WETLAND DELINEATION REPORT
MOUNT SPOKANE SKI AND SNOWBOARD PARK
PROPOSED EXPANSION AREA

PREPARED FOR:

Mount Spokane 2000
29500 North Mount Spokane Drive
Mead, WA 99021
Contact: Brad McQuarrie
509-238-2220

PREPARED BY:

ICF International
317 SW Alder Street, Suite 200
Portland, OR 97205
Contact: Matt Kuziensky
503-525-6162

ICF Project No. 00353.13

March 2014

ICF International. 2014. *Wetlands Delineation Report: Mount Spokane Ski and Snowboard Park Proposed Expansion Area.* March. (ICF 00353.13) Seattle, WA. Prepared for Mt. Spokane 2000, Mead, WA.

Contents

Tables

Figures

Report figures follow Section 10.0 - References

Appendices

Acronyms and Abbreviations

CAO	Critical Areas Ordinance
CFR	Code of Federal Regulations
cfs	cubic foot per second
Corps	Seattle District, Regulatory Branch of the U.S. Army Corps of Engineers
CWA	Clean Water Act
Department	Spokane County Building and Planning Department
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
FEIS	Final Environmental Impact Statement
FAC	facultative wetland
FACW	facultative wet
FACU	facultative upland
HGM	hydrogeomorphic
HPA	Hydraulic Project Approval
ICF	ICF International
JARPA	Joint Aquatic Resources Permit Application
MFP	Master Facilities Plan
MSSSP	Mount Spokane Ski and Snowboard Park
NEPA	National Environmental Policy Act
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
NWP	Nationwide permits
OBL	obligate
OHWM	Ordinary High Water Mark
PASEA	Potential Alpine Ski Expansion Area
PIP	Perennial Initiation Point
PWS	Professional Wetland Scientist
SCC	Spokane County Code
SEIS	Supplemental Environmental Impact Statement
SEPA	Washington State Environmental Policy Act
TES	Towey Ecological Services
UPL	upland
U.S.	United States
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources

1.0 Introduction

ICF International (ICF) was retained by Mount Spokane 2000 (MS 2000) to complete a wetland delineation for a proposed ski area expansion site (project site) at the Mount Spokane Ski and Snowboard Park (MSSSP) in Spokane County, Washington (Figure 1). The purpose of this study is to provide additional information on the wetlands and non-wetland other waters of the project site to address questions raised by the Spokane County Hearing Examiner during the April 9, 2013 appeal hearing that led to the revocation of the project's Timber Harvest Permit and Administrative Decision under the Spokane County Critical Areas Ordinance (CAO).

This report is intended to provide a thorough and complete analysis of the wetland and water resources present on the project site per the requirements of Appendix F of the Spokane County CAO, as referenced in Spokane County Code (SCC) Section 11.20.090.F. It provides the professional qualifications of the delineators, presents a brief overview of the project background, describes the existing site conditions (i.e., project setting), summarizes the methods used to complete the delineation, and discusses the results of the wetland delineation fieldwork performed on the project site between July 29 and August 1, 2013. It also provides the results of the wetland functions assessment, describes the associated buffers required under the Spokane County CAO, and recommends measures to reduce proposed project encroachments into wetlands and their buffers.

2.0 Professional Qualifications

This wetland delineation was performed by Mr. William Granger of Re-Align Environmental and Mr. Matthew Kuziensky of ICF. The professional qualifications of each of these individuals are summarized in the following sections.

Mr. William Granger is the sole proprietor of Re-Align Environmental, a natural resource consulting firm that specializes in strategic environmental analysis, environmental permitting, and implementation planning. He is a Professional Wetland Scientist (PWS) with over 20 years of experience in wetland ecology, delineation, environmental permitting, and mitigation/restoration and has worked on projects throughout the United States and Canada, including multiple ski area planning projects in Washington, Oregon, and California. Bill specializes in leading interdisciplinary teams in complex environmental analyses for land management and development projects on U.S. Forest Service and other federal lands. He has extensive and varied experience with Section 404 of the Clean Water Act (CWA), the National Environmental Policy Act (NEPA), and the Endangered Species Act (ESA), as well as multiple local and state environmental regulations. Prior to starting his own company, Bill worked for over 15 years as a Principal and Senior Environmental Manager for SE Group, a planning and design firm devoted to the mountain resort industry. Beginning with his tenure at SE Group and continuing on with his own firm, he has been involved with the proposed Mount Spokane Ski and Snowboard Park expansion project for the past 10 years and conducted the preliminary wetland and stream mapping work for the site in 2009.

Mr. Matt Kuziensky is a Senior Wetland Scientist with ICF and a certified PWS. He has more than 20 years of experience in regulatory compliance, project permitting, wetland delineation, functional assessment, mitigation planning, and mitigation monitoring. He has managed a wide array of wetland and natural resource-related projects throughout the Pacific Northwest and in other

regions of the United States and Canada. Matt's regulatory experience includes Section 404 of the CWA, the Oregon Removal-Fill Law, Section 10 of the Rivers & Harbors Act of 1899, and NEPA, as well as various regional and local regulations in Oregon and Washington. He has worked for ICF since 2000 and has performed numerous wetlands delineations, permitting documents, and mitigation plans for a wide variety of projects in the Pacific Northwest, Great Plains, and Midwestern regions of the United States including residential/commercial developments, landfills, recreational facilities, mining operations, utility installations, and transportation projects. Prior to joining ICF, Matt worked as a field biologist and project manager for the Regulatory Branch of the U.S. Army Corps of Engineers, Louisville District. While in that position, he received extensive training in federal wetland regulations, wetland delineation, mitigation planning, and wetland functional assessment.

3.0 Project Location and Description

The MSSSP is located in the northern portion of Mount Spokane State Park[1] (Figure 1) and consists of a 1,425 acre area that is managed and operated by MS 2000, a community-based non-profit organization, under a long-term concession agreement with the Washington State Parks and Recreation Commission (Washington State Parks). Of this 1,424 acre area, approximately 575 acres on the southeastern exposure of the mountain accommodates the existing ski area, which includes 32 established ski runs, 5 chairlifts, 2 lodges (including restaurant, lounge, ski school, and equipment rental facility), a ski patrol building, and various administrative support structures (Figure 2). The remaining 850 acres of the MSSSP are undeveloped for alpine ski use and designated by Washington State Parks as the Potential Alpine Ski Expansion Area (PASEA).

The 279 acre project site addressed in this report is located in the southern portion of the PASEA on the northwestern exposure of Mount Spokane (Figure 2). Specific location information for the project site is as follows:

City/County/State:	Approximately 25 miles northeast of Spokane in Spokane County, Washington
General Location:	Northeastern portion of Mount Spokane State Park on the northwestern face of Mount Spokane
PLSS:	Portion of Section 16 of Township 28 North, Range 45 East, Willamette Meridian
Tax Parcel(s):	Spokane County Tax Parcels 58160.9001 and 58090.9001
Latitude/Longitude:	47.925308° N / -117.121048° W (approximate center of site)
Approximate Area:	279 acres
Zoning:	Rural Conservation (RCV)

[1] Mount Spokane State Park is the largest state park in Washington at approximately 13,919 acres (Washington State Parks and Recreation Commission 2013a).

3.1 Proposed Project

The proposed project involves the expansion of the existing alpine ski facilities into a 279 acre portion of the PASEA (Figure 3). Proposed project work includes installation of a new chairlift, including the upper and lower terminal structures and approximately 20 lift towers; construction of seven new ski trails; and installation of associated infrastructure (e.g., utility lines). Construction of these features would require approximately 59.0 acres of clearing and 15.2 acres of grading (SE Group 2013). In addition to the clearing and grading activities, ski trail construction would include edge treatments (i.e., forest edge scalloping and forest edge feathering) in the adjacent forest to reduce the visual and biological effects of trail clearing.

The following section provide a brief overview of the project-related actions to date, including the previous wetland studies conducted on the site.

3.2 Project Background

In August 2010, Washington State Parks adopted a Master Facilities Plan (MFP) for the Mount Spokane State Park, following a multi-year planning process that included the preparation of a Final Environmental Impact Statement (FEIS) under the Washington State Environmental Policy Act (SEPA). The adopted MFP called for additional work on the west side of the mountain in the PASEA to expand existing alpine ski facilities. MS 2000 subsequently submitted technical data regarding its proposed ski area expansion in November 2010 and provided Washington State Parks with a conceptual expansion proposal in December 2010. After evaluation of the technical data and proposal, and following a public comment period, Washington State Parks made a land classification decision for the PASEA in May 2011, allowing for potential expansion pending completion of environmental review pursuant to SEPA. (Washington State Parks and Recreation Commission 2013b)

On April 26, 2012, Washington State Parks released the *Mount Spokane Ski and Snowboard Park Draft Supplemental Environment Impact Statement* (SEIS), which tiered-off the analysis presented in the 2010 FEIS. Following a public review and comment period, the Final SEIS was issued on October 5, 2012. Based on the completion of SEPA review, a final plan of development – identified as Alternate 3 in the Final SEIS – was selected and a detailed development plan was submitted to the Director for review and approval. Alternative 3 called for the construction of a new chairlift, seven new ski trails, and supporting infrastructure, with total ground footprint of approximately 80 acres. The Director approved the final development plan in November 2012 through a formal amendment to the concession agreement between Washington State Parks and MS 2000, pending receipt of all necessary local, state, and federal permits. (Washington State Parks and Recreation Commission 2013b)

