Interim Core Map Documentation for Pygmy Rabbit (Columbia Basin DPS)

Posted on the U.S. Environmental Protection Agency's (EPA) Geoplatform June 2025, updated to remove cultivated lands August 2025
Developed by Compliance Services International (CSI) and Valent

EPA Review Notes

The developers created this core map using EPA' process available at: https://www.epa.gov/endangered-species/process-epa-uses-develop-core-maps-pesticide-use-limitation-areas. EPA reviewed the draft interim map and documentation and evaluated if: (1) the map and documentation are consistent with the agency's process; (2) areas included or excluded from the interim core map are consistent with the biology, habitat, and/or recovery needs of the species; (3) data sources are documented and appropriate; and (4) the GIS data and mapping process are consistent with the stated intention of the developer. EPA agrees that this map is a reasonable depiction of core areas for this species and was consistent with the agency's mapping process.
The core map developed for the Pygmy rabbit is considered interim. This core map can be used to develop pesticide use limitation areas (PULAs) that include the Pygmy rabbit. This core map incorporates information developed by the U.S. Fish and Wildlife Service (FWS) and made available to the public; however, the core map has not been formally reviewed by FWS. This interim core map may be revised in the future to incorporate expert feedback from FWS.

Species Summary

The pygmy rabbit (Columbia Basin DPS) (*Brachylagus idahoensis*); Entity ID 1240) is an endangered mammal. FWS has not designated a critical habitat for the Columbia Basin DPS of the pygmy rabbit. This species requires "tall, densely vegetated big sagebrush (*Artemisia tridentata*), and grass and forb vegetation. They also require deep, loose, sandy-loam soils that allow for burrowing. Connectivity between patches of suitable habitat is important on cliffs with seepage" (FWS, 2024a). Notably, the pygmy rabbit was confirmed to be extinct in the wild in 2004, but a semi-wild breeding program has successfully reintroduced three subpopulations at select locations discussed below. Additional information is provided in **Appendix 1**.

Description of Core Map

The core map for the pygmy rabbit is a biological information core map type with the species range as its outer extent, based on well-defined known locations: semi-wild reintroduced subpopulation regions. These subpopulation areas are entirely within the FWS range, which includes 3 sites identified as Sagebrush Flat, Rimrock, and Beezley Hills. Available known location information from FWS confirms that all 3 subpopulations are occupied. The core map identifies these areas and represents approximately 48,660 acres (**Figure 1**), composed primarily of grassland and shrub/scrub habitat (**Table 1**).

This core map was developed by Compliance Services International (CSI) and Valent. This interim core map has a professional judgment classification of “limited” because the core map was based on well-defined subpopulation boundaries consistent with—and entirely contained by—the species range. When FWS reviews this interim core map, it may be possible to improve the confidence in this core map by evaluating the boundaries of the polygons; because the layer was produced with georeferencing methods, there may be inaccuracies to a scale of the width of several pixels, in this case 30m each.

This core map does not replace or revise the range developed by FWS for this species.

Figure 1. Interim core map for the pygmy rabbit, a total 48,660 acres.

Table 1. Percentage of Interim Core Map Represented by NLCD[1] Land Covers and Associated Example Pesticide Use Sites/Types.

Example pesticide use sites/types	NLCD Class/Value	% Area	Total area for landcover type
Forestry	Deciduous Forest (41)	0%	0%
Forestry	Evergreen Forest (42)	0%	0%
Forestry	Mixed Forest (43)	0%	0%
Agriculture	Pasture/Hay (81)	0%	0%
Agriculture	Cultivated Crops (82)	0%	0%
Mosquito adulticide, residential	Developed Open Space (21)	2%	3%
Mosquito adulticide, residential	Developed Low Intensity (22)	1%	3%
Mosquito adulticide, residential	Developed Medium Intensity (23)	0%	3%
Mosquito adulticide, residential	Developed High Intensity (24)	0%	3%
Invasive species control	Woody Wetlands (90)	0%	97%
Invasive species control	Emergent Herbaceous Wetlands (95)	0%	97%
Invasive species control	Open Water (11)	0%	97%
Invasive species control	Grassland/Herbaceous (71)	20%	97%
Invasive species control	Shrub/Scrub (52)	77%	97%
Invasive species control	Barren Land (31)	0%	97%
Total Acres	Interim Core Map Acres	~ 48,660	

Evaluation of Known Location Information

There are four datasets with known location information:

- Descriptions of locations provided by FWS;
- Occurrence locations in iNaturalist;
- Occurrence locations in the Global Biodiversity Information Facility (GBIF); and
- Occurrence locations in NatureServe.

CSI evaluated these four sets of data before selecting the type of and developing the core map. Overall, there were 14 observations found in iNaturalist, 12 of which were research grade[2]. These 14 locations were generally consistent with the locations available through GBIF, NatureServe, and FWS.

