PROSPECTUS

Harris Homestead Mitigation Bank Preserve
Cheney, Washington

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November 29, 2023

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1. INTRODUCTION

1.1 General Project Overview

The proposed Harris Homestead Mitigation Bank Preserve (HHMBP), also referenced as the "Bank site", is a wetland mitigation bank proposed by Habitat Bank (HB), (operating as "Habitat Banc NW LLC"). Habitat Bank is a private company focused on the development of mitigation banks in Washington State and will operate as the HHMBP Bank Sponsor. S3R3 Solutions (S3R3), an organization that functions as a partnership between the City of Spokane, Spokane County, and the Spokane International Airport to promote economic development in the West Plains Airport Area (WPAA) is the landowner of the proposed Bank site property. HB will oversee all activities required for development and management of the Bank site, including project certification, permitting, construction, maintenance, monitoring, administration of mitigation credit transfers and reporting requirements.

Approximately 394 acres are currently owned outright or controlled by S3R3 and proposed as the Bank site, which is located near Cheney, Washington (**Figures 1 and 2**). Additional acreage or parcels adjacent to the proposed Bank site boundaries may be included into the final Bank project based on interest from neighboring land owners and if those areas are consistent with the Bank project's overall goals and objectives. For purposes of this prospectus, the current 394-acre Bank boundary will be used for area calculations of existing conditions, critical areas and design elements in the prospectus text and figures.

The Bank site property has been used for timber harvest, livestock grazing, and agricultural production for at least five generations of ownership. Historic and present-day agricultural activities, including livestock grazing, livestock feeding/watering areas, pond construction, road crossings, drainage ditches, stream crossings and channelization of streams and wetland outlets, have negatively impacted the functions of the existing aquatic areas on the site. Forested upland areas show evidence of timber harvest and thinning from historic logging practices and grazing of the understory by livestock. Agricultural use over the last 100+ years necessitated the removal of most of the riparian vegetation along Hog Canyon Creek, which is an intermittent stream that spans the southeastern portion of the site. Portions of Hog Canyon Creek that flow through existing wetlands have been channelized to drain the site for hay crop production. Herbaceous vegetation across the site has been heavily impacted by cattle grazing, and reed canarygrass dominates many of the existing wetland areas.

The proposed Bank site parcel is zoned by Spokane County as Rural Conservation (RCV), with Rural Conservation comprehensive plan designation, and is not designated as Agricultural Lands of Long-Term Commercial Significance.

1.1.1 Regional Overview

The Bank site is associated with the Columbia Plateau Regional Biodiversity Corridor, a biodiversity corridor mapped by Washington Department of Fish and Wildlife (WDFW 2023) which extends to the south and east of the Bank site and is ecologically important for enabling species movement among key areas of habitat and supporting native species population viability. The Turnbull National Wildlife Refuge

is located within this biodiversity corridor and is approximately 4 miles southeast of the Bank site. Additionally, approximately 4,000 acres to the north, and 1,000 acres west, east, and south of the Bank site is zoned Rural Conservation (RCV), and consists of a mosaic of wetlands, native shrub-steppe, grassland, and forested habitats. The Rural Conservation zone offers a measure of conservation and some protections from intensive development, by restricting development in these areas to low-impact uses and clustered developments to protect sensitive areas and preserve larger areas of open space. Property use and Zoning in the general vicinity of the Bank site (including parcels that surround the Bank) are either zoned as agricultural, vacant land, single unit residential, or rural residential. Under previous zoning regulations some of these parcels were subdivided for residential use into 10-acre parcels. Presently, parcels in this area of the County can be subdivided into 20-acre parcels for residential use.

Over the last 50 years, Spokane County has had higher population growth compared to the United States national average and this trend is expected to continue in the future. The population in Spokane County was 554,600 people in 2023, growing 0.71% from the previous year and Washington state's Office of Financial Management projects Spokane County's population will exceed 600,000 people by 2040. Spokane County's economy has historically been centered around natural resources, heavily dependent on extractive products produced from farms, forests, and mines. However, as the economy changes, the pace of growth is often hard to predict. The city's economy has now diversified to encompass other industries, including the technology, healthcare, and biotech sectors and other areas of the County are supporting new expansion and developments in manufacturing, distribution, transportation, and general supportive services. All these growth factors contribute to the need for additional infrastructure and transportation related services in the County that often require compensatory mitigation for unavoidable impacts to aquatic resources.

Within the vicinity of the bank site (2-mile radius) existing land uses include small to medium-sized agricultural activities and single-family homes on private tracts 10 acres to over 1,000 acres in size. The majority of activities are ranching, hay production and forestry. The small unincorporated community of Tyler lies to the west near the junction of SR 904 and Interstate 90 (I-90), a major federal interstate highway. Residential lots around Tyler are as small as 2-acres in size.

More recent home building has accelerated in the area overall, the majority on 10 acre lots or greater. Cheney is a larger city located about 6 miles to the east of the Bank site and is home to Eastern Washington University. Since the Covid-19 2020 pandemic, interest in rural residential properties have increased and many larger tracts are likely to split up into smaller 20-acre tracts and sold for home sites. Over time, areas around Tyler and Cheney are likely to continue to develop with more rural and suburban-type housing. However, Rural Conservation (RCV) and Rural Traditional (RT) zoning is designated within an approximate two-mile radius of the Bank site, and this zoning designation area focused on limiting development to lower-impact uses and cluster developments to minimize impacts to critical areas and open space. These zoning guidelines will likely limit more widespread concentrated development in the areas surrounding the Bank site.

In the areas where gradual densification of housing within a historically rural area are likely to occur, impacts in the region could include increased groundwater withdrawals from wells; increased runoff from new impervious surfaces from roads, driveways and buildings; more restrictions to wildlife movement due to fencing; alteration of habitat through vegetation clearing, noise and light pollution. Conversely, some areas on a local scale may see habitat improvements through the removal of livestock grazing on vegetation. This trend must also be considered in light of increasing wildfire danger, if areas are left ungrazed, vegetation cover density may increase and have more fuel for wildfire ignition and spread. Conversely, wetlands and stream corridors are important breaks in the landscape to help mitigate wildfire spread. Restoration specialists and resource agencies working in the Spokane area view restoration of these historical wetland complexes as a natural suppressant to wildfire and part of reestablishing natural fire breaks. As a recent example, southwest of the Bank site, the Watermelon Hill Fire in 2014 stopped at a newly established wetland restoration project that helped create a natural fire break and allowed eventual containment and suppression of the fire.

1.1.2 Bank Site Overview

The Bank site contains a variety of interconnected aquatic habitat types that are representative of the unique but disproportionately small aquatic areas found within the channelized scablands of Eastern Washington. This region and the aquatic areas that have developed within it, has its historical genesis in a series of massive flood events known as the "Missoula Floods" which dramatically shaped the landscape through intense scouring of bedrock and deposition of soils and material across the landscape. Historical flooding, patterns of intense weather, mixed with geology and soils influenced heavily by volcanic eruptions and depositions have created hydrologic patterns that support regionally unique aquatic, as well as upland habitat types, specific to this area of eastern Washington. Restoration actions on the Bank site will focus on improving the degraded functions and values of existing wetlands, reestablishing and creating additional wetland areas and wetland habitat types across the site through grading, removing ditches, culverts and drainages, creating stream channel complexity and connectivity in Hog Canyon Creek, protecting state designated priority habitat types, and improving habitat values for wetland dependent wildlife and plant species through revegetation, which has been heavily impacted and suppressed by agricultural and intense livestock management practices.

Construction of livestock watering ponds and the manipulation of existing wetlands for hunting waterfowl, installation of drainage ditches, and stream channelization has limited the extent of wetland hydrology and the interaction between Hog Canyon Creek and its floodplain. Reestablishing historical wetland hydrology in and around the existing wetlands on the property will be achieved by removing areas of wetland fill placed for livestock management and waterfowl hunting, disabling man-made drainage ditches, constructing stream alcoves, and shallow grading work to create additional wetlands in adjacent upland areas. Restoration of aquatic and upland areas and those features important to wildlife as well as priority habitat types is proposed by removing livestock, discontinuing current agricultural practices, and revegetating riparian, wetland, upland, and priority habitat areas with a diversity of native plant species. Elimination of intensive cattle grazing and the removal of invasive species in wetland areas will also allow the recruitment of native plant species and increase the level of success for establishing

multiple wetland habitat types within reestablished and existing wetlands, stream buffers, and upland habitat types.

Existing upstream or adjacent impacts to the bank site include the I-90 corridor to the north and upstream on Hog Canyon Creek. I-90 bisects the headwater wetlands of Hog Canyon Creek approximately 6 miles northeast of the bank site. From that point, Hog Canyon Creek flows southwesterly through multiple small and medium-sized ranching operations and numerous adjacent farmed wetlands. The stream also flows beneath several (at least six) county roads or collector driveways serving multiple rural lots. At least two suspected man-made ponds or reservoirs also occupy the flow path and channel of Hog Canyon Creek. While a few homesites near the creek exist, most activities within the drainage which are potentially impactful to the bank site are related to agriculture activities. Ranching along the stream and its associated wetlands implies potentially compacted soils, increased runoff, non-point source pollution from manure, denuded stream banks and stream water withdrawals for stock watering and field irrigation. Road culverts imply potential stream channelization, removal of beaver habitat, and runoff from roads and roadside ditches. Ponded areas for reservoirs increase the potential for washouts and erosion during highwater events, and stream drawdowns if used for irrigation.

Additional properties adjacent to the proposed Bank site that provide buffer protection, ecological connections or wildlife corridors and support the project's restoration goals may be added to the project if permanent conservation easements with the current landowners can be secured (**Figure 10**).

1.2 Project Description

This prospectus proposes the establishment of the HHMBP on approximately 394 acres located southwest of Cheney, Washington. The site is in portions of Sections 26, 27, 34, and 35 of Township 23 North, Range 40 East of the Willamette Meridian (**Figure 1**). The site is bounded to the north, west, and east by forest, agricultural land, and low-density residential parcels, and to the south by State Route (SR) 904. Hog Canyon Creek enters the site along the Bank site's east boundary and is channelized in portions of its length before flowing offsite to the south through a culvert crossing under SR-904.

1.3 Regulatory Framework

1.3.1 Compliance with Federal, State, and Local Rules

During the bank establishment and certification process, the HHMBP project will comply with the Federal Rule on Compensatory Mitigation for Losses of Aquatic Resources (33 CFT Parts 325 and 332), which address the rules and regulations governing the establishment and use of wetland mitigation banks. The Bank project will also comply with the State of Washington's Mitigation Banking Rules (WAC 173-700 and RCW 90.84) and the Washington Department of Ecology's *Prospectus Submittal Procedures for Federal and State Wetland Mitigation Banks in Washington State* (2018). Local regulation is governed by the Spokane County Municipal Code (2022) which requires that mitigation banks be consistent with the state's Mitigation Rules (specifically, RCW 90.84); therefore, compliance with the

state's regulations will satisfy local mitigation banking requirements. Prior to Bank site development, all local, state, and federal permits and approvals will be obtained.

The Bank Sponsor and S3R3 are considering several options for the Bank's Stewardship and Long-Term Management and Maintenance requirements of the Federal and State banking rules. The options include S3R3 itself, regional Land Trusts, and Spokane County's Conservation Futures Program. The County program is tax funded and focused on preserving open space, streams, rivers, and other natural resources that enhance the quality of life in Spokane County. The program has already acquired, preserved, and manages 9,524 acres in Spokane County and the bank site could qualify to be enrolled in this program to address maintenance of the site in perpetuity per the banking rule.

1.4 Ownership and Legal Restrictions

The Bank site totals approximately 394 acres, is currently owned or controlled by S3R3 Solutions and is contained within Spokane County Tax Parcel Number 03266.9062. The Bank parcel has been recently combined through a series of boundary line adjustments through a certificate of exemption process. The Bank site is zoned by Spokane County as Rural Conservation (RCV), with a Rural Conservation comprehensive plan designation. RCV zoning allows one dwelling unit per 20 acres and encourages low impact uses and the use of clustering and/or other open space techniques to protect sensitive areas and preserve open space. The Bank site is not designated as Agricultural Lands of Long-Term Commercial Significance.

There are no existing water rights on the site. Short-term irrigation for plant establishment can be provided through solar powered shallow well installation (i.e., less than 5,000 gpd), which would not require water rights for operation. A preliminary survey of water rights in the Bank's sites Upper Hog Canyon Creek sub-watershed identified two water rights for agricultural use on properties approximately 2 to 4 miles south and southwest of the Bank site. No impacts to these surface water rights are anticipated from the mitigation activities proposed in the conceptual site design. Easement restrictions on the property consist of easements granted for future slope adjustments along SR-904, and for power/telephone line access in the interior of the property.

