

Appendix B. Details of the legacy area analysis

This appendix includes details for the information used in the analysis, locations of the data sets, and information on how they were applied. Complete tables and data are available at ORNHP, 1322 SE Morrison St, Portland, OR. The data includes ecological, social, and economic data.

Biological - Ecological

a) Rare, threatened and endangered (T&E) species occurrences and habitat

Data from the Oregon Natural Heritage Program's T&E species databases (Figure 1). Maintained in ArcInfo and Advanced Revelation at ORNHP, 1322 SE Morrison St, Portland, OR. The analysis used number of occurrences of all sensitive species, based on the Association for Biodiversity Information's national ranking system. Evaluated were all species ranked G1-G3 (Globally critically endangered – threatened) and S1-S2 (State Endangered). Occurrences were given points based on the rank, with G1 occurrences given 5 points; G2, 3; and G3, S1, or S2 1 point. The total number of occurrences, the area they occupied, and the points based on threats were used in the analysis. For endangered and threatened fish occurrences, miles of stream was used instead of area of habitat occupied.

b) Acreage of all private forest lands

This information was based on the 1999 USGS Gap Analysis Land Use – Land Cover map (Figure 6). The cover is maintained by the Oregon Natural Heritage Program, which is the Oregon Gap Analysis Program (OR-GAP), office. It was based on satellite imagery from 1991-1993, and has a resolution of 320 acres, so it is fairly coarse. Forest habitats were aggregated, and overlapped with the Land Ownership coverage of Oregon, also developed by OR-GAP. The data is based on 1:100,000 statewide information, from BLM maps, updated with higher resolution information (1:24,000) from the individual BLM, USFS and state agency offices. The data used in the analysis was the acreage figure for private forest lands.

For the Willamette Valley legacy areas, ORNHP used an aggregated vegetation coverage developed from three pieces. The first was a 1:24,000 vegetation map of the Willamette Valley, excluding the Portland Metro Area, developed by the Oregon Department of Fish and Wildlife. The vegetation was mapped and on Ortho-Photo U.S.G.S. quadrangles, and digitized by ODFW. It resides at their Corvallis Office. The second was a vegetation map produced by Ecotrust for the Metro Government's Greenspaces Program. This used recent satellite imagery and mapped areas as small as one acre. The third was a cover developed by the U.S. Forest Service, Forest Sciences Lab, affiliated with Oregon State University's Department of Forestry. This cover was used to fill in areas not covered by the other two.

c) Acreage of priority forest habitats (oak-woodlands, riparian bottomlands and ponderosa pine forest types)

For the statewide analysis, the OR-GAP Land-Use Land-Cover map was used to determine the acreage of these priority habitat types within each potential legacy area. Previous analysis (OR-GAP, Oregon Biodiversity Project, and State of the Environment

Report) identified these as the priority forest habitat types statewide. These previous analysis looked at a combination of factors, primarily historical acres lost and current acres of each type protected.

d) Importance of legacy area to priority wildlife species

This coverage was also based on the OR-GAP datasets and results, on file at the Oregon Natural Heritage Program. Priority wildlife species were identified in the OR-GAP final report, based on a combination of factors, including the percentage of each species current and historic habitat protected as well as the percentage of current and historic habitat lost (due to habitat conversion or range contraction). Details of this analysis are found in the OR-GAP final report (Kagan *et al.* 1999), and the data is available from ORNHP. For the forest legacy analysis, the subset of the priority species which use or are found in forests was used, determined by the wildlife habitat relationships database, and refined by ORNHP staff. There were 64 species included which are:

| Species name | Species name |
|-----------------------------|------------------------------------|
| Dunn's salamander | Red-eyed vireo |
| Southern torrent salamander | Wilson's warbler |
| Cascade torrent salamander | California towhee |
| Columbia torrent salamander | Savannah sparrow |
| Red-legged frog | Yellow-headed blackbird |
| Foothill yellow-legged frog | Purple finch |
| Northern leopard frog | Broad-footed mole |
| American bittern | Western small-footed bat |
| Green heron | Spotted bat |
| Wood duck | Townsend's big-eared bat |
| Green-winged teal | Brazilian free-tailed bat |
| Harlequin duck | Snowshoe hare |
| Hooded merganser | Western gray squirrel |
| Osprey | California kangaroo rat |
| Northern harrier | Western harvest mouse |
| Peregrine falcon | Pinon mouse |
| Willet | White-footed vole |
| Long-billed curlew | California vole |
| Black tern | Pacific jumping mouse |
| Marbled murrelet | American marten |
| Band-tailed pigeon | Fisher |
| Yellow-billed cuckoo | Wolverine |
| Short-eared owl | Mountain lion |
| Lewis's woodpecker | Canada lynx |
| Acorn woodpecker | Bobcat |
| Hammond's flycatcher | White-tailed deer |
| Pacific slope flycatcher | Western pond turtle |
| Ash-throated flycatcher | Side-blotched lizard |
| Pinyon jay | Night snake |
| Pygmy nuthatch | Common kingsnake |
| Mockingbird | Striped whipsnake |
| Hutton's vireo | Pacific coast aquatic garter snake |

