Shrub-Steppe Ecological Integrity Assessment (EIA) Test in Wenas Basin, Yakima County

May 2-3, 2022

Background

Shrub-Steppe Benchmarks: The Yakima County Voluntary Stewardship Program includes goals to protect and enhance biodiversity and sensitive species in shrub-steppe habitats without restricting ongoing or new agricultural activities. Maintaining areas with deep soils and reviewing area of shrub-steppe cover are part of performance metrics. Monitoring focuses on tracking best management practices (BMPs), site visits by technical assistance providers, and remote sensing imagery.

Shrub-Steppe Adaptive Management: The 5-Year Monitoring Report, Supporting Material, December 2020 identified the need for adaptive management regarding shrub-steppe habitat. Shrub-steppe protection benchmarks were below adaptive management thresholds (i.e., less than 2.5% decrease) but in the Upper Yakima basin there were no known conservation practices. In other basins, there did not appear to be shrub-steppe enhancement efforts in shrub-steppe biodiversity, habitat connectivity, or fire related efforts (Alkali-Squilchuck, Klickitat, Rock Glade, or Upper Yakima). The monitoring report suggested adaptive management to address enhancement benchmarks as well as ensure protection thresholds continue to be met, and to consider the advice of a shrub-steppe expert panel including:

- Mapping/modeling of shrub-steppe is difficult. Combine imagery analysis with ownership. Review private rangeland at lower elevations on south slopes. Protect areas with water sources.[1]
- Maintain or increase perennial grass cover. Prevent healthy shrub-steppe from converting to undesirable stable state.
- Implement best practices for grazing including winter grazing and conservation grazing. Address fire mitigation including watching for high shrub cover. **(See Attachment A.)**

Adaptive management plans promoted enhancement or restoration activities with willing landowners.

Technical Panel Input – Connecting Practices with Basin Conditions: While there was acknowledgement by the SCC Director that the overall Work Plan implementation was on the right track, there were Technical Panel comments about connecting dots between implementation activities and on-the-ground outcomes for critical areas (WDFW) and concerns about relying on mapping data that was not ground-truthed or validated (SCC and WSDA).

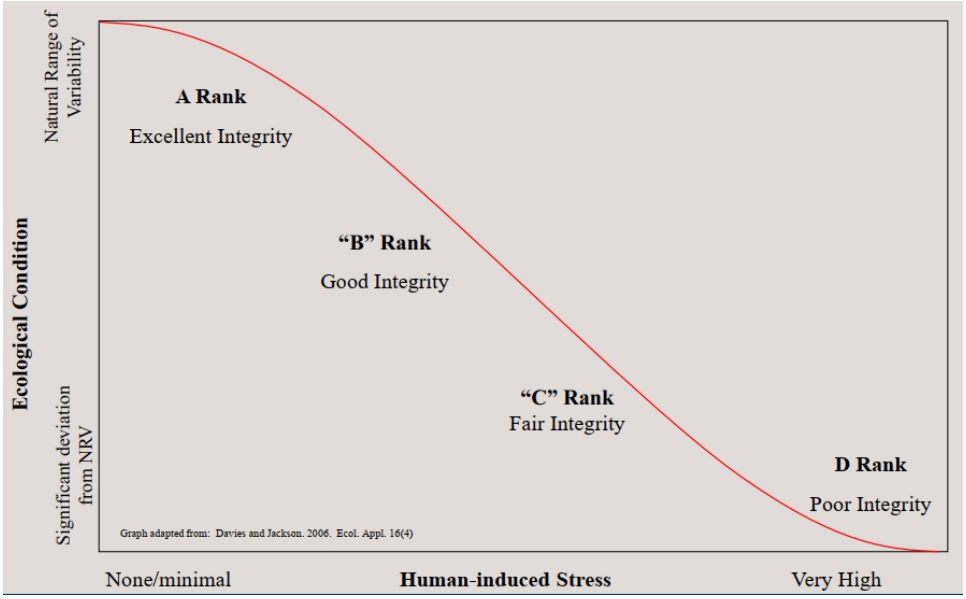
[1] A map tool was created that combines imagery results with ownership and south facing slopes. Login: BERK_MapReader PW: MapReader<2016> https://berk.maps.arcgis.com/apps/webappviewer/index.html?id=b514e20ee5df4c28b68bc4bf4925900d.

