



ECONOMIC ANALYSIS OF CRITICAL  
HABITAT DESIGNATION FOR THE  
LARGE-FLOWERED WOOLLY  
MEADOWFOAM AND COOK'S LOMATIUM

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prepared for:

U.S. Fish and Wildlife Service

4401 N. Fairfax Drive

Arlington, VA 22203

prepared by:

Industrial Economics, Incorporated

2067 Massachusetts Avenue

Cambridge, MA 02140

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## LIST OF ACRONYMS

Act	Endangered Species Act
BLM	U.S. Bureau of Land Management
BLM	U.S. Bureau of Land Management
BOR	U.S. Bureau of Reclamation
CWA	Clean Water Act
DOI	U.S. Department of the Interior
EPA	U.S. Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
FERC	Federal Energy Regulatory Commission
FWS	U.S. Fish and Wildlife Service
HCP	Habitat Conservation Plan
IEC	Industrial Economics, Incorporated
NAICS	North American Industry Classification System
NRCS	Natural Resources Conservation Service
ODA	Oregon Department of Agriculture
ODF	Oregon Department of Forestry
ODOT	Oregon Department of Transportation
OMB	Office of Management and Budget
Oregon Plants	Cook's Lomatium and Large-Flowered Woolly Meadowfoam
ORV	Off-road vehicle
RFA	Regulatory Flexibility Act
SBREFA	Small Business Regulatory Enforcement Fairness Act
Service	U.S. Fish and Wildlife Service
TNC	The Nature Conservancy
USACE	U.S. Army Corps of Engineers
USFS	U.S. Forest Service

## EXECUTIVE SUMMARY

1. The purpose of this report is to identify and analyze the potential economic impacts associated with the designation of critical habitat for the *Limnanthes floccosa ssp. grandiflora* (large-flowered woolly meadowfoam) and *Lomatium cookii* (Cook's lomatium (hereafter "Oregon plants")). This report was prepared by Industrial Economics, Incorporated (IEc), under contract to the U.S. Fish and Wildlife Service (Service).
2. This final economic analysis analyzes the proposed designation as described in the proposed rule. This analysis does not reflect changes to the proposed critical habitat designation made in the final rule. Consequently, description of the habitat designation in the final rule may differ from maps and figures presented in this analysis.<sup>1</sup>
3. On July 28, 2009, the Service proposed critical habitat for the Oregon plants, identifying approximately 11,038 acres organized in 23 "units" in Jackson and Josephine Counties, Oregon.<sup>2</sup> These units are further divided into 35 subunits.<sup>3</sup> Of these acres, the Service is proposing to designate 6,327 acres across eight units for the woolly meadowfoam in Jackson County and 7,109 acres across 17 units for Cook's lomatium in Jackson and Josephine Counties.<sup>4</sup> Both species occur in vernal pool-mounded prairie habitat in the Middle Rogue River Basin's Agate Desert in Jackson County, Oregon. Cook's lomatium is also found in seasonally wet meadow habitat in forest openings in the Illinois River Valley in Josephine County, Oregon.

### FOCUS OF THE ECONOMIC ANALYSIS

4. This analysis describes economic impacts of conservation efforts associated with commercial and residential development, transportation projects, and species conservation and management activities. Additionally, this analysis addresses potential economic impacts of Oregon plants conservation to agriculture, grazing, timber harvest,

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<sup>1</sup> For a detailed discussion of public comments on the draft economic analysis and associated responses, refer to the responses to public comment section of the final rule.

<sup>2</sup> Seventeen units are proposed as critical habitat for the Cook's lomatium while eight units are proposed for the woolly meadowfoam. While this sums to 25 units, two units (White City (RV6) and Whetstone Creek (RV8)) are proposed for both species; therefore, there are 23 unique units proposed.

<sup>3</sup> 74 FR 37314.

<sup>4</sup> Approximately 43 percent (4,711 acres across 15 units) is proposed critical habitat for Cook's lomatium; 36 percent (3,929 acres across six units) is proposed critical habitat for the woolly meadowfoam; 22 percent (2,398 acres across two units) is proposed as critical habitat for both species.

fire management, recreation, and mining, but concludes that these activities are not likely to incur measurable economic impacts.

5. To provide an understanding of the potential economic impacts, this analysis: 1) determines the scope and scale of economic activities within proposed critical habitat; 2) identifies threats to the Oregon plants associated with these economic activities; 3) identifies conservation efforts implemented that would avoid or minimize these threats; and, 4) to the extent feasible, quantifies and monetizes the economic costs of these modifications.
6. Forecast impacts are organized into two categories according to "without critical habitat" and "with critical habitat" scenarios. The "without critical habitat" scenario represents the baseline for the analysis, considering protections otherwise accorded the Oregon plants; for example, under other Federal, State, and local regulations. The "with critical habitat" scenario describes the incremental impacts specifically due to designation of critical habitat for the species. In other words, these incremental conservation efforts and associated economic impacts would not occur but for the designation. This analysis considers both direct and indirect costs. Indirect costs, for example, may result from the influence of critical habitat designation on the decisions of regulators and decision-makers other than the Service (e.g., State agencies and land managers).
7. Because the Service believes that the direct benefits of the proposed rule are best expressed in biological terms, this analysis does not quantify or monetize benefits. However, a qualitative discussion of potential categories of economic benefit is provided in Chapter 7.

#### SUMMARY OF FINDINGS

8. The following points distill the key issues and conclusions of this report:
  - **Incremental impacts are small relative to baseline impacts:** Present value baseline impacts of Oregon plants conservation are forecast to range from \$7.83 million to \$157 million from 2010 to 2029 (applying a seven percent discount rate). In comparison, incremental impacts of critical habitat designation are forecast to range from \$95,200 to \$403,000 (applying a seven percent discount rate).

Baseline impacts include both the costs of carrying out conservation efforts and administrative costs of section 7 consultation for the plants, while incremental impacts include only administrative costs associated with considering adverse modification as part of future section 7 consultations. That is, critical habitat designation for the Oregon plants is not expected to change the amount, design, or regulation of forecast economic activities. The Service does not expect the designation of critical habitat to result in additional project modification recommendations above and beyond those that would be undertaken as part of the baseline (i.e., to comply with Clean Water Act (CWA) requirements or to avoid jeopardy to the species). Further, due to the proximity of the proposed critical habitat to vernal pools and other seasonal wetlands, parties conducting

economic activities with a Federal nexus are already aware of section 7 consultation requirements and regularly consult. As a result, the designation of critical habitat is not expected to result in an increase in consultation activity. Finally, other State and local management agencies and private stakeholders indicate that they will not change their management of Oregon plants' habitat following the designation of critical habitat.

- **The majority of baseline and incremental impacts affect development activities:** Chapter 3 describes forecast baseline and incremental impacts to development activities. Baseline impacts are primarily associated with establishing mitigation areas to offset impacts of forecast development within the proposed critical habitat area. Under the low impact scenario, baseline impacts to development are forecast to be \$6.4 million (82 percent of overall baseline impacts) over the next 20 years (applying a seven percent discount rate). Under the high impact scenario, baseline impacts to development activities are forecast to be \$156 million (99 percent of overall baseline impacts) over the next 20 years (applying a seven percent discount rate).

Baseline impacts to development activities stem from compliance with section 404 of the CWA and Oregon State Law (ORS 196.795-990), which require projects within vernal pool habitat to limit potential adverse effects to wetland areas if the projects include the discharge of dredge or fill material into wetlands.<sup>5,6</sup> Specifically, these laws require that developers avoid, minimize, and/or mitigate potential adverse impacts to vernal pool habitat.<sup>7</sup> This analysis quantifies costs associated with minimizing and mitigating potential adverse impacts to vernal pool habitat. Further this analysis provides a qualitative discussion of the potential economic impacts associated with avoiding adverse impacts to vernal pool habitat.

Incremental impacts to development activities stem solely from administrative costs associated with addressing adverse modification during future section 7 consultations. Incremental impacts related to development are forecast to be \$67,300 (71 percent of overall incremental impacts) under the low impact scenario, and \$375,000 (93 percent of overall incremental impacts) under the high impact scenario (applying a seven percent discount rate).

- **The majority of impacts to transportation and species management activities are baseline impacts:** Chapters 4 and 5 describe forecast baseline and incremental impacts associated with transportation and species management activities, respectively. Baseline impacts to transportation activities stem from continued monitoring and management for the Oregon plants during road

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<sup>5</sup> 40 CFR Part 230.1-7.

<sup>6</sup> ORS 196.795-990.

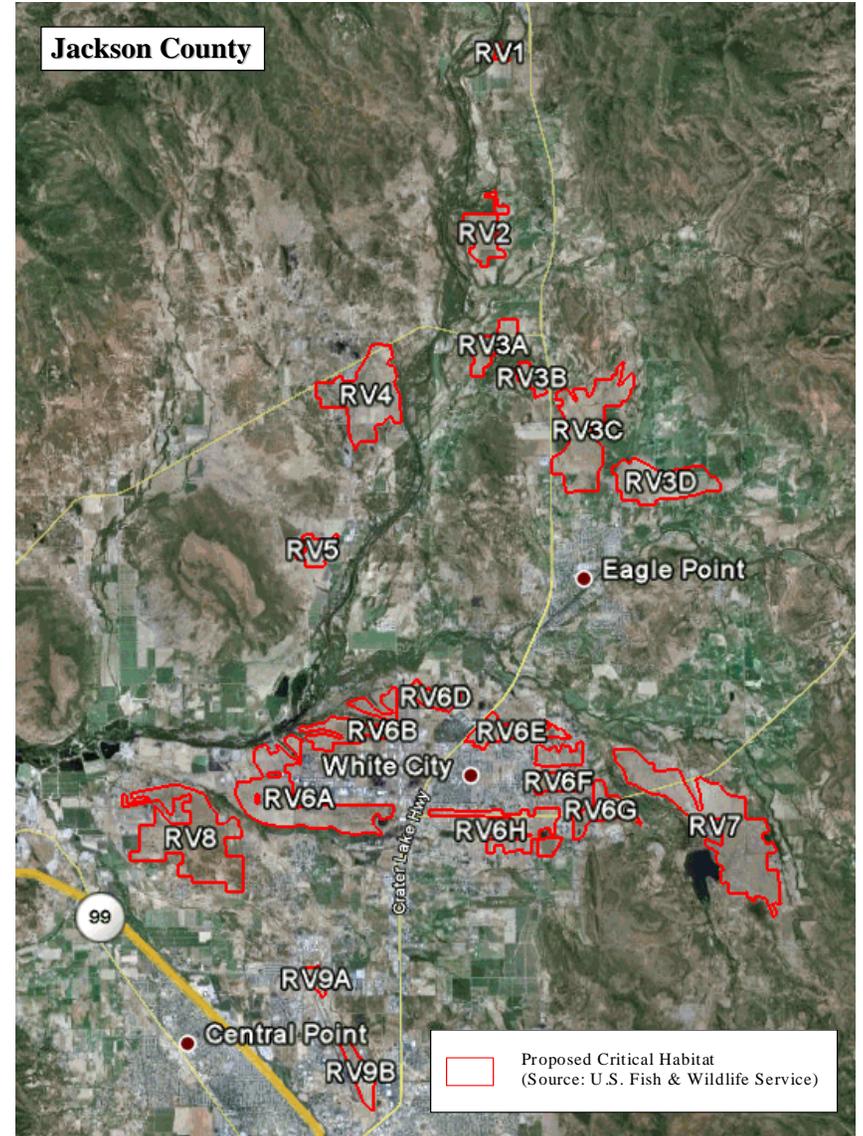
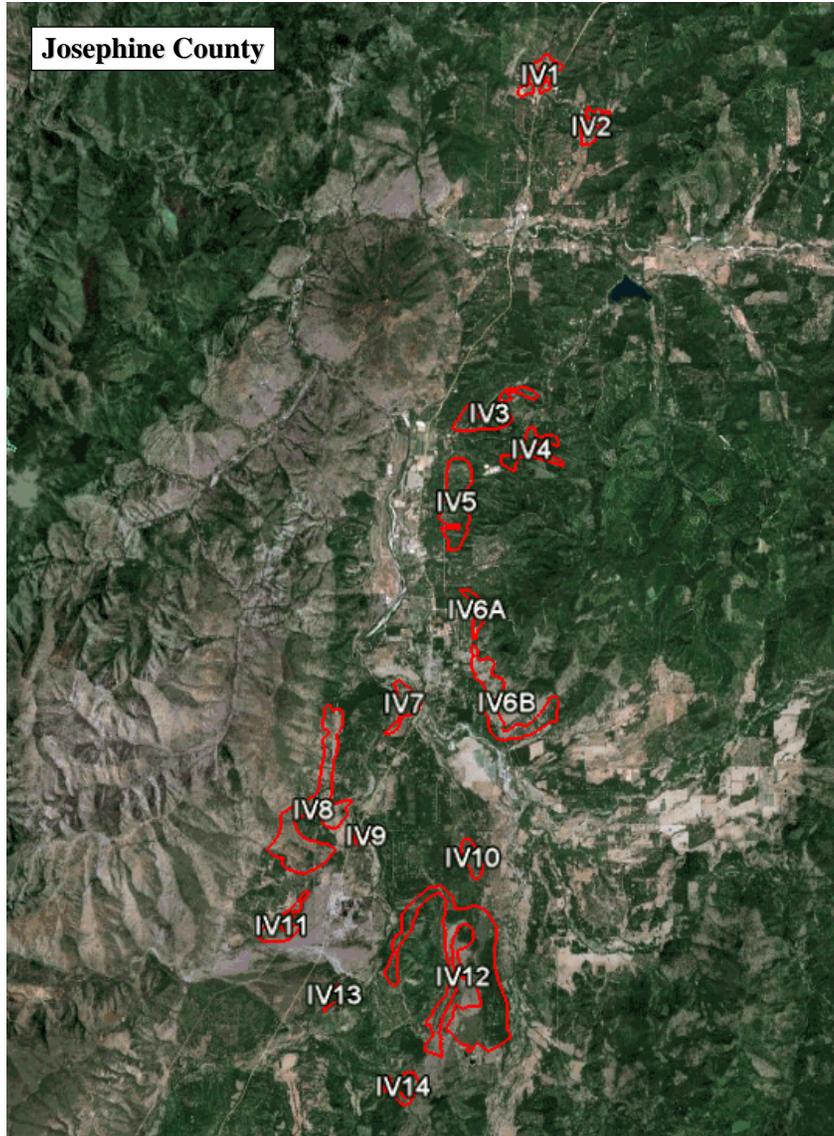
<sup>7</sup> Personal communication with the U.S. Army Corps of Engineers between October 26, 2009 and October 28, 2009 and Oregon Department of State Land on October 27, 2009.

maintenance activities within special management areas and offsetting unavoidable impacts of future highway construction projects by withdrawing credits from an existing conservation/mitigation bank. Baseline impacts associated with species management activities include the continuation of voluntary management and surveying efforts for the Oregon plants on Federal, State, and conservation lands. In total, the present value of baseline transportation impacts over the 20 years following critical habitat designation is estimated to be \$226,000 (applying a seven percent discount rate). The present value of baseline impacts associated with species management activities is estimated to be \$1.2 million (applying a seven percent discount rate).

Incremental impacts are limited to administrative costs associated with addressing adverse modification in future section 7 consultations. Over the 20 year timeframe, impacts are forecast to be \$9,080 and \$18,800 for transportation and species management projects, respectively (applying a seven percent discount rate).

- **A number of economic activities considered in the economic analysis are not forecast to incur baseline or incremental impacts:** This analysis also considers potential impacts to agriculture, grazing, timber harvest, fire management, recreation, conventional mining, and phytomining activities, but does not quantify potential costs. While these activities may constitute threats to the species, they are either not forecast to occur within the proposed critical habitat or are not subject to a Federal nexus requiring consultation with the Service, as described in Chapter 6.

EXHIBIT ES-1 OVERVIEW OF PROPOSED CRITICAL HABITAT IN JOSEPHINE AND JACKSON COUNTIES



**BASELINE AND INCREMENTAL IMPACTS OF OREGON PLANTS CONSERVATION**

9. Exhibits ES-2 and ES-3 summarize baseline and incremental impacts of Oregon plants conservation over the next 20 years by critical habitat subunit. To calculate present value and annualized impacts, guidance provided by OMB specifies the use of a real annual discount rate of seven percent.<sup>8</sup> In addition, OMB recommends conducting a sensitivity analysis using other discount rates, such as three percent.<sup>9</sup> Accordingly, all cost figures presented in Chapters 3 through 5 of this analysis describe present value cost impacts assuming a seven percent discount rate. Appendix B reports forecast impacts assuming a discount rate of three percent to highlight the sensitivity of the results to the discount rate assumption.
10. The present value of total baseline impacts is forecast to be \$7.83 million to \$157 million over the 20 years following the designation of critical habitat (applying a seven percent discount rate). These impacts translate to \$739,000 to \$14.8 million in annualized impacts. The broad range in baseline impacts is due to the range of impacts estimated for future development activities. Under the low forecast development scenario, this analysis assumes that future development will occur only in units where it has occurred in the past at its past rate. Under the high forecast development scenario, this analysis assumes full build-out over the next 20 years of developable areas within units where development has occurred in the past or within units where the proposed rule identifies development as a potential threat to the Oregon plants and their habitat. Baseline impacts to transportation and species management activities are the same under both the low and high impact scenarios.
11. The present value of total incremental impacts is forecast to range from \$95,200 to \$403,000 over the 20 years following the designation of critical habitat (applying a seven percent discount rate). This equates to \$8,990 to \$38,000 in annualized impacts. All incremental impacts stem from the administrative costs associated with addressing adverse modification in future section 7 consultations. As described above for baseline impacts, the range in total incremental impacts is due to the range in development forecasts.

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<sup>8</sup> "A real discount rate that has been adjusted to eliminate the effect of expected inflation should be used to discount constant-dollar or real benefits and costs. A real discount rate can be approximated by subtracting expected inflation from a nominal interest rate... Constant-dollar benefit-cost analyses of proposed investments and regulations should report net present value and other outcomes determined using a real discount rate of 7 percent. This rate approximates the marginal pretax rate of return on an average investment in the private sector in recent years." U.S. Office of Management and Budget, Circular A-94 Revised, October 29, 1992.

<sup>9</sup> U.S. Office of Management and Budget, Circular A-4, September 17, 2003 and U.S. Office of Management and Budget, "Draft 2003 Report to Congress on the Costs and Benefits of Federal Regulations; Notice," 68 Federal Register 5492, February 3, 2003.

EXHIBIT ES-2 FORECAST BASELINE IMPACTS OF OREGON PLANTS CONSERVATION (2010-2029, 2009 DOLLARS)

SUBUNIT	3% DISCOUNT RATE				7% DISCOUNT RATE			
	PRESENT VALUE IMPACT		ANNUALIZED IMPACTS		PRESENT VALUE IMPACT		ANNUALIZED IMPACTS	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
RV1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV3A	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV3B	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV3C	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV3D	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV6A	\$2,180,000	\$44,300,000	\$147,000	\$2,980,000	\$1,640,000	\$32,800,000	\$154,000	\$3,100,000
RV6B	\$355,000	\$3,250,000	\$23,900	\$218,000	\$268,000	\$2,410,000	\$25,300	\$227,000
RV6C	\$15,800	\$28,700	\$1,060	\$1,930	\$13,900	\$23,400	\$1,310	\$2,210
RV6D	\$126,000	\$3,780,000	\$8,480	\$254,000	\$93,400	\$2,800,000	\$8,810	\$264,000
RV6E	\$622,000	\$17,700,000	\$41,800	\$1,190,000	\$465,000	\$13,100,000	\$43,900	\$1,230,000
RV6F	\$906,000	\$27,200,000	\$60,900	\$1,830,000	\$670,000	\$20,100,000	\$63,300	\$1,900,000
RV6G	\$142,000	\$4,260,000	\$9,560	\$287,000	\$105,000	\$3,150,000	\$9,930	\$298,000
RV6H	\$558,000	\$16,700,000	\$37,500	\$1,120,000	\$413,000	\$12,400,000	\$39,000	\$1,170,000
RV7	\$288,000	\$288,000	\$19,400	\$19,400	\$213,000	\$213,000	\$20,100	\$20,100
RV8	\$1,410,000	\$29,100,000	\$94,900	\$1,960,000	\$1,050,000	\$21,500,000	\$99,000	\$2,030,000
RV9A	\$758,000	\$758,000	\$50,900	\$50,900	\$626,000	\$626,000	\$59,100	\$59,100
RV9B	\$2,660,000	\$2,660,000	\$179,000	\$179,000	\$2,200,000	\$2,200,000	\$208,000	\$208,000
IV1	\$9	\$9	\$1	\$1	\$6	\$6	\$1	\$1
IV2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
IV3	\$9,000	\$9,000	\$605	\$605	\$6,400	\$6,400	\$604	\$604
IV4	\$5,170	\$5,170	\$348	\$348	\$3,680	\$3,680	\$347	\$347
IV5	\$14,700	\$14,700	\$988	\$988	\$10,500	\$10,500	\$987	\$987
IV6A	\$1,710	\$6,170,000	\$115	\$415,000	\$1,220	\$4,560,000	\$115	\$431,000
IV6B	\$14,900	\$30,700,000	\$1,000	\$2,070,000	\$12,300	\$22,700,000	\$1,160	\$2,150,000
IV7	\$0	\$2,260,000	\$0	\$152,000	\$0	\$1,670,000	\$0	\$158,000
IV8	\$1,530	\$20,800,000	\$103	\$1,400,000	\$1,090	\$15,400,000	\$103	\$1,460,000
IV9	\$7,970	\$1,680,000	\$535	\$113,000	\$6,620	\$1,250,000	\$625	\$118,000
IV10	\$1,410	\$109,000	\$95	\$7,310	\$1,000	\$80,400	\$95	\$7,590
IV11	\$4,660	\$4,660	\$314	\$314	\$3,320	\$3,320	\$313	\$313
IV12	\$39,900	\$39,900	\$2,680	\$2,680	\$28,400	\$28,400	\$2,680	\$2,680
IV13	\$2,160	\$2,160	\$145	\$145	\$1,540	\$1,540	\$145	\$145
IV14	\$3,420	\$3,420	\$230	\$230	\$2,430	\$2,430	\$230	\$230
<b>Total</b>	<b>\$10,100,000</b>	<b>\$212,000,000</b>	<b>\$681,000</b>	<b>\$14,200,000</b>	<b>\$7,830,000</b>	<b>\$157,000,000</b>	<b>\$739,000</b>	<b>\$14,800,000</b>

Note: Totals may not sum due to rounding.