For the analysis, two factors relating to these 64 species distributions were evaluated. The first was the overall priority species richness for each legacy area, based on the sum of the acreage of all these species in each legacy area. The second was the number of species for which any legacy area provided a significant amount of their habitat (at least 10%). In the final analysis, we used only the second factor.

- e) Viability of the remaining forests in the area and ability of forests to add to or provide buffers for existing national forests, state forests, state parks, or other protected areas

This was based on the average size of the private forests in each of the potential legacy areas. It used the statewide OR-GAP Land-Use Land Cover map overlain with the ownership map to differentiate private and public forests. For each legacy area, the mean size of forested patches was calculated, and the average area for the forested patches remaining was calculated. Unfortunately, the data available for all but the Willamette Basin was not reliable enough to allow us to use this excellent measure of private forest viability in the final legacy area analysis.

Social

- (a) Immediacy, significance and magnitude of conversion threats as defined by:

- ✍ Acreage of forest habitats lost between 1974-1994 (in western Oregon)

This western Oregon coverage was developed by ODF (Figure 10). It is maintained at the ODF Office in Salem and the ODF contact is Gary Lettman. Complete information on how the coverage was developed is outlined in the ODF publication, *Forests, Farms and People* (Azuma *et al.* 1999). The coverage was developed by comparing air photographs of forests from 1974 with those from 1994, and comparing changes. For the forest legacy analysis, the total acreage of habitat lost in each of the western Oregon legacy areas was used.

- ✍ Acreage of forest habitats estimated to be lost by 2005 (in western Oregon)

This map was based on modeled data (Figure 12). It was developed by Jeff Kline and others at the OSU Forest Sciences Laboratory, in Corvallis. It was used in this analysis by totaling the acreage of predicted forest losses by 2005 in each potential legacy area.

- ✍ Acreage of forest habitats lost since European settlement (approx. 1850)

The data used in the analysis was determined by subtracting the forest acreage within each potential legacy area based on the existing OR-GAP Land-Use Land Cover map (Figure 8), from the acreage figure determined from the Presettlement Vegetation Cover, 2001 edition (Figure 7). The OR-GAP Land-Use Land-Cover map is described above and maintained at ORNHP.

The Presettlement Vegetation Coverage, 2001 edition was developed by and is maintained by ORNHP. This cover shows the vegetation of Oregon from approximately 1850. The forest information in this cover is from two sources. The first is an Oregon-Washington forest map obtained from the OSU Forest Sciences Lab, and developed by H.J. Andrews in 1936. This cover maps forest types, based on surveys done in the 1930's. There is no clear scale, but based on the polygon sizes and details, it is estimated at approximately 1:100,000. Generally Andrews' types were used, although a few classes, such as "balsam fir" were reclassified into "grand fir, subalpine fir, Pacific silver fir, and red fir-white fir", based on geography and elevation. The few areas mapped by Andrews as recent clearcuts or burns were reclassified by Jimmy Kagan of ORNHP and Jim Stritholt of the Conservation Biology Institute into the most appropriate adjacent forest class.

The second source was a 1:24,000 presettlement vegetation coverage developed and maintained by ORNHP based on the General Land Office surveyor's notes. These coverages are complete for the entire Willamette Valley, the Umpqua Valley, and for most of the Oregon Coast. The GLO notes were transcribed, and using surveyor's maps, notes and topographic maps, presettlement vegetation was mapped. When the 2001 cover was compiled, the GLO cover was applied over the Andrews cover for the forest map. ORNHP also mapped oak and pine forests in the Rogue Valley, based on personal knowledge at 1:250,000 (development of 1:24,000 GLO maps of the Rogue is just underway). This coverage, including detailed metadata and information on the non-forested habitats is available at ORNHP.