Ecological Integrity Assessment (EIA)

The Washington Department of Natural Resources (DNR) has a Natural Heritage Program and its staff participated in the shrub-steppe expert panel in fall 2020. DNR staff noted there was an updated Ecological Integrity Assessment (EIA) manual to address on-the-ground conditions of shrub-steppe.

The purpose of an EIA is to understand the structure, composition, function, and connectivity of an ecosystem. It considers the integrity of the ecological condition within a natural range of variability. See Exhibit 1.

Exhibit 1. EIA Metric Ratings



Source: DNR 2022.

An EIA uses information at a landscape and site level including vegetation, soil, processes, animals, size, and stressors. The levels of review and detail required also vary:

- EIA Level 1: GIS-based landscape metrics
- EIA Level 2: Rapid, field-based metrics; qualitative/semi-quantitative measures. *Most used.*
- EIA Level 3: Intensive field-based metrics, quantitative-based measures

Once metrics are scored, they are rolled up into five Major Ecological Factors: Landscape, Edge, Vegetation, Soils, and Size. These Major Ecological Factor scores are in turn rolled up into three Primary Rank Factors: Landscape Context, Condition, and Size. These three factors are combined to calculate an overall EIA score/rank.

Field Test: EIA Upland Shrub Steppe

To understand how EIA could be used to help connect dots between shrub-steppe landscape conditions, conservation practices, and prioritization for protection/enhancement, EIA Level 2 training was conducted. Two sites were reviewed with a Level 2 EIA in the Wenas Basin:

WDFW property that has not burned and is not grazed and Comeau Property, which is lightly grazed every year. See Exhibit 2 and Exhibit 3.

Tynan Ramm-Granberg and Irene Weber, DNR Vegetation Ecologists, conducted a virtual training session on May 2, 2022 with: Mike Tobin, North Yakima Conservation District Manager; Rodney Heit, South Yakima Conservation District Manager; Levi Keesecker, Natural Resource Scientist, Washington State Conservation Commission; and Lisa Grueter, Planner/Principal, BERK Consulting. See slides in **Attachment B** . The team met in the field on May 3, 2022 to use the EIA protocol.

Exhibit 2. Wenas Basin Evaluation Sites: WDFW (West) and Comeau (East)