EXHIBIT ES-3 FORECAST INCREMENTAL IMPACTS OF OREGON PLANTS CONSERVATION (2010-2029, 2009 DOLLARS)

SUBUNIT	3% DISCOUNT RATE				7% DISCOUNT RATE			
	PRESENT VALUE IMPACT		ANNUALIZED IMPACTS		PRESENT VALUE IMPACT		ANNUALIZED IMPACTS	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
RV1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV3A	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV3B	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV3C	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV3D	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV6A	\$28,700	\$109,000	\$1,930	\$7,310	\$21,700	\$80,800	\$2,050	\$7,630
RV6B	\$2,500	\$7,990	\$168	\$537	\$1,950	\$6,020	\$185	\$568
RV6C	\$335	\$360	\$23	\$24	\$298	\$316	\$28	\$30
RV6D	\$2,250	\$9,190	\$151	\$618	\$1,670	\$6,800	\$157	\$642
RV6E	\$11,200	\$43,600	\$755	\$2,930	\$8,420	\$32,300	\$795	\$3,050
RV6F	\$16,200	\$66,000	\$1,090	\$4,440	\$12,000	\$48,800	\$1,130	\$4,610
RV6G	\$2,540	\$10,400	\$171	\$697	\$1,880	\$7,670	\$177	\$724
RV6H	\$9,960	\$40,700	\$669	\$2,730	\$7,370	\$30,100	\$695	\$2,840
RV7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV8	\$22,100	\$74,700	\$1,480	\$5,020	\$17,600	\$56,500	\$1,660	\$5,340
RV9A	\$955	\$955	\$64	\$64	\$789	\$789	\$75	\$75
RV9B	\$3,360	\$3,360	\$226	\$226	\$2,780	\$2,780	\$262	\$262
IV1	\$3	\$3	\$0	\$0	\$2	\$2	\$0	\$0
IV2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
IV3	\$2,830	\$2,830	\$190	\$190	\$2,010	\$2,010	\$189	\$189
IV4	\$1,630	\$1,630	\$109	\$109	\$1,150	\$1,150	\$109	\$109
IV5	\$4,620	\$4,620	\$311	\$311	\$3,280	\$3,280	\$309	\$309
IV6A	\$537	\$15,500	\$36	\$1,040	\$381	\$11,500	\$36	\$1,080
IV6B	\$13	\$74,700	\$1	\$5,020	\$9	\$55,200	\$1	\$5,210
IV7	\$0	\$5,490	\$0	\$369	\$0	\$4,060	\$0	\$384
IV8	\$482	\$51,200	\$32	\$3,440	\$342	\$37,800	\$32	\$3,570
IV9	\$188	\$4,260	\$13	\$287	\$133	\$3,150	\$13	\$297
IV10	\$442	\$703	\$30	\$47	\$314	\$507	\$30	\$48
IV11	\$1,470	\$1,470	\$99	\$99	\$1,040	\$1,040	\$99	\$99
IV12	\$12,500	\$12,500	\$842	\$842	\$8,890	\$8,890	\$839	\$839
IV13	\$679	\$679	\$46	\$46	\$482	\$482	\$46	\$46
IV14	\$1,070	\$1,070	\$72	\$72	\$763	\$763	\$72	\$72
<b>Total</b>	<b>\$127,000</b>	<b>\$542,000</b>	<b>\$8,510</b>	<b>\$36,500</b>	<b>\$95,200</b>	<b>\$403,000</b>	<b>\$8,990</b>	<b>\$38,000</b>

Note: Totals may not sum due to rounding.

12. Exhibits ES-4 and ES-5 rank proposed critical habitat subunits according to baseline and incremental impacts, respectively, under the high impact scenario. Subunits RV6A, IV6B, RV8, RV6F, and IV8 are forecast to have the highest baseline and incremental impacts under the high impact scenario. Combined, the baseline impacts to these units account for 72 percent (\$113 million) of the present value baseline impacts (applying a seven percent discount rate). In terms of incremental impacts, the impacts to these units combined represent 69 percent (\$279,000) of the present value incremental impacts (applying a seven percent discount rate).
13. Under the low impact scenario, RV9B, RV6A, RV8, RV6F, and RV9A are forecast to have the highest baseline impacts representing 79 percent (\$6.18 million) of overall baseline impacts (applying a seven percent discount rate). In terms of incremental impacts under the low impact scenario, RV6A, RV8, RV6F, IV12, and RV6E are forecast to have the highest impacts representing 72 percent (\$68,600) of overall incremental impacts (applying a seven percent discount rate).
14. The difference in subunit rankings between the low and high scenarios is due to differences in impacts associated with development. Under the low impact scenario development impacts are forecast to occur in the White City (subunits RV6A-H), Whetstone Creek (RV8), and Medford Airport (subunits RV9A-B) units. Development activity has occurred in the White City and Whetstone Creek units in the past, and is forecast to continue in the future at the same rate. Under the high impact scenario, development impacts are also forecast to occur in the Laurel Road (subunits IV6A-B), Illinois River Forks State Park (IV7), Woodcock Mountain (IV8), Riverwash (IV9), and French Flat North (IV10) units. Development activity has not occurred in any of these units in the past. The high impact scenario, however, assumes full build-out of developable areas within these units plus the White City and Whetstone Creek units. Impacts associated with a development project planned for the Medford Airport unit in 2015 are quantified under both impact scenarios. In general, baseline and incremental impacts are greatest in subunits where development is forecast to occur.
15. As highlighted in Exhibits ES-4 and ES-5, the relative rank of the subunits in terms of baseline economic impact is not sensitive to the discount rate assumption. This is because the majority of the impacts are associated with mitigating development activity and this cost is evenly distributed throughout the timeframe. The relative rank of subunits in terms of the incremental economic impacts, however, is slightly sensitive to discount rate assumption. This is because these costs comprise administrative costs of consultation and the analysis forecasts some specific consultations occurring in specific years in the future. Incremental impacts are therefore less uniformly distributed across the timeframe of the analysis making them more sensitive to the discount rate assumption.

EXHIBIT ES-4 PROPOSED CRITICAL HABITAT SUBUNITS RANKED ACCORDING TO FORECAST  
BASELINE IMPACTS UNDER THE HIGH IMPACT SCENARIO (2010-2029, 2009  
DOLLARS)

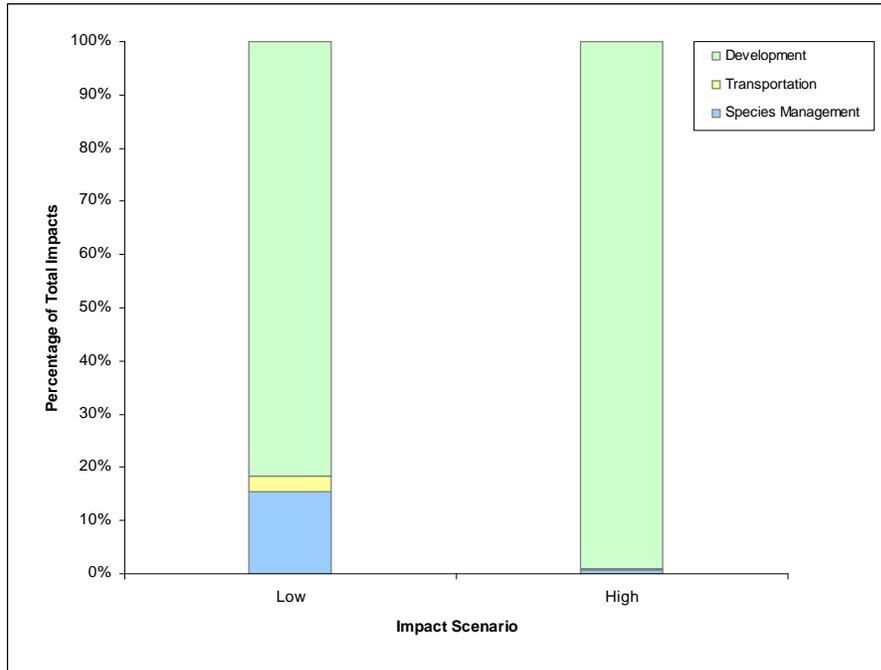
RANK	SUBUNIT	BASELINE IMPACTS (3% DISCOUNT RATE)	SUBUNIT	BASELINE IMPACTS (7% DISCOUNT RATE)
1	RV6A	\$44,300,000	RV6A	\$32,800,000
2	IV6B	\$30,700,000	IV6B	\$22,700,000
3	RV8	\$29,100,000	RV8	\$21,500,000
4	RV6F	\$27,200,000	RV6F	\$20,100,000
5	IV8	\$20,800,000	IV8	\$15,400,000
6	RV6E	\$17,700,000	RV6E	\$13,100,000
7	RV6H	\$16,700,000	RV6H	\$12,400,000
8	IV6A	\$6,170,000	IV6A	\$4,560,000
9	RV6G	\$4,260,000	RV6G	\$3,150,000
10	RV6D	\$3,780,000	RV6D	\$2,800,000
11	RV6B	\$3,250,000	RV6B	\$2,410,000
12	RV9B	\$2,660,000	RV9B	\$2,200,000
13	IV7	\$2,260,000	IV7	\$1,670,000
14	IV9	\$1,680,000	IV9	\$1,250,000
15	RV9A	\$758,000	RV9A	\$626,000
16	RV7	\$288,000	RV7	\$213,000
17	IV10	\$109,000	IV10	\$80,400
18	IV12	\$39,900	IV12	\$28,400
19	RV6C	\$28,700	RV6C	\$23,400
20	IV5	\$14,700	IV5	\$10,500
21	IV3	\$9,000	IV3	\$6,400
22	IV4	\$5,170	IV4	\$3,680
23	IV11	\$4,660	IV11	\$3,320
24	IV14	\$3,420	IV14	\$2,430
25	IV13	\$2,160	IV13	\$1,540
26	IV1	\$9	IV1	\$6

EXHIBIT ES-5 PROPOSED CRITICAL HABITAT SUBUNITS RANKED ACCORDING TO FORECAST  
INCREMENTAL IMPACTS UNDER THE HIGH IMPACT SCENARIO (2010-2029, 2009  
DOLLARS)

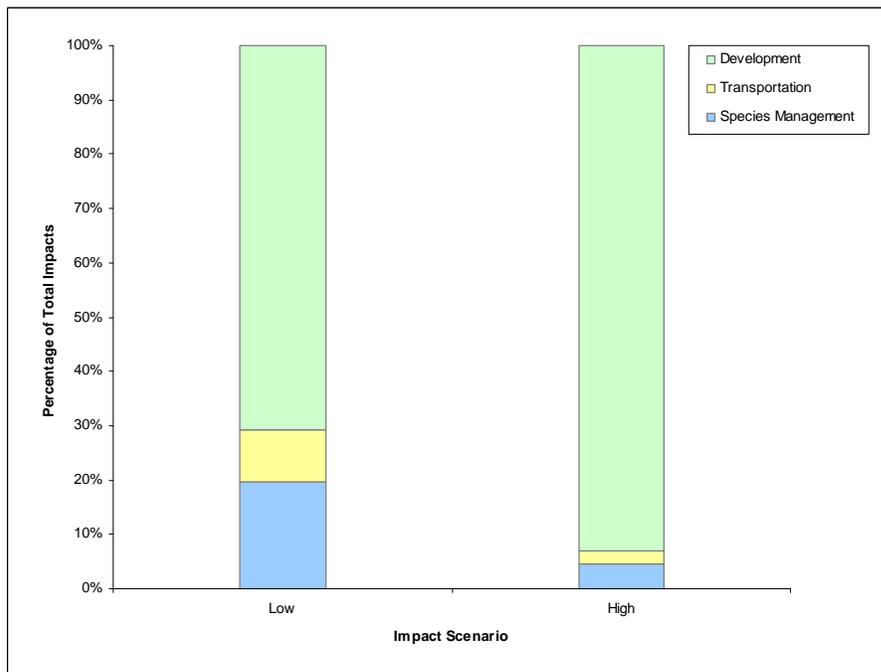
RANK	SUBUNIT	BASELINE IMPACTS (3% DISCOUNT RATE)	SUBUNIT	BASELINE IMPACTS (7% DISCOUNT RATE)
1	RV6A	\$109,000	RV6A	\$80,800
2	IV6B	\$74,700	RV8	\$56,500
3	RV8	\$74,700	IV6B	\$55,200
4	RV6F	\$66,000	RV6F	\$48,800
5	IV8	\$51,200	IV8	\$37,800
6	RV6E	\$43,600	RV6E	\$32,300
7	RV6H	\$40,700	RV6H	\$30,100
8	IV6A	\$15,500	IV6A	\$11,500
9	IV12	\$12,500	IV12	\$8,890
10	RV6G	\$10,400	RV6G	\$7,670
11	RV6D	\$9,190	RV6D	\$6,800
12	RV6B	\$7,990	RV6B	\$6,020
13	IV7	\$5,490	IV7	\$4,060
14	IV5	\$4,620	IV5	\$3,280
15	IV9	\$4,260	IV9	\$3,150
16	RV9B	\$3,360	RV9B	\$2,780
17	IV3	\$2,830	IV3	\$2,010
18	IV4	\$1,630	IV4	\$1,150
19	IV11	\$1,470	IV11	\$1,040
20	IV14	\$1,070	RV9A	\$789
21	RV9A	\$955	IV14	\$763
22	IV10	\$703	IV10	\$507
23	IV13	\$679	IV13	\$482
24	RV6C	\$360	RV6C	\$316
25	IV1	\$3	IV1	\$2

16. Exhibits ES-6 and ES-7 present the relative impacts by affected activity under the baseline and incremental scenarios, respectively. As noted previously, baseline and incremental impacts to transportation and species conservation and management are the same under both the low and high cost assumptions. Under the low impact scenario, impacts to development represent 82 percent (\$6.4 million) of the overall present value baseline impacts (applying a seven percent discount rate). Under the high impact scenario, this share increases to 99 percent (\$156 million).
17. Impacts to development activities represent 71 percent (\$67,300) of the overall present value incremental impacts under the low impact scenario and 93 percent (\$375,000) under the high impact scenario (applying a seven percent discount rate).

**EXHIBIT ES-6 RELATIVE CONTRIBUTION OF ECONOMIC ACTIVITIES TO FORECAST BASELINE IMPACTS (2010-2029, SEVEN PERCENT DISCOUNT RATE)**



**EXHIBIT ES-7 RELATIVE CONTRIBUTION OF ECONOMIC ACTIVITIES TO FORECAST INCREMENTAL IMPACTS (2010-2029, SEVEN PERCENT DISCOUNT RATE)**



**KEY SOURCES OF UNCERTAINTY**

- **Scope and Scale of Future Development:** The key sources of uncertainty in this analysis are related to the scope and scale of future development within the study area. Specific development forecasts were not available from Jackson or Josephine Counties or the State of Oregon. Although the consultation history for the Oregon plants provides some indication of the distribution and frequency of past development in the study area, the populations in Jackson and Josephine Counties are increasing, which may result in added development pressure in the future.<sup>10</sup> Given the uncertainties associated with the rate of future development within the study area, this analysis applies a range of forecast development activities.

The low forecast development scenario assumes that future development will occur with a similar scope and scale as indicated by past consultations. This assumes no increased development pressure in the future. The high forecast development scenario assumes full build-out over the next 20 years of developable areas within units where some indication of development pressure exists. To determine whether a unit may be subject to development in the future for the high forecast scenario, this analysis considers: 1) past development consultation activity in the unit; 2) whether the Service identified development as a potential threat to the Oregon plants within the unit; and 3) county zoning data. The actual rate of future development within the study area is expected to fall within the range presented in this analysis.

- **Modifications to Agricultural Activities:** The proposed rule identifies some agriculture practices as a threat to the Oregon plants and their habitat. No past consultations have occurred, however, for this activity. Further, State and county agencies have not required conservation for the Oregon plants with respect to agriculture. A reason for the lack of past consultations may be the lack of a Federal nexus. Part 232 of the CWA describes that normal farming, silviculture, and ranching activities, including plowing, seeding, cultivating, minor drainage, and harvesting for the production of food, fiber, and forest products are exempt from section 404 of the CWA.<sup>11</sup> While the NRCS indicates that a number of voluntary Federal programs are available to support agricultural activity in the region, farmers and ranchers in Josephine and Jackson Counties have not, thus far, participated in these programs. In the case that landowners choose not to enroll in a voluntary program because of the presence of the Oregon plants or their critical habitat, the foregone financial benefits of enrolling in a voluntary agricultural program may be considered an impact of the presence of the listed Oregon plants or their critical habitat. In such cases, this analysis may underestimate impacts.

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<sup>10</sup> Analysis assumes that future development will be unaffected by the economic downturn in the housing market. That is, the analysis assumes that a surplus of vacant housing units will not develop due to the poor housing market. If such a surplus were to develop, the rate of future development might be less than the rate of past development in the study area. To the extent that future development in the study area is reduced to levels below past levels due to poor housing markets, this analysis overestimates impacts to future development under the low scenario.

<sup>11</sup> 40 CFR Part 232

- Costs of Establishing Timber Harvest Buffers:** Timber harvest is described as a threat to the Oregon plants in the proposed rule. While timber harvest generally occurs outside of the proposed critical habitat area, some harvests occur on the edge of meadows containing Cook's lomatium proposed critical habitat in Josephine County. In these cases, project design criteria developed by the BLM and USFS to limit impacts to listed species during planned projects are implemented. Criteria include establishing buffer areas around Cook's lomatium habitat.<sup>12</sup> Because buffer areas for Cook's lomatium are relatively small (several hundred square feet) compared with the overall size of a timber harvest (several acres), reductions in the size or volume of timber harvests due to buffer areas for Cook's lomatium are expected to be small relative to the overall timber harvest. According to the BLM, reduced harvest sizes and volumes can typically be made up by increasing the harvest size or volume in areas where the plants are not present at no additional cost. To the extent that the establishment of harvest buffer areas reduces total timber production, this analysis underestimates baseline impacts. Because the BLM implements these project design criteria wherever Cook's lomatium or suitable seasonal wetland habitat for Cook's lomatium is found, this analysis does not expect a critical habitat designation to change how the project design criteria are implemented.<sup>13</sup> It is unlikely, therefore, that this analysis has missed incremental impacts related to this activity.
- Extent of Future Mining Activities:** For any mining project within the study area, the BLM would require surveys for the Oregon plants.<sup>14</sup> If the plants were found within the project area, mining activities would have to be altered to protect existing plant populations. In many cases, this might mean precluding mining activities from specific areas within the proposed project area.<sup>15</sup> Whether and where mining may occur within the proposed critical habitat in the future is uncertain. To date, conventional mining activity levels have been low. One miner did contact the BLM in the last year about expanding an existing mining operation into one of his mining claims within the study area. However, no plan of operation has been submitted to the Service to date. In general, conventional mining activity levels are determined by a number of factors including, gold prices, environmental regulations, and existing technology.<sup>16</sup> One reason for the lack of regional mining may be that the existing

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<sup>12</sup> U.S. Bureau of Land Management to U.S. Fish and Wildlife Service, "Rogue River/South Coast Biological Assessment FY 04-08 for Activities that may affect listed species in the Rogue River/South Coast Province for Medford District, Bureau of Land Management, Rogue River and Siskiyou National Forests," July 11, 2003.

<sup>13</sup> Personal communication with Mark Mousseaux, Botanist, Medford District of the U.S. Bureau of Land Management on October 16, 2009.

<sup>14</sup> Medford District of the Bureau of Land Management to the U.S. Fish and Wildlife Service. 2008. FY 2009-2013 Programmatic Assessment For Activities that May Affect the listed endangered plant species Gentner's Fritillary, Cook's Lomatium, McDonald's rockcress, and large-flowered woolly meadowfoam (Biological Assessment). Submitted to the Service on August 28, 2008.

<sup>15</sup> Personal communication with Kirby Bean, Mining Specialist, U.S. Bureau of Land Management on October 19, 2009.

<sup>16</sup> Personal communication with Kirby Bean, Mining Specialist, U.S. Bureau of Land Management on October 19, 2009.

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claims in the study area were heavily mined at the turn of the century, so limited remaining gold may be present. In the case that miners are avoiding existing claims within the region due to the presence of the Oregon plants, the impacts resulting from foregone profits should be considered baseline impacts. In such cases, this analysis may underestimate baseline impacts to conventional mining activities.

Experimental phytomining activities have occurred in the past in the vicinity of proposed critical habitat. Such experimental operations have focused on the extraction of nickel in serpentine soils through the use of two species of yellowtuft (*Alyssum murale* and *Alyssum corsicum*) that naturally accumulate nickel. Both yellowtuft species were placed on the Oregon Department of Agriculture quarantined noxious weed list in the fall of 2009.<sup>17</sup> As quarantined noxious weeds, the import, transport, sale, and propagation of the yellowtuft species is prohibited in Oregon.<sup>18</sup> The designation of critical habitat, therefore, will not result in additional economic impacts to phytomining activities, given that the planting of the two species used in phytomining operations is prohibited under current State regulations. Prohibiting the planting of the two yellowtuft species does provide a conservation benefit to the Oregon plants. The economic impacts of precluding phytomining within the proposed critical habitat area, however, are considered baseline impacts and, as such, not related to the outcome of the critical habitat rulemaking.

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<sup>17</sup> Personal communication with Tim Butler, Noxious Weed Control Program Supervisor, Oregon Department of Agriculture on March 8, 2010.

<sup>18</sup> Oregon Administrative Rules. Oregon Department of Agriculture 603-052-1200. Quarantine; Noxious Weeds.

## CHAPTER 1 | INTRODUCTION AND BACKGROUND

### 1.1 INTRODUCTION

1. Under the Endangered Species Act (the Act), the U.S. Fish and Wildlife Service (Service) proposes to designate critical habitat for *Limnanthes floccosa ssp. grandiflora* (large-flowered woolly meadowfoam) and *Lomatium cookii* (Cook's lomatium) (collectively, "the Oregon Plants"). The plants are endemic to seasonal wetland habitat in southwestern Oregon and were listed as endangered species on November 7, 2002.<sup>1</sup>
2. This final economic analysis analyzes the proposed designation as described in the proposed rule. This analysis does not reflect changes to the proposed critical habitat designation made in the final rule. Consequently, description of the habitat designation in the final rule may differ from maps and figures presented in this analysis.<sup>2</sup>
3. On July 28, 2009, the Service proposed the designation of approximately 11,038 acres as critical habitat, organized in 23 units in Jackson and Josephine Counties, Oregon.<sup>3</sup> These units are further divided into 35 subunits.<sup>4</sup> Of these acres, the Service proposes to designate 6,327 acres across eight units for the woolly meadowfoam in Jackson County and 7,109 acres across 17 units for Cook's lomatium in Jackson and Josephine Counties.<sup>5</sup> Exhibit 1-1 highlights the areas proposed as critical habitat for the Oregon plants.
4. Section 4(b)(2) of the Act requires the Service to consider the economic, national security, and other impacts of designating a particular area as critical habitat. The Service may exclude an area from critical habitat if it determines that the benefits of exclusion outweigh the benefits of specifying the area as part of the critical habitat, unless it also determines that the failure to designate the area as critical habitat will result in the extinction of the species concerned.
5. As described more fully in Chapter 2, this analysis relies on the best available data to estimate the baseline (without critical habitat) and incremental (engendered by critical habitat) economic impacts of designating particular areas as critical habitat for the

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<sup>1</sup> 67 FR 68004.

<sup>2</sup> For a detailed discussion of public comments on the draft economic analysis and associated responses, refer to the responses to public comment section of the final rule.

<sup>3</sup> Seventeen units are proposed as critical habitat for the Cook's lomatium while eight units are proposed for the woolly meadowfoam. While this sums to 25 units, two units (White City (RV6) and Whetstone Creek (RV8)) are proposed for both species; therefore, there are 23 unique units proposed.

<sup>4</sup> 74 FR 37314.

<sup>5</sup> Approximately 43 percent (4,711 acres across 15 units) is proposed critical habitat for Cook's lomatium; 36 percent (3,929 acres across six units) is proposed critical habitat for the woolly meadowfoam; 22 percent (2,398 acres across two units) is proposed as critical habitat for both species.

Oregon plants. The purpose of this report is to provide information to the Service and the Secretary of the U.S. Department of the Interior (DOI) to assist in the determination regarding whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation. This chapter begins with an overview of the proposed acres. It then describes the economic activities that may threaten the Oregon plants and their habitat and describes the regulatory effect of critical habitat on these activities. The chapter concludes with an overview of the remainder of this report.