On December 26, 2012, MS 2000 filed a timber harvest permit application with the Spokane County Building and Planning Department (Department) to proceed with the tree removal required for implementation of the approved development plan. Among other documents, this application included the submittal of a wetland/streams report and Habitat Management Plan (HMP) prepared by Towey Ecological Services, The application was circulated to pertinent public agencies and department for a 15-day comment period, which included the performance of an Environmental Review based on the SEIS. Following this review period, the Department issued a one-year timber harvest permit for the project on January 15, 2013. This decision was subsequently appealed by The

Lands Council on January 17, 2013, who contended that issuance of the permit violated the Spokane County CAO and that the Department failed to adequately document compliance with the timber harvest permit review and approval standards. (Spokane County Hearing Examiner 2013)

On January 18, 2013, Division II of the State Court of Appeals issued a temporary restraining order that prohibited MS 2000 from engaging in any logging or other ground disturbance within the proposed expansion site. This order was followed by the issuance of an injunction enjoining MS 2000 from engaging in such activities pending the consideration of oral arguments by the court at an April 9, 2013 hearing. (Spokane County Hearing Examiner 2013)

Based on testimony presented during the April 9, 2013 hearing, the Spokane County Hearing Examiner affirmed the appeal brought by The Lands Council and reversed the Department's issuance of the timber harvest permit and its related decisions on the requirements of the CAO. Specifically, the Hearing Examiner found that the timber harvest permit issued by the Department did not comply with Spokane County Code (SCC) section 11.20.060 (Wetlands) or 11.20.070 (Fish & Wildlife Habitat & Species Conservation Areas), and should not have been issued to MS 2000 without significant revisions to the previously submitted wetland/stream report and HMP. Specific criticisms of the Towey Ecological Services wetland report included the lack of adequate field surveys, especially within areas identified as streams, and the discrepancies in reported wetlands between the report and a previous habitat study performed by the Pacific Biodiversity Institute (PBI) in summer 2010. (Spokane County Hearing Examiner 2013)

Finally, on September 17, 2013 the Court of Appeals ruled that an EIS should have been performed on the land classification issue prior to any decision related to an expansion of the ski area. This procedural error in effect reversed Washington State Parks 'earlier decision related to the classification of lands within the PASEA and nullified the decision of the Director to approve the ski area expansion. In essence, the lands in the PASEA are now again considered "unclassified" and are in practice managed as Natural Forest Area (NFA). Therefore, on November 12, 2013 Washington State Parks began scoping an EIS that would correct the aforementioned procedural error by preparing an EIS that addresses the land classification issue (i.e., non-project action) as well as the ski area expansion (i.e., project action) in conjunction with one another. It is intended that this wetland delineation report, and the previously released SEIS related to the project action, would inform the environmental analysis contained within the abovementioned EIS.

4.0 Existing Conditions

Mount Spokane is a conical-shaped mountain located at the southern end of the Selkirk Mountain range near the Washington-Idaho border. With a summit of approximately 5,900 feet above mean sea level, Mount Spokane is the highest point in Spokane County and much of the surrounding area (Spokane County Hearing Examiner 2013). It is located within the Western Selkirk Maritime Forest Level IV ecoregion, which is part of the Northern Rockies Level III ecoregion (U.S. Environmental Protection Agency 2010a). The Northern Rockies ecoregion is mountainous and rugged, with a marine-influenced climate and vegetation despite its inland position (U.S. Environmental Protection Agency 2010b). According McGrath et al. (2002), the Western Selkirk Maritime Forest Level IV ecosystem is an unglaciated area composed primarily of mountain slopes, crests, and ridge tops interspersed with narrow valleys. Elevations typically range from 2,100 to 5,000 feet above mean sea level, with local relief (i.e., difference in elevation) typically varying between 600 and 2,800 feet. The surficial geology is characterized by Quaternary volcanic ash, loess, and colluvium overlying

Cretaceous and Precambrian gneiss, granite, and schist bedrock. Soils are typically classified as Andisols. Mean annual precipitation is 22.5 inches and mean temperatures range from 22 to 35° F in January and 50 to 86° F in July.

The study area is situated on the northwest facing slope of Mount Spokane and has elevations ranging from approximately 5,800 feet above mean sea level near the summit to approximately 4,418 feet above mean sea level at the western edge near the proposed bottom terminal site (Washington State Parks and Recreation Commission 2012). Slopes range from 40 to 60% on higher elevations to relatively flat (<5%) on benched areas. The majority of the drainage from the study area flows toward the west to Blanchard Creek, with a small portion of the site draining to the south to Burping Brook. Blanchard Creek is located within Washington Water Resource Inventory Areas (WRIA) #57 – Middle Spokane River, which corresponds to the U.S. Geological Survey (USGS) Upper Spokane watershed (Hydrologic Unit Code [HUC] 17010305) (U.S. Environmental Protection Agency 2013). Burping Brook is within WRIA #55 – Little Spokane River, which corresponds to the USGS Little Spokane watershed (HUC 17010308).

Land cover in the Western Selkirk Maritime Forest Level IV ecoregion is primarily coniferous forest dominated by Douglas-fir (*Pseudotsuga menziesii*), with co- or sub-dominants of grand fir (*Abies grandis*), western redcedar (*Thuja plicata*), western hemlock (*Tsuga hetrophylla*), western larch (*Larix occidentalis*), ponderosa pine (*Pinus ponderosa*), lodgepole pine (*Pinus contorta*), and subalpine fir (*Abies lasiocarpa*) (McGrath et al. 2002). Of these species, grand fir, western redcedar, western hemlock, and western larch are more common on moist sites, with drier sites occupied by ponderosa pine. Subalpine fir and lodgepole pine are typical at colder, higher elevation sites. More specific vegetation information was collected for the Biological Survey Area[2] by the Pacific Biodiversity Institute (PBI) in summer 2010. During this study, PBI identified 15 plant associations within the boundaries of the study area (Table 1).

4.1 Preliminary Wetland Data Collection

Prior to performing fieldwork, the potential for wetlands and non-wetland other waters to be present in the study area was assessed using the following sources.

- The 1973 (Photorevised 1986) Mount Spokane, Washington-Idaho and 1973 Mount Kit Carson, Washington U.S. Geological Survey (USGS) 7.5 Minute Series Topographic Quadrangles (U.S. Geological Survey 1973a and b).
- An online National Wetland Inventory (NWI) map generated using the U.S. Fish and Wildlife Service (USFWS) Wetland Mapper (U.S. Fish and Wildlife Service 2013).
- The online soils map generated using the Natural Resources Conservation Service (NRCS) Web Soil Survey (National Resources Conservation Service 2013).
- A series of aerial photographs obtained from Google Earth Pro.
- The December 17, 2011 and January 10, 2012 wetland categorization/buffer establishment and stream typing/buffer establishment reports prepared by Towey Ecological Services (Towey Ecological Services 2011 and 2013).

[2] The Biological Survey Area is a subset of the SEIS Analysis Area that includes the majority of the PASEA and the entire wetland delineation study area addressed in this report.

- The 2010 PBI report entitled *Biological Surveys Conducted in the SEIS Analysis Area at Mt. Spokane State Park During 2010* (Morrison and Wooten 2010).

The results of the data review are discussed for each source in the following sections.

Table 1. Primary Plant Association Identified of the Study Area[1].

Common Name	Scientific Name	Map Code
Subalpine fir/Lady fern	*Abies lasiocarpa/Athyrium filix-femina*	ABLA/ATFI
Subalpine fir/Hitchcock's woodrush	*Abies lasiocarpa/Luzula glabrata* ssp. *hitchcockii*	ABLA/LUGLH
Subalpine fir/Fools huckleberry	*Abies lasiocarpa/Menziesia ferruginea*	ABLA/MEFE
Subalpine fir/Thinleaf huckleberry	*Abies lasiocarpa/Vaccinium membranaceum*	ABLA/VAME
Subalpine fir/Carolina bugbane	*Abies lasiocarpa/Trautvetteria caroliniensis*	ABLA/TRCA
Subalpine fir/Bear-grass	*Abies lasiocarpa/Xerophyllum tenax*	ABLA/XETE
Sitka alder/Mesic forb	*Alnus viridis* ssp. *sinuata*/Mesic forb	ALVIS/Mesic Forb
Sitka alder/Triangle-leaf groundsel	*Alnus viridis* ssp. *sinuata/Senecio triangularis*	ALVIS/SETR
Sulfur-flower buckwheat–Green fescue	*Eriogonum umbellatum* var. *majus–Festuca viridula*	ERUMM–FEVI
Green fescue–Idaho fescue	*Festuca viridula–Festuca idahoensis*	FEVI–FEID
Spreading phlox/green fescue–Hound's tongue hawkweed	*Phlox diffusa/Festuca viridula–Hieracium cynoglossoides*	PHDI3/FEVI–HICY
Western hemlock/Lady fern	*Tsuga heterophylla/Athyrium filix-femina*	TSHE/ATFI
Western hemlock/Oak fern	*Tsuga heterophylla/Gymnocarpium dryopteris*	TSHE/GYDR
Western hemlock/Fool's huckleberry	*Tsuga heterophylla/Menziesia ferruginea*	TSHE/MEFE
Western hemlock/Bear-grass	*Tsuga heterophylla/Xerophyllum tenax*	TSHE/XETE
[1] Source: Morrison and Wooten 2010.		

