	
SC 2.2	Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state Threatened or Endangered plant species? ☐ YES = **Category I** ☐ NO - not a Heritage wetland	
SC 3.0	**<u>Bogs</u>** ***(see p. 87)*** Does the wetland unit (or any part of the unit) meet both the criteria for soils and vegetations 1. Does the unit have organic soil horizons (i.e., layers of organic soil), either peats or ☐ YES - *go to Q. 3* ☐ NO - *go to Q. 2* 2. Does the unit have organic soils, either peats or mucks, that are <16 inches deep over ☐ YES - *go to Q. 3* ☐ NO - not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other ☐ YES - is a bog for purpose of rating ☐ NO - *go to Q. 4* NOTE: If you are uncertain about the extent of mosses in the understory 4. Is the unit forested (>30% cover) with sitka spruce, subalpine fir, western redcedar, ☐ YES = **Category I** ☐ NO - not a bog for purpose of rating	

SC 4.0 **Forested Wetlands** ***(see p. 90)***	**Category**
Does the wetland unit have at least 1 acre of forest that meets one of these criteria for the ☐ **Old-growth forests**: (west of Cascade Crest) Stands of at least 2 tree species, NOTE: The criterion for dbh is based on measurements for upland ☐ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 - ☐ YES = **Category I** ☐ NO - not a forested wetland w/ special characteristics	
SC 5.0 **Wetlands in Coastal Lagoons** ***(see p. 91)*** Does the wetland meet all of the following criteria of a wtland in a coastal lagoon? ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, ☐ The lagoon in which the wetland is located contains surface water that is saline or ☐ YES = *go to SC 5.1* ☐ NO - not a wetland in a coastal lagoon SC 5.1 Does the wetland meet all of the following 3 conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). ☐ At least 3/4 of the landward edge of the wetland has a 100 foot buffer of shrub, forest, or ungrazed or unmowed grassland. ☐ The wetland is larger than 1/10 acre (4,350 square feet). ☐ YES = **Category I** ☐ NO = **Category II**	

SC 6.0 **Interdunal Wetlands** ***(see p. 93)***	**Category**
Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ☐ YES - *go to SC 6.1* ☐ NO - not an interdunal wetland for rating ***If you answer Yes, you will still need to rate the wetland based on its functions.*** In practical terms, that means the following geographic areas: • Long Beach Peninsula - lands west of SR 103 • Grayland-Westport - lands west of SR 105 • Ocean Shores-Copalis - lands west of SR 1115 and SR 109. SC 6.1 Is wetland 1 acre or larger, or is it in a mosaic of wetlands that is 1 acre or larger? ☐ YES = **Category II** ☐ NO - *go to SC 6.2* SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 ☐ YES = **Category III**	
Category of wetland based on Special Characteristics Choose the "highest" rating if wetland falls into several categories, and record on p. 1. If you answered NO for all types, enter "Not Applicable" on p. 1.	**I**

Wetland Functions and Values Summary Form - WSDOT's BPJ Characterization

Wetland I.D. Wetland A Project: Silver Reef Casino Mitigation Site Assessed by: S. Anderson and S. Smith

Cowardin Class: Estuarine Intertidal Emergent Ecology Category: I Local Rating: 1 Wetland Size: 14.2 acres Date: 6/1/2011

Function/Value	Occurrence Y	Occurrence N	Rationale	Principal Function(s)	Comments
Flood Flow Alteration	Y		The wetland is relatively flat and receives floodwater from adjacent stream.	N	Wetland is located in the lower portion of watershed and is tidally influenced; however, its ability to provide flood storage is relatively small compared to the upstream watershed or the Bay
Sediment Removal	Y		Dense herbaceous vegetation, slow moving water, sediment sources upstream	Y	Due to tidal action, periods of still water are limited, and there is little or no ponding in wetland at low tide.
Nutrient & Toxicant Removal	Y		Sources of excess nutrients and toxicants upstream, dense herbaceous vegetation, bi-daily tidal flooding	Y	Although wetland lacks long duration water detention, it has slow moving water at high tide and dense herbaceous vegetation
Erosion Control & Shoreline Stabilization	Y		Dense herbaceous vegetation and limited signs of erosion	Y	Has medium opportunity during tidal flows and winter storms/
Production of Organic Matter and its Export	Y		Dense herbaceous vegetation and bi-daily tidal flooding/flushing	Y	
General Habitat Suitability	Y		Buffer to north not developed or in use, high plant species diversity, SS, EM and AB Cowardin classes, observed wildlife	Y	Adjacent land uses consists of farmland and gravel road to west. Deer, coyote, river otter, fish, and numerous bird species observed.
Habitat for Aquatic Invertebrates	Y		Little permanent ponded water associated with wetland.	N	Adjacent slough system and pond provide freshwater invertebrate habitat.
Habitat for Amphibians		N	Limited due to lack of ponded freshwater	N	Wetland provides vegetation and structural complexity for adults, but does not provide areas for breeding.
Habitat for Wetland-Associated Mammals	Y		Permanent water adjacent to wetland	Y	Evidence of use by wildlife as noted by tracks, scat and biologist observation.

Adapted from: *Washington State Department of Transportation Wetland Functions Characterization Tool for Linear Projects* (W. Null, G. Skinner, and W. Leonard, WSDOT June, 2000)

Habitat for Wetland-Associated Birds	Y		Presence of shallow open water, emergent vegetation, forested and scrub-shrub in buffer, mud flats, relatively undisturbed grasslands in buffer.	Y	Numerous bird species have been observed by biologists while on site.
General Fish Habitat	Y		Twice daily tidal connection to fish-bearing water body.	Y	Fish have been observed by biologists while on site.
Native Plant Richness	Y		Native plants dominate the wetland.	N	Does not contain 3 or more strata of vegetation, does not have mature trees.
Educational or Scientific Value		N	No documented scientific or educational use.	N	Lacks parking for easy public access.
Uniqueness and Heritage		N	Does not contain document occurrence of state or federally listed species, no designated by National Parks Service.	N	Wetland is part of an estuary.