## 1.2 OVERVIEW OF PROPOSED CRITICAL HABITAT AREA

6. Cook's lomatium is a perennial forb that grows to a height of six to 20 inches. The woolly meadowfoam is an annual plant that grows to a height of two to six inches and is marked by woolly hairs that cover the plant's flowers. Both species occur in vernal pool-mounded prairie habitat in the Middle Rogue River Basin's Agate Desert in Jackson County, Oregon. The proposed rule describes these pools as "rain-fed seasonal wetlands in prairie characterized by gentle mound-swale topography." The plants most frequently occur on alluvial soils in the pools' margins, although they may also be found on the mound tops and depression bottoms. In addition to the vernal pool habitat in Jackson County, Cook's lomatium is also found in seasonally wet meadow habitat in forest openings in the Illinois River Valley in Josephine County, Oregon. In the late spring and summer, water in the vernal pool and wet meadow habitat evaporates, leaving dry depressions that remain until the late fall.<sup>6</sup>
7. The majority (72 percent) of proposed critical habitat for the Oregon plants is privately owned. Secondly, Federal lands represent a significant portion of the areas proposed for critical habitat (14 percent). State (six percent), local (six percent), and conservation/NGO (two percent) lands represent the remaining areas (Exhibit 1-2).<sup>7</sup> The "study area" for the economic analysis is defined as the 11,038 acres proposed for critical habitat designation (Exhibit 1-1).
8. Habitat fragmentation associated with development and transportation infrastructure projects is the most prevalent threat to the Oregon plants. As illustrated in Exhibit 1-1, Josephine County habitat is more rural and subject to less economic activity, and therefore habitat fragmentation, than the Jackson County habitat. The proposed critical habitat in Jackson County is adjacent to existing development, particularly that of White City and the City of Medford. As detailed in Chapters 3 and 4, the proximity of the Jackson County units to urban growth areas result in greater threats to the Oregon plants from development and transportation projects. These economic activities are forecast to occur at relatively low levels in the Josephine County units.

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<sup>6</sup> 74 FR 37315.

<sup>7</sup> Ownership within proposed critical habitat is estimated using: 1.) Jackson County Assessor. 2009. Taxlots for Jackson County Oregon (polygon). Last updated on September 15, 2009; 2.) Josephine County. 2009. Taxcodes (polygon). Last updated on April 22, 2009; and, 3.) State of Oregon. 1999. Oregon Land Ownership and Land Stewardship. Oregon Geospatial Enterprise Office.

### 1.3 ECONOMIC ACTIVITIES CONSIDERED IN THIS ANALYSIS

9. Review of the proposed rule, the rule listing the species as threatened, existing management documents, and the consultation history identified the following economic activities as being potentially affected by conservation efforts for the Oregon plants. The predominant risk factor associated with these activities is habitat fragmentation. The following economic activities are addressed in Chapters 3 through 5 of the economic analysis.
- **Development Activities.** The major threat to the plants associated with development projects is the destruction or fragmentation of vernal pool habitats. Specifically, leveling, ditching, tilling, or impounding water may fill vernal pools and/or alter the surrounding topography, affecting the local hydrology. Chapter 3 contemplates the potential impacts of Oregon plants conservation on development activities.
  - **Transportation Projects.** Road construction (i.e., building or expansion) and maintenance (i.e., painting lines, replacing road signs, mowing grass along roadside) can affect the hydrology of vernal pools and other seasonal wetland habitats. Additionally, plant populations may be destroyed or fragmented during road construction and maintenance projects. Chapter 4 addresses impacts to transportation projects.
  - **Species and Habitat Conservation and Management.** Multiple Federal and State agencies, including the U.S. Bureau of Land Management (BLM), U.S. Forest Service (USFS), U.S. Bureau of Reclamation (BOR), and Oregon Department of Fish and Game, and conservation groups, such as The Nature Conservancy, engage in active species management for the Oregon plants and their habitat. These efforts, such as prescribed burns, vernal pool restoration, and surveying and seeding programs afford baseline protection to the plants. Chapter 5 quantifies the costs of these conservation and management activities.
10. Several activities identified as threats to the Oregon plants in the proposed rule are not expected to incur economic impacts (either in the baseline or incremental scenarios) following the designation of critical habitat for the Oregon plants. Specifically, agricultural, grazing, recreational, timber harvest, fire management, and mining activities are all activities that were identified as threats but are either not forecast to occur within the proposed critical habitat or not expected to implement conservation for the Oregon plants. Chapter 6 describes the extent of each of these activities within the study area, the threats to the Oregon plants associated with these activities, and the reasons that impacts to these activities are not forecast.

### 1.4 REGULATORY CHANGES EXPECTED TO RESULT FROM CRITICAL HABITAT

11. Conservation efforts related to the identified land use activity threats are expected to be undertaken regardless of the critical habitat designation. That is, the Service does not expect critical habitat designation for the Oregon plants to change current conservation activities. Specifically:

1. The proposed critical habitat area in Jackson County is subject to significant baseline protection due to existing regulations protecting vernal pools. This situation characterizes the proposed critical habitat across Jackson County where the U.S. Army Corps of Engineers (USACE) consistently assumes jurisdiction over the wetlands (a Federal nexus for section 7 consultation). Both the vernal pools and the upland areas that constitute proposed critical habitat for the plants are subject to consultation regardless of the critical habitat designation. The upland areas surrounding the plant populations must be protected to ensure continuity of flow within the vernal pool complex and avoid jeopardy to the plants. Project modifications associated with these consultations would be the same regardless of the presence of the plants (i.e., the Service will recommend the same project modifications to avoid or minimize adverse modification of critical habitat as they would to avoid jeopardizing the continued existence of the species).
  2. In Josephine County it is more likely that cases exist where USACE would not take jurisdiction over a proposed critical habitat area as the location and status of wetlands is uncertain. If the Corps does take jurisdiction over an area, the situation is as above in Jackson County. In the case that the Corps does not take jurisdiction over an area, no Federal nexus is present and consultation will not occur on the project regardless of the critical habitat designation.<sup>8</sup>
  3. Finally, research undertaken thus far has not indicated that State or local regulations would change management of these land use activities on State or private land following a designation of critical habitat for the Oregon plants.<sup>9</sup>
12. As a result of these factors, this analysis does not forecast any additional conservation for the Oregon plants due to the designation of critical habitat. The activity-specific chapters of this report describe the existing baseline protections and the reasons that incremental impacts are likely to be only administrative in nature.

#### 1.5 ORGANIZATION OF THE REPORT

13. The remainder of this report proceeds through six additional chapters. Chapter 2 discusses the framework employed in the analysis. Chapters 3 through 6 then cover the assessment of potential economic impacts, organized by economic activity. Finally, Chapter 7 provides a discussion of potential economic benefits.
  - Chapter 3 – Development Activities;
  - Chapter 4 – Transportation Projects;

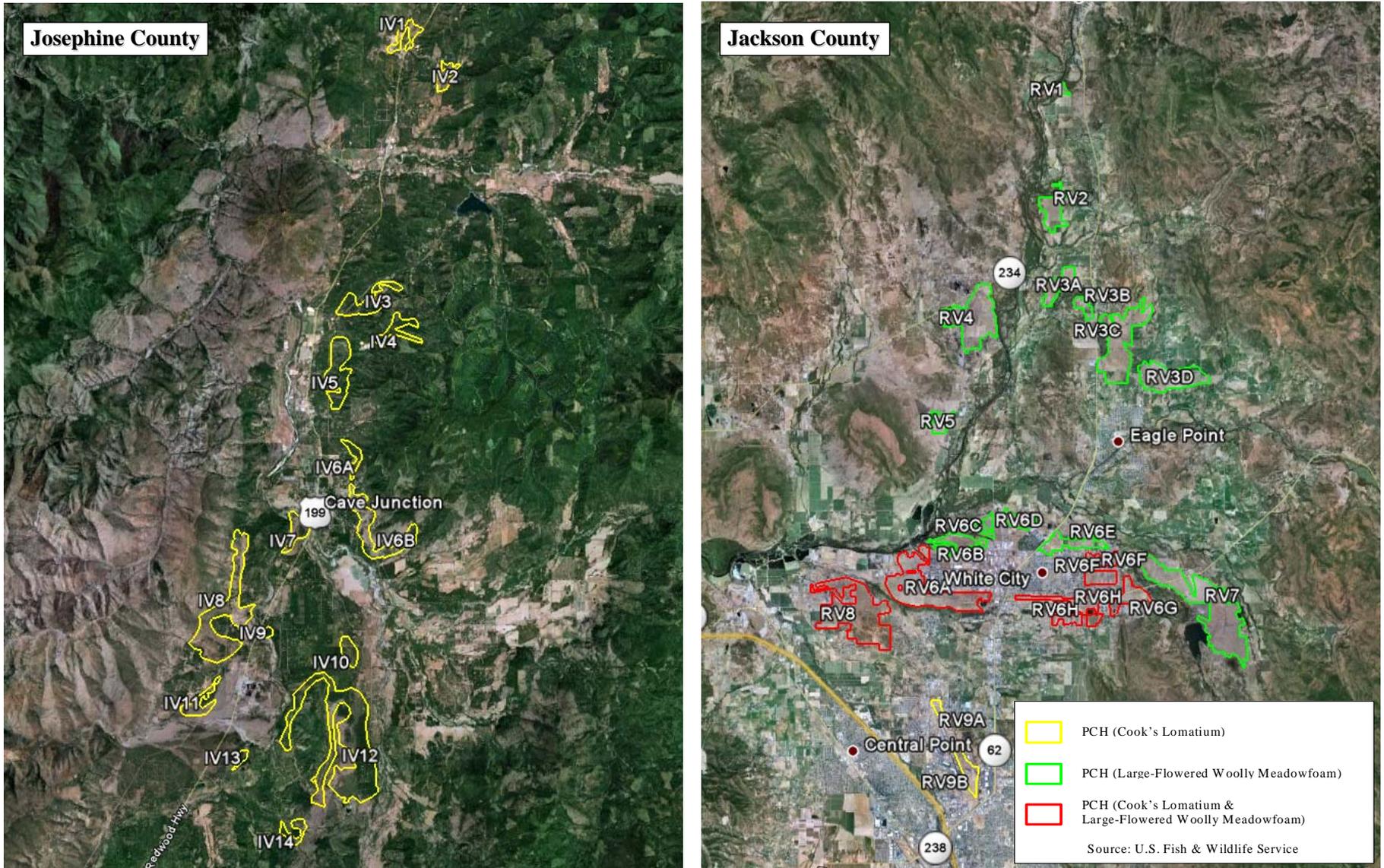
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<sup>8</sup> Personal communication with U.S. Fish and Wildlife Service, Roseburg, OR Field Office; Portland, OR Regional Office; and Endangered Species Branch of Listing on October 13, 2009; U.S. Fish and Wildlife Service Memorandum to Industrial Economics, Inc. September 14, 2009. *Economic Analysis Memorandum Regarding Proposed Critical Habitat Designation for *Limnanthes floccosa* ssp. *grandiflora* and *Lomatium cookii**; and, personal communication with U.S. Fish and Wildlife Service, Roseburg, OR Field Office on October 7, 2009.

<sup>9</sup> Personal communication with Rebecca Currin, Oregon Department of Agriculture, December 6, 2009.

- Chapter 5 – Species Conservation and Management;
  - Chapter 6 – Activities Not Likely to be Affected by Conservation for the Oregon Plants;
  - Chapter 7 - Economic benefits.
14. In addition, the report includes three appendices: Appendix A, which considers potential impacts on small entities and the energy industry; Appendix B, which provides information on the sensitivity of the economic impact estimates to alternative discount rate assumptions; and Appendix C, which provides information on the undiscounted economic impacts.

EXHIBIT 1-1. MAP OF PROPOSED CRITICAL HABITAT FOR THE OREGON PLANTS



## EXHIBIT 1-2. OVERVIEW OF LAND OWNERSHIP IN PROPOSED CRITICAL HABITAT UNITS

SUBUNIT	UNIT NAME	SPECIES	ACREAGE BY OWNER TYPE (PERCENT OF SUBUNIT)					TOTAL ACREAGE (PERCENT OF TOTAL ACRES)
			FEDERAL	STATE	LOCAL	PRIVATE	CONSERVATION / NGO	
IV1	Anderson Creek	Cook's Lomatium	0 (0%)	0 (0%)	0 (0%)	132 (100%)	0 (0%)	132 (1%)
IV10	French Flat North		24 (22%)	0 (0%)	0 (0%)	86 (78%)	0 (0%)	110 (1%)
IV11	Rough and Ready Creek		81 (53%)	0 (0%)	0 (0%)	71 (47%)	0 (0%)	152 (1%)
IV12	French Flat Middle		688 (45%)	0 (0%)	0 (0%)	836 (55%)	0 (0%)	1,524 (14%)
IV13	Indian Hill		37 (82%)	0 (0%)	0 (0%)	8 (18%)	0 (0%)	45 (0%)
IV14	Waldo		59 (59%)	0 (0%)	0 (0%)	41 (41%)	0 (0%)	100 (1%)
IV2	Draper Creek		0 (0%)	0 (0%)	0 (0%)	97 (100%)	0 (0%)	97 (1%)
IV3	Reeves Creek North		155 (60%)	0 (0%)	0 (0%)	105 (40%)	0 (0%)	260 (2%)
IV4	Reeves Creek East		89 (52%)	0 (0%)	5 (3%)	75 (44%)	0 (0%)	170 (2%)
IV5	Reeves Creek South		254 (65%)	0 (0%)	0 (0%)	138 (35%)	0 (0%)	391 (4%)
IV6A	Laurel Road		30 (35%)	0 (0%)	0 (0%)	55 (65%)	0 (0%)	85 (1%)
IV6B			1 (0%)	0 (0%)	1 (0%)	430 (100%)	0 (0%)	431 (4%)
IV7	Illinois River Forks State Park		34 (25%)	60 (44%)	0 (0%)	42 (31%)	0 (0%)	136 (1%)
IV8	Woodcock Mountain		26 (3%)	1 (0%)	0 (0%)	831 (97%)	0 (0%)	859 (8%)
IV9	Riverwash		10 (33%)	0 (0%)	0 (0%)	20 (67%)	0 (0%)	30 (0%)
RV1	Shady Cove	Woolly Meadowfoam	0 (0%)	0 (0%)	0 (0%)	20 (100%)	0 (0%)	20 (0%)
RV2	Hammel Road		0 (0%)	0 (0%)	0 (0%)	207 (100%)	0 (0%)	207 (2%)
RV3A	North Eagle Point		0 (0%)	0 (0%)	0 (0%)	192 (100%)	0 (0%)	192 (2%)
RV3B			0 (0%)	0 (0%)	0 (0%)	71 (100%)	0 (0%)	71 (1%)
RV3C			0 (0%)	0 (0%)	0 (0%)	651 (100%)	0 (0%)	651 (6%)
RV3D			0 (0%)	0 (0%)	0 (0%)	417 (100%)	0 (0%)	417 (4%)
RV4	Rogue Plains		0 (0%)	3 (0%)	1 (0%)	601 (99%)	0 (0%)	605 (5%)
RV5	Table Rock Terrace		0 (0%)	0 (0%)	0 (0%)	122 (100%)	0 (0%)	122 (1%)

SUBUNIT	UNIT NAME	SPECIES	ACREAGE BY OWNER TYPE (PERCENT OF SUBUNIT)					TOTAL ACREAGE (PERCENT OF TOTAL ACRES)
			FEDERAL	STATE	LOCAL	PRIVATE	CONSERVATION / NGO	
RV6A	White City	Woolly Meadowfoam/ Cook's Lomatium	0 (0%)	367 (48%)	229 (30%)	114 (15%)	49 (6%)	759 (7%)
RV6B		Woolly Meadowfoam	0 (0%)	168 (87%)	0 (0%)	26 (13%)	0 (0%)	194 (2%)
RV6C			0 (0%)	89 (100%)	0 (0%)	0 (0%)	0 (0%)	89 (1%)
RV6D			0 (0%)	0 (0%)	0 (0%)	106 (100%)	0 (0%)	106 (1%)
RV6E			0 (0%)	2 (1%)	29 (14%)	171 (84%)	0 (0%)	203 (2%)
RV6F			0 (0%)	0 (0%)	0 (0%)	242 (100%)	0 (0%)	242 (2%)
RV6G		Woolly Meadowfoam/Cook's Lomatium	0 (0%)	0 (0%)	28 (15%)	165 (85%)	0 (0%)	193 (2%)
RV6H			0 (0%)	0 (0%)	93 (30%)	216 (70%)	0 (0%)	308 (3%)
RV7	Agate Lake	Woolly Meadowfoam	95 (9%)	10 (1%)	0 (0%)	948 (90%)	0 (0%)	1,053 (10%)
RV8	Whetstone Creek	Woolly Meadowfoam/Cook's Lomatium	0 (0%)	0 (0%)	92 (10%)	663 (74%)	140 (16%)	896 (8%)
RV9A	Medford Airport	Cook's Lomatium	0 (0%)	0 (0%)	40 (98%)	1 (2%)	0 (0%)	41 (0%)
RV9B			0 (0%)	1 (1%)	139 (93%)	9 (6%)	0 (0%)	149 (1%)
<b>Grand Total</b>			<b>1,583 (14%)</b>	<b>701 (6%)</b>	<b>657 (6%)</b>	<b>7,909 (72%)</b>	<b>189 (2%)</b>	<b>11,039</b>

Notes:

Acreege values may not sum to individual unit totals and grand totals due to rounding.

Sources:

1. U.S. Fish and Wildlife. 2009. Proposed Critical Habitat for Cook's Lomatium and Large-Flowered Woolly Meadowfoam. Received from the Service on August 13, 2009.
2. Jackson County Assessor. 2009. Taxlots for Jackson County Oregon (polygon). Last updated on September 15, 2009.
3. Josephine County. 2009. Taxcodes (polygon). Last updated on April 22, 2009.
4. State of Oregon. 1999. Oregon Land Ownership and Land Stewardship. Oregon Geospatial Enterprise Office.

## CHAPTER 2 | FRAMEWORK FOR THE ANALYSIS

15. The purpose of this report is to estimate the economic impact of actions taken to protect the Oregon plants and their habitats. This analysis examines the impacts of restricting or modifying specific land uses or activities for the benefit of the species and habitat within the proposed critical habitat area. This analysis employs "without critical habitat" and "with critical habitat" scenarios. The "without critical habitat" scenario represents the baseline for the analysis, considering protections already accorded the Oregon plants, for example, under the Federal listing and other Federal, State, and local regulations. The "with critical habitat" scenario describes the incremental impacts associated specifically with the designation of critical habitat for the species. The incremental conservation efforts and associated impacts are those not expected to occur absent the designation of critical habitat for the Oregon plants.
16. This information is intended to assist the Secretary of the U.S. Department of the Interior (DOI) in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.<sup>10</sup> In addition, this information allows the Service to address the requirements of Executive Orders 12866 and 13211, and the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA).<sup>11</sup>
17. This chapter describes the framework for this analysis. First, it describes the case law that led to the selection of the framework applied in this report. It then describes in economic terms the general categories of economic effects that are the focus of regulatory impact analysis, including a discussion of both efficiency and distributional effects. Next, this chapter defines the analytic framework used to measure these impacts in the context of critical habitat regulation and the consideration of benefits. It concludes with a presentation of the information sources relied upon in the analysis.

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<sup>10</sup> 16 U.S.C. §1533(b)(2).

<sup>11</sup> Executive Order 12866, Regulatory Planning and Review, September 30, 1993 (as amended by Executive Order 13258 (2002) and Executive Order 13422 (2007)); Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001; 5. U.S.C. §§601 *et seq*; and Pub Law No. 104-121.

## 2.1 BACKGROUND

18. The U.S. Office of Management and Budget's (OMB) guidelines for conducting economic analysis of regulations direct Federal agencies to measure the costs of a regulatory action against a baseline, which it defines as the "best assessment of the way the world would look absent the proposed action."<sup>12</sup> In other words, the baseline includes the existing regulatory and socio-economic burden imposed on landowners, managers, or other resource users potentially affected by the designation of critical habitat. Impacts that are incremental to that baseline (i.e., occurring over and above existing constraints) are attributable to the proposed regulation. Significant debate has occurred regarding whether assessing the impacts of the Service's proposed regulations using this baseline approach is appropriate in the context of critical habitat designations.
19. In 2001, the U.S. Tenth Circuit Court of Appeals instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat, regardless of whether those impacts are attributable co-extensively to other causes.<sup>13</sup> Specifically, the court stated,
- “The statutory language is plain in requiring some kind of consideration of economic impact in the CHD [critical habitat designation] phase. Although 50 C.F.R. 402.02 is not at issue here, the regulation's definition of the jeopardy standard as fully encompassing the adverse modification standard renders any purported economic analysis done utilizing the baseline approach virtually meaningless. We are compelled by the canons of statutory interpretation to give some effect to the congressional directive that economic impacts be considered at the time of critical habitat designation.... Because economic analysis done using the FWS's [Fish and Wildlife Service's] baseline model is rendered essentially without meaning by 50 C.F.R. § 402.02, we conclude Congress intended that the FWS conduct a full analysis of all of the economic impacts of a critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes. Thus, we hold the baseline approach to economic analysis is not in accord with the language or intent of the ESA [Endangered Species Act].”<sup>14</sup>
20. Since that decision, however, courts in other cases have held that an incremental analysis of impacts stemming solely from the critical habitat rulemaking is proper.<sup>15</sup> For example, in the March 2006 ruling that the August 2004 critical habitat rule for the Peirson's milk-vetch was arbitrary and capricious, the United States District Court for the Northern District of California stated,

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<sup>12</sup> OMB, "Circular A-4," September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

<sup>13</sup> *New Mexico Cattle Growers Assn v. United States Fish and Wildlife Service*, 248 F.3d 1277 (10th Cir. 2001).

<sup>14</sup> *Ibid.*

<sup>15</sup> *Cape Hatteras Access Preservation Alliance v. Department of Interior*, 344 F. Supp. 2d 108 (D.D.C.); *Center for Biological Diversity v. United States Bureau of Land Management*, 422 F. Supp. 2d 1115 (N.D. Cal. 2006).

“The Court is not persuaded by the reasoning of *New Mexico Cattle Growers*, and instead agrees with the reasoning and holding of *Cape Hatteras Access Preservation Alliance v. U.S. Dep’t of the Interior*, 344 F. Supp 2d 108 (D.D.C. 2004). That case also involved a challenge to the Service’s baseline approach and the court held that the baseline approach was both consistent with the language and purpose of the ESA and that it was a reasonable method for assessing the actual costs of a particular critical habitat designation *Id* at 130. ‘To find the true cost of a designation, the world with the designation must be compared to the world without it.’”<sup>16</sup>

21. In order to address the divergent opinions of the courts and provide the most complete information to decision-makers, this economic analysis reports both:
  - a. The baseline impacts of Oregon plants conservation from protections afforded the species absent critical habitat designation; and
  - b. The estimated incremental impacts precipitated specifically by the designation of critical habitat for the species.
  
22. Incremental effects of critical habitat designation are determined using the Service's December 9, 2004 interim guidance on “Application of the ‘Destruction or Adverse Modification’ Standard Under Section 7(a)(2) of the Endangered Species Act” and information from the Service regarding what potential consultations and project modifications may be imposed as a result of critical habitat designation over and above those associated with the listing.<sup>17</sup> Specifically, in *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, the Ninth Circuit invalidated the Service’s regulation defining destruction or adverse modification of critical habitat, and the Service no longer relies on this regulatory definition when analyzing whether an action is likely to destroy or adversely modify critical habitat.<sup>18</sup> Under the statutory provisions of the Endangered Species Act (Act), the Service determines destruction or adverse modification on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would remain functional to serve its intended conservation role for the species. A detailed description of the methodology used to define baseline and incremental impacts is provided later in this Chapter.

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<sup>16</sup> *Center for Biological Diversity et al, Plaintiffs, v. United States Bureau of Land Management et. al, Defendants and American Sand Association, et al, Defendant Intervenors*. Order re: Cross Motions for Summary Judgment, Case 3:03-cv-02509 Document 174 Filed 03/14/2006, pages 44-45.