4.2 U.S. Geological Survey Topographic Map

The USGS topographic maps (1973a and 1973b) show little to no existing development within the study area and vicinity other than the paved summit road and the existing ski area to the east (Figure 4) . Elevations within the study area are shown as ranging from approximately 5,800 feet National Geodetic Vertical Datum (NGVD) on the eastern edge near the summit to approximately 4,440 feet NGVD near the proposed lower chairlift terminal location at the western edge. No wetlands are mapped for the study area; however, one unnamed perennial tributary to Blanchard Creek is shown extending onto the site from the east. Major aquatic features mapped in the vicinity of the study area include Blanchard Creek offsite to the northwest and Burping Brook offsite to the south. Blanchard Creeks flows toward the northeast, eventually draining into the Middle Spokane River. Burping Brook flows south to Deadman Creek. The USGS maps also show an offsite spring to the southeast of the project site, just downslope from Summit Road.

4.3 National Wetland Inventory

The USFWS NWI online Wetland Mapper (2013) does not show any wetlands or other waters in the study area (Figure 5). The closest mapped wetland is located approximately 0.8 miles to the north of the site and consists of a palustrine, forested, broad-leaved deciduous, temporarily flooded (PFO1A) wetland associated with an unnamed tributary to Blanchard Creek. No onsite streams or drainages are shown for the study area by the Wetland Mapper.

4.4 Natural Resources Conservation Service Soil Survey

The NRCS Web Soil Survey (2013) shows the study area as containing five soil map units of three soil series (Figure 6)[3].

- Brickel gravelly ashy silt loam, 15 to 30% slopes (map symbol 5001)
- Vaywood medial silt loam, 15 to 30% slopes (map symbol 5080)
- Vaywood medial silt loam, 30 to 60% slopes (map symbol 5081)
- Bouldercreek ashy silt loam, 15 to 30% slopes (map symbol 5110)
- Bouldercreek ashy silt loam, 30 to 60% slopes (map symbol 5111)

The following descriptions for these soil types and hydric soil classifications were obtained from the Web Soil Survey website (Natural Resources Conservation Service 2013).

Brickel gravelly ashy silt loam – This soil series is described as a well-drained soil located on the back slopes, shoulders, and summits of mountains. It is typically characterized by a 0 to 1 inch surface layer of slightly decomposed plant material overlying a 3 to 9 inch layer of gravelly ashy silt loam. Below 9 inches, the amount of gravel in the soil typically increases, with cobbles becoming prominent below 19 inches. Bedrock typically occurs at 20 to 40 inches below the ground surface. Depth to water table is typically greater than 80 inches. Brickel gravelly ashy silt loam has moderately high to high permeability and low water capacity. This soil is considered non-hydric by the Natural Resources Conservation Service. It is not known to contain hydric inclusions.

Vaywood medial silt loam – This series is a well-drained soil associated with back slopes and foot slopes of mountains. It is typically characterized by a 0 to 3 inch layer of slightly to moderately decomposed plant material overlying 20+ inches of ashy silt loam. Very gravelly/cobbly sandy loams are typically present below 25 inches. Depth to the bedrock and water table is typically greater than 80 inches. Permeability is moderately high to high and available water capacity is moderate. Vaywood medial silt loam is considered to be a non-hydric soil and is not known to contain hydric inclusions.

Bouldercreek ashy silt loam – This soil series is described as a well-drained soil that occurs on back slopes and foot slopes of mountains. It is typically characterized by a 0 to 3 inch layer of slightly to moderately decomposed plant material overlying 20+ inches of ashy silt loam. Very

[3] Note that this is different from the mapped soils reported in the 2012 SEIS (Washington State Parks and Recreation Commission 2012), which indicated that the site was underlain by Vassar silt loam, 30 to 55% slopes (map symbol VaD) and Brickel stony loam, 20 to 55% slopes (map symbol BxD). This is because that data used in the SEIS came from the 1968 version of the Spokane County soil survey.

gravelly sandy loams are typically present between 25 and 33 inches, with extremely cobbly sandy loams present below 33 inches. Depth to bedrock and water table is typically more than 80 inches. Permeability is moderately high to high and available water capacity is moderate. This soil series is considered to be a non-hydric soil and is not known to contain hydric inclusions.

4.5 Historic Aerial Photographs

ICF examined a series of historic aerial photographs for the years 1992, 1995, 2005, 2006, 2009, and 2011 using Google Earth Pro (Figures 7a through 7d). These photos show that up until sometime between 1995 and 2005, the majority of the study area was covered by dense coniferous forest. A few small openings are present in the canopy throughout the study area and a larger clearing occurs in the southern part of the site near a portion of the paved summit access road. Areas of talus are also apparent near the summit. At some point after 1995, a considerable amount of forest die-back occurred in the central and southern portions of the site, creating some larger openings and leaving large areas of down wood and standing dead trees. No obvious wetlands are readily discernible within the study area on any of these photos; however, a few potential drainages can be seen extending downslope toward the northwest on some of the more recent photos. These tend to correspond with the topographic features and drainages shown on the USGS topographic map.

4.6 Towey Ecological Services Wetland/Stream Reports

ICF reviewed the December 17, 2011 and January 10, 2013 wetland and stream characterization and buffer determination reports prepared for the PASEA by TES. One wetland and 18 streams were identified in the PASEA during this study (Figure 8). The wetland was located in the southern portion of the study area and classified as a forested or scrub-shrub slope wetland dominated by alder (*Alnus* sp.), meadow foxtail (*Alopecurus pratensis*), Baltic rush (*Juncus balticus*), and multiple sedges (*Carex* spp.). TES categorized this wetland as a Category III wetland and assigned it a 60 foot buffer in accordance with the Spokane County CAO. In regard to the streams, TES described them as non-fish bearing, perennial (Np) streams per the Washington State Water Typing System (WAC-222-16-031). Streams were described as entrenched channels with average widths of 2 to 3 feet.

4.7 Pacific Biodiversity Institute Report

The 2010 PBI report identified and mapped a series of 325 habitat polygons based on the plant associations present. Of the polygons located either completely or partially in the delineation study area, four (239, 300, 303, and 333) were classified as wetland and four (101, 327, 332, and 336) were determined to contain wetlands (Figure 9). Dominant plant communities for the wetland polygons included Sitka alder/Mesic forb (239, 254, and 303), Western hemlock/Lady fern (300), and Sitka alder/Triangle leaf groundsel (333). Polygons identified as containing wetlands were mapped as Subalpine fir/Thinleaf huckleberry (101), Subalpine fir/Bear-grass (327 and 332), and Subalpine fir/Hitchcock's woodrush (336) plant communities. In addition to these wetland/wetland-containing polygons, 17 polygons (6, 7, 41, 42, 43, 61, 76, 101, 227, 239, 283, 300, 303, 327, 336, 344, and 345) were identified as containing streams (Figure 10).

5.0 Wetland Delineation Field Methods

Wetland delineation fieldwork was conducted on July 29, 30, 31, and August 1, 2013 using the delineation methods outlined in the Corps' *Wetland Delineation Manual* (1987 Manual) (Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (*Regional Supplement)* (U.S. Army Corps of Engineers 2010), and the Washington Department of Ecology's (Ecology's) *Washington State Wetlands Identification and Delineation Manual* (Washington State Department of Ecology 1997). The study area was examined on foot prior to flagging wetland boundaries or collecting wetland delineation data. Drainages were walked to determine their perennial initiation point (PIP), which was defined as the point at which flowing surface water was first observed. Where potential wetlands were encountered, paired upland and wetland data plots were established within representative plant communities that exhibited uniform topographic, soil, and hydrologic characteristics. At each plot, data on the vegetation, soils, and hydrology were collected and recorded on *Regional Supplement* field data forms (Appendix A) using the methods discussed in the following sections. Both manuals and the supplement require the presence of wetland indicators for hydrophytic vegetation, hydric soils, and wetland hydrology for an area to be considered a wetland.

5.1 Wetland Vegetation

Wetland or hydrophytic vegetation is generally defined as *the assemblage of macrophytes*[4] *that occurs in areas where inundation or soil saturation is either permanent or of sufficient frequency and duration to influence plant occurrence* (U.S. Army Corps of Engineers 2010). In order for an area to be considered a wetland, a prevalence of hydrophytic vegetation must be present. Under normal conditions, hydrophytic vegetation is considered prevalent if greater than 50% of the dominant species from each stratum—tree, shrub, vine, and herbaceous—are classified as obligate wetland (OBL), facultative wet wetland (FACW), and/or facultative wetland (FAC), according to the USFWS publication *National List of Plant Species that Occur in Wetlands* (Reed 1988). These classifications are based on moisture tolerance, as indicated in Table 2.

Table 2. Plant Species Indicator Category Definitions

Category	Definition
Obligate (OBL)	Plants that almost always occur in wetlands (estimated probability > 99%) under natural conditions.
Facultative Wetland (FACW)	Plants that usually occur in wetlands (estimated probability 67 to 99%) but are occasionally found in nonwetland areas.
Facultative (FAC)	Plants that are equally likely to occur in wetlands or nonwetlands (estimated probability 33 to 67%).
Facultative Upland (FACU)	Plants that usually occur in nonwetlands (estimated probability 67 to 99%).
Upland (UPL)	Plants that almost always occur in nonwetlands (estimated probability > 99%) under natural conditions.
Source: Reed 1988.	

[4] Macrophytes are plants that can be readily observed without the aid of optical magnification and include all vascular plant species, mosses, and large algae (U.S. Army Corps of Engineers 2010).