☞ Increase in population based on 1990-2000 census increase by county

This is the US Census County Level Data. It is maintained by the census bureau, downloaded from their web site (www.census.gov) or locally from Portland State University at (www.upa.pdx.edu/cprc) as a database, and transformed by ORNHP staff into a GIS coverage. For the analysis, the threats were determined by the actual increase in population for each county.

Threat of conversion was one of the most important factors used in the analysis. In the analysis, each of the potential legacy areas was ranked from 1-9, with 9 being the highest value. These ranks were obtained by combining the four threat factors above (where all four factors were available, or for eastern Oregon using only the last two data layers).

(b) Community interest in Forest Legacy, existence of local partners, including county and city governments, potential for matching funds, and public recreation opportunity

There were no statewide or regional datasets available to look at these factors. So, in the analysis, ORNHP staff rated each of the potential legacy areas 0-5, based on a number of factors. These included 1) the presence of partners and local interest in forest legacy; 2) Contacts by the public, public agency staff or elected officials; 3) presence and interest of private or public partners; and 4) the potential for forest legacy to provide recreational opportunities.

Economic

a) How significant is private forest timber or recreation to the local economy by:

☞ The significance of timber to the local economy (Figure 4)

This data was developed by ODF to look at the local dependence on timber.

The data is summarized by county, and the value was averaged for legacy areas in more than one county. The ODF contact for information is Gary Lettman.

☞ The presence of distressed county or local community (Figure 5)

This is a map developed by the Oregon Economic Development Department.

It looks at the presence of economic distress, much of which is directly related to declines in timber and mill closures.

The economic data from the two data layers above were combined by ORNHP staff into an overall economic value from 0-5, with 5 being the area most stressed and dependant on timber.

The table below shows the summary of the data, and final results. The index formula used the log of the sum of the first six factors (with priority habitats weighted over the acreage of forest losses and private forests) + the Economic, Social and Threat Factors. These last three factors carried the greatest weight.

Legacy Area Priority Table

| Legacy Area | Weighted Eos | Miles of T&E fish | Priority Wildlife * | Private Forest (acres) | Priority Habitats (acres) | Forest Losses (Acres) | Economic | Social | Threat | Index | Priority |
|-----------------------------|--------------|-------------------|---------------------|------------------------|---------------------------|-----------------------|----------|--------|--------|-------|----------|
| Eugene - Springfield | 1209 | 212 | 8 | 326140 | 85209 | 79584 | 2 | 4 | 8 | 18.65 | 1 |
| Corvallis - S. Polk | 382 | 146 | 1 | 197931 | 29483 | 10999 | 2 | 5 | 7 | 18.04 | 2 |
| Bend - La Pine - Metolius | 194 | 30 | 9 | 186673 | 95248 | 7560 | 1 | 3 | 9 | 17.68 | 2 |
| Rogue Valley - Bear Creek | 1064 | 117 | 14 | 160604 | 67344 | 185123 | 2 | 3 | 8 | 17.55 | 2 |
| Metro | 325 | 737 | 4 | 366191 | 30772 | 316761 | 0 | 4 | 9 | 17.26 | 3 |
| Umpqua Valley and Foothills | 1202 | 810 | 6 | 284857 | 98091 | 209582 | 3 | 3 | 5 | 15.72 | 4 |
| Yamhill - N. Polk | 141 | 144 | 1 | 124663 | 21961 | 16686 | 1 | 3 | 7 | 15.07 | 5 |
| Marion County | 291 | 451 | 3 | 89119 | 15770 | 163449 | 1 | 4 | 6 | 14.98 | 5 |
| Wasco/Hood River | 146 | 147 | 2 | 134104 | 80116 | -15 | 2 | 3 | 5 | 14.61 | 5 |
| North Coast | 663 | 724 | 5 | 382564 | 764 | -583 | 2 | 3 | 5 | 13.45 | 6 |
| South Coast | 1285 | 645 | 9 | 460644 | 13844 | 78227 | 3 | 1 | 5 | 13.01 | 7 |
| Illinois Valley | 1586 | 118 | 2 | 87256 | 29085 | 9223 | 3 | 2 | 4 | 13.22 | 7 |
| Wallowa | 75 | 236 | 1 | 34091 | 1638 | 38050 | 3 | 1 | 5 | 12.22 | 7 |
| S. Willamette R. Riparian | 1010 | 441 | 3 | 65487 | 10558 | 83239 | 1 | 3 | 4 | 11.88 | 7 |
| Southern Klamath | 561 | 69 | 23 | 257020 | 143662 | 174966 | 3 | 1 | 2 | 10.87 | 7 |

* This is the number of priority wildlife species with 10% of their statewide distribution in the legacy area.