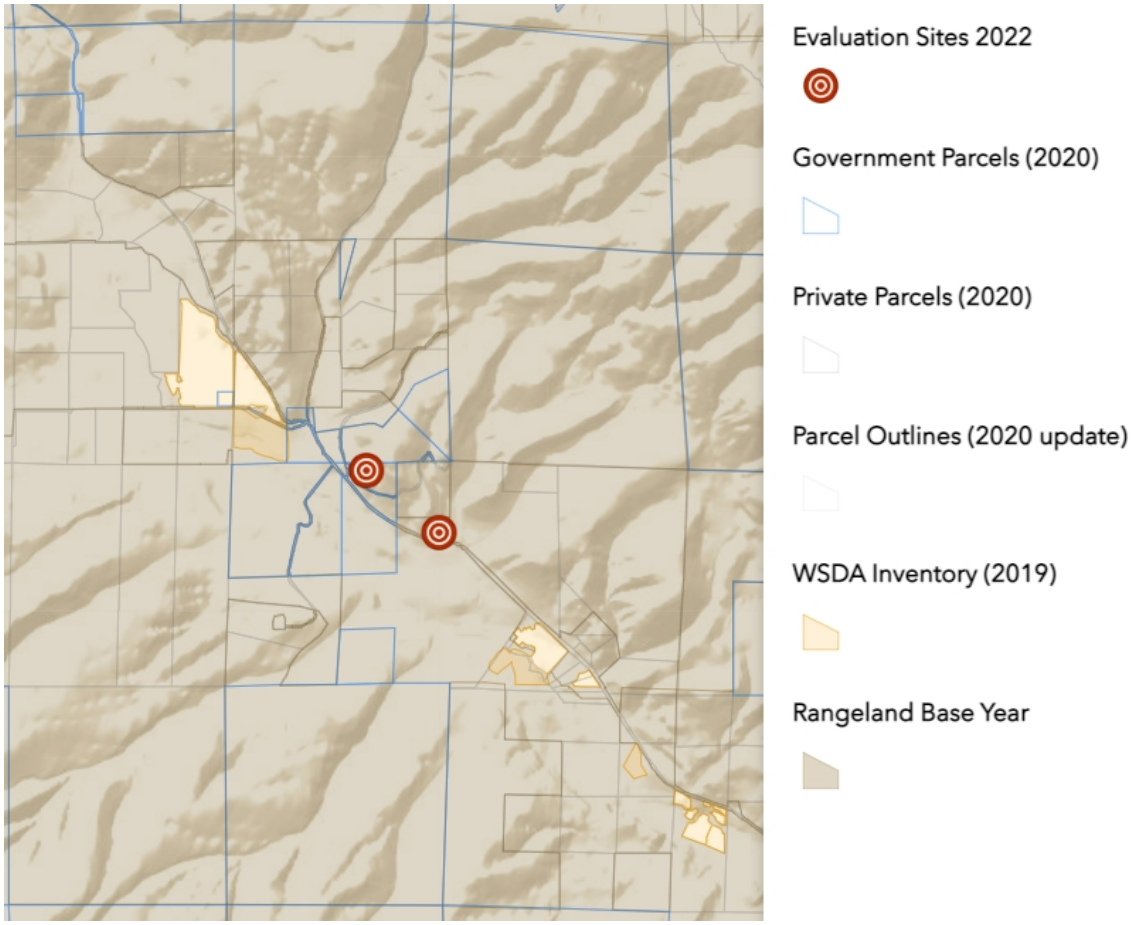
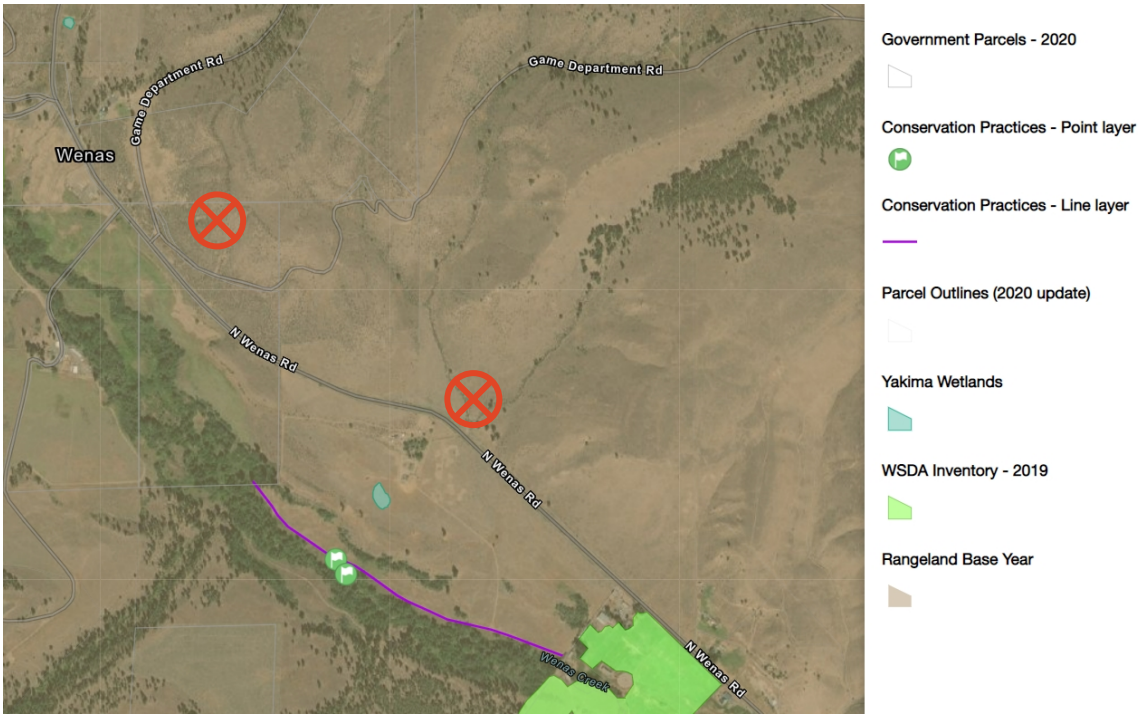