At each data plot, the investigators identified the individual plants present in each of the major vegetation strata (i.e., trees, sapling/shrubs, herbs, and woody vines) to species and recorded their scientific names, percent cover, and wetland indicator status per the *Washington 2013 State Wetland Plant List* (Lichvar 2013) on standard wetland delineation data forms (Appendix A). Cover estimates were determined visually using 5-foot radius circular plots for herbs, 15-foot radius circular plots for saplings/shrubs, and 30-foot radius circular plots for trees and woody vines. Plot configuration and size were adjusted in some areas to account for the presence of different adjacent plant communities, topographic variation, and/or other landscape characteristics. Dominant species were identified for each strata using the 50/20 rule, which defines dominants as the most abundant species that individually or collectively account for more than 50% of the total coverage of vegetation in the stratum (layer), plus any other species that by itself, accounts for at least 20% of the total (U.S. Army Corps of Engineers 2010). The *dominance test* was applied to this list of species to determine if greater than 50% of these species are classified as FAC or wetter. In cases where the dominance test was not met but hydric soil and wetland hydrology indicators were present (see Sections 5.2 and 5.3), the investigators used other methods (e.g., prevalence index) provided in the 2010 Regional Supplement to determine if the hydrophytic vegetation criterion was met.

5.2 Wetland Soils

Hydric soils are defined as soils that are saturated, flooded, or ponded for sufficient duration during the growing season to develop anaerobic (i.e., reducing) conditions in the upper horizons, which favor the growth and regeneration of hydrophytic vegetation (Environmental Laboratory 1987, U.S. Army Corps of Engineers 2010). Soils are classified as hydric based on criteria set forth by the National Technical Committee for Hydric Soils. In general, these criteria include the following:

- Soils that are classified as organic mucks and/or peats (i.e., histosols);
- Mineral soils that are characterized as somewhat poorly drained, poorly drained, or very poorly drained and exhibit high water tables between 0.5 and 1.5 feet from the soil surface for a significant period (usually a week or more) during the growing season;
- Soils that are ponded for a long or very long duration during the growing season; and
- Soils that are frequently flooded for a long or very long duration during the growing season (Environmental Laboratory 1987, U.S. Army Corps of Engineers 2010).

Under these criteria, hydric soils may be further classified as drained or undrained, with drained hydric soils being those for which sufficient ground or surface water has been removed by an artificial means (e.g., ditching, subsurface drain tile) to such an extent that the area would no longer support hydrophytic vegetation (Environmental Laboratory 1987, U.S. Army Corps of Engineers 2010). As such, not all areas of hydric soil are considered to be wetlands.

Hydric soils were identified in the field by digging soil pits to a 16- to 20-inch depth and examining the upper soil profile for hydric soil indicators. A soil may be considered hydric if any one of the following indicators is present:

- more than 50% organic material in the upper horizon,
- histic epipedon in mineral soils,
- strong sulfidic odor,
- reducing conditions, or

- gleyed (gray) or depleted matrix soil colors or redoximorphic features (mottles) with low-chroma matrix colors that meet specific hydric soil indicators (Environmental Laboratory 1987, U.S. Army Corps of Engineers 2010).

At each soil pit, the approximate depth, matrix color and texture, and the color and prevalence of any redoximorphic features were recorded on wetland delineation data forms (Appendix A) for each differing layer in the soil profile. Soil color, including hue, value, and chroma, was determined using the *Munsell Soil Color Chart System* (Kollmorgen Instruments Corporation 1994). Soil classifications and descriptions were obtained from the NRCS Web Soil Survey (Natural Resources Conservation Service 2013). Each soil sample was compared to the hydric soil indicator descriptions provided in the 2010 Regional Supplement to determine if the plot met hydric soil criteria. The type and depth of any restrictive layers (e.g., bedrock, that may have limited the depth of the oil pit were also recorded.

5.3 Wetland Hydrology

Wetland hydrology is defined as soil inundation or saturation for sufficient duration to develop hydric soils that support vegetation typically adapted for life in periodically anaerobic soil conditions (Environmental Laboratory 1987, Army Corps of Engineers 2010). Primary indicators of wetland hydrology include inundation (i.e., standing water), saturation in the upper 12 inches of the soil column, high water table, water marks or lines on adjacent stationary objects (e.g., trees), sediment deposits or drift lines on vegetation, oxidized rhizospheres along living roots, and water-stained leaves, among others. Such indicators should be present for at least 14 consecutive days of the growing season. If any one of these primary indicator is present, then wetland hydrology is considered to be present. In addition to these primary indicators, the presence of two or more secondary hydrology indicators also satisfies the Corps criteria for evidence of wetland hydrology. Such indicators include surface drainage patterns, a dry-season water table, shallow aquitard, saturation visible on aerial photography, geomorphic position, FAC-neutral test, raised ant mounds, and frost-heave hummocks (Army Corps of Engineers 2010).

Hydrology observations were made at each plot and recorded on the delineation data forms (Appendix A). Data collected included presence/absence and depth of saturation and/or inundation, and the presence/absence of other primary and secondary wetland hydrology indicators listed in the 2010 Regional Supplement. Soil pits were used to measure depth of saturation and depth to free water, when present. Based on this information, a determination of the presence/absence of wetland hydrology was then made.

5.4 Wetland Functions Assessment, Rating, and Buffer Determination

Wetland functions were assessed and individual wetlands rated using Ecology's *Washington State Wetland Rating System for Eastern Washington* (Hruby 2004). This method uses functional scores to group wetlands into four different categories (Categories I, II, III, and IV) based on their sensitivity to disturbance, rarity, functional capacity, and the ease at which they can be replaced (i.e., mitigated). These categories are then used to determine the appropriate width for the protective buffer per the requirements of the applicable CAO.

Under Ecology's rating system, the wetlands being assessed are initially classified as one of four following hydrogeomorphic (HGM) types: lacustrine-fringe, slope, riverine, or depressional. They are then assessed for the three major functional groups associated with wetlands—water quality improvement, hydrologic functions provision, and wildlife habitat provision—using HGM specific data forms (Appendix B). These data forms use a series of questions that note the presence or absence of certain indicators[5] that describe the structure of the system or its physical, chemical, or geologic properties. One set of questions are used to reflect the *potential* (i.e., capacity) that a wetland has to provide that function. A second set of questions is used to assess the wetland's *opportunity* to perform that function based on its landscape position and adjacent land use. For the water quality and hydrologic functional groups, the potential score is multiplied by the opportunity score to generate functional scores. For the wildlife habitat functional group, the potential and opportunity scores are added together to generate the functional score. These three scores are then added together to determine the total score for all functions, which is used to assign a wetland category. Each group of functions is given approximately equal importance in setting the category for a wetland.

Using the categories assigned during the rating process, the methods described in Section 11.20.050(C) of the Spokane County CAO were applied to determine the minimum buffers required for each wetland and non-wetland other water. Under this section, the county provides three alternative approaches for determining buffer width based on the amount of information available on the intensity of the prosed impact and wetland functions or special characteristics.

- Alternative 1 – Buffer width based on wetland category only.
- Alternative 2 – Buffer width based on wetland category and expected intensity of impact from proposed changes in land use associated with the project.
- Alternative 3 – Buffer width based on wetland category, expected intensity of impact from the proposed change in land use associated with project, and habitat functions or special characteristics.

Stream buffer widths were determined per Section 11.20.060(C)(1)(h) of the Spokane County CAO.

5.5 Mapping Method

Wetland boundary flags, data plots, and PIPs were surveyed in the field using a Trimble GeoXH GPS receiver. The resulting data file was differentially corrected to sub-meter accuracy and plotted on a base map using AutoCAD® (Figure 11). Stream channel locations were added to the resulting drawing using topography, aerial photography, and the previous mapping established by TES and WDFW. Buffers were established in AutoCAD® by offsetting the delineation boundaries by the appropriate width.

[5] Indicators are easily observed characteristics that are correlated with quantitative or qualitative observation of a function (Hruby 2004).

6.0 Delineation Results

ICF identified five wetlands (Wetland A, B, C, D, and E) and 11 perennial stream channels (Streams 1, 3a, 3b, 4a, 5a, 5b, 6a, 6b, 6c, and 7) within the project site (Figure 11)[6]. Delineated wetlands include one large palustrine scrub-shrub (PSS)/slope wetland with palustrine emergent (PEM) components (Wetland A), and four smaller PSS/slope wetlands (Wetlands B, C, D, and E). Identified streams were all determined to be unnamed tributaries to Blanchard Creek and were classified as Type Np Waters under the Washington Department of Natural Resources (WDNR) Water Typing System (Washington Administrative Code [WAC] 222-16-031) (Table 4). Type Np Waters are non-fish bearing perennial streams that *do not go dry any time of a year of normal rainfall and include the intermittent dry portions of the perennial channel below the uppermost point of perennial flow* (WAC 222-16-031).

The wetlands identified in the field are summarized in Table 3 and discussed in more detail in Section 6.1. Delineated streams are summarized in Table 4 and discussed in Section 6.2. Table 5 shows how each of these features relate to the habitat polygons mapped by PBI. Wetland delineation data forms are provided in Appendix A and the copies of the wetland rating forms are included in Appendix B. Representative site photos are provided in Appendix C.

Table 3. Characteristics of the Delineated Wetlands in Project Site

Feature Name	Cowardin Class[a]	HGM Class[b]	Ecology Wetland Rating[c]	Minimum Buffer Width (feet)[d]	Area in Project Site (acres)
Wetland A	PSS, PEM	Slope	Category II	110	2.70
Wetland B	PSS	Slope	Category II	75	0.41
Wetland C	PSS	Slope	Category IV	40	0.05
Wetland D	PSS	Slope	Category IV	40	0.79
Wetland E	PSS	Slope	Category II	75	0.31
Total					**4.26**

[a] Cowardin Class of wetland within study area based on *Classifications of Wetlands and Deepwater Habitats of the United States* (U.S. Fish and Wildlife Service 1979).