[1] Dewitz, J., 2023, National Land Cover Database (NLCD) 2021 Products: U.S. Geological Survey data release, https://www.usgs.gov/data/national-land-cover-database-nlcd-2021-products

[2] According to iNaturalist, an observation is designated as "research grade" if it 1) is verifiable with date, coordinates, photos/sounds, and not captive; 2) achieves community agreement defined as "more than 2/3 of identifiers needs to agree on the species level ID or lower;" and 3) "must pass a data quality assessment, which includes checks for accurate date and location, evidence of a wild organism, and clear evidence of the organism itself" (https://help.inaturalist.org/en/support/solutions/articles/151000169936-what-is-the-data-quality-assessment-and-how-do-observations-qualify-to-become-research-grade-).

Approach Used to Create Core Map

The core map was developed using the process EPA uses to develop core maps for draft Pesticide Use Limitation Areas for species listed by the U.S. Fish & Wildlife Service (FWS) and their designated critical habitats (referred to as "the process").[3] This core map was developed by CSI using the 4 steps described in the process document:

1. Compile available information for a species;
2. Identify core map type;
3. Develop the core map for the species; and
4. Document the core map.

For step 1, CSI compiled available information for the pygmy rabbit from FWS, as well as observation information available from various publicly available sources (including iNaturalist, GBIF and NatureServe). The information compiled for the pygmy rabbit is included in **Appendix 1**. Influential information that impacted the development of the core map includes a limitation of the species to just its Columbia Basin DPS population, as this is the only one with a listed status under the Endangered Species Act.

For step 2, CSI used the compiled information including the species range and known location information to determine the core map type. CSI compared the known location data to the range and found that known locations were consistent with (and contained within) range, and better represented areas of potential presence of the species. When weighing that information together, CSI selected a core map type of endemic/refined range, modified to include only known location data within its boundary.

For step 3, CSI used FWS documentation to generate the core map. Data sources are discussed in the process document. For this interim core map, CSI georeferenced subpopulation-specific areas delineated in the most recent FWS Recovery Plan (2024a) document. EPA's discussion of the available known location data is provided below. **Appendix 2** provides more details on the GIS analysis and data used to generate the core map.

Discussion of Approaches and Data that were Considered but not Included in Core Map

Given the limited extent of the subpopulations used to represent likely areas inhabited by the species, CSI considered only its range and known location information, and did not consider biological information, habitat, or landcover refinements to develop the core map. CSI determined that a further refinement based on habitat from a national dataset such as LANDFIRE would potentially decrease, rather than increase, confidence in the

[3] Dated 2024, available online at: https://www.epa.gov/endangered-species/process-epa-uses-develop-core-maps- draft-pesticide-use-limitation-areas

core map shape. This is because at relatively small scales, LANDFIRE integrates multiple datasets including satellite imagery, field data, and ecological models; therefore, local validation is limited in some areas, leading to potential inaccuracies when applied at small scales. This is a common problem for most national level landcover datasets.
The subpopulation location information from FWS was determined to be significantly more specific and reliable than the location information from other datasets such as iNaturalist, GBIF, and NatureServe Explorer Pro (public).

Appendix 1. Information compiled for the pygmy rabbit

Recent FWS and WDFW documents

- FWS 5 Year Review (2024) https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/19581.pdf
- FWS Species Status Assessment (2024) https://iris.fws.gov/APPS/ServCat/DownloadFile/263502
- FWS Recovery Plan (2012) https://ecos.fws.gov/docs/recovery_plan/Columbia%20Basin%20Pygmy%20Rabbit%20Final%20RP.pdf
- FWS Recovery Plan Amendment https://ecos.fws.gov/docs/recovery_plan/Pygmy_Rabbit_Final_Recovery_Plan_Amendment_20190807.pdf
- WDFW Sagebrush Flat Wildlife Area Management Plan (2020) https://wdfw.wa.gov/sites/default/files/publications/00483/Sagebrush%20Flat%20Wildlife%20Area%202020%20Update.pdf

Background information

- Status: Federally listed as endangered in 2001.
- Resiliency, redundancy, and representation (the 3Rs)
    - Resiliency: 'Based on our analysis, we estimated that resiliency was high for one subpopulation (Sagebrush Flat), and low for two subpopulations (Beezley Hills and Rimrock).' (Species Status Assessment, 2024)
    - Redundancy: 'The species has one population composed of three subpopulations of varying resiliency, although other subpopulations historically existed, they are now extirpated. The current range of Columbia Basin pygmy rabbit is very restricted, and all subpopulations occur within 26.7 mi (43 km) of one another. Catastrophic events such as wildfire have occurred in the recent past and are likely to reoccur, and a disease outbreak (RHDV2) could occur in the near future. Both threats put individual subpopulations or the species at risk of extirpation / extinction. In fact, the Cold Springs/Pearl Hill Fire Complex burned a total of 400,000 ac (167,408 ha), an area that is significantly larger than the 57,600 ac (23,310 ha) area that is currently occupied by Columbia Basin pygmy rabbits (Gallie 2023f pers. comm.) Because the three subpopulations occur within a small area, the species' redundancy is low – a single wildfire or disease event could result in the species' extinction. Increasing the number of subpopulations and / or increasing their distribution over the landscape would increase the species' redundancy and increase the species' ability to withstand a catastrophic event. To minimize the risk to the species from disease or wildfire, multiple resilient subpopulations should be distributed beyond the currently designated DPS across the Columbia Plateau ecoregion – the historical range of the species. The redundancy of the Columbia Basin pygmy rabbit is low.' (Species Status Assessment, 2024)
    - Representation: 'Historically, the Columbia Basin pygmy rabbit was distributed across a much larger area within the Columbia Plateau ecoregion in Washington. The species' range was reduced to zero when the species was considered extinct (see section 2.5.1 Population Trends, above). As of 2023, the species occurs over approximately 90 m2 (230 km2) of fragmented shrub steppe across three subpopulations (Gallie 2023f pers. comm.). Although Columbia Basin pygmy rabbit's range has expanded in recent years, it is significantly smaller than the area it historically occupied. Environmental conditions across the current range of the Columbia Basin pygmy rabbit are somewhat variable within the relatively small area that