Exhibit 3. Wenas Basin Evaluation Sites: Vicinity



The process included:

- Field: Delineating an assessment area (contiguous habitat extent, minimum five acres typically) and 500 meter buffer, collecting site level data using field form and manual
- GIS: Reviewing historical photos (e.g., Google Earth), reports, GIS data
- Score: Scoring the sites using field and GIS information guided by the Manual

Having selected the sites to compare/contrast a conservation site with a working landscape, the sites differ in ecological integrity. Both sites, however, could be enhanced. Conservation practices could be developed (e.g., addressing invasives, conservation grazing, etc.). See Exhibit 4.

Exhibit 4. Conceptual EIA Test: WDFW and Comeau

Features	WDFW	Comeau
Ecological System	Inter-Mountain Basins Big Sagebrush Steppe	Inter-Mountain Basins Big Sagebrush Steppe
Environmental	Slope: S/SW, mid-slope, ~10% Anthropogenic Disturbance: Below road cut	Slope: S, low/toe slope Natural disturbance: gophers Anthropogenic Disturbance: spring grazing, historically cultivated Soils: Mesic landscape position, deep soils
Species Cover, Native & Non-Native	Trees, shrubs, herbaceous Mostly natives (79%) “C” Fair, may be low	Shrubs, herbaceous, several invasive All shrubs native: 5-10%. Native herb: 1-2%. Assume 9% native. 50-75% non-native (67.5%) “D” Poor
Invasive	Some invasives (~8%) “C” Fair	Exotic and invasives (e.g., Knapweeds, cheat grass) “D” Poor
Native Plant Species Composition	Blue bunch, bitter brush, rabbit brush, etc. “B” Good (some elements A, B or C)	Sagebrush: Big, 3 tip, bitter brush, limited blue bunch Shrubs and grass: C- Native increasers B or C “C” Fair
Vegetation Structure	Primarily grassland with some shrubs, bunch grass reduced from site potential “C” (some elements A and C/D)	Some elements B and some D/D- Some areas cleared “D” Poor
Woody Debris/Litter	“A” excellent, extremely discontinuous litter	“B” Good
Soil	“B” Good	“B-“ disturbed, livestock, gophers
Rough EIA Score	“B-“	“C-“ per EIA score (1.73)

Not fully scored with size or landscape Fully scored with size: “D”

Future Use

Potential areas of use for the EIA include:

- Prioritization for Evaluation or Conservation: The fall 2020 expert panel suggested prioritizing south facing slopes in private ownership, with water sources for enhancement. If several sites are under contention for enhancement, a level 2 EIA site review could help define the relative condition, and the potential for enhancement. This could help with determining the level of investment needed given scarce resources.
- Validate/Confirm Spatial Data: Spot checks using the EIA level 2 could be conducted if future imagery analysis conducted for monitoring shows areas of gain/loss in shrub-steppe that appear puzzling or where there is limited field information on the conditions in the basin.
- Develop Conservation Practices: If it is important to understand native and non-native cover in more detail to help prescribe conservation practices for an individual producer, an EIA level 2 could assist.

Tool Adaptation

Some elements of the field form are complex (e.g., the level of detail for individual plant species on the Species Cover). However, some elements of the field form could be abbreviated depending on the questions being asked about conservation practices or priorities for protection/enhancement (e.g., focus on relative native/non-native cover, composition, structure rather than species cover detail; also can eliminate Element Occurrence Rank).

Matching readily available spatial mapping (e.g., site and area history and adjacent property conditions) could help streamline future efforts. See spatial mapping text box on page 6 and Exhibit 5). Ideally, Yakima County GIS could provide more readily available current property information, e.g. current use, ownership.