Appendix F—Aerial Photo Progression

Figure 1—Future Silver Reef Casino (Lummi Nation) Wetland Mitigation Site: December 22, 2000

Figure 2—Future Silver Reef Casino (Lummi Nation) Wetland Mitigation Site: May 30, 2001

Figure 3—Silver Reef Casino (Lummi Nation) Wetland Mitigation Site: February 21, 2004

Figure 4—Silver Reef Casino (Lummi Nation) Wetland Mitigation Site: May 15, 2008

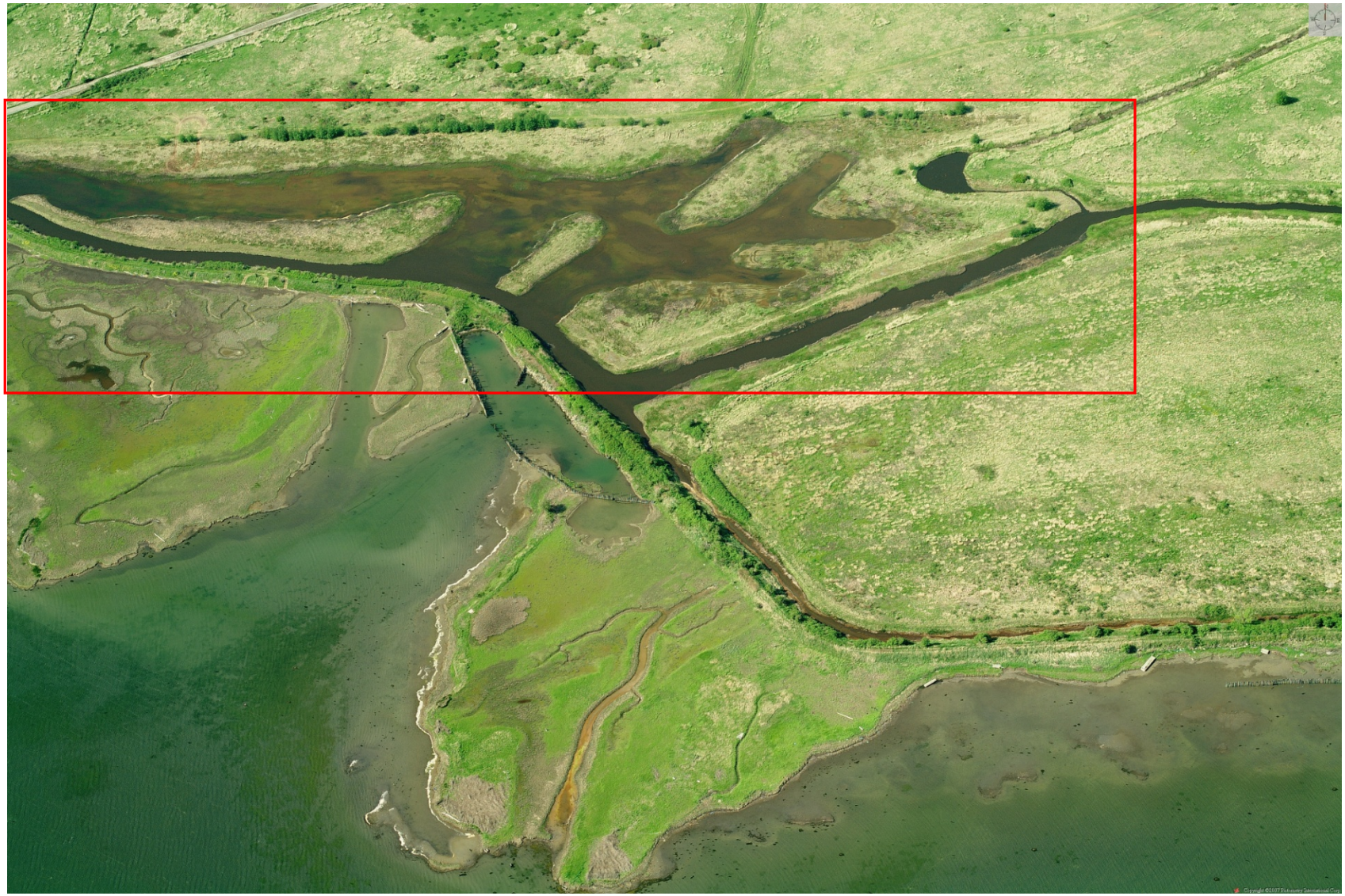


Figure 5—Silver Reef Casino (Lummi Nation) Wetland Mitigation Site: May 15, 2008

Figure 6—Silver Reef Casino (Lummi Nation) Wetland Mitigation Site: March 21, 2010

Figure 7—Silver Reef Casino (Lummi Nation) Wetland Mitigation Site: August 26, 2011

Figure 8—Silver Reef Hotel, Casino, and Spa impact site prior to construction: July 16, 1998. Note the lack of riparian vegetation along Schell Creek located along the eastern boundary of the site.

Figure 9— Silver Reef Hotel, Casino, and Spa impact site post-construction: August 26, 2011. Note the improved riparian corridor along Schell Creek located along the eastern boundary of the site.