is currently occupied. Although they historically occupied only native shrub steppe habitat; the Columbia Basin pygmy rabbit subpopulation at the Sagebrush Flat now also occupies CRP lands (Nerkowski 2021, p. 95). This demonstrates that the Columbia Basin pygmy rabbit can use habitats other than native shrub steppe. However, the loss of intact shrub steppe in the Columbia Plateau ecoregion suggests that most of the Columbia Basin pygmy rabbit's historical ecological representation has very likely been lost. The Columbia Basin pygmy rabbit experienced a genetic bottleneck resulting in a decline in genetic variation. By 2001, all 16 known individuals were captured and transferred to a captive breeding program. Unfortunately, it was clear that the species was suffering from severe inbreeding depression and had diminished reproductive capacity (Elias et al. 2013, pp. 1282- 1283; Hayes 2018, p. 8; Nerkowski 2021, p. 1). Due to a series of translocations of pygmy rabbits from outside the Columbia Basin, the genetic diversity of the Columbia Basin pygmy rabbit is currently significantly higher than that of the 16 founders of the captive breeding program; however, many unique Columbia Basin DPS alleles have been lost (Table 2; Warheit 2001, p. 16; Nerkowski 2021, p. 32). The population is now managed to promote Columbia Basin genetics to the extent possible, acknowledging that much of the species' genetic representation has been lost. Based on the current restricted ecological and genetic diversity, the representation of the Columbia Basin pygmy rabbit is low.' (Species Status Assessment, 2024).

- Habitat, Life History, and Ecology
    - Habitat: "requires tall, densely vegetated big sagebrush (*Artemisia tridentata*), and grass and forb vegetation. They also require deep, loose, sandy-loam soils that allow for burrowing. Connectivity between patches of suitable habitat is important' on cliffs with seepage" (Species Status Assessment, 2024).
    - Soil Type: 'Sandy-loam soils that allow for burrowing. Columbia Basin pygmy rabbit burrows are found within deep, loose soils predominately in the Zen soil series (USDA 1991, p. 8). Zen soils are composed of well drained, aridic loess and alluvium from basalt with components of pumice and volcanic ash (USDA 1991, p. 15). Additional soil series where burrows have been historically found in central Washington include Renslow, Alstown, Horseflat, and Argabak (USDA 1991, p. 7). These soil series are primarily described as silty in texture indicative of areas where higher elevation basalt formations outwash and erode down slope and are deposited along ridges and fans (Camp et al. 2017, p. 68). These soils are underlain with basalt bedrock, indurated duripan, and sands and gravel at a depth between 7 in (17.78 cm) and more than >60 in (152.4 cm)' (Species Status Assessment, 2024).
    - Habitat Loss and Degradation: 'degradation of habitat from invasive species, and urban development. Loss of habitat to agriculture' (Species Status Assessment, 2024).
- Taxonomy
    - Mammal: 'The pygmy rabbit is a member of the family Leporidae, which includes hares and rabbits. The species has been placed in several genera since it was first classified in 1891 as *Lepus idahoensis* (Washington Department of Fish and Wildlife [WDFW] 1995). In 1904, it was reclassified and placed in the genus *Brachylagus*, and in 1930, it was again reclassified and placed in the genus Sylvilagus. More recent examination of dentition (Hibbard 1963) and analysis of blood proteins (Johnson 1968) suggest that the pygmy rabbit differs significantly from species within either the *Lepus* or *Sylvilagus* genera. The pygmy rabbit is now generally considered to be within the monotypic genus *Brachylagus*, and is again classified as *B. idahoensis* (Green and Flinders 1980a; WDFW 1995). There are no recognized

subspecies of the pygmy rabbit (Dalquest 1948; Green and Flinders 1980a)' (Recovery Plan, 2012).