[b] HGM Class of wetlands within study area based on *A Hydrogeomorphic Classification for Wetlands* (Brinson 1993) and the additional classification guidance provided in the *Washington State Wetland Rating System for Eastern Washington* (Hruby 2004).

[c] Ecology rating based on the *Washington State Wetland Rating System for Eastern Washington* (Hruby 2004), data forms provided in Appendix B.

[d] Spokane County buffer widths determined per Spokane County Code Section 11.20.050(C), Alternative 3.

[6] Wetland D is actually located outside of the project site; however, it is included in this report because it is within 150 feet of the site boundary.

Table 4. Characteristics of the Delineated Streams in Project Site

Feature Name	Receiving Water	WDNR Stream Type[a]	Minimum Buffer Width (feet)[b]	Approximate Length within Project Site (feet)
Stream 1	Blanchard Creek	Np	75	191
Stream 3a	Blanchard Creek	Np	75	1,838
Stream 3b	Blanchard Creek	Np	75	1,124
Stream 4a	Blanchard Creek	Np	75	1,817
Stream 5a	Blanchard Creek	Np	75	403
Stream 5b	Blanchard Creek	Np	75	2,206
Stream 6a	Blanchard Creek	Np	75	868
Stream 6b	Blanchard Creek	Np	75	564
Stream 6c	Blanchard Creek	Np	75	885
Stream 7	Blanchard Creek	Np	75	143
Total				**10,451**

[a] Stream type based on WDNR Stream Typing System per WAC 222-16-031.
[b] Spokane County buffer widths determined per Spokane County Code Section 11.20.060(C)(1)(h)

Table 5. Delineated Wetlands and Streams and their Corresponding PBI Habitat Polygons

Feature Name	Corresponding PBI Habitat Polygon[a]
Wetland A	333
Wetland B	239
Wetland C	7
Wetland D (offsite)	254
Wetland E	303
Stream 1	76
Stream 3a	6, 7, 76, 227, 239
Stream 3b	227
Stream 4a	42, 61, 227, 300, 344
Stream 5a	227
Stream 5b	42, 227
Stream 6a	41, 43, 345
Stream 6b	43, 345
Stream 6c	43, 101
Stream 7	43, 144

[a] Per mapping in Morrison and G. Wooten 2010.

6.1 Wetlands

6.1.1 Wetland A

Wetland A is located in the southern portion of the project site, just north of the former location of the historic Mt. Spokane ski lodge (Figure 11). It consists of a relatively large PSS/slope wetland that extends offsite to the south. Wetland A is associated with multiple mid-slope seeps and contains the PIPs of two stream channels, both of which flow to Burping Brook. It is primarily dominated by scrub-shrub vegetation but includes a small area of PEM wetland located in a relatively flat area near in its central portion. The offsite portion of Wetland A includes a former perennial stream channel that was diverted into a springhouse at some time in the past, presumably to supply water to the former lodge. This channel contains two covered concrete block structures: an approximately 8 foot by 8 foot inlet structure on the upstream end and a larger, approximately 20 foot by 20 foot structure that appears to be a storage tank or cistern on the downstream end. This structure appears to discharge into one of the offsite drainages that flow to Burping Brook.

Vegetation

The PSS portions of Wetland A are dominated by dense thickets of Sitka alder (*Alnus viridis*, FACW), with arrow-leaf groundsel (*Senecio triangularis*, FACW), western lady fern (*Athyrium cyclosorum*, FAC), northern bracken fern (*Pteridium aquilinum*, FACU), blue wild rye (*Elymus glaucus*, FACU), and western meadow-rue (*Thalictrum occidentale*, FACU) present in the herbaceous layer. Scattered subalpine fir (FACU) and Engelmann spruce (*Picea engelmannii*, FAC) trees also occur in these areas, as do red elderberry (*Sambucus racemosa*, FACU), bristly black gooseberry (*Ribes lacustre*, FAC), Columbian monkshood (*Aconitum columbianum*, FACW), mountain sweetcicely (*Osmorhiza berteroi*, FACU), and Constance's bittercress (*Cardamine constancei*, NOL).

The PEM portion of Wetland A is dominated by arrow-leaf groundsel, California false hellebore (*Veratrum viride*, FAC), and smooth brome (*Bromus inermis*, FAC). Other common species include slender wood reed (*Cinna latifolia*, FACW), Canadian burnet (*Sanguisorba canadensis*, FACW), firethread sedge (*Carex scopulorum*, OBL), small-flowered wood rush (*Luzula parviflora*, FAC), and Merten's rush (*Juncus mertensianus*, OBL).

The presence of greater than 50% of the dominant species rated FAC or wetter in most of these areas met the 2010 Regional Supplement criterion for hydrophytic vegetation. In some plots, the dominance test was not met but the prevalence index was calculated to be 3.0 or less, satisfying the hydrophytic vegetation criteria.

Soils

Soils within the PSS portion of Wetland A typically exhibited a 3 to 6 inch layer of organic material overlying a layer of 7.5YR 2.5/1 (black) silt loam. Redoximorphic features were present in the underlying layer at 1 to 5%. These soils met the Redox Dark Surface (F6) hydric soil indicator of the 2010 Regional Supplement.

Soils within the PEM portion of Wetland A exhibited a 3 to 6 inch layer of organic peat-like material overlying a layer of 10YR 2/1 (black) to 10YR 3/1 (very dark gray) muck. These soils met the Histic Epipedon (A2) hydric soil indicator of the 2010 Regional Supplement.

Hydrology

Wetland hydrology in the PSS portion of Wetland A was confirmed by the presence of oxidized rhizospheres along living roots (Primary Hydrology Indicator C3). Wetland hydrology in the PEM portion of Wetland A was confirmed by the presence of surface ponding (Primary Hydrology Indicator A1), high water table (Primary Hydrology Indicator A2), and saturation (Primary Hydrology Indicator A3). The presence of one or more primary hydrology indicator meets the wetland hydrology criteria of the 2010 Regional Supplement. In regard to hydrologic regime, the PSS portion is likely seasonally saturated and the PEM portion is likely semi-permanently saturated. Primary hydrologic sources include runoff from snow melt and seasonal storm events, and subsurface seepage.

Boundary Determination

The boundaries of Wetland A were primarily determined by differences in dominant vegetation. Wetlands were typically dominated by Sitka alder and uplands were typically dominated by Green's Mountain ash (*Sorbus scopulina*, FACU). The presence/absence of hydric soils and wetland hydrology indicators were also used.

Wetland Functional Assessment Summary

Wetland A scored a total of 34 points in the functions portion of the Ecology rating system (Appendix C). This score was determined by the following results:

- Water Quality Improvement Functions - Wetland A received a low score (5 out of 24 possible points) for water quality improvement functions. Factors that limited the wetlands ability to perform these types of functions include the presence of slopes greater than 5% and the limited extent of dense, ungrazed herbaceous vegetation. Consequently, Wetland A has little capacity to slow and retain stormwater flows or to filter out sediments and toxicants. Also, due to its location in a relatively undeveloped area, Wetland A has little to no opportunity to improve water quality (i.e., there are little to no pollutant sources in the vicinity that could enter this wetland).
- Hydrologic Functions - Wetland A received a moderate score (6 out of 16 possible points) for hydrologic functions. While the dense, uncut, rigid vegetation of this wetland has the ability to reduce the velocity of surface flows, the lack of small surface depressions limits its ability to retain water. Furthermore, the absence of significant downstream property and aquatic resources subject to flooding or excessive erosive flows provide little to no opportunities for this wetland to perform these types of functions.
- Habitat Functions – Wetland A received a moderately high score (23 out of a possible 36 points) for habitat functions. This was largely due to presence of three vegetation forms, relatively high species richness, high levels of habitat interspersion, presence of relatively undisturbed adjacent buffers, and its proximity to other wetlands. Factors that limit the performance of this function include the lack of aquatic bed and forested areas, absence of surface water, and limited number of special habitat features. The opportunity of the wetland to provide these types of functions was much higher than for the other functional groups.

Buffer Determination and Condition

Based on only the functions scores presented above, Wetland A would be classified as a Category III wetland. However, after completing the *Categorization Based on Special Characteristics* rating

system worksheet, this classification was changed to Category II due to the presence of greater than 50% areal cover by Sitka alder (question SC 5.3 on the form). Although this particular species (*Alnus viridis*) occurs primarily as a shrub in Wetland A and is not one of the alder species listed on the special characteristics worksheet, it is initially fast-growing (Darris 2011) and, when growing in dense thickets, provides many of the same functions as a tree canopy dominated by one of the fast-growing species listed in this section of the worksheet (e.g., *Alnus rubra*, *Populus angustifolia*, *Salix sitchensis*). Such functions include shading, slope stabilization, soil enrichment, and provision of habitat for avian wildlife species such as the olive-sided flycatcher. Furthermore, PBI classified Sitka alder-dominated wetlands as uncommon or possibly unique (Morrison and Wooten 2010). Consequently, ICF determined that a higher rating was warranted for Wetland A.[7]

Under the Spokane County CAO, the minimum buffer width of Wetland A was determined using Alternative 3 in SCC 11.20.050(C)(1)(c). This approach considers the wetland category, expected intensity of impact from the proposed change in land use caused by the project, and the wetland's habitat functions and special characteristics when assigning a buffer width. As a Category II wetland with a habitat functions score of 23 that would be subject to moderate impacts from the construction of ski trails and the clearing of trees, Wetland A received a minimum buffer width of 110 feet (Figure 11).