<sup>17</sup> Director, U.S. Fish and Wildlife Service, Memorandum to Regional Directors and Manager of the California-Nevada Operations Office, Subject: Application of the “Destruction or Adverse Modification” Standard under Section 7(a)(2) of the Endangered Species Act, dated December 9, 2004.

<sup>18</sup> *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, No. 03-35279 (9th Circuit 2004).

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## 2.2 CATEGORIES OF POTENTIAL ECONOMIC EFFECTS OF SPECIES CONSERVATION

23. This economic analysis considers both the economic efficiency and distributional effects that may result from efforts to protect the Oregon plants and their habitats. Economic efficiency effects generally reflect “opportunity costs” associated with the commitment of resources required to accomplish species and habitat conservation. For example, if the set of activities that may take place on a parcel of land is limited as a result of the designation or the presence of the species, and thus the market value of the land is reduced, this reduction in value represents one measure of opportunity cost or change in economic efficiency. Similarly, the costs incurred by a Federal action agency to consult with the Service under section 7 represent opportunity costs of Oregon plants conservation efforts.
24. This analysis also addresses the distribution of impacts associated with the designation, including an assessment of any local or regional impacts of habitat conservation and the potential effects of conservation efforts on small entities and the energy industry. This information may be used by decision-makers to assess whether the effects of species conservation efforts unduly burden a particular group or economic sector. For example, while conservation efforts may have a small impact relative to the national economy, individuals employed in a particular sector of the regional economy may experience relatively greater impacts. The differences between economic efficiency effects and distributional effects, as well as their application in this analysis, are discussed in greater detail below.

### 2.2.1 EFFICIENCY EFFECTS

25. At the guidance of OMB and in compliance with Executive Order 12866 "Regulatory Planning and Review," Federal agencies measure changes in economic efficiency in order to understand how society, as a whole, will be affected by a regulatory action. In the context of regulations that protect the Oregon plants' habitat, these efficiency effects represent the opportunity cost of resources used or benefits foregone by society as a result of the regulations. Economists generally characterize opportunity costs in terms of changes in producer and consumer surpluses in affected markets.<sup>19</sup>
26. In some instances, compliance costs may provide a reasonable approximation for the efficiency effects associated with a regulatory action. For example, a Federal land manager may enter into a consultation with the Service to ensure that a particular activity will not adversely modify critical habitat. The effort required for the consultation is an economic opportunity cost because the landowner or manager's time and effort would have been spent in an alternative activity had the parcel not been included in the designation. When compliance activity is not expected to significantly affect markets -- that is, not result in a shift in the quantity of a good or service provided at a given price, or in the quantity of a good or service demanded given a change in price -- the

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<sup>19</sup> For additional information on the definition of "surplus" and an explanation of consumer and producer surplus in the context of regulatory analysis, see: Gramlich, Edward M., A Guide to Benefit-Cost Analysis (2nd Ed.), Prospect Heights, Illinois: Waveland Press, Inc., 1990; and U.S. Environmental Protection Agency, Guidelines for Preparing Economic Analyses, EPA 240-R-00-003, September 2000, available at <http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Guidelines.html>.

measurement of compliance costs can provide a reasonable estimate of the change in economic efficiency.

27. Where habitat protection measures are expected to significantly impact a market, it may be necessary to estimate changes in producer and consumer surpluses. For example, protection measures that reduce or preclude the development of large areas of land may shift the price and quantity of housing supplied in a region. In this case, changes in economic efficiency (i.e., social welfare) can be measured by considering changes in producer and consumer surplus in the market.

#### 2.2.2 DISTRIBUTIONAL AND REGIONAL ECONOMIC EFFECTS

28. Measurements of changes in economic efficiency focus on the net impact of conservation efforts, without consideration of how certain economic sectors or groups of people are affected. Thus, a discussion of efficiency effects alone may miss important distributional considerations. OMB encourages Federal agencies to consider distributional effects separately from efficiency effects.<sup>20</sup> This analysis considers several types of distributional effects, including impacts on small entities; impacts on energy supply, distribution, and use; and regional economic impacts. It is important to note that these are fundamentally different measures of economic impact than efficiency effects, and thus cannot be added to or compared with estimates of changes in economic efficiency.

##### Impacts on Small Entities and Energy Supply, Distribution, and Use

29. This analysis considers how small entities, including small businesses, organizations, and governments, as defined by the Regulatory Flexibility Act, might be affected by future species conservation efforts.<sup>21</sup> In addition, in response to Executive Order 13211 "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," this analysis considers the future impacts of conservation efforts on the energy industry and its customers.<sup>22</sup>

##### Regional Economic Effects

30. Regional economic impact analysis can provide an assessment of the potential localized effects of conservation efforts. Specifically, regional economic impact analysis produces a quantitative estimate of the potential magnitude of the initial change in the regional economy resulting from a regulatory action. Regional economic impacts are commonly measured using regional input/output models. These models rely on multipliers that represent the relationship between a change in one sector of the economy (e.g., expenditures by recreators) and the effect of that change on economic output, income, or employment in other local industries (e.g., suppliers of goods and services to recreators).

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<sup>20</sup> U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

<sup>21</sup> 5 U.S.C. §§601 *et seq.*

<sup>22</sup> Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001.

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These economic data provide a quantitative estimate of the magnitude of shifts of jobs and revenues in the local economy.

31. The use of regional input/output models in an analysis of the impacts of species and habitat conservation efforts can overstate the long-term impacts of a regulatory change. Most importantly, these models provide a static view of the economy of a region. That is, they measure the initial impact of a regulatory change on an economy but do not consider long-term adjustments that the economy will make in response to this change. For example, these models provide estimates of the number of jobs lost as a result of a regulatory change, but do not consider re-employment of these individuals over time or other adaptive responses by impacted businesses. In addition, the flow of goods and services across the regional boundaries defined in the model may change as a result of the regulation, compensating for a potential decrease in economic activity within the region.
32. Despite these and other limitations, in certain circumstances regional economic impact analysis may provide useful information about the scale and scope of localized impacts. It is important to remember that measures of regional economic effects generally reflect shifts in resource use rather than efficiency losses. Thus, these types of distributional effects are reported separately from efficiency effects (i.e., not summed). In addition, measures of regional economic impact cannot be compared with estimates of efficiency effects, but should be considered as distinct measures of impact.
33. Impacts associated with Oregon plants conservation efforts are primarily administrative costs of section 7 consultation and costs of purchasing and maintaining mitigation areas to offset the impacts of development on the habitat. As conservation of the Oregon plants' habitat is not forecast to change the type or level of economic activity occurring, broader regional economic impacts are not anticipated.

### 2.3 ANALYTIC FRAMEWORK AND SCOPE OF THE ANALYSIS

34. This analysis identifies those economic activities most likely to threaten the listed species and their habitats and, where possible, quantifies the economic impact to avoid or minimize such threats within the boundaries of the proposed critical habitat area, as described in Chapter 1.
35. This section provides a description of the methodology used to separately identify baseline impacts and incremental impacts stemming from the proposed designation of critical habitat for the Oregon plants. This evaluation of impacts in a "with critical habitat designation" versus a "without critical habitat designation" framework effectively measures the net change in economic activity associated with the proposed rulemaking.

#### 2.3.1 IDENTIFYING BASELINE IMPACTS

36. The baseline for this analysis is the existing state of regulation, prior to the designation of critical habitat, which provides protection to the species under the Act, as well as under other Federal, State and local laws and guidelines. This "without critical habitat designation" scenario also considers a wide range of additional factors beyond the compliance costs of regulations that provide protection to the listed species. As

recommended by OMB, the baseline incorporates, as appropriate, trends in market conditions, implementation of other regulations and policies by the Service and other government entities, and trends in other factors that have the potential to affect economic costs and benefits, such as the rate of regional economic growth in potentially affected industries.

37. Baseline impacts include sections 7, 9, and 10 of the Act, and economic impacts resulting from these protections to the extent that they are expected to occur absent the designation of critical habitat for the species.
- Section 7 of the Act, absent critical habitat designation, requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species. The portion of the administrative costs of consultations under the jeopardy standard, along with the impacts of project modifications resulting from consideration of this standard, are considered baseline impacts.
  - Section 9 defines the actions that are prohibited by the Act. In particular, it prohibits the "take" of endangered wildlife, where "take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."<sup>23</sup> The economic impacts associated with this section manifest themselves in sections 7 and 10.
  - Under section 10(a)(1)(B) of the Act, an entity (e.g., a landowner or local government) may develop a Habitat Conservation Plan (HCP) for a listed animal species in order to meet the conditions for issuance of an incidental take permit in connection with a land or water use activity or project.<sup>24</sup> The requirements posed by the HCP may have economic impacts associated with the goal of ensuring that the effects of incidental take are adequately avoided or minimized. The development and implementation of HCPs is considered a baseline protection for the species and habitat unless the HCP is determined to be precipitated by the designation of critical habitat, or the designation influences stipulated conservation efforts under HCPs.

Enforcement actions taken in response to violations of the Act are not included in this analysis.

38. The protection of listed species and habitat is not limited to the Act. Other Federal agencies, as well as State and local governments, may also seek to protect the natural resources under their jurisdiction. If compliance with the Clean Water Act or State environmental quality laws, for example, protects habitat for the species, such protective efforts are considered to be baseline protections and costs associated with these efforts are categorized accordingly. Of note, however, is that such efforts may not be considered

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<sup>23</sup> 16 U.S.C. 1532.

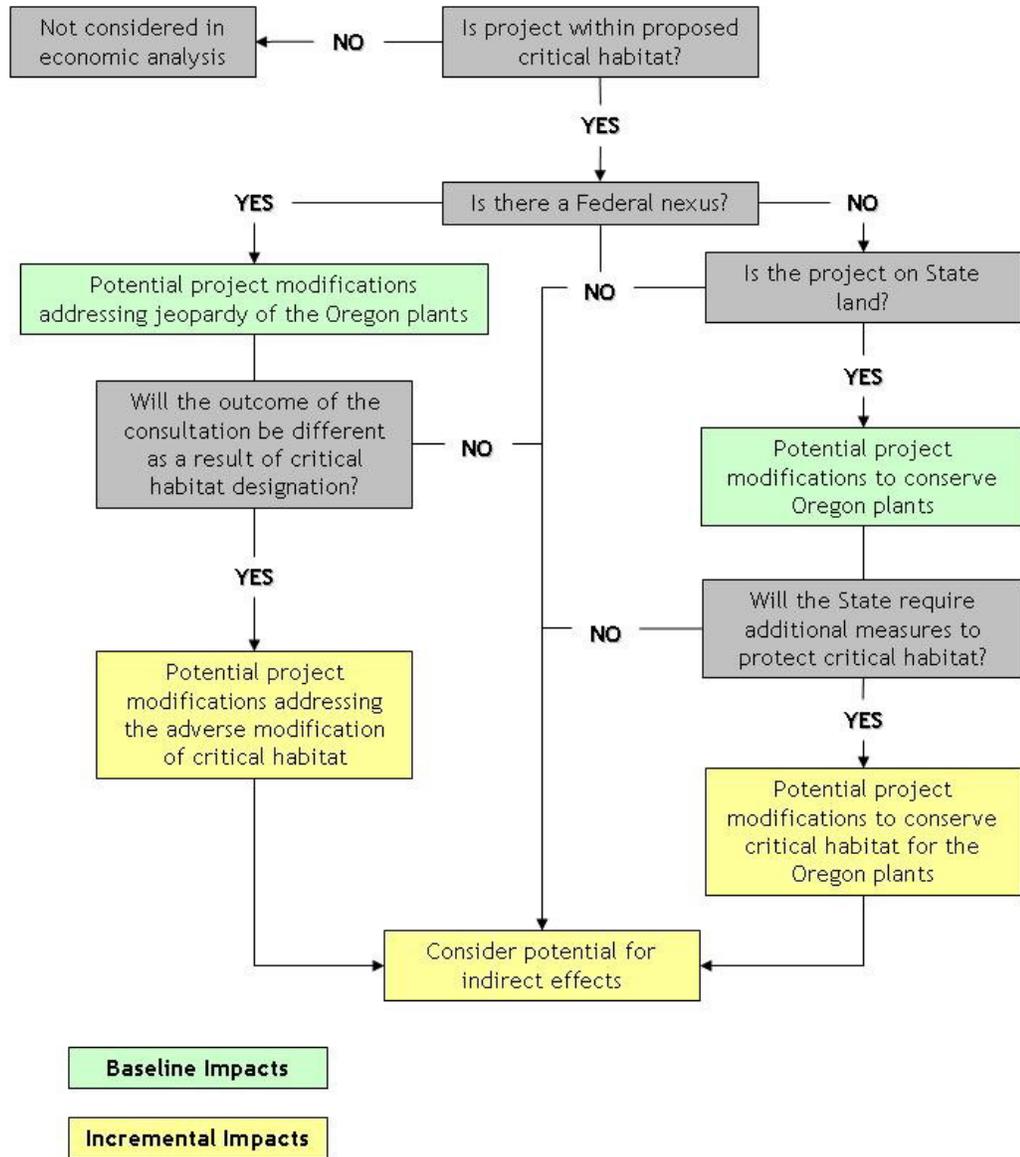
<sup>24</sup> U.S. Fish and Wildlife Service, "Endangered Species and Habitat Conservation Planning," August 6, 2002, accessed at <http://endangered.fws.gov/hcp/>.

baseline in the case that they would not have been triggered absent the designation of critical habitat. In these cases, they are considered incremental impacts and are discussed below.

### 2.3.2 IDENTIFYING INCREMENTAL IMPACTS

39. This analysis separately quantifies the incremental impacts of this rulemaking. The focus of the incremental analysis is to determine the impacts on land uses and activities from the designation of critical habitat that are above and beyond those impacts due to existing required or voluntary conservation efforts being undertaken due to other Federal, State, and local regulations or guidelines.
40. When critical habitat is designated, section 7 requires Federal agencies to ensure that their actions will not result in the destruction or adverse modification of critical habitat (in addition to considering whether the actions are likely to jeopardize the continued existence of the species). The added administrative costs of including consideration of critical habitat in section 7 consultations, and the additional impacts of implementing project modifications resulting from the protection of critical habitat are the direct compliance costs of designating critical habitat. These costs are not in the baseline and are considered incremental impacts of the rulemaking.
41. Exhibit 2-1 depicts the decision analysis regarding whether an impact should be considered incremental. The following sections describe this decision tree in detail.
42. Incremental impacts may be the direct compliance costs associated with additional effort for consultations, reinitiated consultations, new consultations occurring specifically because of the designation, and additional project modifications that would not have been required under the jeopardy standard. Additionally, incremental impacts may include indirect impacts resulting from reaction to the potential designation of critical habitat (e.g., implementing Oregon plants conservation efforts in an effort to avoid designation of critical habitat), triggering of additional requirements under State or local laws intended to protect sensitive habitat, and uncertainty and perceptual effects on markets.

EXHIBIT 2-1. IDENTIFYING INCREMENTAL IMPACTS OF CRITICAL HABITAT DESIGNATION



Direct Impacts

43. The direct, incremental impacts of critical habitat designation stem from the consideration of the potential for destruction or adverse modification of critical habitat during section 7 consultations. The two categories of direct, incremental impacts of critical habitat designation are: 1) the administrative costs of conducting section 7 consultation; and 2) implementation of any project modifications requested by the Service through section 7 consultation to avoid or minimize potential destruction or adverse modification of critical habitat.

Administrative Section 7 Consultation Costs

44. Parties involved in section 7 consultations include the Service, a Federal "action agency," and in some cases, a private entity involved in the project or land use activity. The action agency (i.e., the Federal nexus necessitating the consultation) serves as the liaison with the Service. While consultations are required for activities that involve a Federal nexus and may jeopardize the continued existence of the species regardless of whether critical habitat is designated, the designation may increase the effort for consultations in the case that the project or activity in question may adversely modify critical habitat. Administrative efforts for consultation may therefore result in both baseline and incremental impacts.
45. In general, three different scenarios associated with the designation of critical habitat may trigger incremental administrative consultation costs:
1. **Additional effort to address adverse modification in a new consultation** - New consultations taking place after critical habitat designation may require additional effort to address critical habitat issues above and beyond the listing issues. In this case, only the additional administrative effort required to consider critical habitat is considered an incremental impact of the designation.
  2. **Re-initiation of consultation to address adverse modification -** Consultations that have already been completed on a project or activity may require re-initiation to address critical habitat. In this case, the costs of re-initiating the consultation, including all associated administrative and project modification costs are considered incremental impacts of the designation.
  3. **Incremental consultation resulting entirely from critical habitat designation** - Critical habitat designation may trigger additional consultations that may not occur absent the designation (e.g., for an activity for which adverse modification may be an issue, while jeopardy is not, or consultations resulting from the new information about the potential presence of the species provided by the designation). Such consultations may, for example, be triggered in critical habitat areas that are not occupied by the species. All associated administrative and project modification costs

of incremental consultations are considered incremental impacts of the designation.

46. The administrative costs of these consultations vary depending on the specifics of the project. One way to address this variability is to show a range of possible costs of consultation, as it may not be possible to predict the precise outcome of each future consultation in terms of level of effort. Review of consultation records and discussions with Service field offices resulted in a range of estimated administrative costs of consultation. For simplicity, the average of the range of costs in each category is applied in this analysis.
47. Exhibit 2-2 provides estimated administrative consultation costs representing effort required for all types of consultation, including those that considered both adverse modification and jeopardy. To estimate the fractions of the total administrative consultation costs that are baseline and incremental, the following assumptions were applied.
- The greatest effort will be associated with consultations that consider both jeopardy and adverse modification. Depending on whether the consultation is precipitated by the listing or the critical habitat designation, part or all of the costs, respectively, will be attributed to the proposed rule.
  - Efficiencies exist when considering both jeopardy and adverse modification at the same time (e.g., in staff time saved for project review and report writing), and therefore incremental administrative costs of considering adverse modification in consultations precipitated by the listing result in the least incremental effort, roughly one-quarter of the cost of the entire consultation. The remaining three-quarters of the costs are attributed to consideration of the jeopardy standard in the baseline scenario. This latter amount also represents the cost of a consultation that only considers adverse modification (e.g., an incremental consultation for activities in unoccupied critical habitat) and is attributed wholly to critical habitat.
  - Incremental costs of the re-initiation of a previously completed consultation because of the critical habitat designation are assumed to be approximately half the cost of a consultation considering both jeopardy and adverse modification. This assumes that re-initiations are less time-consuming as the groundwork for the project has already been considered in terms of its effect on the species. However, because the previously completed effort must be re-opened, they are more costly than simply adding consideration of critical habitat to a consultation already underway.

## EXHIBIT 2-2. ADMINISTRATIVE CONSULTATIONS COSTS (2009 DOLLARS)

BASELINE ADMINISTRATIVE COSTS OF CONSULTATION					
CONSULTATION TYPE	SERVICE	FEDERAL AGENCY	THIRD PARTY	BIOLOGICAL ASSESSMENT	TOTAL COSTS
BASELINE COSTS OF CONSULTATION CONSIDERING JEOPARDY (DOES NOT INCLUDE CONSIDERATION OF ADVERSE MODIFICATION)					
Technical Assistance	\$420	n/a	\$788	n/a	\$1,130
Informal	\$1,840	\$2,330	\$1,540	\$1,500	\$7,130
Formal	\$4,090	\$4,610	\$2,630	\$3,600	\$15,000
Programmatic	\$12,300	\$10,200	n/a	\$4,200	\$26,700
INCREMENTAL ADMINISTRATIVE COSTS OF CONSULTATION					
CONSULTATION TYPE	SERVICE	FEDERAL AGENCY	THIRD PARTY	BIOLOGICAL ASSESSMENT	TOTAL COSTS
NEW CONSULTATION RESULTING ENTIRELY FROM CRITICAL HABITAT DESIGNATION (TOTAL COST OF A CONSULTATION CONSIDERING BOTH JEOPARDY AND ADVERSE MODIFICATION)					
Technical Assistance	\$560	n/a	\$1,050	n/a	\$1,500
Informal	\$2,450	\$3,100	\$2,050	\$2,000	\$9,500
Formal	\$5,450	\$6,150	\$3,500	\$4,800	\$20,000
Programmatic	\$16,400	\$13,700	n/a	\$5,600	\$35,700
RE-INITIATION OF CONSULTATION TO ADDRESS ADVERSE MODIFICATION					
Technical Assistance	\$280	n/a	\$525	n/a	\$750
Informal	\$1,230	\$1,550	\$1,030	\$1,000	\$4,750
Formal	\$2,730	\$3,080	\$1,750	\$2,400	\$10,000
Programmatic	\$8,200	\$6,830	n/a	\$2,800	\$17,800
ADDITIONAL EFFORT TO ADDRESS ADVERSE MODIFICATION IN A NEW CONSULTATION (ADDITIVE WITH BASELINE COSTS, SHOWN ABOVE, OF CONSIDERING JEOPARDY)					
Technical Assistance	\$140	n/a	\$263	n/a	\$375
Informal	\$613	\$775	\$513	\$500	\$2,380
Formal	\$1,360	\$1,540	\$875	\$1,200	\$5,000
Programmatic	\$4,100	\$3,410	n/a	\$1,400	\$8,910
Source: IEC analysis of full administrative costs is based on data from the Federal Government Schedule Rates, Office of Personnel Management, 2008, and a review of consultation records from several Service field offices across the country conducted in 2002.					
Notes:					
1. Estimates are rounded to three significant digits and may not sum due to rounding.					
2. Estimates reflect average hourly time required by staff.					

Section 7 Project Modification Impacts

48. Section 7 consultation considering critical habitat may also result in additional project modification recommendations specifically addressing potential destruction or adverse

modification of critical habitat. For forecast consultations considering jeopardy and adverse modification, and for re-initiations of past consultations to consider critical habitat, the economic impacts of project modifications undertaken to avoid or minimize adverse modification are considered incremental impacts of critical habitat designation. For consultations that are forecast to occur specifically because of the designation (incremental consultations), impacts of all associated project modifications are assumed to be incremental impacts of the designation. This is summarized below.

1. **Additional effort to address adverse modification in a new consultation** - Only project modifications above and beyond what would be requested to avoid or minimize jeopardy are considered incremental.
2. **Re-initiation of consultation to address adverse modification** - Only project modifications above and beyond what was requested to avoid or minimize jeopardy are considered incremental.
3. **Incremental consultation resulting entirely from critical habitat designation** - Impacts of all project modifications are considered incremental.

#### Indirect Impacts

49. The designation of critical habitat may, under certain circumstances, affect actions that do not have a Federal nexus and thus are not subject to the provisions of section 7 under the Act. Indirect impacts are those unintended changes in economic behavior that may occur outside of the Act, through other Federal, State, or local actions, and that are caused by the designation of critical habitat. This section identifies common types of indirect impacts that may be associated with the designation of critical habitat. Importantly, these types of impacts are not always considered incremental. In the case that these types of conservation efforts and economic effects are expected to occur regardless of critical habitat designation, they are appropriately considered baseline impacts in this analysis.

#### Habitat Conservation Plans

50. Under section 10 of the Act, landowners seeking an incidental take permit must develop an HCP to counterbalance the potential harmful effects that an otherwise lawful activity may have on a species. As such, the purpose of the habitat conservation planning process is to ensure that the effects of incidental take are adequately avoided or minimized. Thus, HCPs are developed to ensure compliance with section 9 of the Act and to meet the requirements of section 10 of the Act.
51. Application for an incidental take permit and completion of an HCP are not required or necessarily recommended by a critical habitat designation. However, in certain situations the new information provided by the proposed critical habitat rule may prompt a landowner to apply for an incidental take permit. For example, a landowner may have been previously unaware of the potential presence of the species on his or her property, and expeditious completion of an HCP may offer the landowner regulatory relief in the form of exclusion from the final critical habitat designation. In this case, the effort involved in creating the HCP and undertaking associated conservation efforts are

considered an incremental effect of designation. No specific plans to prepare new HCPs in response to this proposed designation were identified.