1.5 Sponsor Information/Qualifications

Since 2001, Habitat Bank has been the leader in developing, permitting, and managing mitigation bank projects throughout Washington State. Habitat Bank certified the State's first privately sponsored mitigation bank (Snohomish Basin Mitigation Bank) under the Wetland Mitigation Banking Pilot Program in 2005 and developed the State's first joint Wetland and ESA Salmon Habitat Conservation Bank (Coweeman River Mitigation Bank) in 2016. In total, Habitat Bank has developed and certified five mitigation bank projects in Washington State: Snohomish Basin Mitigation Bank, Columbia River Mitigation Bank, East Fork Lewis Mitigation Bank, Coweeman River Mitigation Bank and Keller Farm Mitigation Bank. Together with local project consultants and other experts in the field, Habitat Bank will utilize their specific experience, technical expertise, and knowledge of aquatic resource restoration to successfully establish and operate a mitigation bank on the project site. Habitat Bank will work with a

variety of consultants on this bank project, most of whom have previous experience working with Habitat Bank in the establishment of wetland and conservation banks in Washington State.

S3R3 Solutions was created in 2017 by an interlocal agreement between the City of Spokane and Spokane County to promote economic development and provide certainty to business within its boundaries. The purpose of the organization is to prepare approximately 9,000 acres of property, both public and private, with the infrastructure to support business development, to assist new businesses in the West Plains Airport Area Public Development Authority with their permitting processes, and buy, sell, and develop infrastructure and real estate to create jobs and economic prosperity for the Spokane area. Organizational operations are currently managed by its Executive Director, Chris Pengra, with support, direction, and oversight provided by the organization's Board of Directors. The Board is comprised of City and County elected officials, the County CEO and City Administrator, the Spokane Airport CEO, and two private citizens, providing a diverse knowledge base in infrastructure planning, permitting, and development to support the Executive Director and the organization in its role as the Bank property owner.

2. WATERSHED CONDITIONS, NEEDS, AND RESTORATION GOALS

2.1 WRIA 34 – Palouse Watershed Overview

The Bank site is in the Palouse River Watershed, which is designated as Water Resource Inventory Area (WRIA) 34 **(Figure 2).** The Palouse Watershed encompasses the area influenced by the Palouse River, which originates in the mountains northeast of Moscow, Idaho, and flows to the west across the Washington State border into eastern Washington. The watershed covers portions of Whitman, Adams, Lincoln, and Spokane counties in Washington, and Latah County in Idaho. Most of the watershed (83 percent) is located within Washington counties.

The Palouse River and its tributaries drain approximately 2.1 million acres in Washington and Idaho and include over 398 miles of streams and tributaries. The Palouse River flows west/southwest across the watershed, eventually connecting with the Snake River at the southwest corner of the watershed. The main river systems within the watershed are the Palouse River (north and south forks) and its major tributaries which include Rebel Flat Creek, Rock Creek, Pine Creek, Union Flat Creek, and Cow Creek. Unlike many other river systems across Washington, the Palouse River and its tributaries are free of man-made barriers, allowing the streams to flow freely across the watershed (HDR/EES Inc. 2007). Approximately 6 miles from Palouse River's confluence with the Snake River it drops significantly in elevation, falling approximately 185 feet over the Palouse Falls. The Palouse Falls function as a natural barrier to fish passage and effectively isolate the upper reaches of the Palouse River from anadromous salmonids and other fish species that migrate from the Snake River. There are currently no ESA-listed fish upstream from the Palouse Falls.

Geography within the Palouse Watershed ranges from coniferous forest, high elevation mountain ranges and alluvial formed valleys in the eastern portion of the watershed in Idaho, to more rolling topography in the central and western portions of the watershed where the watershed boundary

crosses into Washington. Topography in the central portions of the watershed were formed from windblown silt deposits (referred to as loess) over basalt, with the western portion transitioning into the Channeled Scablands. The Channeled Scablands were formed by massive floods that occurred over the last two million years, with the most recent occurring between 10,000 and 12,000 years ago. These repetitive floods scoured the land, removing loess and other soils and leaving behind a land characterized by flat plateaus and steep canyon sides. A more detail discussion of how the floods impacted the landscape of the Bank site is provided in **Section 4.5.2** which discusses the wetland and upland association evidenced by the cycle of flooding and deposition that occurs in lands characterized by large-scale repetitive flood events.

Precipitation in the watershed ranges from 50 inches annually in the eastern mountains to 10 inches annually in the western part of the watershed, which is much drier. Precipitation is generally heaviest in the winter months with most of the precipitation in the eastern mountains falling as snow.

Agriculture is the predominate land use in the Palouse Watershed, covering approximately 67 percent of the watershed, followed by rangeland (26 percent) and forested (6 percent) land uses. Urban development represents a very small portion of the overall land use (1 percent) in the watershed with most development concentrated in the cities of Moscow, Idaho and Pullman, Washington (HDR/EES Inc. 2007).

The *Palouse Watershed Plan* (HDR/EES, Inc. 2007) identified four specific management areas based on similarities in land use, habitat, and hydrological characteristics in the WRIA to facilitate effective watershed planning. These four areas consist of the Cow/Rock Creek, Central/Lower Palouse, and North and South Fork Palouse management areas which reflect the west, central, and eastern portions of the watershed and help further characterize the differences in these specific areas (**Figure 2**).

The Bank site is located in the Cow/Rock Creek Management Area which is in the north and western portion of the watershed and contains the Cow and Rock Creek drainages which discharge directly into the Palouse River. Cow and Rock Creeks drainages are in the Channeled Scablands and encompass most of the existing lakes and wetlands in the Palouse Watershed. The Bank site is in the northern portion of the watershed, in the Cow Creek drainage. The northern portion of the watershed consists primarily of the Cheney/Palouse Flood Tract of the Channeled Scablands and is characterized by relatively flat topography, shallow depositional soils, basalt formations, and numerous shallow depressions and channels containing wetlands and small tributary streams. This management area also contains the Turnbull National Wildlife Refuge which encompasses over 20,000 acres dominated by ponderosa pine, wetlands, meadow steppe, and riparian habitat in the Channeled Scablands, and is located approximately 4 miles southeast of the Bank site.

2.2 Watershed Needs/Goals Pertinent to the Proposed Project

The watershed needs and goals pertinent to the proposed Bank site consist of both those at the overall watershed level and those more specific to the management area in which the Bank resides. While there have been few watershed planning and management documents developed for the eastern

Washington watersheds, several have been identified that were developed to assist in characterizing and facilitating planning and management goals in the Palouse Watershed:

- The *Palouse Subbasin Management Plan* (Gilmore, S. & Cook, T. 2004)
- *Palouse Watershed Plan* (HDR/EES, Inc. & Golder Associates 2007).
- *WRIA 34 – Palouse Watershed Detailed Implementation Plan* (Golder Associates Inc. & Dally Environmental 2009)

Key watershed issues listed in the *Palouse Watershed Plan* (HDR/EES, Inc. & Golder Associates 2007) and the *WRIA 34 – Palouse Watershed Detailed Implementation Plan* (Golder Associates Inc. & Dally Environmental 2009) are summarized below. Issues that are also identified in the Cow/Rock Creek Management Area are indicated with a C/R:

- Riparian areas not functioning to their potential and need to be restored/enhanced (C/R)
- Complete loss of riparian habitat, including wetlands (C/R)
- Erosion from land use activities (croplands, urban development, forestry, roads) (C/R)
- pH, fecal coliform, dissolved oxygen, and water temperature levels exceeding water quality standards (C/R)
- Elevated nitrate concentrations in groundwater (C/R)
- Rural communities experiencing water supply issues
- Surface flows are inadequate to sustain instream flow and aquatic habitat during summer low flow periods

Establishing the Bank site in the watershed will allow most of the key management issues listed above to be addressed, including those in the Cow/Rock Creek Management Area. Specifically, restoration actions on the Bank site will provide the opportunity to restore functionality to riparian and wetland habitat by establishing native vegetation in existing wetlands and riparian corridors that will improve habitat structure. Enhancing riparian habitat by installing native riparian vegetation within the Bank site can also benefit instream flow by restoring a more natural flow regime, enhance recharge of groundwater, and improve water temperature and quality. Discontinuing agricultural and livestock production activities will reduce erosion and improve water quality onsite, including reducing the amount of nitrates concentrated in the soil that could pass to groundwater.

The *Palouse Subbasin Management Plan* was also developed to identify specific management actions that would support the vision for the Plan, which was to "promote reasonable and sustainable populations of fish and wildlife species and their associated habitats throughout the subbasin" (Gilmore, S. & Cook, T. 2004). The objectives developed to support that vision which are relevant to the establishment of the Bank were summarized from the specific objectives listed in the Plan, which identify habitats, species, and coordination of instream flow implementation plans. They are summarized as:

- Protect native riparian habitat, identify degraded riparian habitats suitable for restoration, and restore degraded riparian habitat

- Protect native wetland habitat, identify degraded wetland habitats suitable for restoration, and restore degraded wetland habitat
- Protect native grassland habitats and restore lost and degraded grassland habitat
- Protect native shrub-steppe habitats and restore degraded shrub-steppe habitat
- Protect old growth ponderosa pine habitats and restore altered ponderosa pine habitats
- Protect native mixed conifer habitats and restore altered mixed conifer habitats
- Increase wildlife habitat value on agricultural land for focal species support
- Coordinate instream flow implementation plan actions proposed by WRIA 34 Planning Unit

The Bank site's habitat and species composition and potential for restoration of its degraded habitats meets the Plan's objectives of protection and restoration of degraded riparian, wetland, grassland, shrub-steppe, ponderosa pine, and mixed conifer habitats. Restoration and protection of these habitats would therefore support the ultimate vision of the Plan by promoting sustainability of the wildlife species dependent on these habitats for forage, cover, and the continuation of their life cycles.

3. BANK SITE SELECTION

The Bank site meets the criteria for selecting a mitigation site according to the guidance *Selecting Wetland Mitigation Sites Using a Watershed Approach (Eastern Washington)* (Hruby, Harper and Stanley 2010). The guidance helps gauge the potential of a mitigation site by identifying the ability of a site to be sustainable over time, to restore watershed processes, and to replace functions lost in other wetlands by restoration actions in the site. According to the methodology in the guidance, the Bank site satisfies the watershed criteria for mitigation site potential and sustainability. Additionally, it satisfies the criteria of suitability for restoration by providing improvements to wetland and stream hydrology (removing fill and ditches throughout the site), water quality (by removing agricultural and livestock management practices), and plant and wildlife species richness (removing ditches and fill, controlling invasive species, adding habitat structures, and installing native species). The Bank site includes a number of Washington State Department of Fish and Wildlife terrestrial and aquatic priority habitats, including Aspen Stands, Talus, Caves, Biodiversity Corridors, Eastside Steppe and Shrub-steppe Habitat (terrestrial) as well as Freshwater Wetlands and Instream Habitat (aquatic). Furthermore, the site contains vernal pool wetlands which are wetlands designated as "wetlands with special characteristics" that "have an importance or value that may supersede their functions" *WA State Wetland Rating System for Eastern WA* (Hruby 2014).

As enumerated in the previous section, the location of the Bank site and its restoration potential fulfill a significant number of the objectives and key management issues identified in the Palouse Watershed, as well as the Cow/Rock Creek Management Area in which it resides, which further supports its suitability and priority for restoration within the Watershed. Additionally, the potential to reestablish wetland acreage and hydrology on the site by removing ditches and drainage systems supports Washington State's long stated policy goal of no net-loss of wetland acreage and function.

The Bank site's potential for improving degraded riparian and wetland habitats meets the Palouse Watershed's management plan's objectives by increasing functionality and values of these habitats

through protection and restoration of degraded habitats across a wide variety of vegetation communities. Enhancing riparian habitat through planting riparian vegetation, removing fill, and disabling ditches, and discontinuing agricultural and livestock production activities will also function to meet the watershed plan's objectives by reducing erosion and improving recharge of groundwater, water temperature, and water quality.

Impaired hydrology and riparian conditions in the Bank's sub-watersheds (Upper and Lower Hog Canyon Creek) are also found throughout the Palouse Watershed and the Cow/Rock Creek Management Area. Hog Canyon Creek has been highly impacted by agriculture and livestock management activities, resulting in areas of channelization, modifying its stream channel and contributing to erosion, nutrient inputs, and significant removal of riparian vegetation along its length. Removing livestock management practices and agricultural uses, increasing stream channel complexity and sinuosity, and enhancing a riparian plant community in the reach of Hog Canyon Creek onsite will provide needed improvements to the watershed hydrology and riparian habitat in its associated sub-watersheds, while also improving a wide variety of functions targeted for improvement throughout the Palouse Watershed.