- Relevant Potential Pesticide Use Sites
    - Site-specific threats include the use of herbicides to control noxious weeds at the Sagebrush Flats WMA (WDFW, 2020).
    - Pesticide use at Beezley Hills and Rimrock subpopulations is unknown.
- Relevant Recovery Criteria and Actions
    - Recovery Plan (2012) Select Recovery Objectives
        - Long-term: Increase the size, number, distribution, and security of free-ranging subpopulations of the Columbia Basin pygmy rabbit so that the population may be reclassified as threatened and, ultimately, be removed from the List of Endangered and Threatened Wildlife and Plants pursuant to the ESA.
    - Recovery Criteria (5 Year Review, 2024)
        - For the DPS to be considered for downlisting, there should be six subpopulations with stable 5- year average effective population sizes including two subpopulations of 375 individuals, one subpopulation of 250 individuals, two subpopulations of 125 individuals, and one subpopulation of 750 individuals. These subpopulations need to be within REA(s) with appropriate conservation agreements in place to support reintroduction efforts and facilitate connectivity among subpopulations. In addition to these population metrics, measures to protect the rabbits and their habitat from epidemics, fires and other disasters must be in place within the REAs (WDFW 1995, p. 25). At this time, no downlisting criteria have been met.
        - For the DPS to be delisted, it should have a minimum 5-year average of at least 2,800 adult Columbia Basin pygmy rabbits in at least 12 populations. Of these, at least four populations should have 500 or more adults each and at least eight populations should have 100 or more adults each.

Range

- Historical Range: The historical range of the pygmy rabbit included much of the semiarid shrub steppe biome of the Great Basin and adjacent intermountain regions of the western United States (Green and Flinders 1980a, p. 1) in portions of Montana, Idaho, Wyoming, Utah, Nevada, California, Oregon, and Washington. Pygmy rabbits were not distributed continuously across their range, but local populations were connected by dispersal habitat such as dense vegetation along permanent and intermittent stream channels, alluvial fans, and sagebrush plains.
- Columbia Basin DPS Size: 5,632,900 acres
- FWS Range with Subpopulations

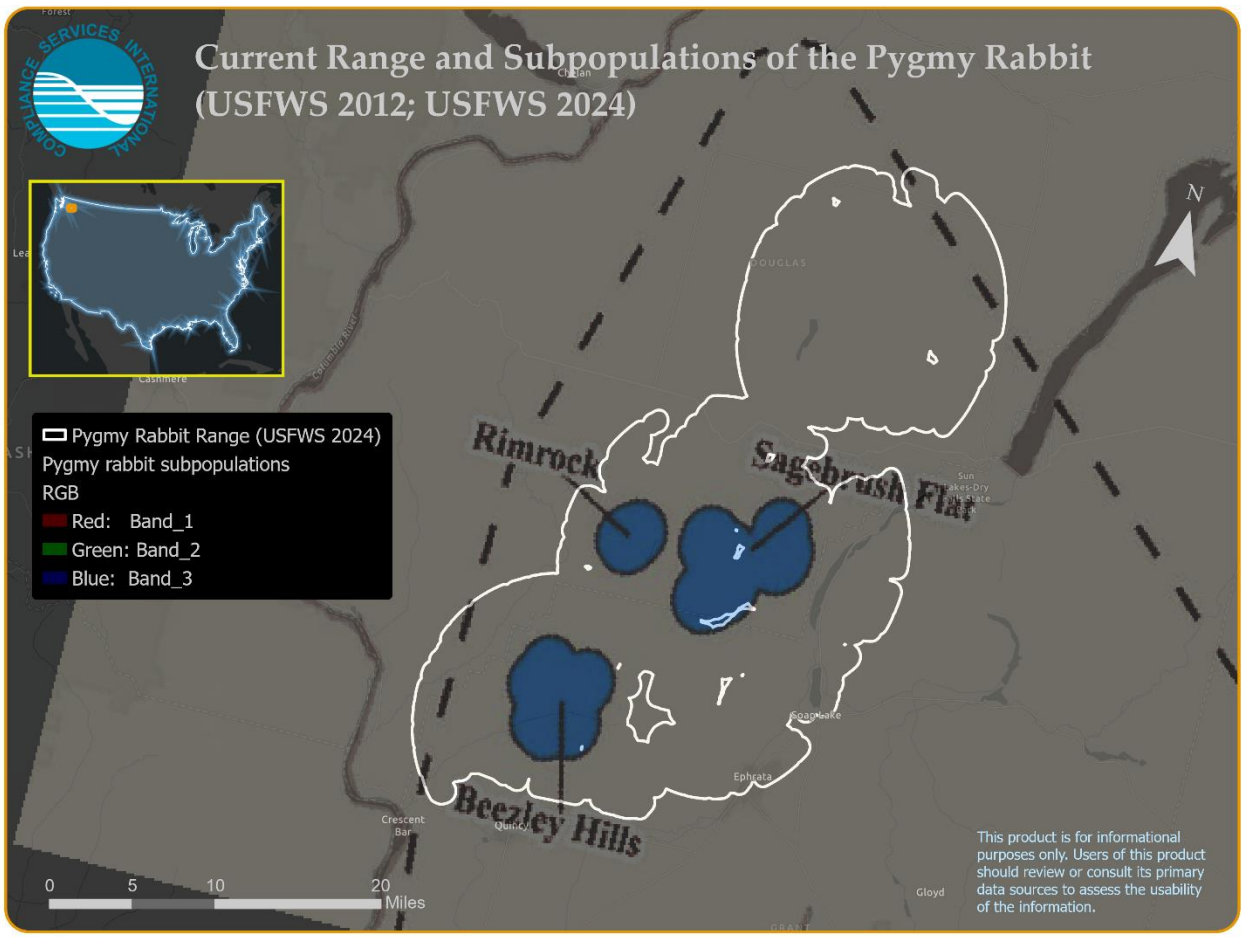

Figure 1. Range and subpopulations of the pygmy rabbit (FWS 2012; FWS 2024).