Other State and Local Laws

52. Under certain circumstances, critical habitat designation may provide new information to a community about the sensitive ecological nature of a geographic region, potentially triggering additional economic impacts under other State or local laws. In cases where these impacts would not have been triggered absent critical habitat designation, they are considered indirect, incremental impacts of the designation.

Additional Indirect Impacts

53. In addition to the indirect effects of compliance with other laws or triggered by the designation, project proponents, land managers and landowners may face additional indirect impacts, including the following:
- **Time Delays** - Both public and private entities may experience incremental time delays for projects and other activities due to requirements associated with the need to reinitiate the section 7 consultation process and/or compliance with other laws triggered by the designation. To the extent that delays result from the designation, they are considered indirect, incremental impacts of the designation.
  - **Regulatory Uncertainty** - The Service conducts each section 7 consultation on a case-by-case basis and issues a biological opinion on formal consultations based on species-specific and site-specific information. As a result, government agencies and affiliated private parties who consult with the Service under section 7 may face uncertainty concerning whether project modifications will be recommended by the Service and what the nature of these modifications will be. This uncertainty may diminish as consultations are completed and additional information becomes available on the effects of critical habitat on specific activities. Where information suggests that this type of regulatory uncertainty stemming from the designation may affect a project or economic behavior, associated impacts are considered indirect, incremental impacts of the designation.
  - **Stigma** - In some cases, the public may perceive that critical habitat designation may result in limitations on private property uses above and beyond those associated with anticipated project modifications and regulatory uncertainty described above. Public attitudes about the limits or restrictions that critical habitat may impose can cause real economic effects to property owners, regardless of whether such limits are actually imposed. All else equal, a property that is designated as critical habitat may have a lower market value than an identical property that is not within the boundaries of critical habitat due to perceived limitations or restrictions. As the public becomes aware of the true regulatory burden imposed by critical habitat, the impact of the designation on property markets may decrease. To the extent that potential stigma effects on markets are probable and identifiable, these impacts are considered indirect, incremental impacts of the designation.

### 2.3.3 BENEFITS

54. Under Executive Order 12866, OMB directs Federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions.<sup>25</sup> OMB's Circular A-4 distinguishes two types of economic benefits: *direct benefits and ancillary benefits*. Ancillary benefits are defined as favorable impacts of a rulemaking that are typically unrelated, or secondary, to the statutory purpose of the rulemaking.<sup>26</sup>
55. In the context of critical habitat, the primary purpose of the rulemaking (i.e., the direct benefit) is the potential to enhance conservation of the species. The published economics literature has documented that social welfare benefits can result from the conservation and recovery of endangered and threatened species. In its guidance for implementing Executive Order 12866, OMB acknowledges that it may not be feasible to monetize, or even quantify, the benefits of environmental regulations due to either an absence of defensible, relevant studies or a lack of resources on the implementing agency's part to conduct new research.<sup>27</sup> *Rather than rely on economic measures, the Service believes that the direct benefits of the proposed rule are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking.*
56. Critical habitat designation may also generate ancillary benefits. Critical habitat aids in the conservation of species specifically by protecting the primary constituent elements on which the species depends. To this end, critical habitat designation can result in maintenance of particular environmental conditions that may generate other social benefits aside from the preservation of the species. That is, management actions undertaken to conserve a species or habitat may have coincident, positive social welfare implications, such as increased recreational opportunities in a region. While they are not the primary purpose of critical habitat, these ancillary benefits may result in gains in employment, output, or income that may offset the direct, negative impacts to a region's economy resulting from actions to conserve a species or its habitat.
57. It is often difficult to evaluate the ancillary benefits of critical habitat designation. To the extent that the ancillary benefits of the rulemaking may be captured by the market through an identifiable shift in resource allocation, they are factored into the overall economic impact assessment in this report. For example, if habitat preserves are created to protect a species, the value of existing residential property adjacent to those preserves may increase, resulting in a measurable positive impact. Where data are available, this analysis attempts to capture the *net* economic impact (i.e., the increased regulatory burden less any discernable offsetting market gains), of species conservation efforts imposed on regulated entities and the regional economy.

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<sup>25</sup> Executive Order 12866, Regulatory Planning and Review, September 30, 1993.

<sup>26</sup> U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

<sup>27</sup> *Ibid.*

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#### 2.3.4 GEOGRAPHIC SCOPE OF THE ANALYSIS

58. Economic impacts of conservation for the Oregon plants are considered across the entire area proposed for critical habitat designation, as defined in Chapter 1. Results are presented for each of the 23 units of proposed critical habitat.

#### 2.3.5 ANALYTIC TIME FRAME

59. Ideally, the time frame of this analysis would be based on the expected time period over which the critical habitat regulation is expected to be in place. Specifically, the analysis would forecast impacts of implementing this rule through species recovery (i.e., when the rule is no longer required). However, absent specific information on the expected time frame for recovery of the Oregon plants, this analysis forecasts impacts over a “reasonably foreseeable” time frame. This time frame may vary by category of economic activity, depending on available information regarding activities that are currently authorized, permitted, or funded, or for which proposed plans are currently available. This information may be found, for example, in local government land use plans or Federal agency planning documents.
60. Based on available data, this analysis estimates economic impacts to activities from 2010 (expected year of the final critical habitat rule) to 2029, 20 years from the expected year of final critical habitat designation. Because it includes costs only to a 20-year time horizon, this analysis could underestimate present value impacts in the case that critical habitat effects continue beyond 20 years.

#### 2.4 INFORMATION SOURCES

61. The primary sources of information for this report are communications with, and data provided by, personnel from the Service, Federal, State, and local governments and other stakeholders. In addition, this analysis relies upon the Service's section 7 consultation records, and existing management plans that consider the Oregon plants. The complete list of contacted stakeholders is within the reference section at the end of this document.

## CHAPTER 3 | DEVELOPMENT ACTIVITIES

62. Development activities within the proposed critical habitat area include residential and commercial development projects, as well as public works projects, such as construction or maintenance of sewer and water lines. As described in the proposed rule, the major threat to the Oregon plants associated with development projects is the destruction or fragmentation of vernal pool habitats.<sup>28</sup> Specifically, leveling, ditching, tilling, or impounding water may fill vernal pools and/or alter the surrounding topography, affecting the local hydrology.
63. Actions that fill vernal pools and alter their hydrology are subject to section 404 of the CWA and ORS 196.795-990, both of which require projects to reduce potential adverse impacts to wetland areas through appropriate and practicable steps.<sup>29,30</sup> Further, projects subject to section 404 of the CWA and ORS 196.795-990 must not jeopardize the continued existence of endangered or threatened species within the wetland area. Any conservation effort taken to comply with these laws during a development project will benefit the Oregon plants either directly by avoiding jeopardy or indirectly by limiting adverse impacts on vernal pool habitat.<sup>31</sup> Past section 7 consultations for development projects have all been triggered by the need for a section 404 permit pursuant to the CWA.<sup>32</sup> In these consultations, the Service did not request project modifications beyond those already proposed as part of the development project in order to comply with the CWA. Thus, the baseline impacts to development activities quantified in this analysis result from compliance with section 404 of the CWA and/or ORS 196.795-990. The only exceptions are those baseline and incremental administrative costs associated with section 7 consultation.
64. Pursuant to section 404 of the CWA and ORS 196.795-990, developers avoid, minimize, and mitigate project impacts on wetland areas. Where feasible, development projects are designed to avoid affecting vernal pool habitat. Where impacts are unavoidable, development projects may be altered to minimize adverse impacts to vernal pool habitats.

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<sup>28</sup> 74 FR 37314.

<sup>29</sup> 40 CFR Part 230.1-7.

<sup>30</sup> ORS 196.795-990.

<sup>31</sup> Personal communication with the Service on September 14, 2009; October 7, 2009; and October 14, 2009.

<sup>32</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

Finally, habitat mitigation may take place to offset any unavoidable adverse impacts to vernal pool habitat due to a proposed development project.<sup>33</sup>

65. In general, it is difficult to separate those conservation efforts applied during development projects to avoid adverse impacts to vernal pool habitats from those conservation efforts that would avoid impacts to the Oregon plants and their habitat. Conservation efforts taken to avoid adverse impacts to vernal pool habitat within the study area will also benefit the Oregon plants.<sup>34</sup> Thus, the costs of conservation efforts implemented to comply with the CWA and ORS 196.795-990 are quantified as baseline impacts. Incremental impacts quantified in this analysis stem, solely, from administrative costs associated with the additional effort to address adverse modification during future section 7 consultations because minimization and mitigation conservation efforts undertaken pursuant to section 404 of the CWA and ORS 196.795-990 are not expected to change following the designation of critical habitat.
66. The USACE, charged with issuing permits for projects pursuant to section 404 of the CWA, claims jurisdiction in all vernal pool habitats within proposed critical habitat.<sup>35</sup> All proposed critical habitat in Jackson County is considered to be vernal pool habitat making it subject to the requirements of section 404 of the CWA. Some seasonal wetland habitat within proposed critical habitat in Josephine County is not considered to be vernal pool habitat. The USACE may not claim jurisdiction in these areas, however the State may claim jurisdiction pursuant to ORS 196.795-990.<sup>36</sup> The State does not, however, anticipate requiring additional conservation efforts for the Oregon plants and their associated wetland habitat following the designation of critical habitat.<sup>37</sup> Development projects within wetland habitat in Josephine County not subject to section 404 of the CWA or ORS 196.795-990 are not expected to incur any impacts related to conservation of the Oregon plants as no Federal nexus exists to require section 7 consultation nor does Federal or State law require protection of the wetland areas.
67. Exhibit 3-1 summarizes the baseline and incremental impacts of Oregon plants conservation efforts on future development activities as detailed in the remainder of this chapter. The majority of impacts (approximately 90 percent) under the economic baseline are due to the establishment and development of compensatory mitigation areas to offset unavoidable impacts vernal pool habitat.

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<sup>33</sup> Personal communication with the U.S. Army Corps of Engineers between October 26, 2009 and October 28, 2009 and Dana Field, Mitigation Specialist, Oregon Department of State Land on October 27, 2009.

<sup>34</sup> Personal communication with the Service on September 14, 2009; October 7, 2009; and October 14, 2009.

<sup>35</sup> Personal communication with the Service on September 14, 2009; October 7, 2009; and October 14, 2009.

<sup>36</sup> ORS 196.795-990.

<sup>37</sup> Personal communication with Dana Field, Mitigation Specialist, Oregon Department of State Lands on October 27, 2009.

**EXHIBIT 3-1 SUMMARY OF IMPACTS TO DEVELOPMENT ACTIVITIES 2010-2029 (SEVEN PERCENT DISCOUNT RATE, 2009 DOLLARS)**

PRESENT VALUE IMPACTS	ANNUALIZED IMPACTS
<b>BASELINE</b>	
\$6,400,000 - \$156,000,000	\$604,000 - \$14,700,000
<b>INCREMENTAL</b>	
\$67,300 - \$375,000	\$6,360 - \$35,400

68. The broad range of impacts is due to a difference in the level of forecast development activity according to low and high scenarios. The low and high scenarios vary according to three factors: 1) the scope of development activity (distribution across subunits); 2) the scale of development activity (levels of future development); and 3) the potential CWA mitigation requirements applied to offset impacts to wetland habitat.
69. The low scenario assumes the scope and scale of development activity in the future will reflect the consultation history for the Oregon plants. In other words, future development is forecast to occur within the subunits and at the frequency for which past section 7 consultation has occurred. As a result, the low scenario assumes 1.13 future development projects will occur annually across the White City (subunits RV6A-H) and Whetstone Creek (RV8) units.
70. The high scenario assumes full build-out of developable areas within the proposed critical habitat by 2029. As a result, 6.55 future development projects are forecast to occur annually across the White City (subunits RV6A-H), Whetstone Creek (RV8), Laurel Road (IV6A-B), Illinois River Forks State Park (IV7), Woodcock Mountain (IV8), Riverwash (IV9), and French Flat North (IV10) units. Additionally, future development projects are assumed to be required to offset impacts to vernal pool and seasonal wetland habitats at a one to one mitigation ratio under the low scenario, and 7.72 to one under the high scenario.<sup>38</sup>
71. The remainder of this chapter is organized according to the following analytic methodology to quantify impacts:
1. Forecast scope and scale of future development projects across the study area;
  2. Describe the potential conservation efforts for the Oregon plants related to these development activities;
  3. Estimate costs associated with complying with section 404 of the CWA and ORS 196.795-990; and
  4. Describe results, including both baseline and incremental impacts to future development projects.

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<sup>38</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

### 3.1 SCOPE AND SCALE OF FUTURE DEVELOPMENT

72. Future development within the study area is expected to occur mainly in and around the urban areas of White City and the City of Medford in Jackson County. Significant development currently exists within these areas. Exhibit 3-2 illustrates the juxtaposition of proposed critical habitat and existing development, in particular of subunits RV6A-H, RV8, and RV9A-B. The average annual population growth rates for White City and the City of Medford are high relative to the overall growth rate for Jackson County indicating that these areas may experience greater development pressure in the future than rural areas in the County. Specifically, the populations of White City and the City of Medford increased at an average annual growth rate of 2.2 and 2.34 percent, respectively, between 1980 and 2005 as compared to Jackson County which increased at an average annual growth rate of 1.55 percent over the same period.<sup>39</sup> To date, all section 7 consultations for development projects have occurred within the White City (subunits RV6A-H) and Whetstone Creek (RV8) units.<sup>40</sup> Additionally, a known future development project is planned to occur in the Medford Airport (subunits RV9A-B) unit.<sup>41</sup>
73. The areas proposed for critical habitat in Josephine County are more rural than proposed critical habitat areas in Jackson County. The main landuses are agriculture and grazing. To date, there has been little development in the areas proposed for critical habitat. However, a number of areas within proposed critical habitat in Josephine County (912 acres) are zoned for rural residential development.<sup>42</sup> The population in Josephine County is increasing, but at a slower rate than the population in Jackson County. Specifically, the overall population in the County increased from 76,300 to 81,600 between 2000 and 2008, with a 0.92 percent average annual growth rate.<sup>43</sup> Comparatively, the population in Jackson County increased from 184,000 to 201,000 with a 1.27 percent average annual growth rate over the same time period.

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<sup>39</sup> Jackson County. 2006. Jackson County Comprehensive Plan. Chapter 18: Population. Jackson County Board of Commissioners. Amended July 30, 2006.

<sup>40</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

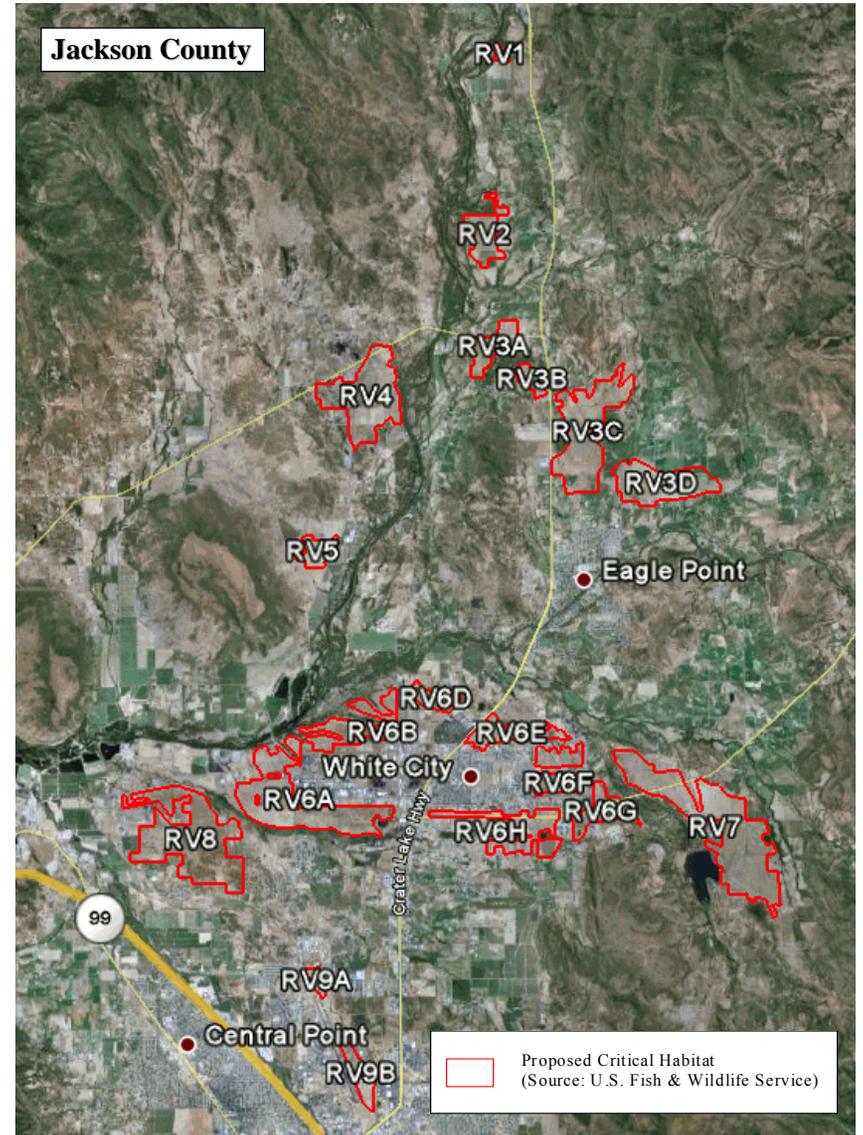
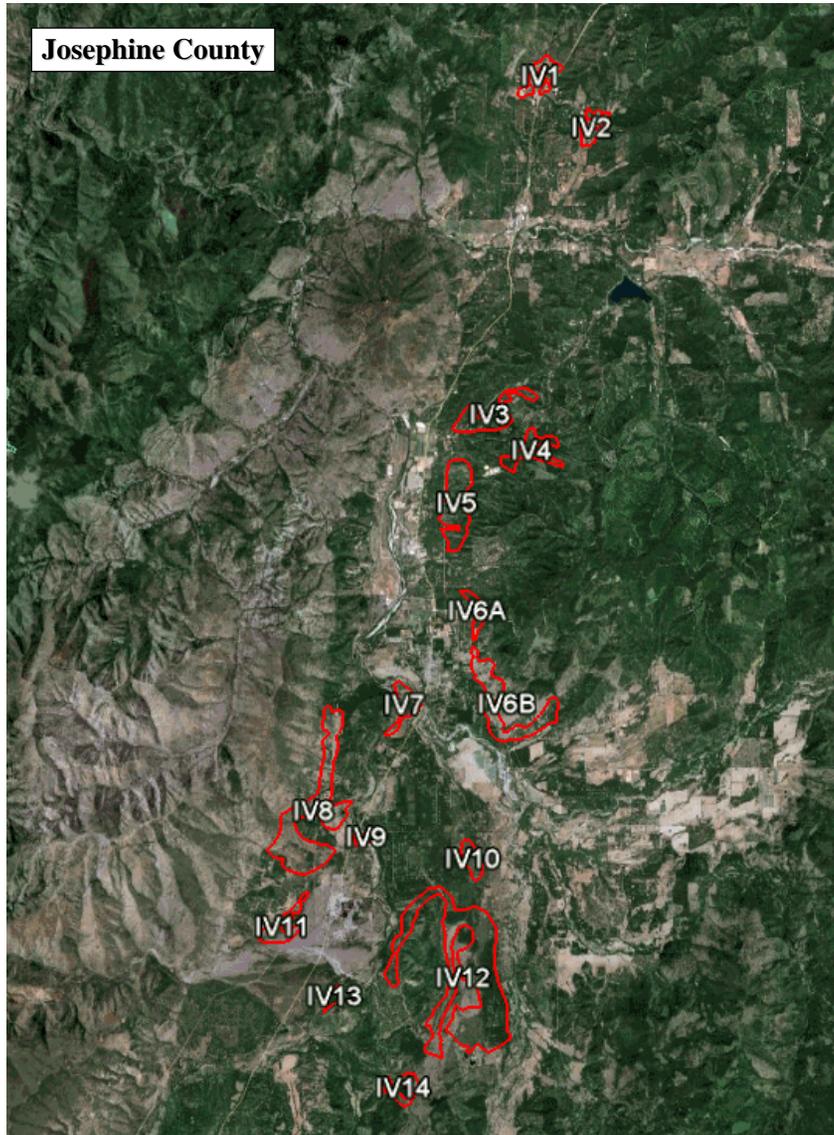
<sup>41</sup> Personal communication with Kelly Madding, Director, Jackson County Board of Commissioners on November 12, 2009.

<sup>42</sup> Based on GIS analysis using zoning data for Josephine County: Josephine County. 2009. Zoning (Polygon dataset). Accessed online at <http://68.185.2.151/website/data/shapefiles/> on October 5, 2009.

<sup>43</sup> U.S. Census Bureau. 2009. Table 1: Annual Estimates of the Resident Population for Counties of Oregon: April 1, 2000 to July 1, 2008 (CO-EST2008-01-41). Population Division, U.S. Census Bureau. March 19, 2009.

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EXHIBIT 3-2 PROPOSED CRITICAL HABITAT OVERVIEW



74. Significant uncertainty exists regarding the level of future development activity within the study area. Specifically, areas within Josephine County have not been developed to date, but may be developed in the future. Further, the section 7 consultation history provides an estimate of past development within White City and the City of Medford, but does not include development projects where no adverse affects to vernal pool habitat or the Oregon plants were likely. Therefore forecasts based solely on the section 7 consultation history may underestimate future development within the study area. Due to the uncertainty regarding future development projects within the study area, this analysis presents a range of forecast development projects based on low and high development scenarios. The actual level of future development projects is expected to fall within the range presented in this analysis.
75. The low scenario relies upon the section 7 consultation history to forecast future development activities within the White City (subunits RV6A-H) and Whetstone Creek (RV8) units. The low scenario is based on the assumption that future development within the study area will be limited to areas where development has occurred in the past, namely, the White City (subunits RV6A-H) and Whetstone Creek (RV8) units. Further, the low scenario assumes that future development projects will occur at the same rate in vernal pool habitat as demonstrated historically.<sup>44</sup>
76. Similar to the low scenario, the high scenario projects future development activity in the White City (subunits RV6A-H) and Whetstone Creek (RV8) units. However, the high scenario also projects development activity in the Laurel Road (IV6A-B), Illinois River Forks State Park (IV7), Woodcock Mountain (IV8), Riverwash (IV9), and French Flat North (IV10) units in Josephine County. Although development projects have not occurred in these areas in the past, the proposed rule identifies rural development as a threat to the Oregon plants and their habitat in these units in addition to the White City and Whetstone Creek units.<sup>45</sup> Future development is not forecast in other units as available information does not indicate that development activity in other units is likely in the future. The high scenario conservatively assumes full build-out of developable areas within the timeframe of this analysis (20 years following the designation) within units where development is identified as a threat in the proposed rule.<sup>46</sup>
77. Full build-out of developable areas within the 20-year timeframe is considered possible given the increasing population trends in White City and Jackson and Josephine Counties. If the populations in White City and Jackson and Josephine Counties continue to increase

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<sup>44</sup> This analysis does not take into account the potential effect of the recent economic downturn in the housing market on future development activity. In the case that the downturn results in a surplus of vacant housing units, development activity may decrease in the near term, in which case impacts may be lower than the low impact scenario presented in this analysis.

<sup>45</sup> 74 FR 37314.