Vegetation in the Wetland A buffer is primarily dominated by native shrubs and herbs, with some trees. Dominant plants include Green's mountain ash, red elderberry, western meadow-rue, bristly black gooseberry, northern bracken fern, and blue wildrye. Dominant trees include grand fir and subalpine fir. For the most part, the buffer of Wetland A is relatively natural with some minor disturbance associated with hiking/mountain bike trails.

6.1.2 Wetlands B and C

Wetland B and C are PSS/slope wetlands located in the northern portion of the project site, along a perennial tributary (Stream 3a) to Blanchard Creek (Figure 11). They consist of PSS/slope wetlands that occur on small topographic benches that have developed on moderately steep forested slopes.

Vegetation

Wetlands B and C are dominated by Sitka alder (FACW), with arrow-leaf groundsel (FACW), common lady fern (FAC), Columbian monkshood (FACW), and Siberian spring beauty (*Claytonia sibirica*, FAC) present in the herbaceous layer. Other species present include red elderberry (FACU) and water parsnip (*Sium suave*, OBL). The presence of greater than 50% of the dominant species rated FAC or wetter within these wetlands met the 2010 Regional Supplement criteria for hydrophytic vegetation.

Soils

Soils within these wetlands typically exhibited a 10YR 2/1 (black) to 10YR 3/1 (very dark gray) peaty or silty material in the upper 6 to 10 inches. Below this, soils typically consists of 10YR 2/1 muck with no apparent redoximorphic features. These soil characteristics met the Black Histic (A1) hydric soil indicator of the 2010 Regional Supplement.

[7] Note that the same rationale was used in the rating of Wetlands B and E.

Hydrology

Wetland hydrology was confirmed in Wetlands B and C by the presence of surface ponding (Primary Hydrology Indicator A1), high water table (Primary Hydrology Indicator A2), and saturation (Primary Hydrology Indicator A3). Drainage patterns (Secondary Hydrology Indicator B10), were also apparent in Wetland B. The presence of one or more primary hydrology indicator meets the wetland hydrology criteria of the 2010 Regional Supplement. The hydrologic regime of these wetlands was determined to be seasonally saturated. Primary hydrologic sources include runoff from snow melt and seasonal storm events, and subsurface seepage.

Boundary Determination

The boundaries of Wetland B and C were primarily determined by differences in the dominant vegetation, the presence/absence of hydric soils, and the presence/absence of wetland hydrology indicators. The primary differentiating plant species included Sitka alder in wetlands and subalpine fir (FACU) in uplands. Other upland species used to define the boundary included, common beargrass (*Xerophyllum tenax*, NOL), red baneberry (*Actaea rubra*, FACU), and western hemlock (FACU).

Wetland Functional Assessment Summary

Wetlands B and C both scored a total of 27 points in the functions portion of the Ecology rating system (Appendix C). This score was determined by the following results:

- Water Quality Improvement Functions – Both Wetlands B and C received low scores (5 and 4 out of 24 possible points, respectively) for water quality improvement functions. Factors that limited the ability of these wetlands to improve water quality include the presence of slopes greater than 5% and the lack of dense, ungrazed herbaceous vegetation. Both wetlands have little capacity to slow and retain stormwater flows or to filter out sediments and toxicants. Also, due to their location in a relatively undeveloped area, neither wetland has the opportunity to receive pollutants from adjacent areas.
- Hydrologic Functions - Wetland B received a moderate score (6 out of 16 possible points) and Wetland C received a low score (2 out of 16 possible points) for hydrologic functions. Wetland B scored higher in this functional group because it is more densely vegetated with scrub-shrub vegetation. Wetland C, however, does exhibit small surface depressions that allow it to retain small amounts of water. Due to the absence of significant downstream property and aquatic resources subject to flooding or excessive erosive flows, neither wetland has the opportunity to perform these types of functions.
- Habitat Functions – Both wetlands received moderate score (16 and 21 out of a possible 36 points, respectively) for habitat functions. Limiting factors included the presence of only 1 to 2 vegetation forms, the presence of only 4 to 5 plant species, and a minimal number of special habitat features. Both wetlands had relatively undisturbed buffers and were proximal to other wetlands. As with Wetland A, the opportunity for these wetlands to provide habitat functions was higher than the other functional groups.

Buffer Determination and Condition

Based on only the functions scores presented in Section 6.2.5, both Wetlands B and C would be classified as Category IV wetlands. However, due to the presence of greater than 50% areal cover by

Sitka alder, the classification of Wetland B was adjusted to Category II (see rationale for Wetland A classification).

Under the Spokane County CAO, the minimum buffer width of Wetlands B and C were determined using Alternative 3 in SCC 11.20.050(C)(1)(c). As a Category II wetland with a habitat functions score of 16 that would be subject to moderate impacts from the construction of ski trails and the clearing of trees, Wetland B received a minimum buffer width of 75 feet (Figure 11). Wetland C, a Category IV wetland that would be subject to the same types of moderate impacts, received a minimum buffer width of 40 feet[8].

The buffers of Wetland B and C are relatively undisturbed and dominated by native trees, shrubs, and herbs. Common vegetation includes subalpine fir, western hemlock, red baneberry, beargrass, starry false Solomon's seal, and huckleberry. A considerable amount of down woody debris is also present.

6.1.3 Wetlands D and E

Wetlands D and E are PSS/slope wetlands that are associated with mid-slope seeps (Figure 11). Both are located upslope from perennial stream channels that drain to Blanchard Creek. Wetland D is located offsite to the northwest and is included in this report because it is within 150 feet of the project site. Wetland E is located in the northern portion of the project site, upslope from Stream 1. Like Wetlands B and C, these wetlands are situated on small, relatively flat benches that occur on moderately steep forested slopes.

Vegetation

Wetland D is primarily dominated by western hemlock (FACU), with some Sitka alder (FACW) also present. Herbaceous vegetation includes common lady fern (FAC), arrow-leaf groundsel (FACW), starry false Solomon's Seal (*Maianthemum stellatum*, FAC), and spring beauty (*Claytonia* sp., FACU to FAC). Wetland E is dominated by Sitka alder (FACW), with some bristly black gooseberry (FAC) and alder-leaf buckthorn (*Rhamnus alnifolia*, FACW) also present. Dominant herbs included common lady fern (FAC), arrow-leaf groundsel (FACU to FAC). The presence of greater than 50% of the dominant species rated FAC or wetter within both of these areas met the 2010 Regional Supplement criterion for hydrophytic vegetation.

Soils

Soils in Wetlands D and E were similar to those observed in Wetlands B and C. They included a 0 to 6 inch layer of dark (10YR 2/1 to 10YR 3/1) colored organic material overlying muck. These soil characteristics met the Black Histic (A1) hydric soil indicator of the 2010 Regional Supplement.

Hydrology

Wetland hydrology in Wetlands D and E was confirmed by the presence of high water table (Primary Hydrology Indicator A2) and saturation (Primary Hydrology Indicator A3) in both wetlands. The presence of any one or more primary hydrology indicator meets the wetland hydrology criteria of the 2010 Regional Supplement. The hydrologic regime of these wetlands was determined to be seasonally saturated. Primary hydrologic sources include runoff from snow melt and seasonal storm events, and subsurface seepage.

[8] Under Alternative 3, the wildlife habitat score does not matter for Category IV wetlands.

Boundary Determination

The boundaries of Wetlands D and E were primarily determined by differences in the dominant vegetation, the presence/absence of hydric soils, and the presence/absence of wetland hydrology indicators. The primary differentiating plant species included Sitka alder (wetland) and subalpine fir (upland). Other upland species used to define the boundary included common beargrass, and red baneberry.

Wetland Functional Assessment Summary

Wetland D received a total of 25 points and Wetland E received a total of 27 points in the functions portion of the Ecology rating system (Appendix C). This score was determined by the following results:

- Water Quality Improvement Functions – Both wetland received low scores (4 and 5 out of 24 possible points, respectively) for water quality improvement functions. Factors that limited the ability of these wetlands to improve water quality include the presence of slopes greater than 2%, the limited amount of dense vegetation suitable for filtering out, and the lack of opportunity to receive pollutants from adjacent areas.
- Hydrologic Functions – For hydrologic functions, wetland D received a low score (0 out of 16 possible points), while Wetland E received a moderate score (6 out of a possible 16 points). Limiting factors in Wetland D include the lack of dense vegetation, absence of small surface depressions, and the lack of opportunity to perform these types of functions. Although Wetland E also lacks the opportunity to perform these functions, it does possess dense vegetation, which increases its ability to slow the velocity of surface flows.
- Habitat Functions – Both Wetlands D and E received moderate score (21 and 16 out of a possible 36 points, respectively). Wetland D scored higher because it had two vegetation forms that comprised greater than 30% cover exhibited higher interspersion of habitats, and had standing snags present. Both wetlands had relatively undisturbed adjacent buffers and both are near other wetlands.

Buffer Determination and Condition

Based on only the functions scores presented in Section 6.2.5, both Wetlands D and E were classified as Category IV wetlands. However, due to the dominance of alder in Wetland E, it was re-classified as a Category II wetland based on the presence of greater than 50% areal cover by Sitka alder (see rationale for Wetland A classification). Under Alternative 3 of SCC 11.20.050(C)(1)(c), the minimum buffer width for Category IV wetlands is 40 feet. The minimum buffer for a Category II wetland with a habitat score of 16 is 75 feet.