4. EXISTING AND PROPOSED CONDITIONS

4.1 Historic And Current Land Use

The site was likely used by indigenous peoples for harvesting of camas, game, and procuring raw materials for tool production (Transect Archaeology 2022). With the advent of early European trappers, explorers and settlers to the area, beaver trapping would have been an important economic activity for a period of years that would have dramatically changed the landscape through reductions in the beaver population and clearing of dams and impoundments.

By the late 1800s, General Land Office (GLO) maps show evidence of a formalized trail in the Bank site that provided access to a late 19th to early 20th century homestead or ranching operation (Transect Archaeology 2022). This historic land use is supported by the previous property owner who confirmed the Bank site property has been used for timber, livestock, and agricultural production for at least five generations of ownership. Evidence of historic and present-day agriculture and livestock production activities observed onsite include fences, active pastures, hay fields, and excavated ponds in wetland areas for livestock watering stations, man-made ponds used for hunting waterfowl, drainage ditches, culverted road crossings, stream channelization, and remnant feeding stations.

A portion of the Hog Canyon Creek stream channel has been modified into a straight, incised channel, which appears to have existed since at least the 1950s, but possibly as far back as the early 1900s. The existing wetland in the southern portion of the Bank site was modified in the 1980s through creation of individual pond/berm structures to facilitate hunting of waterfowl (Transect Archaeology 2022). The forested portions of the site show evidence of being logged through thinning practices for timber production, and intact forested areas relegated primarily to quaking aspen stands near wetland edges and along upland drainages. Many of the native ponderosa pine forests have been historically logged or thinned for agricultural purposes. Hay is harvested on the lower southeastern portion of the site once to twice annually early to mid-summer and then grazed by livestock through the fall.

4.2 Wetlands

The completed wetland delineation (2022) revealed the Bank site has 58.33 acres of wetlands that include 30.23 acres of depressional wetlands, 26.6 acres of riverine wetlands, and 1.5 acres of seasonal depressional vernal pools (**Figure 3**).

Many of the depressional wetlands are encircled by stands of quaking aspen with an understory of natives such as serviceberry, hawthorns, chokecherry,, and dogwood. Emergent wetland vegetation throughout the site has been heavily impacted by grazing and invasive forage species limiting species diversity to native rush and bulrush species. Most wetlands onsite are dominated by reed canarygrass. The most intact species diversity is found in vernal pools where shallow soils and seasonal hydrology discourage the development of reed canarygrass that is seen in the other wetlands onsite. Many of the transitional species typical to vernal pools are present in the spring, such as popcorn flower, Camas lily, curly dock, Baltic rush, and pincushion flower.

Drainage ditches, excavated livestock watering ponds, and man-made ponds used for hunting waterfowl have affected wetland hydrology both by limiting onsite wetlands' ability to store water during high rainfall periods and by draining surrounding areas more rapidly during periods of low rainfall. Additionally, excavation for the ponds may have penetrated the localized aquitard, allowing wetland hydrology to pass more rapidly into deeper groundwater systems, potentially decreasing soil hydrology. Five dataloggers were installed in January and March 2022 to monitor hydrology. Hydrology monitoring will continue during the process of bank establishment.

Wetland hydric soils consist of silt loams and mucks found in the Cocolalla, Cocolalla-Hardesty, and Saltese muck mapped soil units (**Figure 4).** Cocolalla-series soils are silt loams whose compositions are influenced by volcanic ash, which also influences the Saltese series organic soils. These organic soils are formed from decomposition of reeds, sedges, and other plant material, with a component of ash.

4.3 Streams

The Bank site contains a segment of Hog Canyon Creek, an intermittent stream that flows through the southeastern portion of the site and supports the existing riverine wetland complex. This portion of Hog Canyon Creek is in the Upper Hog Canyon Creek sub-watershed, about 4 miles south of the creek's headwaters. Hog Canyon Creek drains to Cow Creek in the upper portion of the Cow Creek drainage. Cow Creek flows to the Palouse River, which ultimately joins with the Snake River. The portion of the creek that flows though the site has been channelized/dredged and most of the associated riparian area vegetation has been converted to pasture for grazing. There is limited sinuosity and channel complexity in the Bank site, and the southern portion of the stream is impacted by two stream crossing structures before exiting the site through a series of 18-inch pipes and a 3-foot by 4-foot box culvert under SR-904.

4.4 Priority Habitats/Wildlife

There are several Washington State Department of Fish and Wildlife (WDFW) Priority Habitats located throughout the site, including Biodiversity Corridors, Eastside-Steppe, Shrub-Steppe, Aspen Stands, Caves, and Talus (terrestrial) as well as freshwater wetland and instream habitat (aquatic). There are numerous Aspen Stands onsite near wetland edges and around upland drainages. Caves and Talus are

also present in numerous rock outcrops in the uplands, many of which are within wetland buffers. Many of these priority habitats have been affected by agricultural and livestock management activities, including impacts to vegetation and wildlife habitat. Both enhancement and preservation of these priority habitats by removing land management agricultural activities and restoring native plant species will provide significant functional uplift. The Bank site is a documented migration corridor for Rocky Mountain elk and other large mammals such as moose, mule deer, and white-tailed deer, many of which use the site to access the Turnbull National Wildlife Refuge and surrounding areas in the spring and fall.

4.5 Uplands and Upland/Wetland Associations

4.5.1 Uplands

The uplands on site are characterized by a basalt Scabland, a landscape of plateaus and rock formations elevated above the existing wetlands and stream habitats. These areas have been characterized by high levels of disturbance from livestock and agricultural activities that have displaced much of the native shrub-steppe vegetation with more weedy and invasive species. Many of the priority habitats on site are located in uplands, including wetland and stream buffers and areas adjacent to them. Priority mapped habitat landscape features such as caves and talus intermix the vegetated and non-vegetated areas.

Vegetation in the uplands is characterized by patchy areas of forest/scrub-shrub vegetation intermixed with shrub-steppe habitat and open grasslands. Native vegetation includes a variety of bunchgrass and sagebrush species, wheatgrass, bluegrass, snowberry, rose, quaking aspen, and ponderosa pine. The primary non-natives and invasives include cheatgrass, Russian thistle, goatweed, and tansy ragwort. General soil map unit types found in the uplands are the Rockly-Northstar-Rock outcrop-Cocolalla soils are formed on Channeled Scablands and basalt plateaus. These soils are formed from basalt with a mix of loess and volcanic ash.

4.5.2 Upland/Wetland Association (Areas of Upland Influence)

The conceptual site design incorporates uplands enhancement directly adjacent to the wetlands, which are transitional zones that influence or are associated with the continuing function of both systems. The key to upland/wetland associations at the proposed Bank site is understanding how the landscape in eastern Washington was originally formed. The following discussion borrows from and references the book *Cataclysms on the Columbia, The Great Missoula Floods* (Allen, Burns, M. and Burns, S. 2009).

The Missoula floodwaters (up to 89 distinct floods by some estimates) were as much as 500 feet above the present site of Spokane. "The waters breached the wide, low divide into the upper reaches of the Cheney-Palouse scablands to the south and poured northwest down the Spokane River into the Columbia towards Grand Coulee."

The following is an excerpt from the book describing the Cheney-Palouse Scabland, which is the landscape in evidence at the proposed Bank site:

"*Almost unbelievably massive, the Cheney-Palouse Scabland sluiceway (wider than the Amazon) slopes*

southwest for 90 miles, from Spokane to the Snake River, and dwarfs even the majestic Grand Coulee in width and length. Its completely braided pattern weaves across an area that is 10-35 miles wide and covers 2,500 square miles as it drops 1,300 feet in elevation along its course. It has a gradient of 14 feet per mile, which is half as steep as the average gradient from Lake Missoula to the sea. The channels branch and then join again over and over as they cover the area between Spokane and the Snake River. Many kolks (closed depressions) were active during each flood, scouring out the bedrock." (Allen, Burns, M. and Burns, S. 2009).

Before the floods, the region was covered with a thick layer of loess that covered the basalt bedrock. During the floods only a few islands of loess, rising a few feet above the water, would appear in the upper course to the south of Cheney, Washington. Farther south, these "Palouse Islands" become more numerous, and east of Ritzville the floods split to occupy many channels that shaped between 30 elongated islands before reaching the Snake River south of the town of Washtucna. Today the valleys are dry with occasional lakes and ponds, except where the scouring and plucking of the bedrock floor within the channels produced depressions now occupied by the hundreds of small lakes dotting the area.

The Bank site exhibits nearly all (4 of 5) listed erosional features that make up the criteria for recognition of the great floods that formed the basis for the wetland and upland associations:

- Relative scarcity of soil or soft sediment along floodways below the level of the highest flood crest. This is evident at the Bank site where little to no soil profile is found on the bedrock plateaus and side slopes of the rock outcrops.

- Scablands topography (mesas and intervening dry channels) resulting from the scouring and irregular plucking out of pieces of rock (fractured joint blocks) from the underlying Columbia River Basalts. The "plucked out" pieces of rock are generally not found at the Bank site as they were moved off-site and downstream by the floods. The remaining rock outcrops are those rocks not eroded from the site.

- A braided or anastomosed pattern of the numerous dry channels and divide crossings where the floodwaters top their channels and spill over onto other channels or valleys producing kolks or "closed depressions" (hollows with no drainage outlets) in the channel floors. Wetlands 12 and 15 are good examples of kolks at the proposed Bank site (**Figure 3**).

- Widening and deepening of main valleys, forming steepened walls and cliffs (escarpments). Wetland 1 lies within a relatively wide and deep valley with steepened vertical walls that widen as it progresses downstream. Wetland 13 is in a similar "widened" valley progressing downstream.

Historic erosive forces that cut or "sluiced" through this landscape in multiple deep floods affect present

day relationships between wetlands and adjoining uplands. Water always seeks the most direct route for drainage, cutting through the most erodible sections of the landscape. Wetlands in the Bank site, and Hog Canyon Creek, are occupying these historic drainage routes. The rock outcrops at the Bank site also accentuated the process of scour and erosion, deflecting and directing the flood waters back into the gradually broadening and deepening channels. Without the rock outcrops to serve as sluice "sideboards", the valleys, channels, and depressions, and the wetlands and streams that occupy them, would not have formed into the unique landscape of the Cheney-Palouse Scablands.

With the recession of glaciers and subsidence of the great floods, the prominent natural force influencing the site became wind. Loess soils of the Palouse are evidence of the millenniums of easterly wind-blown silt particles carried from the coastal plains and mountains of present-day western Washington and Oregon. The time necessary to accumulate silt deposits has been relatively short (15,000-18,000 years) spanning the gap between the last flood and present day. Wind-blow silt is mostly deposited in valleys and depressions at the Bank site, being less likely to persist and accumulate on bare rock terraces, plateaus, and outcrops. Particles landing on exposed rocky surfaces are usually temporary, and later resume wind-driven movement into depressions where they are caught by water, vegetation, and previously deposited soils, either wind-blown or eroded down from upstream sources in the same drainage. This erosion and deposition process is present at the Bank site where the soils in the depressions are of substantially greater depth and formation than any that can be found on the rock outcrops. Some of the flat or level rock outcrops show signs of shallow mound or dune-like formations where windblow silt deposits are occurring, even if at a very slow pace. These features demonstrate the length of time needed for soils to establish on wind-scoured surfaces.

Prior to European settlement and conversion to agriculture, beaver activity would have been expansive throughout the Cheney-Palouse scablands. The area has multiple streams and water sources as well as quaking aspen—a choice food source—along with willow and other shrub and tree species. Beavers rely on streams and wetlands as sites for dams and lodges, and the presence of aspen and other shrubs and trees for food sources and construction materials would have supported large populations. Beavers are one of the most prominent examples of a species that relies on an upland-wetland association. Through damming activities, they also expand wetlands into uplands and therefore create habitat for other species.

Wetlands provide water and food sources for other wildlife, including numerous mammal, bird and amphibian species. Species that range or migrate over large areas are most likely to travel along the riparian areas of streams and the adjacent uplands to wetlands due to the reliable presence of water.

Forested uplands also provide shade and wind breaks for the onsite wetlands and Hog Canyon Creek, including important morning and late afternoon shade for the valleys and depressions where wetlands occur. Similarly, forested uplands reduce the effect on wetlands and streams from drying winds that generally blow west to east across the region and reduce the hydrology available to plants and wildlife. Upland areas that are draining into aquatic areas also serve during heavy and prolonged rain events and snowmelts to shed and distribute water to adjacent wetlands. The bedrock base and shallow soils in the

uplands do not infiltrate all precipitation, therefore, a significant amount of runoff flows downslope to the adjacent wetlands, including vernal pools. At the Bank site, by measuring from the wetland boundaries outward to encompass adjacent slopes that contribute to this runoff, most areas have slope distances which are 300-feet or greater in length from top of slope to wetland edge. Also in this zone, aspen stands and cottonwood trees are the dominant tree species creating a canopy and wind break. These species are not found anywhere else on the Bank site. Aspen and cottonwood stands create leaf litter and organic material which is shaded and damp and a key habitat feature supporting the terrestrial life cycle stage of amphibians as well as shade, protection and cool areas for a variety of mammals. This upland transition zone has been impacted by cattle grazing and hay cutting on the site, however, it is expected that these areas will rapidly recover when those land use activities are ended.