Spatial Mapping

Historical Aerial Photography

• Look for onsite and adjacent land use changes, natural succession, etc.

• Google Maps/Google Earth (photos back to 1990's)

• USGS Earth Explorer (historical aerial photography) http://earthexplorer.usgs.gov/

Site reports

• Take advantage of previously compiled data

GIS data

• Landscape setting, topography, geology, location of stressors

• Wetlands of High Conservation Value map viewer: http://www.dnr.wa.gov/NHPwetlandviewer

• Ecological Systems Map: https://data-wadnr.opendata.arcgis.com/datasets/ecological-systems-ofwashington-zipped-raster-grid

• National Hydrography Dataset: https://www.usgs.gov/national-hydrography/national-hydrographydataset

• County map viewers (look for stormwater features)

• DNR GIS data: http://www.dnr.wa.gov/GIS and https://lidarportal.dnr.wa.gov/

• WDOE GIS data: http://www.ecy.wa.gov/services/gis/data/data.htm

Developed for NYCD/SYCD Monitoring

BERK developed ARC GIS layers with all Critical Areas addressed in Work Plan and Tracking of Conservation Practices:

- Wetlands, Streams, Floodplains, CARA, Habitat: http://arcg.is/0fmzSj
- Shrub Steppe including Habitat, Geologic, Conservation Practices: http://arcg.is/uHvCb
- Topo and Shrub Steppe: Login: BERK_MapReader | PW: MapReader<2016> https://berk.maps.arcgis.com/apps/webappviewer/index.html?id=b514e20ee5df4c28b68bc4bf4925900d

State Conservation Commission Resources

- General Monitoring Library: https://airtable.com/shrfKW5QDEiVRK04P/tblYmofD3mDODClHk
- Land Cart: https://landcart-301816.wm.r.appspot.com/#/home It leverages cloud computing and Google Earth Engine and produces estimates/predictions of various land-cover metrics (% sagebrush, woody veg, etc.) *Note from Levi: A simple summary for one of the sites visited seemed pretty close.*

Exhibit 5. EIA LAN2 Land Use Index and Sources

Land Use Code	Land Use Index Calculation	Source
LU1	Paved roads / parking lots	Aerial, Assessor
LU2	Domestic, commercial, or publicly developed buildings and facilities (non-vegetated)	Aerial, Assessor
LU3	Gravel pit / quarry / open pit / strip mining	Aerial, Assessor
LU4	Unpaved roads (e.g., driveway, tractor trail, 4-wheel drive, logging roads)	Aerial, Assessor
LU5	Agriculture: tilled crop production	WSDA
LU6	Intensively developed vegetation (golf courses, lawns, etc.)	Aerial
LU7	Vegetation conversion (chaining, cabling, roto-chopping, clearcut)	Aerial
LU8	Agriculture: permanent crop (vineyard, orchard, nursery, hayed pasture, etc.)	WSDA
LU9	Intense recreation (ATV use / camping / popular fishing spot, etc.)	Aerial, Assessor
LU10	Military training areas (armor, mechanized)	Assessor
LU11	Heavy grazing by livestock on pastures or native rangeland	Aerial, visual inspection
LU12	Heavy logging or tree removal (50-75% of trees >30 cm dbh removed)	Aerial, visual inspection
LU13	Commercial tree plantations / holiday tree farms	Assessor
LU14	Recent old fields and other disturbed fallow lands dominated by ruderal and exotic species	Aerial, visual inspection
LU15	Dam sites and flood disturbed shorelines around water storage reservoirs and boating	Shoreline Master Program Maps
LU16	Moderate grazing of native grassland	Aerial, visual inspection
LU17	Moderate recreation (high-use trail)	Yakima County trail plan, 2020
LU18	Mature old fields and other fallow lands with natural composition	Aerial, visual inspection
LU19	Selective logging or tree removal (<50% of trees >30 cm dbh removed)	Aerial, visual inspection
LU20	Light grazing or haying of native rangeland	Aerial, visual inspection
LU21	Light recreation (low-use trail)	Yakima County trail plan, 2020
LU22	Natural area / land managed for native vegetation	Assessor