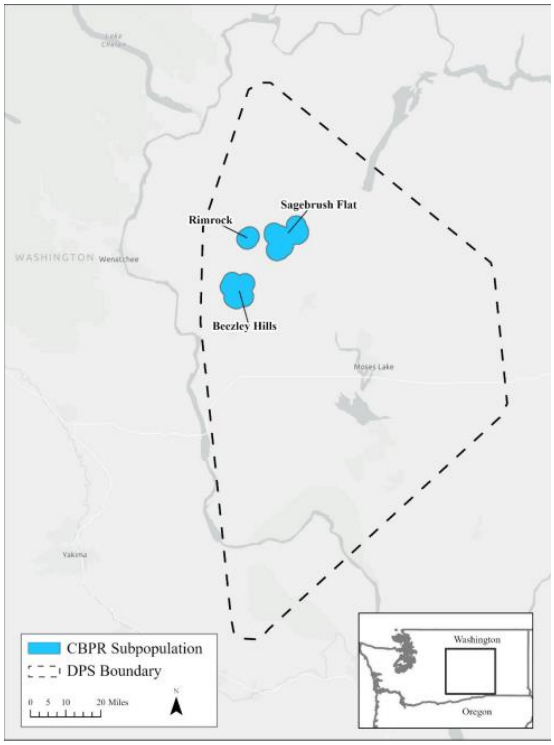

Figure 2. Map showing location of the three current Columbia Basin pygmy rabbit subpopulation. Copied from Figure 3 of the Species Status Assessment (FWS 2024a).

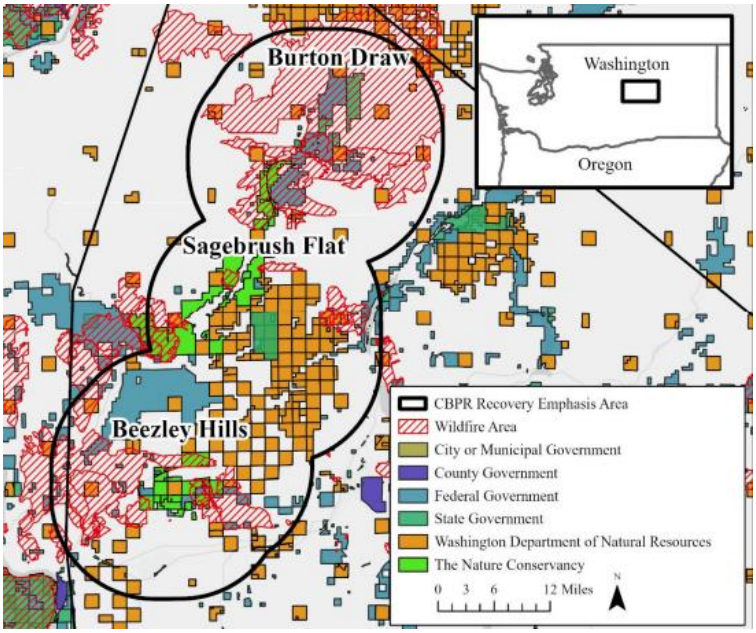

Figure 3. Map of land ownership and incidence of wildfire within three Columbia Basin pygmy rabbit Recovery Emphasis Areas (Service 2022; WDNR 2023a, WDNR 2023b; TNC 2024). Copied from Figure 5 of the Species Status Assessment (FWS 2024a).