Associations between the wetlands and uplands at the Bank site are numerous and complex. Basalt rock formations, cataclysmic floods, loess, climate, and beaver activity have created a unique landscape with an intricate complex of associated habitats. Removing agricultural land management practices will allow the Bank site to return to a more natural interplay between the uplands and aquatic areas. The 300-foot buffer zone designating these important upland areas on the Bank site with specific benefits to aquatic areas are displayed on the Bank site figures to specifically designate their importance to aquatic areas on site.

5. SITE SPECIFIC RESTORATION GOALS

Aquatic area critical habitat impacts from agricultural and livestock production activities provide many opportunities for re-establishment, creation, rehabilitation, and enhancement in wetlands and uplands at the Bank site (**Figures 5, 6 and 7**). These opportunities have been developed as site-specific restoration goals and include the following:

- Re-establish wetland hydrology by disabling drainage ditches, livestock watering ponds, and man-made ponds used for hunting waterfowl
- Creating vernal pools in areas with suitable characteristics for establishment
- Creating additional depressional wetlands where existing wetlands have been impacted by land management practices
- Rehabilitating existing wetlands by disabling drainage ditches and reconnecting Hog Canyon Creek to its floodplain
- Increase channel complexity within Hog Canyon Creek by excavating stream alcoves, redirecting flow from spring areas, and adding habitat features such as boulders and large woody material.
- Restore stream flow to a more natural elevation through culvert removal and installing a log/rock check structure
- Enhance existing wetlands, areas of upland influence, and priority habitats (aspen stands, shrub-steppe, and riparian) by discontinuing agricultural practices, installing native plantings, and removing invasive species
- Restore riparian vegetation along Hog Canyon Creek (including newly created stream alcoves) which is lacking in riparian cover and complexity

6. CONCEPTUAL SITE DESIGN

The final project design will be developed in collaboration with the IRT and other local experts with experience in channeled scablands restoration after adequate site analysis. The initial data collected on the site, evidence of historic and existing land use impacts from agricultural and livestock management, key action areas and objectives in the surrounding watershed, and past experience on similar projects have all contributed to a conceptual design for the Bank site (**Figures 5 6 and 7**).

The key elements of the project design involve re-establishment, creation, rehabilitation, and enhancement of both aquatic and terrestrial habitats. Wetland reestablishment will occur in those areas where site fill for livestock management and waterfowl hunting have altered wetland hydrology and where wetland hydrology has been drained for hay production. Reestablishing the historic wetland hydroperiod in these areas will restart wetland processes to support their functions as depressional or riverine wetland systems.

Wetland creation by shallow grading around existing wetlands and the elimination of drainage systems as well as the potential of constructing additional vernal pools will also increase overall wetland acreage onsite. Wetland creation actions will increase the footprint of several existing wetlands which have had their boundaries constrained by drainage ditches or narrowed channels, and the placement of Hog Canyon Creek in a channelized ditch. These constraints have reduced the occurrence of longer duration hydroperiods which could sustain a larger wetland area. Disabling drainage ditches and shallow excavation will provide the necessary elevations and hydrology to create additional wetland area. The conceptual site design also explores opportunities to recreate vernal pools, a rare wetland type that is significant and important for seasonal wildlife habitat and reproduction, biodiversity, and federal and state listed species (Washington Department of Ecology, et. al. 2021). Potential vernal pool creation will occur in upland areas where bedrock is present, and a layer of impervious soil is either present or can be added to create the conditions for containing seasonal wetland hydrology long enough to support plant and wildlife species unique to this type of wetland. The design and implementation of creating vernal pools will be based on the methods employed by numerous successful vernal pool areas that have been recreated in the Central Valley of California. These vernal pools are hydrologically and biologically similar to the vernal pools in eastern Washington, sharing close to 70 percent of the same plant species (Bjork, Curtis, and Dunwiddie, Peter 2004). Additional supporting data will be collected from local vernal pool areas that have been monitored and studied on nearby sites in Spokane County as well as from existing vernal pools on the Bank site.

The Bank site also provides opportunities for rehabilitation of wetlands in the existing stream channel. Several of the existing wetlands are impacted by their connection to drainage ditches that rapidly drain wetland areas. Disabling the drainage ditches can slow this process and allow hydrologic functions such as groundwater recharge to occur. Hog Canyon Creek provides an opportunity for increasing channel complexity and sinuosity by adding stream alcoves and woody material/boulders to the channel. Further rehabilitation can be provided by removing the existing culvert and adding a log and rock outfall structure or beaver dam analog (BDA) to provide a more natural exit elevation to the stream channel mimicking what beaver would have historically created on sections of Hog Canyon Creek.

Wetland enhancement activities will include installation of native tree and shrub species in wetland, riparian, and upland influence areas, removal of invasive species, and discontinuing agricultural and livestock management activities onsite. These actions will provide improvements in vegetative cover and diversity to reverse the impacts of the historic land use on the site by reducing nutrient and chemical inputs, reducing erosion, and establishing native plant communities.

Wetland preservation on the Bank site will take place within the existing vernal pools and remaining upland/priority habitat areas being designated as preservation. Bank site protection measures consisting of recording a conservation easement over the entire Bank site and fencing around the Bank site boundaries will protect these areas in perpetuity.

The Bank site's proposed mitigation activities are further detailed in **Table 1**.

Table 1. Mitigation Activity and Conceptual Site Design

Type of Mitigation Proposed		Area Proposed	Proposed Acreage	Type of Treatment	Treatment Result
Re-establishment	Wetland Re-establishment	Area surrounding Wetlands 1, 2, 6 & 13, and between Wetlands 1 & 2	27.2 acres	• Removing fill by disabling of livestock and waterfowl hunting ponds • Disable drainage ditches • Install native wetland tree/shrub species	• Gain in overall wetland area • Returning natural/historic function to former wetland areas • Re-establish wetland hydroperiods • Re-establish wetland communities and processes • Increase vegetative cover and diversity
Creation	Wetland Creation	Potential areas suitable for vernal pool creation	3.3 acres[1]	• Add soil or restrictive layer over existing bedrock • Install vernal pool vegetation through planting or seed source	• Gain in overall vernal pool wetland area • Increase in habitat for rare plant and animal species found in vernal pools
		Areas suitable for additional depressional wetland creation (around Wetlands 8 and 10)	2.8 acres	• Shallow grading around existing wetland areas that have been narrowed or channelized • Install native wetland tree/shrub species	• Increase function and area of existing wetlands • Increase in wetland communities and processes • Increase vegetative cover and diversity
Rehabilitation	Wetland Rehabilitation	Wetlands 2, 3, 5, 6, 7, 9, 10, 12, 13 and 20 Existing ditches	35.73 acres	• Disable drainage ditches • Reconnect Hog Canyon Creek floodplain by removing fill • Install native wetland tree/shrub species	• Rehabilitation of historic wetland hydrologic processes through reconnection of Hog Canyon Creek floodplain and disabling ditches • Increase in specific wetland hydrologic functions (groundwater recharge, decrease rapid removal of water from wetland) • Increase vegetative cover and diversity

[1]Potential vernal pool creation area is approximate and represents an overall potential area where individual smaller vernal pools may be created in the future.

Type of Mitigation Proposed		Area Proposed	Proposed Acreage	Type of Treatment	Treatment Result
	Stream Rehabilitation	Hog Canyon Creek	N/A	• Add excavated alcoves to channelized portion of stream channel • Direct springs on south side of Wetland 3 so flow goes into Hog Canyon creek • Remove culvert and add log and rock check dam or BDA • Add wood and boulders to creek	• Increase stream channel complexity and sinuosity • Rehabilitate stream flow by correcting to a more natural elevation
Enhancement	Wetland Enhancement	Remainder of wetlands not proposed for rehabilitation or re-establishment	21.1 acres	• Install native wetland tree/shrub species	• Increase vegetative cover and diversity
	Upland Enhancement	Area of Upland Influence	206.3 acres	• Install native tree/shrub species (including aspen) in targeted areas of disturbance (primitive roads/cow trails) • Remove invasive plant species • Removing livestock • Ceasing hay crop production	• Improve upland habitat diversity and increase priority habitat areas • Reduction of nutrient and chemical inputs • Reduction in erosion and sedimentation rates • Increases in native species colonization
	Stream Enhancement	Hog Canyon Creek (stream channel and newly create stream alcoves)	N/A	• Install native tree/shrub species along stream channel	• Enhancement of riparian vegetation along stream channel • Increase vegetative cover and shading along stream channel • Reduce water temperature and sediment input within stream • Improve water quality
Preservation	Wetland Preservation	Vernal Pool Wetlands 14, 17, 18, 19	1.5 acres	• Preservation of existing vernal pools	• Protection of rare and limited wetland class
	Upland Preservation	Remaining Upland and Priority Habitat Areas	96.07 acres	• Preservation of remaining upland and priority habitat areas	• Protection of remaining uplands and Priority Habitat Areas

7. PROPOSED SERVICE AREA AND PROJECT NEEDS

7.1 Proposed Service Area

The proposed service area incorporates portions of Zones 1 and 3, as described in the 2010 Ecology document *Selecting Wetland Mitigation Sites Using a Watershed Approach (Eastern Washington*) **(Figures 8 and 9).** The area surrounding the S3R3 development area, and the Bank site is designated by Ecology as Zone 1; that is, an area where mitigation sites can be selected by surface drainage basins. Zone 1 is generally defined as having 5 to 10 inches of annual precipitation; however, due to the unique geologic history in southern Spokane County combined with longer periods of drier weather in recent years, wetlands in this zone appear to be influenced as much by the movement of ground water as by surface

drainage and precipitation. This combination is also characteristic of Zone 3, having on average 1 to 5 inches of annual precipitation. Most of the middle and lower watersheds that the Bank site drains into are in Zone 3. From the Bank site, Hog Canyon Creek flows southwesterly to Sprague Lake, Cow Creek, the Palouse River, the Snake River, and ultimately the Columbia River, largely within WRIA 34-Palouse. Proceeding downstream, this series of waterbodies and water courses receives hydrology from a combination of surface water drainages and aquifer discharges in Zones 1 and 3. Equally significant is that the groundwater underlying the bank site also contributes to the adjacent and closely associated WRIA's of 43-Upper Crab and 56-Hangman. Each of these WRIA's in turn support several other downstream WRIA's covering much of the Columbia Plateau and Basin. As explained in more detail in the following section, the three WRIA's of 34-Palouse, 43-Upper Crab and 56-Hangman are the key stitches that knit the service area of the 12 WRIA's together. Soils, geologic history, landform, climate, ecosystem and land use also knit these WRIA's together for an appropriate bank service area.

A proposed service area for Bank site is represented on **Figure 9**. The service area is based on guidance developed by Ecology and upon shared attributes of drainage basins in the Water Resource Inventory Areas (WRIAs). The bank site is within WRIA 34-Palouse. Immediately adjacent WRIA's include 43-Upper Crab and 56-Hangman. Regionally proximate to the Bank site and hydrologically connected downstream with these three WRIA's are eight other WRIA's: 57-Middle Spokane, 55-Little Spokane, 54-Lower Spokane, 53-Lower Lake Roosevelt, 50-Foster, 42-Grand Coulee, 44-Moses Coulee and 41-Lower Crab. Most distant yet still connected through groundwater and irrigation water pumped in the Columbia Basin Project is WRIA 36-Esquatzel. To the east the service area abuts the Idaho state border, a political boundary. Areas NOT proposed in the service area are significantly different in their hydrological associations and other features including landform, elevation, climate, soils, etc. The common attributes and connections between WRIAs include:

- Geologic Conditions/Landscape

  All of the proposed WRIA's have a shared geologic history with at minimum a portion, in several cases entirely, of each WRIA's area being eroded and shaped by the Missoula Floods. These cataclysmic floods, potentially up to 89 distinct flood events, occurred over thousands of years during the last ice age. Each of the proposed service area WRIA's contain one or more of the following flood-created features including terraces, lakes, basins, scablands, rock outcrops, cliffs, hanging valleys, coulees and other unique flood landforms created during the floods. The service area WRIA's DO NOT include those to the south, WRIA 35-Middle Snake, WRIA 33-Lower Snake, and WRIA 37-Lower Yakima. Even though these have Missoula Flood features they are WRIA's associated with the Snake and Yakima River systems. Not included to the west or north of the proposed service area are those WRIA's outside of the Columbia Basin and lacking flood features. To the east the service area abuts the Idaho state border, a political boundary.