The buffers of Wetlands D and E are similar to those found around Wetlands B and C in both disturbance level and species composition.

6.2 Perennial Streams

The 11 perennial streams identified on the project site (Figure 11) are all very similar in character. They typically consist of relatively straight, narrow, v-shaped channels with gradients greater than 20%. Channel widths are typically 1 to 2 feet at the PIP and gradually increase to 3 to 4 feet by the time the stream exits the project site. Offsite, these channels continue to widen as they move

downslope, with channel widths of up to 6 feet observed along the Chair 4 Road at the outer edge of the PASEA. Stream substrate is primarily cobble and does not typically support instream vegetation. Flow rates observed at the time of the site visits were typically less than 0.5 cubic feet per second (cfs), with a few streams flowing at 1 to 2 cfs. Woody debris of varying sizes is frequently present throughout these channels.

Streams 1, 3a, 3b, 4a, 5a, and 5b are located in more densely forested areas, while Streams 6a, 6b, 6c, and 7 are located in more open areas. Typical vegetation adjacent to the streams in the more densely forested areas includes subalpine fir, Engelmann spruce, western hemlock, common lady fern, common beargrass, red baneberry, fool's huckleberry (*Menziesia ferruginea*), thin-leaf huckleberry (*Vaccinium membranaceum*), starry false Solomon's seal, and occasional Sitka alder. Plant species adjacent to streams in the more open areas include arrow-leaf groundsel, thin-leaf huckleberry, and common beargrass.

Boundary Determination

Only streams that exhibited perennial flow at the time of the site visit were included in the delineation mapping. Each of these drainages was followed upslope to the point where water first began flowing over the ground surface (i.e., the PIP). This point was flagged and recorded using the GPS unit (when possible). Using the PIP as a starting point, the approximate centerline of each stream was then mapped using topographic mapping and aerial photography. Stream channels were not surveyed with the GPS in the field because of reception problems caused by the steep terrain and relatively dense canopy cover. Based on conditions observed in the field, each stream was mapped with an average channel width of 3 feet from bank to bank based on observations of the ordinary high water mark (OHWM) in the field. These boundaries were used as a basis for establishing the required stream buffers under the Spokane County CAO (see Section 6.2.5).

Buffer Determination and Condition

In accordance with Section 11.20.060(C)(1)(h) of the Spokane County CAO, each of the streams identified on the project site was assigned a buffer width of 75 feet, as specified for Type Np Waters. Buffers were established in AutoCAD© by offsetting from the estimated stream bank locations. In areas were streams intersected wetlands (e.g., Stream 3a and Wetland B and C), the stream and wetland buffers were incorporated, with the widest buffer applied to the mapping.

Stream buffers are typically natural and undisturbed throughout the project site. These buffers are dominated by native trees, shrubs, and herbaceous vegetation including subalpine fir, Engelmann spruce, western hemlock, common lady fern, common beargrass, red baneberry, fool's huckleberry (*Menziesia ferruginea*), thin-leaf huckleberry (*Vaccinium membranaceum*), starry false Solomon's seal, and occasional Sitka alder in the more densely forested areas. Arrow-leaf groundsel, thin-leaf huckleberry, and common beargrass dominate more open areas. These buffers typically contain a considerable amount of woody debris of multiple size and condition (e.g., freshly fallen, moderately rotted, well-rotted) classes. Standing snags are also common.

7.0 Proposed Encroachments

As proposed under Alternative 3 of the Final SEIS, the project would result in some encroachments into wetlands, stream channels, and the CAO buffers associated with these resources (Figure 12). For the purposes of this evaluation, spanning the stream channel with an arch culvert or other

structure was considered an encroachment even though no physical impact below the OHWM of the stream would occur. The area of these potential encroachments is summarized for each project feature in Table 6 and briefly described in the following sections. Potential mitigation to compensate for these encroachments is also discussed.

Table 6. Proposed Project Encroachment into Wetlands, Stream, and Associated Buffers

Project Feature	Resource Affected	Wetland/Stream Channel Encroachment (sq. ft.)[a]	Buffer Encroachment (sq. ft.)
Ski Trail 1	Wetland A	0	15,073
	Stream 6a	156	
	Stream 6b	180	25,134[b]
	Stream 6c	180	
Ski Trail 2	Stream 6a	0	19,777
Ski Trail 3	Stream 4a	240	
	Stream 5a	177	32,303[b]
	Stream 5b	219	
Ski Trail 4/Chair Lift 6	Stream 4a	159	
	Stream 5a	117	24,408[b]
	Stream 5b	123	
Ski Trail 5	N/A	0	0
Ski Trail 6	Wetland E	5,870	27,232
Ski Trail 7	Stream 1	243	14,459
	Stream 3b	255	12,906
Total		**7,757 (0.18 acre)**	**171,292 (3.93 acres)**

[a] Stream encroachment calculations based on an average channel width of 3 feet. However, no physical disturbance below the OHWM of stream channels would occur during construction.

[b] Buffer encroachments were not separated by stream type due to multiple overlapping areas.

7.1 Type of Encroachment

During construction, project encroachments would include the following types of activities:

- Clearing for ski trail and chair lift construction.
- Clearing and grading for ski trail and chair lift construction.
- Post-construction usage.

No fill placement into wetlands or streams is proposed as a part of the project. In some locations, plastic arch culverts or timber bridges may need to be constructed to carry the future ski trails across some of the deeper drainages that lie in ravines or channel cuts. These structures would be

designed to completely span the channel and would not result in the excavation or placement of any fill material in wetlands or below the OHWM of streams. The location of such structures has yet to be determined.

7.1.1 Clearing Activities

According to the January 2013 document, *Mt. Spokane Ski and Snowboard Park Trail Clearing Prescriptions* (Mount Spokane 2000), proposed trail clearing would include both full trail clearing and trail edge treatment (i.e., forest edge scalloping and forest edge feathering). All clearing work would be performed in accordance with the following procedures:

- Approved trail limits and edge treatment boundaries would be flagged in the field prior to any clearing work;
- All trees will be cut by manual methods (i.e., no mechanized timber harvesting equipment would be used to fell trees);
- Felled trees will be lopped and scattered along trail edges or in Riparian Reserve areas; and
- All understory vegetation less than 2 feet tall will be retained.

Mechanical equipment may be used to cut and/or move trees felled during clearing operations. If trees are felled over snow, their stumps will be flush-cut by hand during the snow-free season. To the extent practical, if snow is present snow cats would be used to move cut trees. If trees are not felled over snow, then they will be flush-cut at the time of felling. In areas where clearing is the only impact proposed, stumps would not be removed. (Mount Spokane 2000, 2013)

Based on Figure 17 of the Final SEIS (Appendix D), clearing activities would potentially affect the channels and buffers of Streams 1, 3b, 4a, 5a, 5b, 6a, 6b, and 6c. Due to the revised wetland mapping presented in this report, it is also likely that a small portion of the buffer of Wetland A, and a portion of Wetland E and its associated buffer would be impacted by clearing activities.

7.1.2 Clearing and Grading Activities

Clearing and grading for ski trail construction would involve removing all trees from the construction limits, removing all tree stumps, re-grading the soil surface, and re-vegetating the disturbed area with a native seed mix (SE Group 2013). Clearing and grading would occur in all locations where structures (e.g., chair lift towers) are proposed and in portions of the ski trails where a smooth surface is necessary. Clearing and grading work would be performed using heavy equipment including excavators and bulldozers.

Based on the previous (TES) wetland study, Alternative 3 of the Final SEIS did not require any clearing and grading work in wetlands, streams, or their associated buffers (see Final SEIS Figure 17 in Appendix D). However, with the revised wetland and stream delineation, it now appears that the proposed clearing and grading in the connector trail between Ski Trails 2, 3, and 4 could potentially affect Stream 5a and its associated buffer (see Figure 12).

7.1.3 Post-Construction Activities

Once established, most of the regular activity within the proposed ski trails and chair lift would be associated with skiers/snowboarders crossing these areas when they are covered with several feet

of snow. Such activities would not cause direct physical impact to these wetland and stream resources or their associated buffers.

In addition to these activities, routine maintenance of ski trails would also occur. Such maintenance would focus on maintaining vegetation and preventing erosion and would include such activities as implementing noxious weed control using integrated pest management, managing vegetation height in established ski trails, and pruning or removing trees that could pose a potential hazard to persons or property (Mount Spokane 2000, 2012).

7.2 Potential Mitigation Options

Because no wetlands or streams would be filled as part of the project[9], no compensatory mitigation for those resources is expected to be required by the Corps or Ecology under their respective regulatory programs. However, because the Spokane County CAO prohibits most activities, including vegetation removal and grading, within the buffers associated with such resources, mitigation measures to address proposed project encroachments will need to be addressed. As with federal and state regulations, the mitigation process is required to follow the standard sequencing where avoidance and minimization must be considered before compensatory mitigation can be used.

Based on a preliminary review of the proposed resource and buffer encroachments shown on Figure 12, the following mitigation options should be considered to reduce impacts.