<sup>46</sup> This analysis does not account for potential changes in zoning within the proposed critical habitat area. To the extent that areas zoned for future development decrease or increase during the timeframe of this analysis, impacts may be over- or underestimated.

at their current rates, full build-out of these areas may be necessary to accommodate future populations. Applying average annual growth rates based on population changes between 1980 and 2005, this analysis estimates that the populations will increase by 4,515 (White City), 74,508 (Jackson County), and 22,946 (Josephine County) people between 2010 and 2029.<sup>47,48</sup> Based on county zoning data, full build-out of developable areas in proposed critical habitat will provide housing for an additional 2,920 (White City), 3,214 (Jackson County), and 334 (Josephine County) people over the 20-year timeframe, assuming an average of three people per housing unit.<sup>49,50</sup> Given that population forecasts for White City and Jackson and Josephine Counties exceed the populations supported by the forecast level of development, this analysis assumes full build-out of developable areas is a reasonable high impact scenario. As further evidence of this conclusion, Jackson County estimates that 90 percent build-out will occur in White City in 2022 based on population forecasts estimated using percentage changes in population.<sup>51</sup> Additional details on the methodology used to forecast future development activity under the low and high scenarios is provided below.

### 3.1.1 LOW SCENARIO FORECAST OF FUTURE DEVELOPMENT

78. There have been nine past consultations on development projects within the study area. Past consultations have occurred for projects in the White City (subunits RV6A-H) and Whetstone Creek (RV8) units within Jackson County. This analysis assumes that all future development projects will require section 7 consultation triggered by the need for a section 404 permit pursuant to the CWA. This analysis forecasts the annual number of future consultations for development projects by dividing the number of past development consultations (nine) by the number of years between the plant's listing (2002) and the present (eight years). The forecast number of future consultations (1.13) is then used as a proxy for the number of future development projects, given the previous assumption. Future development projects are distributed across the White City and Whetstone Creek subunits according to the distribution of developable areas within the subunits. Exhibit 3-3 presents the distribution of developable areas and the forecast number of annual development projects by subunit.

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<sup>47</sup> Jackson County. 2006. Jackson County Comprehensive Plan. Chapter 18: Population. Jackson County Board of Commissioners. Amended July 30, 2006.

<sup>48</sup> The forecast population for Jackson County includes increases in the population of White City.

<sup>49</sup> Based on GIS analysis using zoning data for Josephine and Jackson Counties: Josephine County. 2009. Zoning (Polygon dataset). Accessed online at <http://68.185.2.151/website/data/shapefiles/> on October 5, 2009; and, Jackson County GIS Services. 2005. Jackson County Zoning (Polygon Dataset). Accessed online at <http://www.smartmap.org/downloads.cfm> on October 5, 2009.

<sup>50</sup> The forecast increase in available housing for White City is based on full build-out within the "urban containment boundary," outside of which development at urban density levels is prohibited.

<sup>51</sup> Jackson County. 2006. Jackson County Comprehensive Plan. Chapter 23: Urban Lands Element. Jackson County Board of Commissioners. Amended July 30, 2006.

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**EXHIBIT 3-3 DISTRIBUTION OF DEVELOPABLE AREAS WITHIN WHITE CITY AND WHETSTONE CREEK SUBUNITS AND THE FORECAST NUMBER OF ANNUAL DEVELOPMENT PROJECTS BY SUBUNIT (2010-2029)**

SUBUNIT	DEVELOPABLE AREAS (ACRES)	PERCENT OF TOTAL DEVELOPABLE AREAS	FORECAST NUMBER OF FUTURE DEVELOPMENT PROJECTS PER YEAR
RV6A	389	30%	0.34
RV6B	27	2%	0.02
RV6C	0	0%	0.00
RV6D	34	3%	0.03
RV6E	157	12%	0.14
RV6F	242	19%	0.21
RV6G	38	3%	0.03
RV6H	149	12%	0.13
RV8	256	20%	0.22
<b>Total</b>	<b>1,292</b>	<b>100%</b>	<b>1.13</b>
Sources: 1. Jackson County GIS Services. 2005. Jackson County Zoning (Polygon Dataset). Accessed online at <a href="http://www.smartmap.org/downloads.cfm">http://www.smartmap.org/downloads.cfm</a> on October 5, 2009. 2. Review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.			

**3.1.2 HIGH SCENARIO FORECAST OF FUTURE DEVELOPMENT**

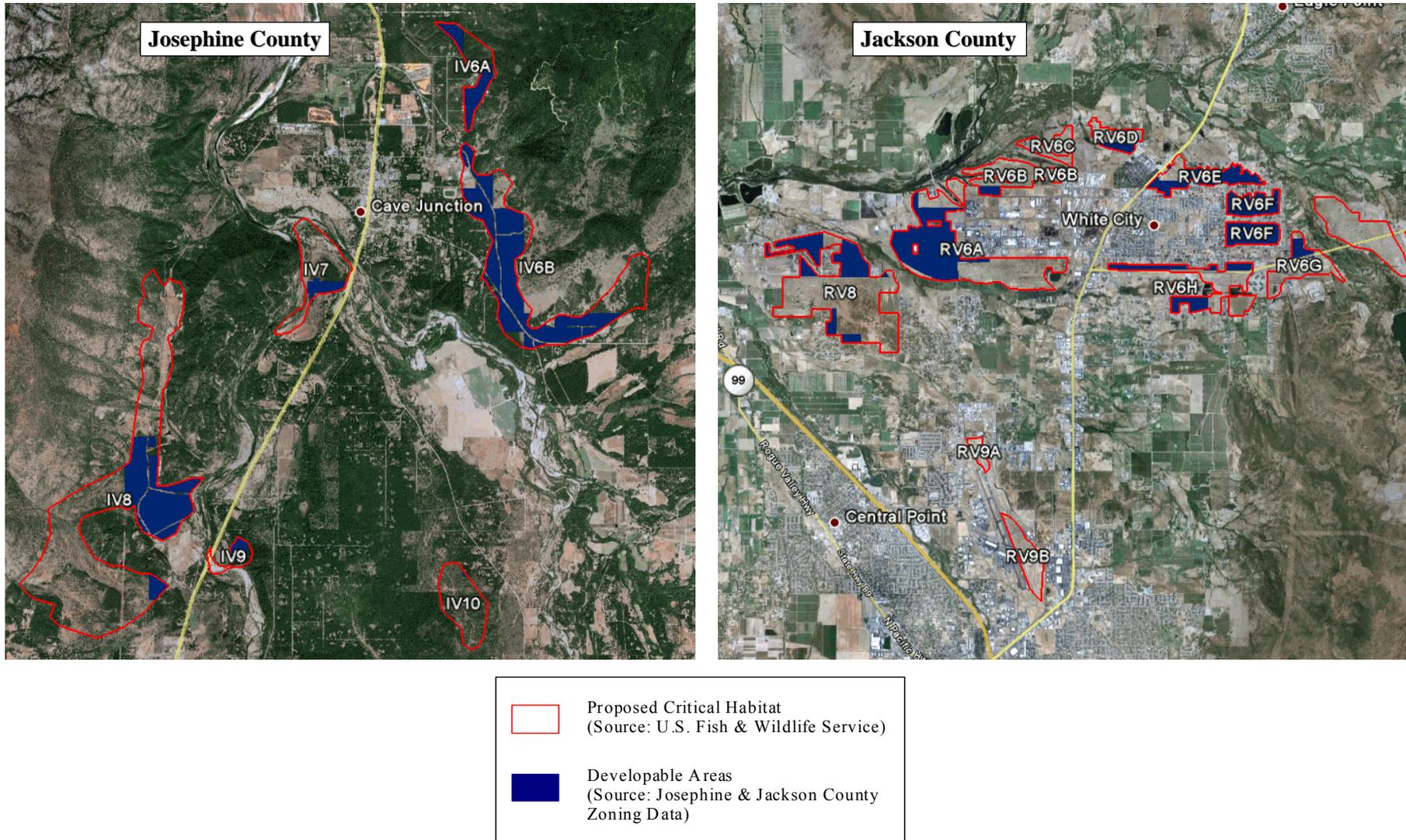
79. The high scenario assumes full build-out of developable areas within proposed critical habitat units where development is identified as a threat in the proposed rule. These units include the White City (subunits RV6A-H) and Whetstone Creek (RV8) units in Jackson County and the Laurel Road (IV6A-B), Illinois River Forks State Park (IV7), Woodcock Mountain (IV8), Riverwash (IV9), and French Flat North (IV10) units in Josephine County. Exhibit 3-4 presents the distribution of developable areas within these subunits based on county zoning data.<sup>52</sup> Exhibit 3-5 illustrates the geographic distribution of these areas. In total, 1,843 acres are zoned for potential future development: 1,292 acres (70 percent) in Jackson County and 551 acres (30 percent) in Josephine County.

<sup>52</sup> Based on GIS analysis using zoning data for Josephine and Jackson Counties: Josephine County. 2009. Zoning (Polygon dataset). Accessed online at <http://68.185.2.151/website/data/shapefiles/> on October 5, 2009; and, Jackson County GIS Services. 2005. Jackson County Zoning (Polygon Dataset). Accessed online at <http://www.smartmap.org/downloads.cfm> on October 5, 2009.

**EXHIBIT 3-4 DISTRIBUTION OF DEVELOPABLE AREAS WITHIN SUBUNITS WHERE DEVELOPMENT IS PROJECTED TO OCCUR IN THE FUTURE UNDER THE HIGH SCENARIO**

SUBUNIT	DEVELOPABLE AREAS (ACRES)	PERCENT OF TOTAL DEVELOPABLE ACRES
RV6A	389	21%
RV6B	27	1%
RV6C	0	0%
RV6D	34	2%
RV6E	157	9%
RV6F	242	13%
RV6G	38	2%
RV6H	149	8%
RV8	256	14%
IV6A	55	3%
IV6B	274	15%
IV7	20	1%
IV8	186	10%
IV9	15	1%
IV10	1	0%
<b>Total</b>	<b>1,843</b>	<b>100%</b>
Source: Josephine County. 2009. Zoning (Polygon dataset). Accessed online at <a href="http://68.185.2.151/website/data/shapefiles/">http://68.185.2.151/website/data/shapefiles/</a> on October 5, 2009; and, Jackson County GIS Services. 2005. Jackson County Zoning (Polygon Dataset). Accessed online at <a href="http://www.smartmap.org/downloads.cfm">http://www.smartmap.org/downloads.cfm</a> on October 5, 2009.		

EXHIBIT 3-5 DISTRIBUTION OF DEVELOPABLE AREAS WITHIN SUBUNITS WHERE FUTURE DEVELOPMENT IS FORECAST TO OCCUR



80. This analysis conservatively assumes that all future development projects under the high scenario will require section 7 consultation for the Oregon plants. Therefore, it is necessary to estimate the annual number of future development projects forecast to occur within each of the subunits identified in Exhibit 3-4. Based on the scale of the nine past development projects requiring section 7 consultation (project size ranges from less than an acre to 61.4 acres), the average development project size is estimated to be 14.06 acres.<sup>53</sup> Dividing the total developable acres by the average development project size yields the total number of future development projects assuming full build-out of developable areas ( $1,843/14.06 \approx 131$  projects).
81. Absent specific information on the timing of potential future development projects, this analysis assumes an even distribution of development over the 20-year timeframe of the analysis, yielding an annual number of future development projects of 6.55. The estimated annual number of projects is distributed across the subunits where future development is forecast to occur according to the proportion of developable areas within the subunits (Exhibit 3-4). Exhibit 3-6 presents the forecast annual number of development projects under the high scenario by subunit.

### 3.1.3 SPECIFIC FUTURE DEVELOPMENT ACTIVITIES

82. Communication with local governments and stakeholders identified one specific development project forecast to occur within the study area in the future. The Jackson County Board of Commissioners is currently planning to expand a section of runway within the Medford Airport unit (subunits RV9A-B) in 2015. The runway expansion project is expected to include 10.3 acres within proposed critical habitat for construction of additional runway and associated safety areas.

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<sup>53</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

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**EXHIBIT 3-6 FORECAST ANNUAL AND TOTAL DEVELOPMENT PROJECTS BY SUBUNIT (HIGH SCENARIO, ASSUMES FULL BUILD-OUT OF DEVELOPABLE AREAS IN TARGETED UNITS)**

SUBUNIT	NUMBER OF ANNUAL DEVELOPMENT PROJECTS	TOTAL NUMBER OF DEVELOPMENT PROJECTS (2010-2029)
RV6A	1.38	28
RV6B	0.09	2
RV6C	0.00	0
RV6D	0.12	2
RV6E	0.56	11
RV6F	0.86	17
RV6G	0.14	3
RV6H	0.53	11
RV8	0.91	18
IV6A	0.20	4
IV6B	0.97	19
IV7	0.07	1
IV8	0.66	13
IV9	0.05	1
IV10	0.00	0
<b>Total</b>	<b>6.55</b>	<b>131</b>
Sources:		
1. Consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.		
2. Josephine County. 2009. Zoning (Polygon dataset). Accessed online at <a href="http://68.185.2.151/website/data/shapefiles/">http://68.185.2.151/website/data/shapefiles/</a> on October 5, 2009; and, Jackson County GIS Services. 2005. Jackson County Zoning (Polygon Dataset). Accessed online at <a href="http://www.smartmap.org/downloads.cfm">http://www.smartmap.org/downloads.cfm</a> on October 5, 2009.		

**3.2 OREGON PLANTS CONSERVATION EFFORTS ASSOCIATED WITH DEVELOPMENT ACTIVITIES**

83. Conservation efforts implemented for the Oregon plants during development projects are related to meeting the requirements of section 404 of the CWA and ORS 196.795-990. Both regulations require development projects to reduce potential adverse impacts to wetland areas through appropriate and practicable steps.<sup>54,55</sup> Section 404 of the CWA also requires development projects to avoid jeopardizing the continued existence of the Oregon plants, which may require section 7 consultation with the Service.<sup>56</sup> Any conservation effort taken to comply with either section 404 of the CWA or ORS

<sup>54</sup> 40 CFR Part 230.1-7.

<sup>55</sup> ORS 196.795-990.

<sup>56</sup> 40 CFR Part 230.1-7.

196.795.990 within the study area will benefit the Oregon plants.<sup>57</sup> The costs associated with implementing such conservation efforts are quantified as part of the economic baseline as the associated conservation efforts would be implemented even in the absence of critical habitat. Further, the Service has not requested additional conservation efforts for the Oregon plants during section 7 consultations for development projects above and beyond the conservation efforts already planned in order to comply with section 404 of the CWA.<sup>58</sup> Thus, all the conservation efforts described in this section are baseline efforts taken in order to comply with section 404 of the CWA and ORS 196.795-990.<sup>59</sup>

### 3.2.1 AVOIDANCE CONSERVATION EFFORTS

84. Impact avoidance conservation efforts include relocating or cancelling a portion of a project to avoid affecting vernal pool habitat.<sup>60</sup> To date, only one past development project proposed impact avoidance conservation efforts.<sup>61</sup> Specifically, Jackson County School District (#9) altered their original development plan for the construction of a new middle school building in White City (subunits RV6A-H), shifting the construction of the building slightly to the north and cancelling the construction of two soccer fields and a baseball field to avoid impacts to five vernal pool areas totaling 0.3 acres.<sup>62</sup> In this example, economic impacts may result from additional construction costs associated with the alternative location and welfare losses associated with reduced recreational opportunities.
85. Forecasting impact avoidance conservation efforts likely to be implemented during future development activities is difficult because avoidance efforts have been rarely implemented and are specific to individual development projects. Given the uncertainty regarding the frequency of future avoidance conservation efforts, this analysis does not quantify economic impacts associated with potential future impact avoidance conservation efforts. As described below, this analysis instead assumes that development will occur with appropriate mitigation requirements. To the extent that future development projects implement avoidance conservation efforts in place of mitigation, and the costs of avoidance are more or less than the costs of mitigation, this analysis may underestimate or overestimate baseline impacts to future development activities.

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<sup>57</sup> Personal communication with the Service on September 14, 2009; October 7, 2009; and October 14, 2009.

<sup>58</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

<sup>59</sup> Personal communication with the Service on September 14, 2009; October 7, 2009; and October 14, 2009.

<sup>60</sup> Personal communication with the U.S. Army Corps of Engineers between October 26, 2009 and October 28, 2009 and Dana Field, Mitigation Specialist, Oregon Department of State Land on October 27, 2009.

<sup>61</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

<sup>62</sup> U.S. Fish and Wildlife Service to Portland District, U.S. Army Corps of Engineers. 2002. "Endangered Species Act, Section 7 consultation, Biological Opinion regarding the Public Notice (PN) for a wetland permit application for the Jackson County School District #9 (applicant) to conduct earth work and construction of school buildings in White City, Jackson County, Oregon (#2002-00097) (Proposed Action)." U.S. Fish and Wildlife Service, Roseburg Field Office. Roseburg, Oregon. 1-15-03-F-013.

### 3.2.2 MINIMIZATION CONSERVATION EFFORTS

86. Minimization conservation efforts are implemented to limit potential adverse impacts of development activities to vernal pool habitat pursuant to section 404 of the CWA and ORS 196.795-990.<sup>63</sup> Based on a review of the minimization conservation efforts implemented in past development projects, these efforts generally include efforts to limit erosion leading to siltation and sedimentation of vernal pool habitats and efforts to ensure that vernal pool hydrology is not altered.<sup>64</sup> Such efforts include installing silt fencing, earth dikes, and sediment traps and basins, keeping tracked vehicles out of vernal pool areas, limiting ground disturbing activities to the dry summer months, and conducting a pre-construction meeting to go over the location of vernal pool habitats within the project area. Based on local engineer experience on a number of development projects for the Jackson County Urban Renewal Agency in and around vernal pool habitat, costs associated with implementing erosion control efforts and efforts to prevent the alteration of vernal pool hydrology during development projects are estimated to be \$3,000 per acre of vernal pool habitat.<sup>65</sup>

### 3.2.3 MITIGATION CONSERVATION EFFORTS

87. Mitigation conservation efforts are applied as part of development projects to offset unavoidable adverse impacts to vernal pool habitat pursuant to section 404 of the CWA and ORS 196.795-990.<sup>66</sup> In general, mitigation conservation efforts can be broken into three types: establishment, development, and long-term monitoring and management. These efforts are described below.<sup>67</sup>
- **Establishment of Mitigation Areas:** Includes either the purchase of vernal pool areas outside the project site as off-site mitigation areas or the setting aside of vernal pool areas within the project site as on-site mitigation areas.
  - **Development of Mitigation Areas:** Includes enhancing or restoring vernal pool habitats and repopulating Oregon plants within mitigation areas. Specific efforts include excavating vernal pools, eliminating noxious weeds and woody vegetation, and seeding areas to establish or enhance Oregon plant populations.
  - **Monitoring/Management of Mitigation Areas:** Includes the long term monitoring and management of mitigation areas to ensure that the mitigation area maintains fully functional vernal pools and healthy Oregon plant populations.

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<sup>63</sup> Personal communication with the U.S. Army Corps of Engineers between October 26, 2009 and October 28, 2009 and Dana Field, Mitigation Specialist, Oregon Department of State Land on October 27, 2009.

<sup>64</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

<sup>65</sup> Personal communication with Bart Deming of Hardy Engineering on November 17, 2009.

<sup>66</sup> Personal communication with the U.S. Army Corps of Engineers between October 26, 2009 and October 28, 2009 and Dana Field, Mitigation Specialist, Oregon Department of State Land on October 27, 2009.

<sup>67</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

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88. Mitigation area establishment and development costs are typically incurred together as a one-time cost when a mitigation area is first created by the developer.<sup>68</sup> These costs are typically higher than long-term monitoring and management costs. Monitoring and management costs are incurred by the developer on an annual basis for an average of five years following the establishment of the mitigation area.<sup>69</sup> Based on the costs required to establish the Oregon Department of Transportation (ODOT) Mitigation/Conservation Bank described in Chapter 4, this analysis estimates the cost of mitigation area establishment and development to be approximately \$17,800 per acre of mitigation area land.<sup>70</sup> The long-term management of the ODOT conservation bank is carried out by The Nature Conservancy. Based on the annual costs of managing the ODOT Mitigation/Conservation Bank estimated by The Nature Conservancy, long-term mitigation area monitoring and management costs are estimated to be \$209 per acre of mitigation area land.<sup>71</sup>

#### 3.2.4 MITIGATION CONSERVATION EFFORTS LIKELY TO BE APPLIED DURING THE JACKSON COUNTY MEDFORD AIRPORT RUNWAY EXPANSION PROJECT

89. Conservation efforts implemented during the future Medford Airport runway expansion project are expected to stem from the need for a section 404 permit pursuant to the CWA requiring efforts to limit adverse effects of the runway expansion on vernal pool habitat and avoid jeopardizing the continued existence of the Oregon plants. Specifically, the Board of Commissioners expects to be required to create a 30.9-acre on-site mitigation area to offset potential adverse impacts to vernal pool habitat associated with the 10.3-acre project (assumes three acres of mitigation for every acre of development) in order to receive a 404 permit. The mitigation area will also provide baseline protection for the Oregon plants.<sup>72</sup>
90. In past consultations on development projects, the Service has not requested project modifications in addition to the conservation efforts proposed to comply with section 404 of the CWA.<sup>73</sup> Thus, no additional baseline conservation efforts are expected to be requested for the Medford Airport runway expansion project beyond the establishment of the mitigation area and conservation efforts to minimize impacts to vernal pool habitat and the Oregon plants. The Service does not anticipate requiring additional conservation

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<sup>68</sup> Personal communication with Bart Deming of Hardy Engineering on November 17, 2009. The Jackson County Urban Renewal Agency utilizes Hardy Engineering for many of its development projects and recommended that they be contacted for conservation effort cost estimates.

<sup>69</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009; and, personal communication with Bart Deming of Hardy Engineering on November 17, 2009.

<sup>70</sup> Personal communication with Bill Werncke, Mitigation Specialist, Oregon Department of Transportation on October 28, 2009.

<sup>71</sup> Personal communication with Darren Borgias, Ecologist, The Nature Conservancy on November 9, 2009.

<sup>72</sup> Written communication with Kelly Madding, Director, Jackson County Board of Commissioners on November 12, 2009.

<sup>73</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

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efforts for the Oregon plants following the designation of critical habitat.<sup>74</sup> Thus, the Medford Airport runway expansion project is not forecast to incur incremental impacts beyond the administrative costs of addressing adverse modification in the section 7 consultation required for the issuance of a 404 permit.

### 3.3 FORECASTING IMPACTS TO FUTURE DEVELOPMENT PROJECTS

91. This analysis first quantifies per project costs associated with implementing minimization and mitigation conservation efforts. Next annual minimization and mitigation conservation effort costs are estimated by applying the low and high scenario forecasts of future development projects within the study area (presented in section 3.1) to the per project cost estimates. Exhibit 3-7 presents per-acre, per-project, and annual costs associated with minimization and mitigation conservation efforts and summarizes the derivation of these costs. The derivation of these costs is described in more detail below.

#### 3.3.1 PER-PROJECT MINIMIZATION CONSERVATION EFFORT COSTS

92. Minimization conservation efforts are limited to vernal pool areas, rather than associated upland areas feeding the pools, within the development project site and are estimated to be \$3,000 per acre (see Minimization Conservation Efforts discussion in section 3.2).<sup>75</sup> Estimating future minimization conservation effort costs requires estimating the amount of vernal pool area likely to be affected in future development projects. Based on past development projects requiring section 7 consultation, the average amount of wetted vernal pool area affected per development project is estimated to be 0.26 acres.<sup>76</sup> This analysis applies the average amount of vernal pool area affected in past development projects as an estimate of the amount of vernal pool area likely to be affected in each future development project. Multiplying the average amount of vernal pool area affected in past projects and the minimization conservation effort cost estimate of \$3,000 per acre of vernal pool area yields a minimization conservation effort cost estimate of \$791 per future development project.

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<sup>74</sup> Personal communication with the Service on September 14, 2009; October 7, 2009; and October 14, 2009.