- Soils

  Loess soils are formed by windblown silt deposits interrupted with multiple small to gigantic cut channels and coulees scoured by the Missoula Floods. The predominant wind direction was

from the southwest from the Columbia River Gorge and the Pasco Basin area, depositing silt soils north and easterly across the majority of the proposed service area. Loess soil deposits are found on 9 of the 12 proposed WRIA's, the only three without loess are northerly within the proposed service area including WRIA's 50-Foster, 55-Little Spokane and 57 Middle Spokane. Two of the western WRIA's in the proposed service area, WRIA's 36-Esquatzel and 41-Lower Crab also contain sand dunes from the historic wind deposits.

- Climate and Precipitation

  The proposed service area WRIA's all share relatively low precipitation, 5-15 inches annually within the rain shadow of the Cascade Mountains to the west. The southwestern WRIA's in the proposed service area are the driest at an average of 5-10 inches annual precipitation and the northeastern WRIA's are the "wettest" in the service area with 10-15 inches average annual precipitation. The overall topography within the service area, sloping consistently downward from northeast to southwest, is such that the WRIA's with higher precipitation support surface hydrology downstream within the WRIA's with lower precipitation. The average annual extreme low temperature across the service area ranges from 5 degrees to -10 degrees Fahrenheit, the coldest zone at the higher elevations west of Spokane including the proposed bank site. Snow accumulations at these higher elevations also support annual and seasonal downstream flows and aquifer recharge across the proposed service area.

- Other Hydrology Sources

  In addition to precipitation and snowmelt, other major common sources of hydrology within the service area are groundwater aquifers and runoff from irrigation. All WRIA's within the proposed service area are located within the Columbia Plateau Regional Aquifer System containing a mosaic of two interwoven aquifer types: Unconsolidated-deposit aquifers and Miocene basaltic-rock aquifers. Several WRIA's bisect locally named and managed aquifers including the Spokane-Rathdrum Prairie Aquifer, Palouse Aquifer and Odessa Aquifer. A common attribute across the WRIA's is aquifer draw-down. While the amount of water held in the basalts can be large, the recharge in the semi-arid Columbia basin is quite small, averaging 10 inches per year or less in the region. In areas where intensive pumping is occurring, water levels are declining. In fact, basalt aquifer levels are declining not only in Odessa, but in several areas around the Columbia Plateau, including the Palouse Aquifer and in WRIA's outside of the service area including those near Umatilla, and part of the Yakima basin. The service area WRIA's also share the common hydrology source of runoff from irrigated agricultural lands, including but not limited to, large reclamation projects such as the Columbia Basin Project with water supplied by the Columbia River, groundwater from aquifers pumped from wells, surface water pumped or gravity fed from reservoirs and ponds including excavated stock watering ponds (present at bank site).

- Hydrologic Interactions

The proposed bank site lies within and near the upper headwaters of WRIA 34-Palouse. Within a short distance, less than a mile to the northwest is the watershed boundary of WRIA 43-Upper Crab. To the east of the bank site, less than 4 miles distant, is the watershed boundary of WRIA-56-Hangman. The undulating plateau of the bank site area shares common elevations ranging from 2,250 feet to 2,350 feet with these two adjacent WRIA's. Also shared is common soils and rock formations. It is predictable that groundwater in this area (Odessa and Palouse aquifers) supplies hydrology into all three WRIA's, the flow direction at the land surface only dictated by local topography and historical geomorphic actions such as erosion over time. WRIA-56-Hangman drains to the Spokane River Valley and therefore has hydrologic connections to the Spokane Valley-Rathdrum Prairie aquifer. In turn, this aquifer and its surface water component, the Spokane River, knits together hydrologically WRIA's 57-Middle Spokane, 55-Little Spokane and 54-Lower Spokane. Further downstream from the Spokane River is WRIA's 53-Lower Lake Roosevelt, 50-Foster, 42-Grand Coulee, and 44-Moses Coulee. At the Grand Coulee Dam, Columbia River water is pumped back up onto the plateau and diverted to areas west and south of Lake Roosevelt into these WRIA's. Thus, groundwater sourced into WRIA 56-Hangman by the aquifer underlying the bank site has hydrologic connections within 8 of the 12 WRIA's within the proposed service area. Similarly, WRIA's 43-Upper Crab and 41-Lower Crab, knitted together hydrologically by Lower and Upper Crab Creek, are two large WRIA's making up the central portion of the service area, ultimately draining to the Columbia River south of Vantage. These Crab Creek WRIA's also have a source of hydrology from the aquifer underlying the bank site. Cow Creek watershed, where the bank site is located on one of its tributaries, Hog Canyon Creek, is roughly the western third of WRIA 34-Palouse which includes the North, South, Central/Lower sections of the Palouse River. The lowest lying WRIA in the service area in terms of elevation is 36-Esquatzel. It is also the driest in terms of precipitation. This WRIA abuts 41-Lower Crab and 34-Palouse and was included in the proposed service area due to its reliance on both the Columbia River and Odessa aquifer for irrigation. Both water sources have a hydrologic connection to the bank site, even though remote at a regional scale and by distance.

- Ecosystem

  The bank site lies just within a transition zone where shrub-steppe melds with pine forests in areas where annual precipitation reaches sufficient quantities to support growth of Ponderosa pine. All of the proposed service area WRIA's are either dominated by shrub-steppe, ponderosa pine forest, or a combination of both. Within shrub-steppe zones, dominant vegetation includes fourwing saltbrush, Antelope bitterbrush, greasewood, Wyoming big sagebrush, bluebunch wheatgrass, needlegrass, and Sandberg bluegrass. Ponderosa pine forests include common snowberry, wild rose, white spirea, Idaho fescue, bluebunch wheatgrass, arrowleaf balsamroot, and pinegrass. Wetlands and stream banks include willow, red-osier dogwood, cattails, rushes and sedges. Throughout the service area, wetlands and streams including reservoirs and ponds, are relatively scarce over the landscape due to the low level of annual precipitation. Wetland hydrology is often "flashy" and often present only during spring rains and snowmelt typified by vernal pools which dry quickly as temperatures warm seasonally. It is noted for soils

descriptions throughout the service area WRIA's that natural vegetation can be extremely scarce because of farming pressures.

- Land Use

  Within all of the service area WRIAs, agriculture dominates both irrigated and non-irrigated lands. Livestock ranching is present throughout the service area but concentrated more to the east and north outside of the more intensively irrigated regions. Field crops include but are not limited to, wheat, barley, peas, and lentils, other small grains, hops, vegetables, wine grapes, vegetables, and hay. Also present is some forestry and sparse settlement associated with an agricultural economy; aeronautics and airports prominent among increasingly diverse industry around greater Spokane area; land shipping routes such as rail and highway for moving goods/services east-west from the interior to the coastal areas on the Pacific Rim with ports and more dense populations.

Further justification for the proposed service area is based on 33 CFR 332.8(d)(6)(ii)(A) of the Federal Rule for Mitigation Banks and In-Lieu Fee Programs:

"The economic viability of the mitigation bank or in-lieu fee program may also be considered in determining the size of the service area".

In support of the proposed service area extent, there is a practical economic justification for the service area based on the limited geographical size and relative populations within WRIAs in this region and the limited amount of wetlands that occur in the service area extent. Defining a service area in this region based on 1 or 2 WRIAs could not support the economic investment for a mitigation bank or possibility that mitigation banks will be proposed or utilized, given the number of potential impacts regulated by local, State and Federal agencies. While the economic justification for the service area extent is a practical consideration under the Federal Rule, it is consistent and not contradictory to the methods for determining interconnected and related watersheds in state mitigation guidance for Eastern Washington.

7.2 Project Needs

The Bank site provides a significant opportunity to reestablish, create, rehabilitate, enhance, and preserve high quality wetlands, riparian areas, associated uplands, wetland buffers, and priority habitats in a region of Washington State that will continue to grow and require appropriate compensatory mitigation for unavoidable impacts. The site was once a larger historic wetland complex, including vernal pools and priority habitats, which have been impacted by generations of agricultural and livestock use. The underlying characteristics of the site such as hydrologic input, soil composition, and location in the landscape provides a higher potential of overall success for the proposed mitigation activities once the land use disturbances are discontinued and the project is completed. Additionally, the Bank site's location and potential for restoration meets many of the objectives and key management issues outlined for improvements in the Palouse Watershed, adding to the success of the Watershed's management plan's implementation goals.

Additionally, State and local regulatory agencies have created guidance for the protection, restoration and mitigation of shrub-steppe priority habitat in Eastern Washington. Shrub-steppe habitat is protected through local critical areas codes, which require habitat management plans and mitigation for unavoidable impacts. Habitat Bank will work with local agencies and the Washington State Department of Fish and Wildlife to quantify the existing shrub-steppe habitat on the bank site and any enhancement actions to this habitat at the Bank to allow the use of the Bank for shrub-steppe mitigation under local critical area code regulations.

Development pressures in the general area, an expanding population base and continued growth in Spokane County make the Bank site a desirable property for a mitigation bank site. S3R3 Solutions was created through a partnership between the City and County of Spokane and the Spokane International Airport (SIA) to promote economic development in the area surrounding the SIA. With imminent growth across the West Plains, including the Spokane International Airport, Fairchild Air Force Base, and private industrial developments, there is an immediate need to mitigate several industrial developments in these areas. The use of onsite mitigation for compensation for these development impacts is problematic, as all development located within the WPAA falls within a 5-mile radius of the SIA and is subject to the Federal Aviation Administration published Advisory Circular No. 150/5200-33B/C - Hazardous Wildlife Attractants on and Near Airports. Any potential onsite mitigation area proposed could provide habitat for wildlife species that could be hazardous for airport operations., Therefore finding a mitigation site outside of this radius of FAA regulation is needed to provide a viable option to compensate for development impacts within West Plains Airport Area. Unlike onsite mitigation within the WPAA, the proposed Bank site is located approximately 12 miles from the Spokane International Airport (SIA), and therefore would not be subject to the FAA's hazardous wildlife restrictions.

As a condition of mitigation bank certification in Washington State, the Bank site will be permanently protected and managed in perpetuity by a qualified third party. Habitat Bank has experience working with and setting up the protection of mitigation bank sites in perpetuity with qualified entities in Washington State to meet bank site certification standards and long-term protection of restored aquatic resources. Once the project is certified and constructed, the restoration of the Bank site's diverse mixture of wetland, riparian, upland, and priority habitat types, will provide a high quality and sustainable source of mitigation for planned and future compensatory mitigation needs when they occur within the region.

7.3 REFERENCES

Allen, Burns, M. and Burns, S. 2009. *Cataclysms on the Columbia, The Great Missoula Floods.*

Bjork, Curtis, and Dunwiddie, Peter. 2004. *Floristics and Distribution of Vernal Pools on the Columbia Plateau of Eastern Washington.* Rhodora, Vol. 106, No. 928, pp. 327-347.

Gilmore, S., and Cook, T. 2004. *Palouse Subbasin Management Plan*. Final Draft May 2004. Prepared by: Resource Planning Unlimited Inc., project lead: Palouse-Rock Lake Conservation District.

Golder Associates Inc. & Dally Environmental 2009. *WRIA 34 – Palouse Watershed Detailed Implementation Plan*. (Funded through Washington State Department of Ecology Grant No. GO800439).

HDR/EES Inc. & Golder Associates. 2007. *Palouse Watershed Plan – Planning Unit Draft WRIA 34*. October 2007. Palouse Conservation District (funded through Washington State Department of Ecology Grant No. GO200368).

Hruby, T., K. Harper, and S. Stanley. 2010. *Selecting Wetland Mitigation Sites Using a Watershed Approach (Eastern Washington)*. Washington State Department of Ecology Publication #10-06-007.

Hruby, T. (2014). Washington State Wetland Rating System for Eastern Washington: 2014 Update. (Publication #14-06-030). Olympia, WA: Washington Department of Ecology.

Spokane County. 2022. *Spokane County Municipal Code.*

Transect Archaeology. 2022. *A Cultural Resources Survey for the Lazy H Wetland Mitigation Bank Project*, Spokane County, Washington.

Washington State Department of Ecology. 2018. *Prospectus Submittal Procedures for Federal and State Wetland Mitigation Banks in Washington State* (Revised, June 2018). Access Online June 2022: https://ecology.wa.gov/Water-Shorelines/Wetlands/Mitigation/Wetland-mitigation-banking/Templates-guidance-documents

Washington State Department of Ecology, U.S. Army Corps of Engineers Seattle District, and U.S. Environmental Protection Agency Region 10. 2021. *Wetland Mitigation in Washington State–Part 1: Agency Policies and Guidance (Version 2)*. Washington State Department of Ecology Publication #21-06-003.

Washington Department of Fish & Wildlife (WDFW). 2023. Originally published August 2008, updated June 2023. Priority Habitats and Species List. Olympia, Washington. 299pp.