- **Known Locations**
    - The Columbia Basin pygmy rabbit was confirmed to be extinct in the wild in 2004. The three subpopulations are reintroduced populations from a semi-wild breeding program at Sagebrush Flat REA. These rabbits were of mixed ancestry (mixed Columbia Basin, Nevada/Oregon/Idaho, and Wyoming ancestry).
    - Known locations summarized in the 2024 5-year review
        - The Columbia Basin DPS of the pygmy rabbit occurs in 3 subpopulations in Washington State: Sagebrush Flat, Beezley Hills and Rimrock.
        - Figure 2 above identifies these locations.
    - Figure 3 above maps land ownership in the known locations (2024 5-year review)
- **Estimated Numbers (from USFWS 2024a)**
    - Sagebrush Flat: The estimated number of total rabbits in the winter of 23/24 is 98
    - Beezley Hills: The estimated number of total rabbits in the winter of 23/24 is 29
    - Rimrock: The estimated number of total rabbits in the winter of 23/24 is nine
- **Downlisting Criteria from the 2012 Recovery Plan (Downlisting will be considered if one of the following criteria is met)**
    - Subpopulations at two recovery emphasis areas each have a 5-year average Ne of at least 375 individuals, and a third recovery emphasis area has been formally established through completion of one or more appropriate conservation agreements and is available for initial reintroduction efforts; or
    - A subpopulation at one recovery emphasis area has a 5-year average Ne of at least of 250 individuals, and subpopulations at two other recovery emphasis areas each have a 5-year average Ne of at least 125 individuals; or
    - A single subpopulation with a 5-year average Ne of at least of 750 individuals has been reestablished through dispersal and range expansion from one or more recovery emphasis areas, and appropriate conservation agreements have been reached to include the newly occupied habitats within the recovery emphasis area(s) involved and management measures to maintain identified dispersal corridors have been agreed to and implemented.
- **Delisting Criteria from the 2019 Recovery Plan Amendment (Species may be considered for delisting when the following criteria are met)**
    - A minimum 5-year average of at least 2,800 adult Columbia Basin pygmy rabbits in at least 12 populations. Of these, at least four populations have 500 or more adults each and at least eight populations have 100 or more adults each.
    - Habitat security for the 12 populations has been established (WDFW 1995,p.25).

- iNaturalist: https://www.inaturalist.org/observations?taxon_id=1398530
    - 12 research-grade observations, all of which have public coordinate data (Figure 4).

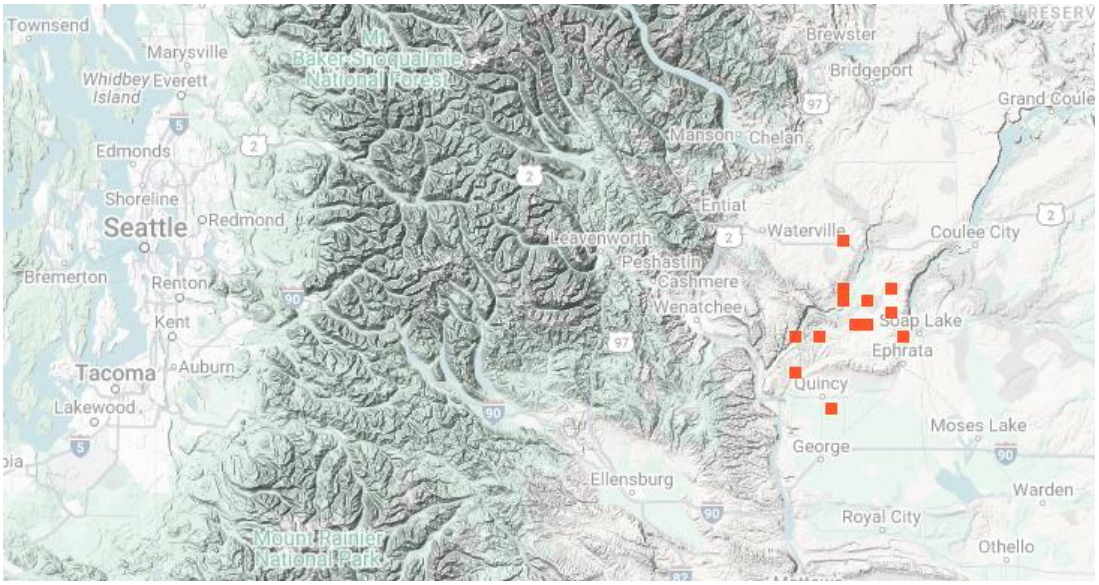

Figure 4. iNaturalist occurrences for the pygmy rabbit (Columbia Basin DPS only; accessed January 24, 2025).

- GBIF: https://http://www.gbif.org/species/2436688
    - GBIF includes 2,239 observation records dated from 1877 to 2024 (or undated). 108 of these are dated 2010-Present. Forty-six of these have usable coordinate data (precision with at least 3 decimal places in decimal degree coordinates). Four of these are in the vicinity of the Columbia Basin DPS of the Pygmy rabbit, all of which are contained within its range.
    - The four occurrences for the pygmy rabbit Columbia Basin DPS with usable coordinates are iNaturalist occurrences (Figure 5).

Figure 5. GBIF observations for the pygmy rabbit (Columbia Basin DPS only; 2010-Present; accessed January 24, 2025).

- NatureServe Explorer Pro: https://explorer.natureserve.org/pro/Map?taxonUniqueId=ELEMENT_GLOBAL.2.102656

- NatureServe Explorer Pro does not identify any “Documented Distribution” occurrences for the Pygmy rabbit in the vicinity of the Columbia Basin DPS (**Figure 6**). This is not surprising because the species is considered extinct in the wild.