- Wetland A Buffer – Consider realigning Ski Trail 1 to the north to avoid the Wetland A buffer. Use buffer averaging per Spokane County CAO Section 11.20.050(C)(3) to address any remaining unavoidable encroachment.
- Wetland E and Wetland E Buffer – Under the current design, no fill placement or grading would occur in these areas. However, some clearing may be required. Rerouting Ski Trail 6 to the southwest or northeast would avoid or minimize potential disturbance to the vegetation of Wetland E and its associated buffer. If encroachments cannot be completely eliminated, onsite buffer mitigation at a replacement ratio of 1.5:1 may be possible by enhancing or expanding the buffer around Wetland A, the most unique and highest functioning wetland within the project site.
- Stream 6a Buffer – Reroute Ski Trail 6 to north to avoid buffer. Use buffer averaging per Spokane County CAO Section 11.20.060(C)(1)(h)for riparian buffers to address any remaining unavoidable encroachment.
- Stream 1, 3b, 4a, 5a, 5b, 6a, 6b, and 6c Channel and Buffer Crossing – Eliminate proposed grading where connector trail between Ski Trails 2, 3, and 4 would cross Stream 5a and its associated buffer. Minimize buffer disturbance as much as possible by narrowing the proposed ski trails at stream crossing. Use buffer averaging per Spokane County CAO Section 11.20.060(C)(1)(k)for riparian buffers to address any remaining unavoidable encroachment. Revegetate ski trail crossings at streams with native herbs and low-growing shrubs to provide habitat and shading of channel.
- Buffer Restoration/Revegetation – Following construction, all riparian buffers disturbed by clearing for the ski lift and trails should be revegetated with native, low growing shrubs and herbaceous plants compatible with ski operations. Disturbed riparian buffers should be

[9] Although Wetland E would be crossed by Ski Trail 6, no fill placement or grading would occur in that wetland.

evaluated post-construction to access condition and develop site-specific enhancement prescriptions to maximize vegetative cover, soil stabilization and water quality (consistent with the Erosion and Sediment Control plan), and habitat value for wildlife. Plant suitability should be based on species present in adjacent vegetative communities, and mayinclude species such as thin-leaf huckleberry, Alaska blueberry (*Vaccinium alakanaense*), Sitka alder, thimbleberry (*Rubus parviflorus*), twinberry (*Linnaea borealis*), beargrass, lady fern, and Hitchcock's woodrush (*Luzula glabrata* ssp. *hitchcockii*), depending upon availability.

8.0 Conclusion

During the July 2013 wetland delineation, ICF identified five wetlands (Wetland A, B, C, D, and E) and 11 perennial stream channels (Streams 1, 3a, 3b, 4a, 5a, 5b, 6a, 6b, 6c, and 7) on the 279 acre project site (Figure 11). In general, the location of Wetland A and many of the stream channels corresponded with those previously identified by TES in 2011. However, ICF found four additional wetlands (Wetlands B, C, D, and E) and one additional perennial stream (Stream 5a) on or within 150 feet of the project site that were not previously identified by TES. Wetlands and streams delineated by ICF correlated fairly well with the wetland and stream habitat polygons mapped by PBI in 2010.

All delineated wetlands were assessed using Ecology's *Washington State Wetland Rating System for Eastern Washington* (Hruby 2004). Assessment results were used to determine the appropriate protective buffers per the Spokane County CAO. Assigned wetland buffer widths varied from 40 to 110 feet, with Wetland A receiving the widest buffer. All streams were determined to be non-fish bearing, perennial (Type Np) waters and assigned a buffer width of 75 feet.

In comparing the proposed development plan (Alternative 3 of the Final SEIS) with the revised delineation map, ICF noted several areas where the new ski trails and chair lift would encroach into wetlands, streams, and associated protective buffers. Most of this potential encroachment is associated with the proposed clearing of vegetation, although there is one area of potential grading in the proposed connector trail between Ski Trails 2, 3, and 4 that could affect Stream 5a and its associated buffer. Aside from this potential activity, no excavation or fill placement would occur in any of the delineated wetlands and streams. Post-construction usage of the project site is not expected to result in direct physical impact to these wetlands and streams, or their associated buffers, as most activities would occur in the wintertime when these resources are covered with several feet of snow.

Moving forward, MS 2000 should review the need for grading in the portion of the connector ski trail that crosses Stream 5a and eliminate or reduce the extent of this activity, if possible. Proposed clearing encroachments in Wetland E and buffers should also be reevaluated to determine if further avoidance or minimization is possible. For any remaining unavoidable encroachments, onsite mitigation opportunities such as buffer averaging should be investigated.

9.0 Disclaimer

This report documents the investigation, best professional judgment, and conclusions of ICF. It is correct and complete to the best of our knowledge. It should be considered a Preliminary Jurisdictional Determination of wetlands and other waters and used at your own risk, unless it has

been reviewed and approved in writing by the U.S. Army Corps of Engineers, Seattle District and the Washington Department of Ecology.

10.0 References

Brinson, M. M. 1993. *A Hydrogeomorphic Classification for Wetlands*. Technical Report WRP-DE-4. U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service PUBL. FWS/OBS-79/31. 103p.

Darris, D.C. 2011. Plant Guide for Sitka alder (Alnus viridis ssp. sinuata). U.S. Department of Agriculture, Natural Resources Conservation Service. Plant Materials Center. Corvallis, OR.

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

Hruby, T. 2004. *Washington State Wetlands Rating System for Eastern Washington - Revised*. Washington Department of Ecology. Ecology Publication #04-06-15, Olympia, WA.

Kollmorgen Instruments Corporation. 1994 (Revised Edition). *Munsell Soil Color Charts*. Kollmorgen Instruments Corporation, New Windsor, NY.

Lichvar, R.W. 2013. *Washington 2013 State Wetland Plant List*. U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH, and BONAP, Chapel Hill, NC.

McGrath, C.L., A.J. Woods, J.M. Omernik, S.A. Bryce, M. Edmonson, J.A. Nesser, J. Shelden, R.C. Crawford, J.A. Comstock, and M.D. Plocher. 2002. *Ecoregions of Idaho* (color poster with map, descriptive text, summary tables, and photography): Reston, U.S. Geological Survey (map scale 1:1,350,000).

Morrison, P.H. and G. Wooten. 2010. *Biological Surveys Conducted in the SEIS Analysis Area at Mt. Spokane State Park During 2010*. Pacific Biodiversity Institute. Winthrop, WA. 151 pp.

Mount Spokane 2000. 2012. *Mt. Spokane State Park Ski Area Expansion: Post Construction Vegetation Maintenance Plan*. December. Mead, WA.

Mount Spokane 2000. 2013. *Mt. Spokane Ski and Snowboard Park Trail Clearing Prescriptions*. January. Mead, WA.

Natural Resources Conservation Service. 2013. Web Soil Survey. Available: < http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>. Accessed: August 13, 2013.

SE Group. 2013. July 1, 2013 Memorandum to Julie Shatto of Spokane County from Chris Ward of SE Group regarding Spokane Ski and Snowboard Park.

Spokane County Hearing Examiner. 2013. Appeal of Timber Harvest Permit, and of Administrative Decision under County Critical Areas Ordinance, issued by Spokane County Building and Planning Department – Findings of Fact, Conclusions of Law, and Decision. File No. B-1203366. April 9, 2013. Spokane, WA. 34 pp.

Towey Ecological Services. 2011. *Wetland Categorization/Buffer Establishment-Stream Typing/Buffer Establishment: PASEA*. December. Cheney, WA. Prepared for Mt. Spokane 2000, Mead, WA.

Towey Ecological Services. 2013. *Wetland Categorization/Buffer Establishment-Stream Typing/Buffer Establishment: PASEA*. January. Cheney, WA. Prepared for Mt. Spokane 2000, Mead, WA.

U.S. Army Corps of Engineers. 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region*. Technical Report TR-10-3. U.S. Army Engineer Research and Development Center. Vicksburg, MS.

U.S. Environmental Protection Agency. 2010a. Level III and IV Ecoregions of Washington (Map). June. Available: < ftp://ftp.epa.gov/wed/ecoregions/wa/wa_eco.pdf >. Accessed: August 13, 2013.

U.S. Environmental Protection Agency. 2010b. Primary Distinguishing Characteristics of Level III Ecoregions of the Continental United States. July. Available: http://www.epa.gov/wed/pages/ecoregions/level_iii_iv.htm#State Map. Accessed: August 21, 2013.

U.S. Environmental Protection Agency. 2013. Surf Your Watershed Website. Available: < http://cfpub.epa.gov/surf/locate/index.cfm>. Accessed: August 19, 2013.

U.S. Fish and Wildlife Service. 2013. National Wetland Inventory Wetland Mapper. Available: < http://www.fws.gov/wetlands/Wetlands-Mapper.html>. Accessed: August 13, 2013.

U.S. Geological Survey. 1973a. 7.5' Series (Topographic)—Mount Kit Carson, Washington Quadrangle. U.S. Geological Survey. Reston, VA.

U.S. Geological Survey. 1973b. 7.5' Series (Topographic)—Mount Spokane, Washington-Idaho Quadrangle (Photorevised 1986). U.S. Geological Survey. Reston, VA.

Washington State Department of Ecology. 1997. *Washington State Wetlands Identification and Delineation Manual*. Washington Department of Ecology Publication #96 94. Olympia, WA.

Washington State Parks and Recreation Commission. *2012. Mount Spokane Ski and Snowboard Park Final Supplemental Environmental Impact Statement*. October. Olympia, WA.

Washington State Parks and Recreation Commission. 2013a. Mount Spokane State Park Webpage. Available: http://www.parks.wa.gov/parks/?selectedpark=Mount%20Spokane. Accessed: August 13, 2013.

Washington State Parks and Recreation Commission. 2013b. Mount Spokane Potential Alpine Ski Expansion Area (PASEA) Website. Available: < http://www.parks.wa.gov/plans/mtspokane2/>. Accessed: August 13, 2013.

FIGURES