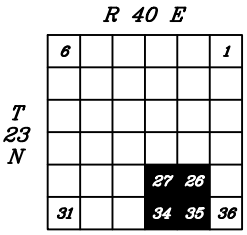
WASHINGTON

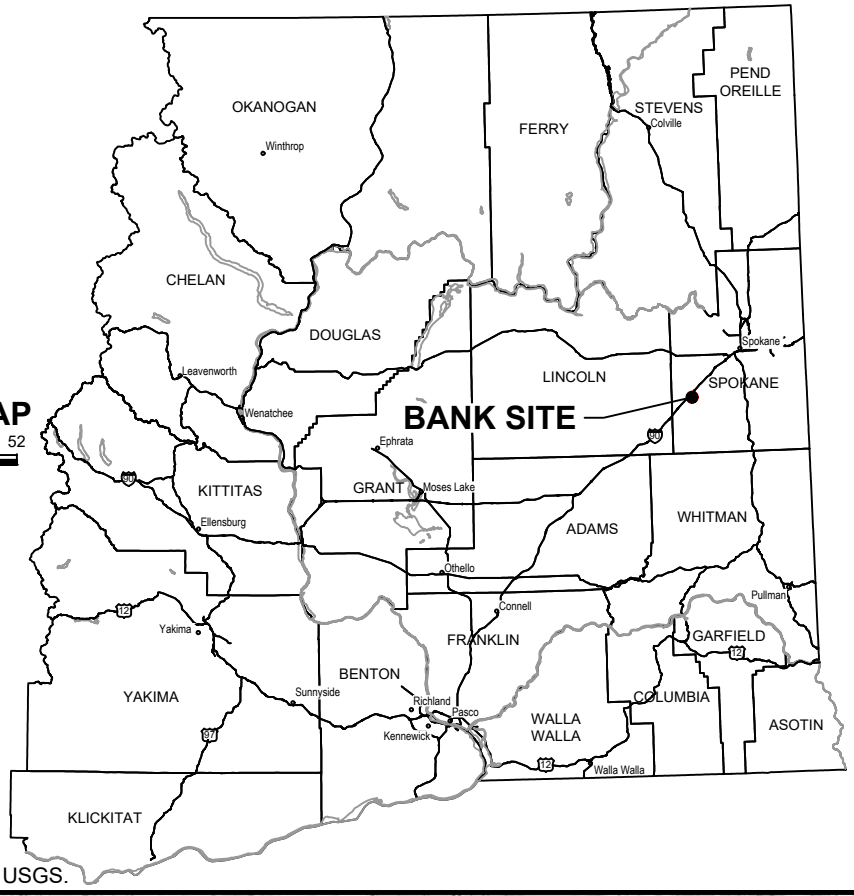
47.4568° Latitude
-117.7362° Longitude

LOCATION MAP

PROJECT VICINITY MAP

0 52
SCALE IN MILES





NOTE:
Quadrangle topographic map from USGS.

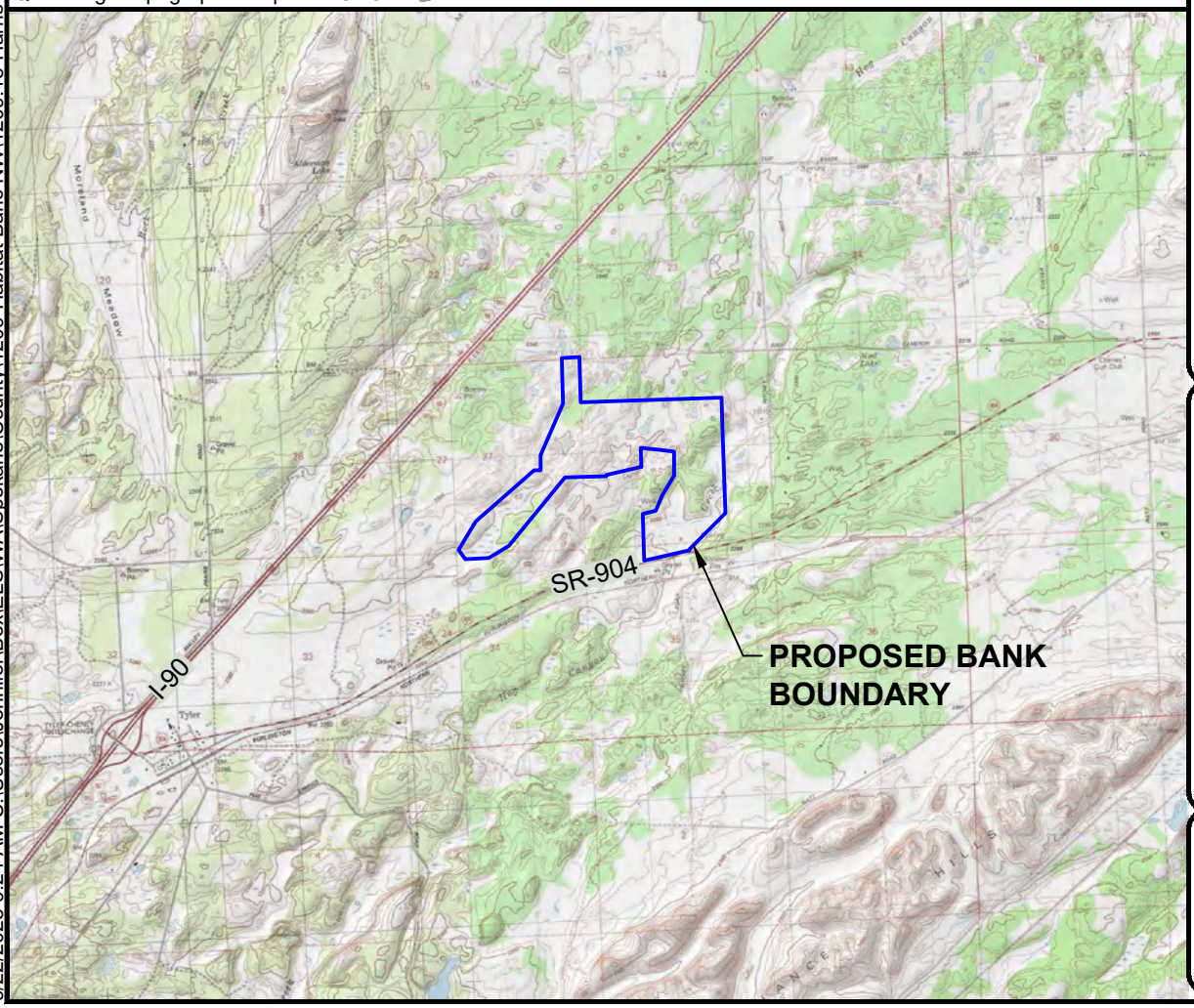


Figure 1
VICINITY MAP
Harris Homestead Mitigation Bank Preserve Prospectus
Habitat Banc NW
Spokane County, Washington
Section 26, 27, 34, & 35, Township 23N, Range 40E, W.M.

DATE: 9/22/23
DWN: JKJ
REQ. BY: KB
PRJ. MGR: FN
CHK: FN/KB
PROJECT NO: 1209.18

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0 1 2
SCALE IN MILES

N
W E

Proposed Bank Boundary

Spokane
Medical Lake
Cheney
Harrington
Sprague
Ritzville
Rosalia
Colfax
Palouse
Pullman
Moscow
Potlatch
La Crosse
Colton
Pomeroy

WRIA 57
WRIA 56
WRIA 43
WRIA 34
WRIA 41
WRIA 36
WRIA 35
WRIA 33

Cow / Rock Creek
Central / Lower Palouse
North Fork Palouse
South Fork Palouse

Washington
Idaho

Crab Creek
Sprague Lake
Turnbull Lake
Williams Lake
Hangman Creek
Rock Lake
Pine Creek
Cottonwood Creek
Rock Creek
Palouse River
Cow Creek
Union Flat Creek
Willow Creek
Alkali Flat Creek
Snake River

2
90
23
27
95
195
261
26
105

Legend

- WRIA34 Palouse Watershed
- ID Palouse Watershed
- Management Areas
- Adjoining-WRIAs
- State
- Counties
- Streams
- Lakes
- Turnbull National Wildlife Refuge
- Hwys
- Cities
- Proposed Bank Boundary

NOTE(S):

1. Palouse Watershed Management Areas Map from the Palouse Watershed Plan (HDR/EES, Inc. & Golder Associates 2007.

Figure 2
PALOUSE WATERSHED MANAGEMENT AREAS
Harris Homestead Mitigation Bank Preserve Prospectus
Habitat Banc NW
Spokane County, Washington
Section 26, 27, 34, & 35, Township 23N, Range 40E, W.M.

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0 8 16
SCALE IN MILES

N
W E
S

WETLAND SUMMARY TABLE WITHIN BANK BOUNDARY		
WETLAND NO.	WETLAND TYPE	APPROX. ACRES
1	DEPRESSIONAL	15.6
2	DEPRESSIONAL	0.1
3	DEPRESSIONAL	2.4
4	DEPRESSIONAL	3.6
5	DEPRESSIONAL	0.6
6	DEPRESSIONAL	1.5
7	DEPRESSIONAL	0.4
8	DEPRESSIONAL	1.2
9	DEPRESSIONAL	0.9
10	DEPRESSIONAL	2.9
11	DEPRESSIONAL	0.2
12	DEPRESSIONAL	0.3
13	RIVERINE	26.6
14	VERNAL	0.3
15	DEPRESSIONAL	0.2
16	DEPRESSIONAL	0.3
17	VERNAL	0.1
18	VERNAL	0.7
19	VERNAL	0.4
20	DEPRESSIONAL	0.03
TOTAL:		58.33

LEGEND

- PROPOSED BANK BOUNDARY (~394 AC.) EXISTING OR PLANNED PARCELS
- SECTION LINE
- EXISTING STREAM CHANNEL WITH FLOW DIRECTION
- DITCH
- EXISTING SPRING
- ASPEN STAND
- DATA LOGGERS

WETLAND AREA (58.33 AC.)

- DEPRESSIONAL/RIVERINE WETLAND (56.83 AC.)
- DEPRESSIONAL VERNAL POOL WETLAND (1.5 AC.)

BANK SITE PARCEL #03266.9062

CONSERVATION & ACCESS EASEMENT AFN: 7290469

2 - STOCK POND

HOG CANYON CREEK

EXISTING WETLAND CROSSING

SR 904

NOTE: The site boundaries and parcel numbers are subject to change.

Figure 3
EXISTING CONDITIONS
Harris Homestead Mitigation Bank Preserve Prospectus
Habitat Banc NW
Spokane County, Washington
Sections 26, 27, 34, & 35, Township 23N, Range 40E, W.M.

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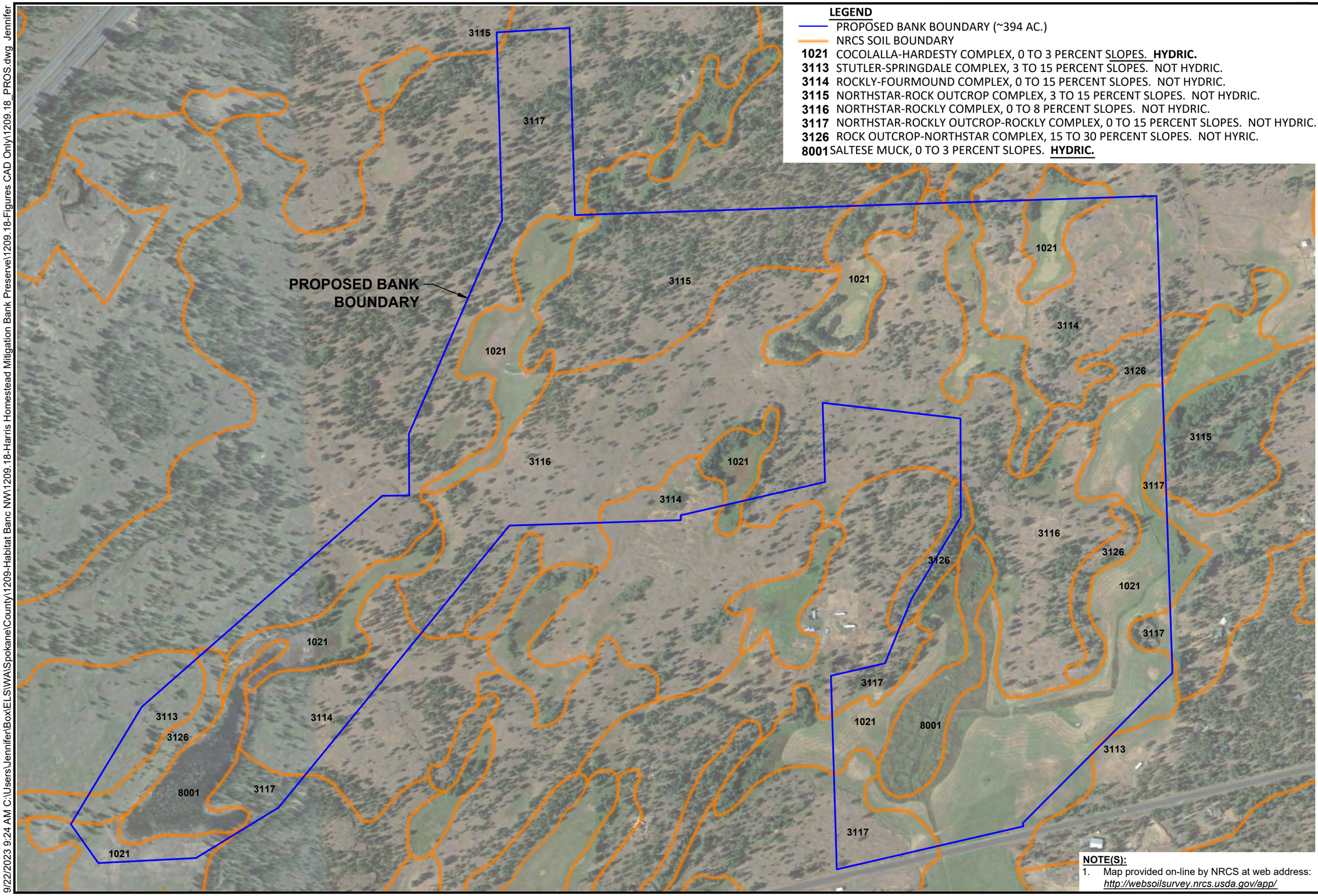
1200 0 600 SCALE IN FEET

N W E S



LEGEND

PROPOSED BANK BOUNDARY (~394 AC.)