<sup>75</sup> Personal communication with Bart Deming of Hardy Engineering on November 17, 2009. The Jackson County Urban Renewal Agency utilizes Hardy Engineering for many of its development projects and recommended that they be contacted for conservation effort cost estimates.

<sup>76</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

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**EXHIBIT 3-7 PER-ACRE, PER-PROJECT, AND ANNUAL COSTS ASSOCIATED WITH IMPLEMENTING MINIMIZATION AND MITIGATION CONSERVATION EFFORTS (2010-2029, UNDISCOUNTED COSTS, 2009 DOLLARS)**

ROW ID	DESCRIPTION	SCENARIO		SOURCE/DERIVATION
		LOW	HIGH	
A	Average Development Project Size (Acres)	14.06		Average of past projects
B	Average Wetted Vernal Pool Area Affected per Development Project (Acres)	0.264		Average of past projects
C	Mitigation Area Required per Acre of Development (Acres) <sup>a</sup>	1.00	7.72	Average of past projects
D	Forecast Number of Future Development Projects per Year	1.13	6.55	Low Scenario: consultation history High Scenario: (developable areas)/(A)/(20 years)
<b>PER-ACRE COSTS<sup>b</sup></b>				
E	Minimization Conservation Efforts	\$3,000		Expert opinion of local project engineer
F	Mitigation Area Establishment and Development	\$17,800		Expert opinion of ODOT mitigation specialist
G	Mitigation Area Monitoring and Management	\$209		Expert opinion of The Nature Conservancy ecologist
<b>PER-PROJECT COSTS<sup>b</sup></b>				
H	Minimization Conservation Efforts <sup>c</sup>	\$791		(B) x (E)
I	Mitigation Area Establishment and Development	\$250,000	\$1,930,000	(A) x (C) x (F)
J	Mitigation Area Monitoring and Management	\$2,940	\$22,700	(A) x (C) x (G)
<b>ANNUAL COSTS<sup>b</sup></b>				
K	Minimization Conservation Efforts	\$890	\$5,190	(D) x (H)
L	Mitigation Area Establishment and Development	\$281,000	\$12,600,000	(D) x (I)
M	Mitigation Area Monitoring and Management <sup>d</sup>	\$16,500	\$743,000	(D) x (J) x 5
Notes:				
<p>a. Mitigation areas are determined per acre of development rather than per acre of wetted vernal pool area within the development project site because the USACE seeks to ensure "no net loss" of intact, vernal pool complexes, which include associated upland areas feeding inter-connected vernal pools, as opposed to isolated vernal pools. Personal communication with the U.S. Army Corps of Engineers between October 26, 2009 and October 28, 2009.</p> <p>b. Cost estimates may not calculate due to rounding.</p> <p>c. Minimization efforts include actions to limit erosion and prevent the alteration of vernal pool hydrology. As such, they are only necessary around wetted vernal pool areas, not associated upland areas.</p> <p>d. For simplicity, this analysis applies the annual costs reported in row M to all years in the timeframe (2010-2029), although monitoring and management costs in years 2010-2014 are less than five times (D) x (J).</p>				

### 3.3.2 PER-PROJECT MITIGATION CONSERVATION EFFORT COSTS

93. Past development projects requiring section 7 consultation have been subject to a range of mitigation in order to comply with section 404 of the CWA and ORS 196.795-990. Specifically, mitigation areas have ranged from less than an acre to 7.71 acres per acre of development. The USACE indicated that they would require at least one acre of mitigation per acre of development to comply with section 404 of the CWA.<sup>77,78</sup> Due to the extent of variation in the size of past mitigation areas implemented to offset adverse impacts to vernal pool habitat, this analysis applies a range of mitigation area sizes. In the low scenario, this analysis estimates that an acre of mitigation will be required per acre of development based on personal communication with the USACE. In the high scenario, this analysis estimates that 7.71 acres of mitigation will be required per acre of development based on past section 7 consultation. The size of all future mitigation implemented during future development projects is expected to fall within this range.
94. Past development projects within the study area requiring section 7 consultation ranged in size from less than an acre for a utility-line right-of-way to 61.35 acres for a new commercial factory.<sup>79</sup> The average size of past development projects within the study area requiring section 7 consultation is 14.06 acres. This analysis applies the average size of past development projects requiring section 7 consultation as an estimate of the average size of future development projects within the study area. Applying the average size of future development projects to the range of mitigation area size requirements, this analysis estimates that future mitigation per development project will range from 14.06 acres in the low scenario to 108.52 acres in the high scenario.
95. Mitigation area establishment and development costs are estimated to be \$17,800 per acre and mitigation area long-term monitoring and management costs are estimated to be \$209 per acre (see Mitigation Conservation Efforts discussion in section 3.2).<sup>80,81</sup> Applying the per-acre costs for mitigation area establishment and development to the range of mitigation areas required per future development project, this analysis estimates that future mitigation area establishment and development will cost \$250,000 on the low-end, and \$1.93 million on the high-end per future development project. Applying the per-acre cost of long-term monitoring and management, this analysis estimates that long-term monitoring and management of mitigation areas will cost \$2,940 on the low-end, and \$22,700 on the high-end per development project.

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<sup>77</sup> Personal communication with the U.S. Army Corps of Engineers between October 26, 2009 and October 28, 2009.

<sup>78</sup> Mitigation areas are determined per acre of development rather than per acre of vernal pool area within the development project site because the USACE seeks to ensure "no net loss" of intact, vernal pool complexes, which include associated upland areas feeding inter-connected vernal pools, as opposed to isolated vernal pools.

<sup>79</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

<sup>80</sup> Personal communication with Bill Werncke, Mitigation Specialist, Oregon Department of Transportation on October 28, 2009.

<sup>81</sup> Personal communication with Darren Borgias, Ecologist, The Nature Conservancy on November 9, 2009.

### 3.3.3 ANNUAL MINIMIZATION AND MITIGATION CONSERVATION EFFORT COSTS

96. In order to estimate annual costs associated with implementing minimization and mitigation conservation efforts, this analysis applies the per-project minimization and mitigation costs derived above to the forecast of future development projects. This analysis forecasts 1.13 future development projects within the study area annually under the low scenario and 6.55 future development projects under the high scenario (see forecast development projects discussion in section 3.1). Applying the low and high scenario forecasts for future development to the per project costs of implementing minimization conservation efforts, this analysis estimates that future minimization conservation efforts will range in cost from \$890 under the low scenario, to \$5,190 under the high scenario.
97. In order to estimate annual mitigation conservation effort costs, this analysis assumes that forecast development projects under the low scenario will be subject to the low-end of mitigation area size requirements (one acre of mitigation per acre of development), while forecast development projects under the high scenario will be subject to the high-end of mitigation area size requirements (7.71 acres of mitigation per acre of development). Further, this analysis assumes that in any given year, long-term monitoring and management will be occurring for all the mitigation areas established in the past five years.<sup>82</sup> Applying the low-end per-project mitigation conservation effort costs to the low scenario forecast of future development projects, this analysis estimates that mitigation area establishment and development will cost \$281,000 annually while long-term monitoring and management of mitigation areas will cost \$16,500 annually. Applying the high-end per-project mitigation conservation effort costs to the high scenario forecast of future development projects, this analysis estimates that mitigation area establishment and development will cost \$12.6 million annually while long-term monitoring and management of mitigation areas will cost \$743,000 annually.

### 3.3.4 CONSERVATION EFFORT COSTS ASSOCIATED WITH THE JACKSON COUNTY MEDFORD AIRPORT RUNWAY EXPANSION PROJECT

98. The Jackson County Board of Commissioners expects to establish and develop a 30.9-acre mitigation area to offset potential adverse impacts to vernal pool habitat associated with their runway expansion project in the Medford Airport unit (subunits RV9A-B) pursuant to section 404 of the CWA and ORS 196.795.990.<sup>83</sup> The Board of Commissioners estimates that mitigation area establishment and development costs will total \$3.92 million in 2015. Additionally, this analysis estimates that the mitigation area will require annual monitoring and management for a total of five years following the establishment of the mitigation area. In order to estimate annual monitoring costs to Jackson County, this analysis applies the estimate of monitoring and management used to estimate monitoring and management costs to forecast development projects of \$209 per

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<sup>82</sup> In any given year, monitoring and management is ongoing for mitigation areas established one, two, three, four, and five years ago because monitoring and management occurs annually for the first five years following the establishment of a mitigation area (see section 3.2).

<sup>83</sup> Written communication with Kelly Madding, Director, Jackson County Board of Commissioners on November 12, 2009.

acre of mitigation area land. Applying the per-acre monitoring and management cost estimate to the 30.9-acre mitigation area, monitoring and management costs to the Jackson County Board of Commissioners are expected to total \$6,460 annually between 2016 and 2020.

### 3.4 IMPACTS TO FUTURE DEVELOPMENT PROJECTS

99. Impacts to future development projects stem from three sources: 1) minimization conservation efforts implemented to limit potential adverse impacts to vernal pool habitat associated with development activity; 2) mitigation conservation efforts implemented to offset potential adverse impacts to vernal pool habitat associated with development activity; and, 3) administrative costs associated with formal section 7 consultations on development projects (as described in Exhibit 2-2).<sup>84</sup> This section presents baseline and incremental impacts to future development activities within the study area.

#### 3.4.1 BASELINE IMPACTS TO DEVELOPMENT PROJECTS

100. Exhibit 3-8 presents present value and annualized baseline impacts to development projects forecast under the low and high scenarios and to the Jackson County Board of Commissioners Medford Airport development project by subunit. For forecast development projects under the low scenario, total baseline impacts to development activities are distributed across subunits according to the distribution of developable acres in the White City (subunits RV6A-H) and Whetstone Creek (RV8) units. For forecast development projects under the high scenario, total baseline impacts to development activities are distributed across subunits according to the distribution of developable acres in the White City (subunits RV6A-H) and Whetstone Creek (RV8) units in Jackson County and the Laurel Road (subunits IV6A-B), Illinois River Forks State Park (IV7), Woodcock Mountain (IV8), Riverwash (IV9), and French Flat North (IV10) units in Josephine County. Impacts to the Medford Airport development project are distributed across subunits RV9A and RV9B according to the distribution of Jackson County land ownership within these subunits.

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<sup>84</sup> The analysis conservatively assumes that section 7 consultation will occur for all future development projects triggered by the need for a section 404 permit pursuant to the CWA. Thus, the number of development projects under the low and high scenarios are multiplied by the administrative costs of consultation presented in Exhibit 2-2 to forecast administrative costs to future development projects.

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**EXHIBIT 3-8 TOTAL POST-DESIGNATION BASELINE IMPACTS TO DEVELOPMENT ACTIVITIES BY SUBUNIT (SEVEN PERCENT DISCOUNT RATE, 2009 DOLLARS)**

SUBUNIT	PRESENT VALUE IMPACTS		ANNUALIZED IMPACTS	
	LOW	HIGH	LOW	HIGH
RV6A	\$1,080,000	\$32,200,000	\$102,000	\$3,040,000
RV6B	\$73,900	\$2,210,000	\$6,970	\$209,000
RV6C	\$329	\$9,850	\$31	\$930
RV6D	\$93,400	\$2,800,000	\$8,810	\$264,000
RV6E	\$435,000	\$13,000,000	\$41,000	\$1,230,000
RV6F	\$670,000	\$20,100,000	\$63,300	\$1,900,000
RV6G	\$105,000	\$3,150,000	\$9,930	\$298,000
RV6H	\$413,000	\$12,400,000	\$39,000	\$1,170,000
RV8	\$707,000	\$21,200,000	\$66,700	\$2,000,000
RV9A	\$626,000	\$626,000	\$59,100	\$59,100
RV9B	\$2,200,000	\$2,200,000	\$208,000	\$208,000
IV6A	\$0	\$4,560,000	\$0	\$431,000
IV6B	\$0	\$22,700,000	\$0	\$2,140,000
IV7	\$0	\$1,670,000	\$0	\$158,000
IV8	\$0	\$15,400,000	\$0	\$1,460,000
IV9	\$0	\$1,240,000	\$0	\$117,000
IV10	\$0	\$79,400	\$0	\$7,500
<b>Total</b>	<b>\$6,400,000</b>	<b>\$156,000,000</b>	<b>\$604,000</b>	<b>\$14,700,000</b>

Note: Totals may not sum due to rounding.

101. Exhibit 3-9 presents the distribution of baseline present value impacts to future development projects by impact source. The greatest baseline impact to future development projects is due to the establishment and development of conservation areas to offset potential adverse impacts to vernal pool habitat associated with development activity.

**EXHIBIT 3-9 DISTRIBUTION OF POST-DESIGNATION BASELINE IMPACTS TO DEVELOPMENT ACTIVITIES ACROSS IMPACT SOURCES (SEVEN PERCENT DISCOUNT RATE, 2009 DOLLARS)**

SOURCE OF IMPACT	PRESENT VALUE IMPACT		PERCENT OF OVERALL IMPACT	
	LOW	HIGH	LOW	HIGH
Mitigation Area Establishment and Development	5,980,000	146,000,000	93.50%	93.80%
Long-Term Management and Monitoring of Mitigation Area	206,000	8,440,000	3.22%	5.43%
Conservation Efforts to Minimize Impacts of Development	10,100	58,800	0.16%	0.04%
Administrative Costs of Section 7 Consultation	202,000	1,120,000	3.16%	0.72%
<b>Total</b>	<b>6,400,000</b>	<b>156,000,000</b>	<b>100.00%</b>	<b>100.00%</b>
Note: Totals may not sum due to rounding.				

**3.4.2 INCREMENTAL IMPACTS TO DEVELOPMENT PROJECTS**

102. Exhibit 3-10 presents present value and annualized incremental impacts under the low and high scenarios. Total incremental impacts associated with forecast development projects under the low and high scenarios and the Medford Airport project are distributed across subunits using the same methodology used to distribute baseline impacts.
103. Incremental impacts are limited to the administrative costs of section 7 consultations for future development projects. No additional incremental impacts are forecast because minimization and mitigation conservation efforts undertaken pursuant to section 404 of the CWA and ORS 196.795-990 are not expected to change following the designation of critical habitat. In past section 7 consultations for development projects, all of which were triggered by the need for a section 404 permit pursuant to the CWA, the Service has not required project modifications in addition to conservation efforts proposed to meet the requirements of the CWA.<sup>85</sup> The Service does not anticipate requiring additional project modifications following the designation of critical habitat.<sup>86</sup> Rather, the conservation efforts applied under baseline conditions are thought to provide sufficient protection against adverse modification. Finally, the USACE and the Oregon Department of State Lands do not anticipate requiring additional conservation effort to meet the requirements

<sup>85</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

<sup>86</sup> Written communication with the U.S. Fish and Wildlife Service on September 14, 2009, October 7, 2009, and October 14, 2009.

of section 404 of the CWA and ORS 196.795.990 following the designation of critical habitat.<sup>87</sup>

**EXHIBIT 3-10 TOTAL POST-DESIGNATION INCREMENTAL IMPACTS TO DEVELOPMENT ACTIVITIES BY SUBUNIT (SEVEN PERCENT DISCOUNT RATE, 2009 DOLLARS)**

SUBUNIT	PRESENT VALUE IMPACTS		ANNUALIZED IMPACTS	
	LOW	HIGH	LOW	HIGH
RV6A	\$19,200	\$78,400	\$1,810	\$7,400
RV6B	\$1,320	\$5,380	\$124	\$508
RV6C	\$6	\$24	\$1	\$2
RV6D	\$1,670	\$6,800	\$157	\$642
RV6E	\$7,760	\$31,700	\$732	\$2,990
RV6F	\$12,000	\$48,800	\$1,130	\$4,610
RV6G	\$1,880	\$7,670	\$177	\$724
RV6H	\$7,370	\$30,100	\$695	\$2,840
RV8	\$12,600	\$51,500	\$1,190	\$4,860
RV9A	\$789	\$789	\$75	\$75
RV9B	\$2,780	\$2,780	\$262	\$262
IV6A	\$0	\$11,100	\$0	\$1,050
IV6B	\$0	\$55,200	\$0	\$5,210
IV7	\$0	\$4,060	\$0	\$384
IV8	\$0	\$37,500	\$0	\$3,540
IV9	\$0	\$3,020	\$0	\$285
IV10	\$0	\$193	\$0	\$18
<b>Total</b>	<b>\$67,300</b>	<b>\$375,000</b>	<b>\$6,360</b>	<b>\$35,400</b>

Note: Totals may not sum due to rounding.

### 3.5 ASSUMPTIONS AND CAVEATS

104. The most significant caveat associated with the analysis of impacts to future development activities is related to the forecast of anticipated development activity. Ideally, this analysis would have used a combination of population growth forecasts and the annual number of State permit requests for development projects in wetland areas in Josephine and Jackson Counties, White City, and the City of Medford to forecast future development activity. The number of State permit requests since the Oregon plants were listed is thought to be inclusive of all past development projects in the study area. However, State permit data were not available at the time this analysis was conducted. Therefore, this analysis forecasts a range of future development projects with the low scenario based on the number of past section 7 consultations on development projects within the study area and the high scenario based on the assumption that all developable areas within units where development is considered a threat to the species will be

<sup>87</sup> Personal communication with the U.S. Army Corps of Engineers between October 26, 2009 and October 28, 2009 and Dana Field, Mitigation Specialist, Oregon Department of State Land on October 27, 2009.

developed within the analysis timeframe. The high scenario is considered reasonable given that population forecasts for White City and Jackson and Josephine Counties are considerably larger than the additional population full build-out of developable areas within proposed critical habitat would support through the creation of new housing units (see Section 3.1). The actual number of future development projects within the study area is expected to fall within the range presented in this analysis.

105. Exhibit 3-11 presents this issue and other assumptions and caveats which may affect the estimates of impacts to development activities associated with critical habitat designation for the Oregon plants.

#### EXHIBIT 3-11 SUMMARY OF ASSUMPTIONS AND CAVEATS USED IN DEVELOPMENT ANALYSIS

ASSUMPTION/CAVEAT	POTENTIAL EFFECT ON RESULTS
Analysis forecasts a low and high range for future development projects based on the section 7 consultation history and the assumption of full build-out of developable areas within units where development is identified as a threat to the Oregon plants and their habitat.	+/-
Analysis assumes that all forecast future development projects will require section 7 consultation triggered by the need for a section 404 permit pursuant to the Clean Water Act.	+
Analysis does not account for the potential effect of the economic downturn in the housing market on forecast development activity.	+
Analysis does not account for potential future re-zoning of the proposed critical habitat area (e.g., increasing or reducing the area available for potential development).	+/-
Under the high scenario, analysis assumes that future development will occur in subunits where development activity has occurred in the past and in subunits where future development activity is identified as a threat to the Oregon plants in the proposed rule.	+
Analysis applies the per-acre cost of establishing and developing the Oregon Department of Transportation mitigation/conservation bank to estimate impacts associated with compensatory mitigation applied to offset the impacts of future development projects.	+/-
Analysis assumes that modifying future development project to avoid impacts to the Oregon plants and their habitat will occur infrequently and will not result in significant economic impact to future development activities.	-
Analysis assumes development activity will not occur in proposed critical habitat units outside of RV6, RV7, RV8, RV9, IV6, IV7, IV8, IV9, and IV10 within the timeframe for this analysis.	-
+: This assumption may result in an overestimate of real costs. -: This assumption may result in an underestimate of real costs. +/-: This assumption has an unknown effect on estimates.	

## CHAPTER 4 | TRANSPORTATION PROJECTS

106. Transportation projects in the study area may include road construction (i.e., building or expanding roads) and maintenance (i.e., painting lines, replacing road signs, mowing grass along roadside) actions. The proposed rule notes that road construction and maintenance activities can affect the hydrology of the vernal pools and seasonal wetlands on which the Oregon plants depend for survival.<sup>88</sup> Additionally, plant populations may be destroyed or fragmented during road construction and maintenance projects.
107. Conservation costs to transportation projects are anticipated to include actions taken to avoid, minimize, and mitigate potential impacts on the Oregon plants and their habitat associated with road construction projects. Further, costs stem from conservation actions associated with road maintenance activities. Conservation actions related to road maintenance activities are routinely undertaken by the Oregon Department of Transportation (ODOT), which monitors and protects existing Oregon plant populations in roadside areas as part of efforts to protect wetland habitat and Federally- and State-listed species (including the Oregon plants).
108. This chapter describes the road construction and maintenance activities that are expected to occur in the study area. Next, it describes the conservation actions currently undertaken to avoid, minimize, and mitigate potential effects of road construction projects on the Oregon plants and their habitat and the conservation actions implemented as part of routine road maintenance activities. Finally, this chapter presents the economic costs associated with altering road construction projects and typical road maintenance activities to benefit the Oregon plants and their habitat. Exhibit 4-1 provides a summary of baseline and incremental impacts to transportation activities as described in the remainder of this chapter.

**EXHIBIT 4-1 SUMMARY OF IMPACTS TO TRANSPORTATION ACTIVITIES 2010-2029 (SEVEN PERCENT DISCOUNT RATE, 2009 DOLLARS)**

PRESENT VALUE IMPACTS	ANNUALIZED IMPACTS
<b>BASELINE</b>	
\$226,000	\$21,300
<b>INCREMENTAL</b>	
\$9,080	\$857

<sup>88</sup> 74 FR37314.

109. Because ODOT already implements conservation for the Oregon plants whenever known plant populations are present within a transportation project area, these costs are considered to fall under the baseline for this analysis.<sup>89</sup> The Service does not expect to request additional conservation actions for the plants following the designation of critical habitat.<sup>90</sup> Thus, incremental impacts to transportation activities are limited to administrative costs associated with the additional effort of addressing adverse modification during future section 7 consultations.

#### 4.1 ROAD CONSTRUCTION AND MAINTENANCE ACTIVITIES

110. The majority of road construction and maintenance activities within the study area are carried out by ODOT. Local governments may also undertake road construction and maintenance activities as part of development projects. Economic impacts to local governments associated with residential and commercial development projects, including associated transportation infrastructure, are described and quantified in Chapter 3 of this analysis. This chapter considers only those impacts incurred by ODOT during road construction and maintenance projects.
111. In general, road construction activities include expanding an existing roadway, replacing a bridge, constructing a new road, or re-routing an existing road. Road maintenance activities include routine measures, such as, clearing snow, fixing road shoulders, maintaining guard rails, and mowing roadside grass. Road maintenance activities occur regularly throughout the year, while road construction activities occur periodically over multiple years.
112. The remainder of this section details the measures taken by ODOT to limit impacts of typical road construction and maintenance activities on the Oregon plants and their habitat within the study area.

##### 4.1.1 ROAD CONSTRUCTION ACTIVITIES

113. In general, ODOT's strategy for any road construction project in an area known to contain an endangered or threatened species or its habitat is to:
1. Avoid impacts;
  2. If complete impact avoidance is not possible, then minimize impacts to the greatest extent possible; and finally,
  3. If necessary, mitigate for unavoidable impacts.<sup>91</sup>

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<sup>89</sup> Personal communication with Christine Maguire, Terrestrial Biology Coordinator, Oregon Department of Transportation on October 9, 2009.

<sup>90</sup> Written communication with the U.S. Fish and Wildlife Service on October 14, 2009.

<sup>91</sup> Personal communication with Christine Maguire, Terrestrial Biology Coordinator, Oregon Department of Transportation on October 9, 2009.