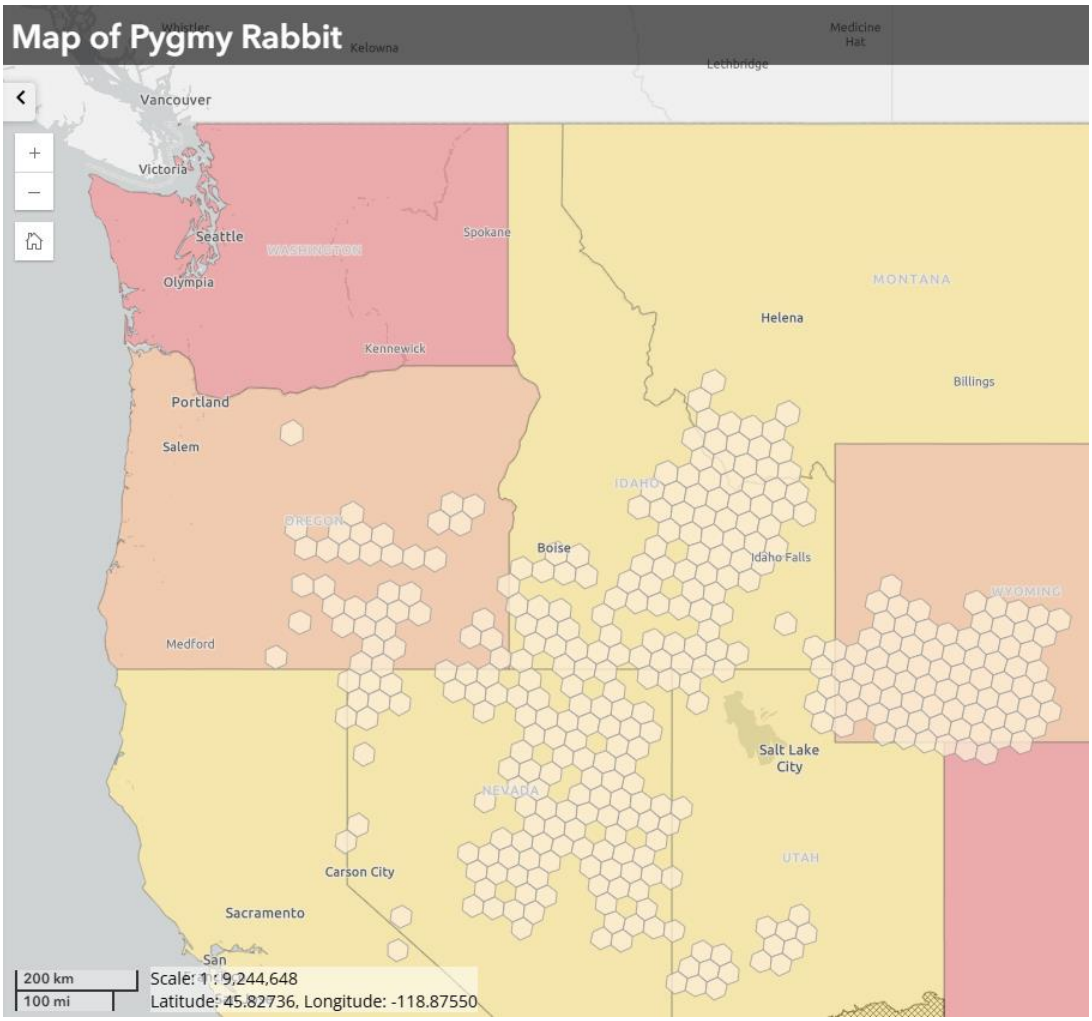

Figure 6. Documented Distribution occurrences (hexagons) for the pygmy rabbit, none of which are in the vicinity of the Columbia Basin DPS (accessed January 24, 2025).

Appendix 2. GIS Data Review and Method to Develop Core Map

The core map for this species is based on range, but with extent limited to areas of occupancy of known extant subpopulations as of the most recent Species Status Assessment (FWS 2024a). The pygmy rabbit Columbia Basin DPS does not have federally designated critical habitat, and its current range is suitably endemic and refined for use as the basis of the core map type. However, after an examination of known occurrences inside and outside the range, some area was removed from the range (and no area added) to arrive at the core map's final shape.

1. References and Software

- FWS Species Range: https://www.fws.gov/species/pygmy-rabbit-brachylagus-idahoensis
- Software used: ArcGIS Pro version 3.2

2. Datasets Used in Core Map Development

2.1. Range

The range for this species was last updated by FWS on June 8, 2022. A shapefile including species range for all listed species was downloaded from the FWS ECOS website on January 24, 2025. The shapefile was converted to a feature class stored in a file geodatabase and reprojected to WKID #4269 ("North America Albers Equal Area Conic").

1) Using an ArcGIS Web Map the species was queried based on the ECOS listed "Entity ID" of 1240 and exported as a feature class to a temporary file geodatabase as a standalone Entity ID-specific layer.
2) The area of the range was calculated automatically by loading it into the software (ArcGIS Pro version 3.2) and reading its area from the attribute table ("Shape_Area"), then converting its units (square meters) into acres with a conversion rate of 0.000247105.
3) This feature class was added to an ArcPro map and compared against the available known locations described in the FWS Species Status Assessment (SSA), and the available occurrence information from the GBIF database. The current range captures the 3 subpopulation locations identified in the SSA and includes the occurrence information from iNaturalist (via GBIF).