NRCS SOIL BOUNDARY

1021 COCOLALLA-HARDESTY COMPLEX, 0 TO 3 PERCENT SLOPES. **HYDRIC.**

3113 STUTLER-SPRINGDALE COMPLEX, 3 TO 15 PERCENT SLOPES. NOT HYDRIC.

3114 ROCKLY-FOURMOUND COMPLEX, 0 TO 15 PERCENT SLOPES. NOT HYDRIC.

3115 NORTHSTAR-ROCK OUTCROP COMPLEX, 3 TO 15 PERCENT SLOPES. NOT HYDRIC.

3116 NORTHSTAR-ROCKLY COMPLEX, 0 TO 8 PERCENT SLOPES. NOT HYDRIC.

3117 NORTHSTAR-ROCKLY OUTCROP-ROCKLY COMPLEX, 0 TO 15 PERCENT SLOPES. NOT HYDRIC.

3126 ROCK OUTCROP-NORTHSTAR COMPLEX, 15 TO 30 PERCENT SLOPES. NOT HYRIC.

8001 SALTESE MUCK, 0 TO 3 PERCENT SLOPES. **HYDRIC.**

NOTE(S):

1. Map provided on-line by NRCS at web address: *http://websoilsurvey.nrcs.usda.gov/app/*

Figure 4
NRCS SOIL SURVEY
Harris Homestead Mitigation Bank Preserve Prospectus
Habitat Banc NW
Spokane County, Washington
Sections 26, 27, 34, & 35, Township 23N, Range 40E, W.M.

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1200
600
0
SCALE IN FEET

N
W
E
S

LEGEND

- PROPOSED BANK BOUNDARY (~394 AC.) EXISTING OR PLANNED PARCELS
- SECTION LINE
- EXISTING STREAM CHANNEL WITH FLOW DIRECTION
- DITCH
- EXISTING SPRING
- ASPEN STAND

WETLAND AREA (58.33 AC.)

- DEPRESSIONAL/RIVERINE WETLAND (56.83 AC.)
- DEPRESSIONAL VERNAL POOL WETLAND (1.5 AC.)

PROPOSED RESTORATION ACTIONS

- WETLAND REESTABLISHMENT (27.2 AC.)
- WETLAND REHABILITATION (35.73 AC.)
- DEPRESSIONAL WETLAND CREATION (2.8 AC.)
- POTENTIAL VERNAL POOL CREATION[1] (3.3 AC.)
- DEPRESSIONAL/RIVERINE WETLAND ENHANCEMENT (21.1 AC.)
- DEPRESSIONAL VERNAL POOL WETLAND PRESERVATION (1.5 AC.)
- AREA OF UPLAND INFLUENCE ENHANCEMENT (206.3 AC.)
- UPLAND/PRIORITY HABITAT PRESERVATION (96.07 AC.)
- EXCAVATED STREAM ALCOVE
- SPRING REDIRECTION CHANNEL
- DITCH FILL/RECONTOURING

BANK SITE PARCEL #03266.9062

2 - STOCK POND

CONSERVATION & ACCESS EASEMENT AFN: 7290469

PARCEL #03266.9035

HOG CANYON CREEK

EXISTING WETLAND CROSSING

SR 904

NOTE: The site boundaries and parcel numbers are subject to change.

[1]Potential vernal pool creation area is approximate, and represents an overall potential area where individual vernal pools may be created in the future.

Figure 5
CONCEPTUAL BANK SITE DESIGN
Harris Homestead Mitigation Bank Preserve Prospectus
Habitat Banc NW
Spokane County, Washington
Sections 26, 27, 34, & 35, Township 23N, Range 40E, W.M.

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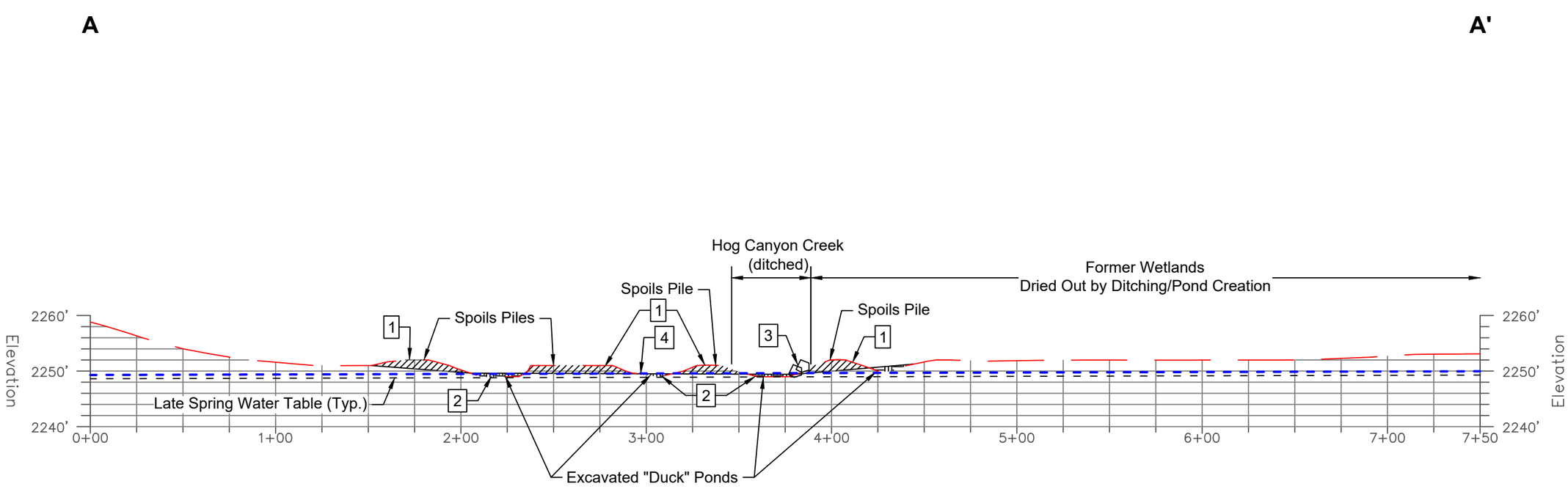
SCALE IN FEET
0
600
1200

N
W
E
S



RIVERINE WETLAND REESTABLISHMENT PLAN

1. Remove spoils piles.
2. Replace spoils to duck ponds.
3. Reconfigure stream channel; add boulders or LWD.
4. Raise water table.

NOTE(S):

1. Elevations from National Oceanic and Atmospheric Administration (NOAA) Digital Coast Data Access Viewer. Custom processing of "2013 OLC Lidar: Turnbull National Wildlife Refuge, WA". Charleston, SC: NOAA Office for Coastal Management. Accessed Apr 26, 2022 at https://coast.noaa.gov/dataviewer.
2. Elevations are exaggerated for detail.

LEGEND:

- Existing Surface
- Current Approximate Late Spring Water Table Level
- Proposed Cut
- Proposed Fill
- Predicted Future Approximate Late Spring Water Table Level

Figure 6
CROSS SECTION TYPICAL RIVERINE WETLAND REESTABLISHMENT
Harris Homestead Mitigation Bank Preserve Prospectus
Habitat Banc NW
Spokane County, Washington
Section 26, 27, 34, & 35, Township 23N, Range 40E, W.M.

DATE: 9/22/23
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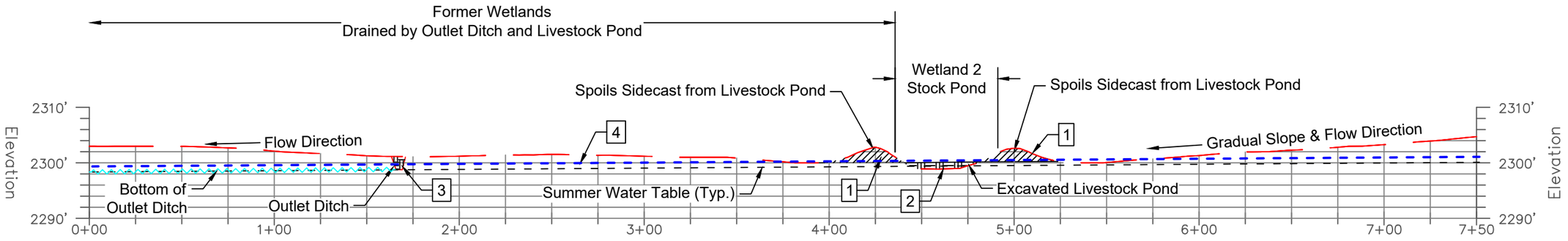
HORIZONTAL SCALE IN FEET
VERTICAL EXAGGERATION = 3X
0
60
120



DEPRESSIONAL WETLAND REESTABLISHMENT PLAN

1. Remove sidecast spoils.
2. Replace sidecast spoils to livestock pond.
3. Disable ditch by replacing spoils.
4. Raise water table.

LEGEND:

- Existing Surface
- Current Approximate Summer Water Table Level
- Approximate Profile Elevation of Bottom of Outlet Ditch
- Proposed Cut
- Proposed Fill
- Predicted Future Approximate Summer Water Table Level

NOTE(S):

1. Elevations from National Oceanic and Atmospheric Administration (NOAA) Digital Coast Data Access Viewer. Custom processing of "2013 OLC Lidar: Turnbull National Wildlife Refuge, WA". Charleston, SC: NOAA Office for Coastal Management. Accessed Apr 26, 2022 at https://coast.noaa.gov/dataviewer.
2. Elevations are exaggerated for detail.

Figure 7
CROSS SECTION TYPICAL DEPRESSIONAL WETLAND REESTABLISHMENT
Harris Homestead Mitigation Bank Preserve Prospectus
Habitat Banc NW
Spokane County, Washington
Section 26, 27, 34, & 35, Township 23N, Range 40E, W.M.

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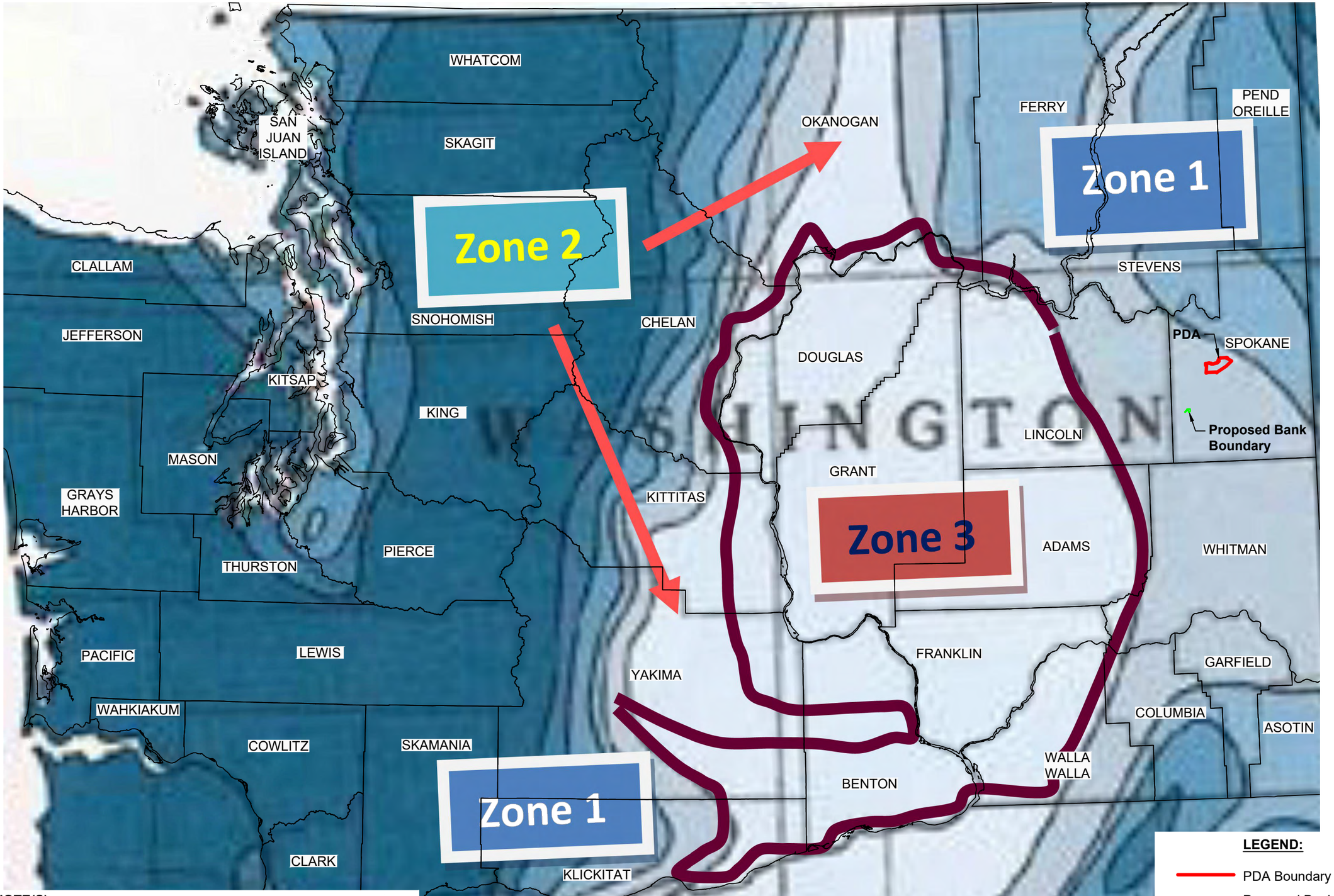
HORIZONTAL SCALE IN FEET
VERTICAL EXAGGERATION = 3X
0
60
120



NOTE(S):

1. Map from *Selecting Wetland Mitigation Sites Using a Watershed Approach (Eastern Washington)*, November 2010.

LEGEND:

- PDA Boundary
- Proposed Bank Boundary
- County Boundary

SCALE IN MILES: 0, 25, 50

N, W, E, S

Figure 8
EASTERN WASHINGTON HYDROLOGIC UNIT ZONES
Harris Homestead Mitigation Bank Preserve Prospectus
Habitat Banc NW
Spokane County, Washington
Sections 26, 27, 34, & 35, Township 23N, Range 40E, W.M.

DATE: 9/22/23
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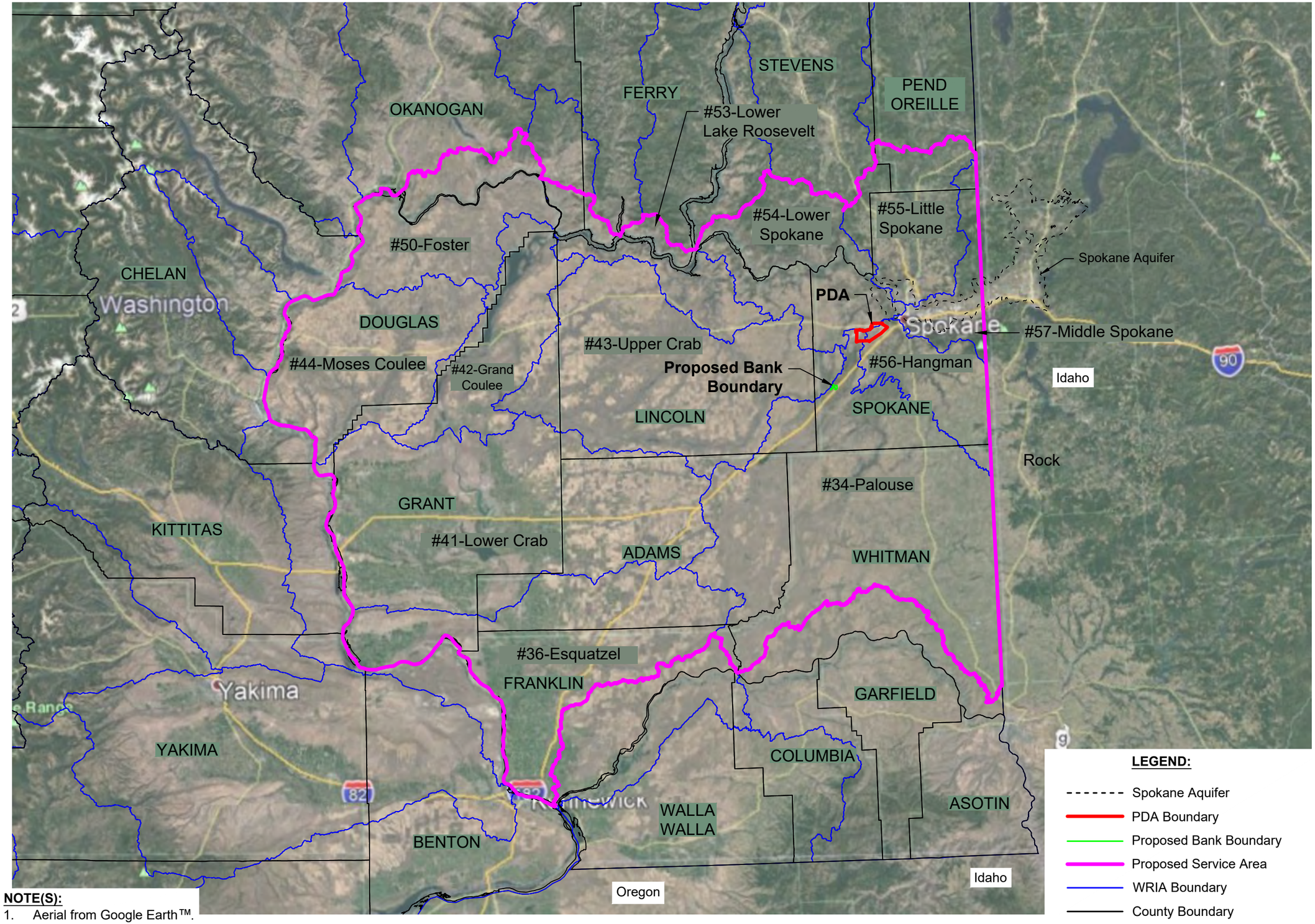

NOTE(S):

1. Aerial from Google Earth™.

LEGEND:

- Spokane Aquifer
- PDA Boundary
- Proposed Bank Boundary
- Proposed Service Area
- WRIA Boundary
- County Boundary

SCALE IN MILES: 0, 20, 40

N, W, E, S

Figure 9
SERVICE AREA
Harris Homestead Mitigation Bank Preserve Prospectus
Habitat Banc NW
Spokane County, Washington
Section 26, 27, 34, & 35, Township 23N, Range 40E, W.M.

DATE: 9/22/23
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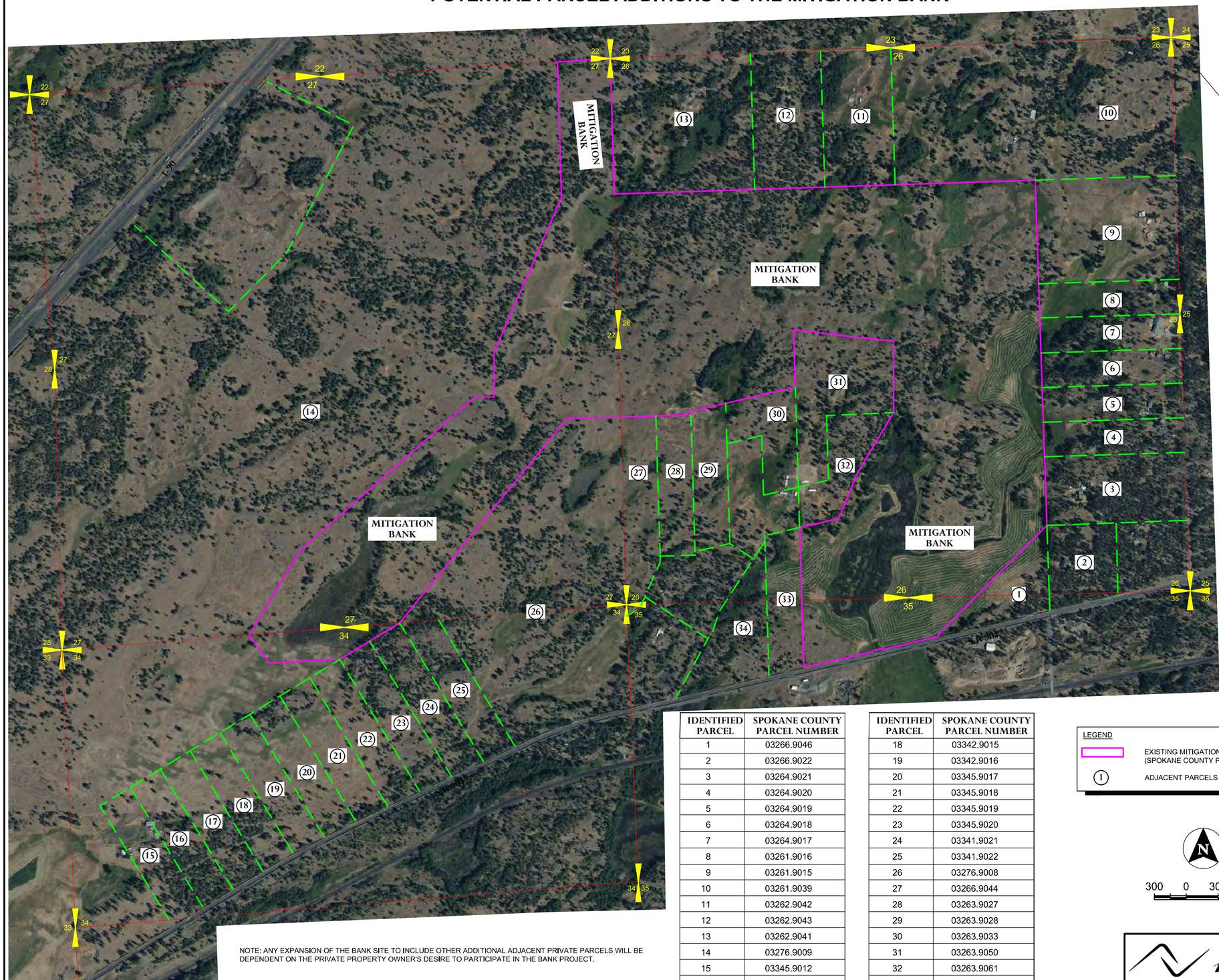
FIGURE 10

POTENTIAL PARCEL ADDITIONS TO THE MITIGATION BANK



NOTE: ANY EXPANSION OF THE BANK SITE TO INCLUDE OTHER ADDITIONAL ADJACENT PRIVATE PARCELS WILL BE DEPENDENT ON THE PRIVATE PROPERTY OWNER'S DESIRE TO PARTICIPATE IN THE BANK PROJECT.

IDENTIFIED PARCEL	SPOKANE COUNTY PARCEL NUMBER
1	03266.9046
2	03266.9022
3	03264.9021
4	03264.9020
5	03264.9019
6	03264.9018
7	03264.9017
8	03261.9016
9	03261.9015
10	03261.9039
11	03262.9042
12	03262.9043
13	03262.9041
14	03276.9009
15	03345.9012
16	03342.9013
17	03342.9014

IDENTIFIED PARCEL	SPOKANE COUNTY PARCEL NUMBER
18	03342.9015
19	03342.9016
20	03345.9017
21	03345.9018
22	03345.9019
23	03345.9020
24	03341.9021
25	03341.9022
26	03276.9008
27	03266.9044
28	03263.9027
29	03263.9028
30	03263.9033
31	03263.9050
32	03263.9061
33	03356.9043
34	03356.9060

LEGEND

EXISTING MITIGATION BANK PROPERTY [394 ACRES] (SPOKANE COUNTY PARCEL #03266.9062)

(1) ADJACENT PARCELS ELIGIBLE TO PARTICIPATE IN BANK

N

300 0 300 600

ARDURRA
1717 S. RUSTLE STREET, SUITE 201
SPOKANE, WA 99224
509-319-2580 | WWW.ARDURRA.COM