2.2. Species Status Assessment

The SSA document published in August 2024 states that the pygmy rabbit has been extirpated from the wild. Currently, the species persists in three subpopulations of reintroduced captive (semi-wild) breeding programs. The spatial extent of these subpopulations is represented in **Figure 3** of the source document and reproduced in **Figure 2**.

[5] https://epa.maps.arcgis.com/home/item.html?id=2c0a74713eb04ae5921fca27c854a331- updated each week from the FWS ECOS database.

3. **Creating the Core Map**

3.1. Defining the Core Map Extent

The core map was created by converting subpopulation boundaries into a usable spatial data layer using the sequential georeferencing procedure below. The intermediate and final layers are provided as a separate attachment to this document, and the development process represented in **Figure 7** below.

1. Export the species range to a geodatabase used for intermediate spatial layers ("Pygmy_Rabbit.gdb") and name the species layer "PR." Subsequent layers created are also stored in Pygmy_Rabbit.gdb.
2. Save the map from the SSA that includes subpopulation info as an image file ("Pygmy_Rabbit_Subpopulations.jpg").
3. Add the image to the GIS and save it to the working file geodatabase ("PR_Sub"). Fit the image to a window zoomed into the vicinity of the species range, render it partially transparent (70% transparency was used) and use control points to reorient the image to be aligned with identifiable features in the background.
4. Reclassify the image to isolate the color associated with subpopulations on the original map, blue in this case ("PR_Sub_rec").
5. Use the Raster to Polygon tool to convert the reclassified layer to a vector layer. This is done to facilitate future steps, including final delivery of a feature class representing the core map ("PR_Sub_rec_r2p"). Edit a select few vertices of some polygons to enclose the perimeters of each shape that may contribute to the final layer.
6. Use the Feature to Polygon tool to fill any holes in the polygon layer ("PR_Sub_rec_r2p_f2p").
7. Create a new polygon layer to be used solely for clipping purposes in the next step ("PR_polygon_4clip"). This polygon encloses just the desired shapes without intersecting them and excludes any unwanted shapes residual from the reclassification step.
8. Use the Pairwise Clip tool to clip the working layer ("PR_Sub_rec_r2p_f2p") by the manually created polygon (PR_polygon_4clip) to generate a new layer ("PR_Sub_rec_r2p_f2p_pc").
9. Use the Pairwise Dissolve tool to dissolve the polygons from the last step into a single polygon ("PR_Sub_rec_r2p_f2p_pc_pd"). Core maps are delivered as single polygons.
10. Use the Pairwise Clip tool to clip the working layer ("PR_Sub_rec_r2p_f2p_pc_pd") by the species range () to generate a new layer ("PR_Sub_rec_r2p_f2p_pc_pd_pcRange"). This layer was exported to the same file geodatabase and renamed to more easily identify it as the interim core map ("Pygmy_rabbit_CoreMap").

Figure 7. Progression from range and known occurrences of the pygmy rabbit (Columbia Basin DPS subpopulations) to interim core map.

3.2. Cultivated Lands-based Refinement

A refinement based on EPA's published cultivated layer for use in core map development was considered appropriate. As the last step of core map development, the core map was refined using the Pairwise Erase tool to remove areas of overlap with EPA's layer of cultivated areas > 25 acres. Smoothing was applied according to the procedure in Appendix 3 of EPA's core map process document. The final geodatabase to be used to upload the core map to EPA's Geoplatform should be Pygmy Rabbit Cultivated Removed.gdb. The feature class that is the core map is called Pygmy_Rabbit_Coremap_Smooth, and this is mapped as **Figure 1** in the main document.

4. Datasets Considered but Not Used in Core Map Development

4.1. Known Location Data

Location data for the pygmy rabbit from iNaturalist, GBIF, and NatureServe Explorer Pro (public) were considered, but found to be less specific and reliable than the subpopulation location information from FWS. The georeferencing process needed to use the FWS data was suitably straightforward and accurate with respect to the image extracted from FWS documentation.

4.2. Biological Information (Habitat) Data

With the spatial extent reduced to just areas of subpopulation areas, there was then the option to refine the core map using landcover/habitat datasets crosswalked to areas matching descriptions of the pygmy rabbit Columbia Basin DPS's range. However, the datasets considered—the National Landcover Database (NLCD) and LANDFIRE—are national in scope and not tailored to the relatively small area inhabited by pygmy rabbit Columbia Basin DPS subpopulations. Any refinements using those data risked decreasing, rather than increasing, confidence in representing the true extent of the species for core map development. This is because at relatively small scales, these data sources integrate multiple datasets including satellite imagery, field data, and ecological models; therefore, local validation is limited in some areas, leading to potential inaccuracies when applied at small scales. This is a common problem for most national level landcover datasets.

References

5.1 Documents

- U.S. Environmental Protection Agency. *Process EPA Uses to Develop Core Maps for Pesticide Use Limitation Areas*. Accessed April 3, 2025. https://www.epa.gov/endangered-species/process-epa-uses-develop-core-maps-pesticide-use-limitation-areas.
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