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For the majority of road construction projects, ODOT is able to avoid impacts to endangered or threatened plant species with minimal additional project cost.<sup>92</sup> The exception to this general rule is road expansion projects, which usually require project modifications to minimize impacts to listed plant species and mitigation measures to offset unavoidable impacts. To date there have been no section 7 consultations addressing the effects of an ODOT road construction project on the Oregon plants or their habitat.<sup>93</sup> ODOT states, and the consultation record supports that there have been no road construction projects within the study area since the Oregon plants were listed.<sup>94</sup>

114. In the foreseeable future, few road construction projects are expected to occur in the study area.<sup>95</sup> The only known future project that is likely to be affected by the presence of the Oregon plants and their critical habitat is the realignment of State Highway 62 near White City.<sup>96</sup> Exhibit 4-2 presents proposed critical habitat for the Oregon plants in relation to State Highway 62 (Crater Lake Highway) near White City. The Highway 62 realignment project is currently still being planned. ODOT states that the final plan will minimize impacts to the Oregon plants, vernal pool fairy shrimp, and vernal pool habitat to the greatest extent possible.<sup>97</sup> Despite planning the realignment to minimize impacts to the Oregon plants, vernal pool fairy shrimp, and vernal pool habitat, the realignment project is expected to require significant mitigation. In anticipation of the mitigation measures likely to be required as part of the Highway 62 realignment, ODOT established an 80.2-acre joint mitigation/conservation bank in White City.<sup>98,99</sup> The mitigation/conservation bank and associated costs are described in more detail below.

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<sup>92</sup> Personal communication with Christine Maguire, Terrestrial Biology Coordinator, Oregon Department of Transportation on October 9, 2009.

<sup>93</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

<sup>94</sup> Road construction projects receive funding from the Federal Highway Administration and therefore require section 7 consultation if an endangered or threatened species or critical habitat is present in the project area. Additionally, the need for a section 404 permit pursuant to the Clean Water Act may require section 7 consultation if an endangered or threatened species or critical habitat is present in the project area. The lack of road construction projects within the last five years was confirmed through personal communication with the Oregon Department of Transportation Service liaison on October 27, 2009.

<sup>95</sup> Personal communication with several ODOT staff members, including: Christine Maguire on October 9, 2009; Ken Cannon on October 27, 2009; and Bill Werncke on October 28, 2009. Additionally, based on personal communication with the Oregon Department of Transportation Service liaison on October 27, 2009.

<sup>96</sup> Personal communication with the Oregon Department of Transportation Service liaison on October 27, 2009.

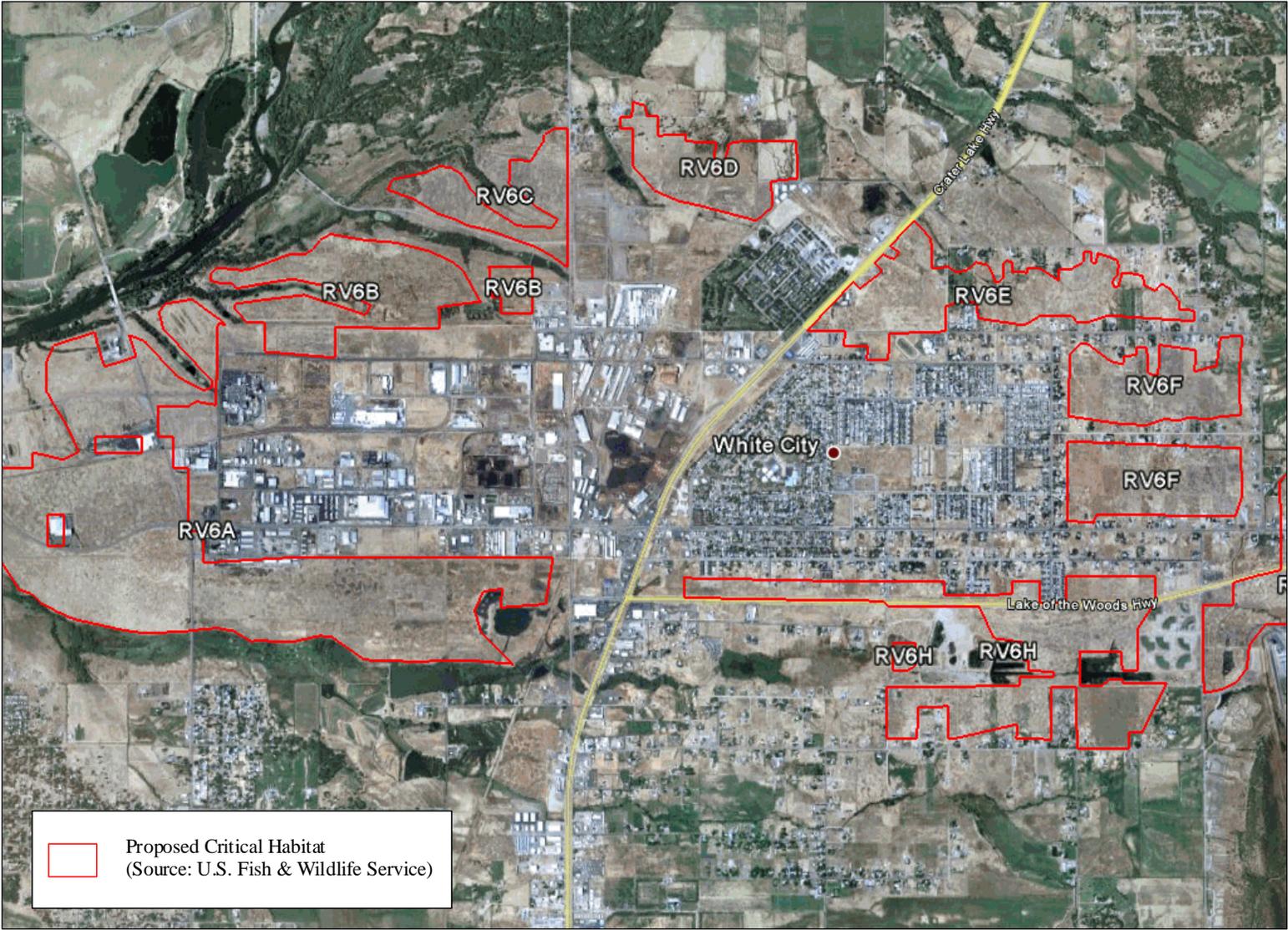
<sup>97</sup> Personal communication with the Oregon Department of Transportation Service liaison on October 27, 2009 and Bill Werncke, mitigation specialist, Oregon Department of Transportation on October 28, 2009.

<sup>98</sup> U.S. Fish and Wildlife Service. 2009. Endangered Species Act Section 7 Intra-Service informal and formal consultation for the Oregon Department of Transportation's Vernal Pool Conservation Bank, Jackson County, Oregon. Fish and Wildlife Service, Roseburg Field Office. Roseburg, Oregon. July 4, 2009.

<sup>99</sup> Personal communication with Bill Werncke, mitigation specialist, Oregon Department of Transportation on October 28, 2009.

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EXHIBIT 4-2 PROPOSED CRITICAL HABITAT IN RELATION TO HIGHWAY 62 (CRATER LAKE HIGHWAY) NEAR WHITE CITY



## Oregon Department of Transportation Conservation Bank

115. The ODOT conservation bank is a joint mitigation/conservation bank. This means it can be used as compensatory mitigation for unavoidable impacts to vernal pool habitats and compensatory conservation for unavoidable impacts to threatened and endangered species, namely, the Cook's lomatium, large-flowered woolly meadowfoam, and vernal pool fairy shrimp.<sup>100</sup> The bank is 80.23 acres in size and is located in high functioning vernal pool complex habitat near White City, which falls within critical habitat for the vernal pool fairy shrimp and proposed critical habitat for the Oregon plants. The bank was finalized in 2009. However, no bank credits have been used to date for any endangered or threatened species or vernal pool habitat.<sup>101</sup>
116. In total, there are 16.5 credits available in the conservation bank (i.e., ODOT can mitigate unavoidable impacts to 16.5 acres of vernal pool habitat, Oregon plant's habitat, and vernal pool fairy shrimp habitat associated with road construction projects). Currently, the Cook's lomatium is absent from the conservation bank area. As part of their management plan for the conservation bank, ODOT plans on seeding both Cook's lomatium and large-flowered woolly meadowfoam to enhance regional populations of these species. Further, ODOT has plans to restore three acres of vernal pool habitat within the bank. The successful reestablishment of large-flowered woolly meadowfoam and enhancement of Cook's lomatium populations and the successful restoration of the three acres of vernal pool habitat would provide ODOT with an additional 4.5 compensatory mitigation/conservation credits. Thus, a total of 21 credits may be available from the conservation bank in the future.<sup>102</sup>
117. Costs associated with the establishing and operating the conservation bank stem from purchasing the land for the bank, actively managing for the Oregon plants, vernal pool fairy shrimp, and vernal pool habitat in general, and monitoring Oregon plants and vernal pool fairy shrimp populations.<sup>103</sup> Active management activities include:
- re-contouring pool and mound microtopography;
  - low levels of cattle grazing to limit the establishment of noxious weeds and non-native grasses;
  - conducting prescribed burns to limit the establishment of noxious weeds and non-native grasses and limit habitat succession;

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<sup>100</sup> U.S. Fish and Wildlife Service. 2009. Endangered Species Act Section 7 Intra-Service informal and formal consultation for the Oregon Department of Transportation's Vernal Pool Conservation Bank, Jackson County, Oregon. Fish and Wildlife Service, Roseburg Field Office. Roseburg, Oregon. July 4, 2009.

<sup>101</sup> Personal communication with Bill Warncke, mitigation specialist, Oregon Department of Transportation on October 28, 2009.

<sup>102</sup> Personal communication with Bill Warncke, mitigation specialist, Oregon Department of Transportation on October 28, 2009.

<sup>103</sup> Personal communication with Bill Warncke, mitigation specialist, Oregon Department of Transportation on October 28, 2009.

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- planting Cook's lomatium and large-flowered woolly meadowfoam.<sup>104</sup>

The management activities and long-term monitoring within the bank will be carried out by The Nature Conservancy (TNC). TNC will continue to manage in perpetuity once the operational life of the bank is over (i.e., ODOT has utilized all available credits). In total, ODOT spent approximately \$1.91 million to establish the mitigation bank and ensure its management in perpetuity. The total costs of the bank include a \$480,000 endowment paid to TNC for its services managing the bank in perpetuity.<sup>105</sup> The portion of the costs of establishing the conservation bank that can be attributed to conserving the Oregon plants and their habitat are included in the impact estimates presented in section 4.2.

#### 4.1.2 ROAD MAINTENANCE ACTIVITIES

118. All road maintenance activities are State funded. No Federal nexus exists requiring section 7 consultation for the Oregon plants. ODOT does, however, implement conservation efforts for all State- and Federally-listed endangered or threatened species present within maintenance project areas. Specifically, areas containing known populations of endangered or threatened plant species are classified by ODOT as "special management areas." ODOT develops specific management plans for each special management area, which include measures to limit impacts on endangered or threatened plant species. Conservation efforts include altering the timing of maintenance activities and avoiding plant populations. ODOT monitors known populations of endangered and threatened species on an annual basis. Further, ODOT enhances endangered and threatened species' habitat where practical and economically feasible.<sup>106</sup>
119. Two special management areas intersect proposed critical habitat for the Oregon plants.<sup>107</sup> Impacts associated with developing management plans, monitoring plant populations, and enhancing plant habitat within the special management areas are quantified in section 4.2. Impacts associated with altering maintenance activities to limit impacts on the Oregon plants are expected to be minimal as frequently conservation efforts reduce the area in which maintenance activities take place.<sup>108</sup> This analysis therefore only quantifies impacts associated with management plan development, monitoring, and habitat enhancement.
120. In order to streamline road maintenance projects, ODOT is currently working on a State-wide habitat conservation plan (HCP) with the Service, which should be finalized in the

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<sup>104</sup> U.S. Fish and Wildlife Service. 2009. Endangered Species Act Section 7 Intra-Service informal and formal consultation for the Oregon Department of Transportation's Vernal Pool Conservation Bank, Jackson County, Oregon. Fish and Wildlife Service, Roseburg Field Office. Roseburg, Oregon. July 4, 2009.

<sup>105</sup> Personal communication with Bill Warncke, mitigation specialist, Oregon Department of Transportation on October 28, 2009.

<sup>106</sup> Personal communication with Christine Maguire, terrestrial biology coordinator, Oregon Department of Transportation on October 9, 2009.

<sup>107</sup> U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Proposed Designation of Critical Habitat for *Limnanthes floccosa* ssp. (Large-Flowered Woolly Meadowfoam) and *Lomatium cookii* (Cook's lomatium); Proposed Rule, published in the *Federal Register* on Tuesday, July 28, 2009, Vol. 74, No. 143.

<sup>108</sup> Personal communication with Melinda Trask, botanist, Oregon Department of Transportation on October 27, 2009.

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spring of 2011. The HCP is being developed in order to get an incidental take permit for the Oregon silver spot butterfly and fender's blue butterfly. However, the HCP includes conservation for the Oregon plants, along with all other State-listed plant species. The HCP will allow ODOT to remove listed plants from the operational roadway once.<sup>109</sup> After the initial removal of listed plants from the operational roadway, ODOT will actively manage listed plant populations that re-establish in the operational roadway. The initial removal of Oregon plants will be offset by withdrawing credits from ODOT's conservation bank. ODOT estimates that the total cost of developing the HCP will range from \$750,000 to \$1.0 million. The costs of including conservation efforts for the Oregon plants in the HCP are included in the impact estimates presented in section 4.2.<sup>110</sup>

#### 4.2 IMPACTS TO TRANSPORTATION ACTIVITIES

121. Impacts to transportation activities stem from conservation efforts applied during road maintenance projects as well as mitigating for unavoidable impacts during road construction or enlargement projects. Exhibit 4-3 presents the total baseline and incremental impacts to transportation activities within the study area by subunit.

EXHIBIT 4-3 TOTAL BASELINE AND INCREMENTAL IMPACTS TO TRANSPORTATION ACTIVITIES BY SUBUNIT (SEVEN PERCENT DISCOUNT RATE, 2009 DOLLARS)

SUBUNIT	BASELINE IMPACTS		INCREMENTAL IMPACTS	
	PRESENT VALUE IMPACTS	ANNUALIZED IMPACTS	PRESENT VALUE IMPACTS	ANNUALIZED IMPACTS
RV6A	\$119,000	\$11,300	\$2,490	\$235
RV6B	\$29,200	\$2,750	\$636	\$60
RV6C	\$13,400	\$1,260	\$292	\$28
RV6E	\$30,500	\$2,880	\$665	\$63
RV8	\$15,000	\$1,420	\$5,000	\$472
IV6B	\$12,300	\$1,160	\$0	\$0
IV9	\$6,200	\$585	\$0	\$0
Total	\$226,000	\$21,300	\$9,080	\$857

Note: Estimates may not sum to those reported due to rounding.

##### 4.2.1 BASELINE IMPACTS

122. The majority of baseline impacts (\$168,000 discounted at seven percent) stem from compensatory mitigation required to offset unavoidable impacts to the Oregon plants and their habitat during the Highway 62 re-alignment project expected to occur in 2013. It is likely that two acres of vernal pool habitat containing the Oregon plants will be affected

<sup>109</sup> The operational roadway includes the roadway surface, the roadside drainage ditch, and a four-foot buffer to the outside of the roadside drainage ditch.

<sup>110</sup> Personal communication with Christine Maguire, terrestrial biology coordinator, Oregon Department of Transportation on October 9, 2009.

by this project and require compensatory mitigation.<sup>111</sup> The compensatory mitigation required to offset impacts to two acres is estimated to 8.68 acres.<sup>112</sup> Applying the per-acre cost of establishing the conservation bank (approximately \$23,700 undiscounted), yields a mitigation cost of roughly \$168,000 applying a seven percent discount rate.<sup>113,114</sup>

123. Conservation actions associated with road maintenance activities also contribute significantly to baseline impacts (\$30,400 discounted at seven percent). Conservation actions include monitoring for the Oregon plants, developing management plans for “special management areas,” enhancing Oregon plants habitat, and including efforts for the Oregon plants in a State-wide HCP for road maintenance activities. The total costs of carrying out conservation actions for the Oregon plants as part of road maintenance activities over the timeframe for this analysis (20 years following the designation of critical habitat) are presented in Exhibit 4-4.<sup>115</sup>

**EXHIBIT 4-4 TOTAL COSTS OF CONSERVATION ACTIONS ASSOCIATED WITH ROAD MAINTENANCE ACTIVITIES WITHIN THE STUDY AREA (2010-2029, UNDISCOUNTED, 2009 DOLLARS)**

SOURCE OF COST	TOTAL COSTS
Monitoring	\$28,800
HCP Development	\$8,700
Management Plan Development	\$2,500
Enhancement	\$4,500
<b>Total</b>	<b>\$44,500</b>
Source: Written communication with Melinda Trask, Botanist, Oregon Department of Transportation on November 5, 2009.	

124. Finally, baseline impacts include the administrative costs associated with two future section 7 consultations for transportation activities. The first consultation is expected to occur in 2010 as part of a section 404 permit request pursuant to the Clean Water Act in order to proceed with wetland restoration within the conservation bank. The second consultation is expected to occur in 2013 addressing the Highway 62 re-alignment. In total, baseline administrative costs are expected to be \$27,200 (discounted at seven percent).

<sup>111</sup> Personal communication with Brad Livingston, Wetland Specialist, Oregon Department of Transportation on November 12, 2009.

<sup>112</sup> Two acres require two credits from the conservation bank. A credit is equivalent to 4.34 bank acres (average of: [total bank area = 80.23] / [total credits available = 16.5 or 21]). Thus, 2 credits is equivalent to 8.68 acres.

<sup>113</sup> The per-acre cost of establishing the mitigation bank is estimated by dividing the total cost of the bank \$1.91 million by the total size of the bank (80.23 acres).

<sup>114</sup> Conservation bank cost and credit information based on personal communication with Bill Werncke on October 28, 2009.

<sup>115</sup> Costs associated with conservation measures implemented as part of road maintenance activities are based on written communication with Melinda Trask, Botanist, Oregon Department of Transportation on November 5, 2009.

#### 4.2.2 INCREMENTAL IMPACTS

125. Incremental impacts stem from the administrative costs of addressing adverse modification during the 2010 and 2013 section 7 consultations on transportation projects. Additional compensatory mitigation for future road construction projects is not expected to be required following the designation of critical habitat because the mitigation required to offset impacts to vernal pool habitat known to contain the Oregon plants should provide sufficient protection of critical habitat.<sup>116</sup> Further, ODOT has no plans to modify the conservation efforts they apply during road maintenance projects following the designation of critical habitat.<sup>117</sup> Thus, incremental impacts are limited to administrative costs of the section 7 consultations.

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<sup>116</sup> Written communication with the U.S. Fish and Wildlife Service on October 14, 2009.

<sup>117</sup> Based on personal communication with Christine Maguire, Terrestrial Biology Coordinator, Oregon Department of Transportation on October 9, 2009 and Melinda Trask, Botanist, Oregon Department of Transportation on October 27, 2009.

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## CHAPTER 5 | SPECIES CONSERVATION AND MANAGEMENT ACTIVITIES

126. Federal and State agencies, as well as non-profit organizations, manage lands within the proposed critical habitat area for the conservation of the Oregon plants. This chapter quantifies costs associated with ongoing conservation activities that benefit the Oregon plants and their habitat. Active species management activities include:
- surveying and monitoring for the Oregon plants;
  - preserving Oregon plants habitat through the use of prescribed burns and low-levels of grazing, which prevent the spread of noxious weeds and nonnative grasses into vernal pools and limit natural succession processes that might convert vernal pool habitat to shrubland;
  - enhancing Oregon plants habitat by restoring vernal pool habitat; and,
  - re-establishing and/or enlarging Oregon plant populations through seeding programs.

Economic impacts associated with these species management activities do not stem from consultations, but instead are part of programs designed specifically to benefit listed species and other protected habitats. Exhibit 5-1 summarizes baseline and incremental species management costs within the study area by subunit. Incremental costs are limited to administrative efforts associated with addressing adverse modification of critical habitat during future consultations on management projects. The remainder of this chapter details the development of cost estimates presented in Exhibit 5-1.

**EXHIBIT 5-1 TOTAL POST-DESIGNATION BASELINE AND INCREMENTAL ACTIVE SPECIES MANAGEMENT COSTS BY SUBUNIT (2009 DOLLARS, APPLYING A SEVEN PERCENT DISCOUNT RATE)**

SUBUNIT	BASELINE IMPACTS		INCREMENTAL IMPACTS	
	PRESENT VALUE IMPACTS	ANNUALIZED IMPACTS	PRESENT VALUE IMPACTS	ANNUALIZED IMPACTS
RV6A	\$440,000	\$41,600	\$0	\$0
RV6B	\$165,000	\$15,600	\$0	\$0
RV6C	\$210	\$20	\$0	\$0
RV7	\$213,000	\$20,100	\$0	\$0
RV8	\$326,000	\$30,800	\$0	\$0
IV1	\$6	\$1	\$2	\$0
IV3	\$6,400	\$604	\$2,010	\$189
IV4	\$3,680	\$347	\$1,150	\$109
IV5	\$10,500	\$987	\$3,280	\$309
IV6A	\$1,220	\$115	\$381	\$36
IV6B	\$30	\$3	\$9	\$1
IV8	\$1,090	\$103	\$342	\$32
IV9	\$425	\$40	\$133	\$13
IV10	\$1,000	\$95	\$314	\$30
IV11	\$3,320	\$313	\$1,040	\$99
IV12	\$28,400	\$2,680	\$8,890	\$839
IV13	\$1,540	\$145	\$482	\$46
IV14	\$2,430	\$230	\$763	\$72
<b>Total</b>	<b>\$1,200,000</b>	<b>\$114,000</b>	<b>\$18,800</b>	<b>\$1,770</b>
Note: Totals may not sum due to rounding.				

**5.1 ACTIVE SPECIES MANAGEMENT WITHIN PROPOSED CRITICAL HABITAT**

127. Several Federal and State agencies, including the U.S. Bureau of Land Management (BLM), U.S. Forest Service (USFS), U.S. Bureau of Reclamation (BOR), Oregon Department of Fish and Game, and conservation groups, such as The Nature Conservancy, engage in active species management for the Oregon plants and their habitat. Exhibit 5-2 presents the areas within proposed critical habitat where active species management activities currently take place. These ongoing conservation and management activities for the species are forecast to continue into the foreseeable future and are thus considered baseline costs of conservation for the Oregon plants. Agencies implementing these conservation and management activities indicate that they will not change their behavior following the designation of critical habitat. As a result the only incremental impacts are administrative costs associated with section 7 consultation

regarding Federal conservation and management activities within the proposed critical habitat area.<sup>118</sup>

#### 5.1.1 BLM AND USFS MANAGEMENT ACTIVITIES

128. The BLM and USFS jointly survey for the presence of the Oregon plants prior to all activities occurring on BLM or USFS land (e.g., timber harvest, grazing, mining, etc.). If the Oregon plants are found within a project area, activity-specific project design criteria designed to preserve the plants and their habitat are implemented. These criteria are discussed qualitatively in Chapter 6 and are expected to have minimal economic impact.
129. The BLM and USFS manage roughly 900,000 acres in Jackson, Josephine, and Douglas Counties. On average, the BLM and USFS survey roughly 30,000 acres annually for the presence of endangered and threatened species. Applying this ratio to the BLM and USFS areas proposed for critical habitat, this analysis estimates that roughly 48 acres are surveyed annually for the Oregon plants within the study area at a cost of \$314.<sup>119,120</sup>
130. Additionally, the BLM maintains a management plan (Medford District Bureau of Land Management Resource Management Plan), which covers all BLM activities, including its species management activities on BLM land in Jackson and Josephine Counties. The management plan is updated every five years. Each updated version of the management plan is subject to programmatic section 7 consultation with the Service to determine the effects of BLM activities on the Oregon plants and their habitat. The baseline administrative costs of the programmatic consultation are estimated to be \$26,700 (undiscounted), while the incremental administrative costs associated with addressing adverse modification following the designation of critical habitat are estimated to be \$8,910 (undiscounted). These costs are included in the impacts presented in Exhibit 5-1.

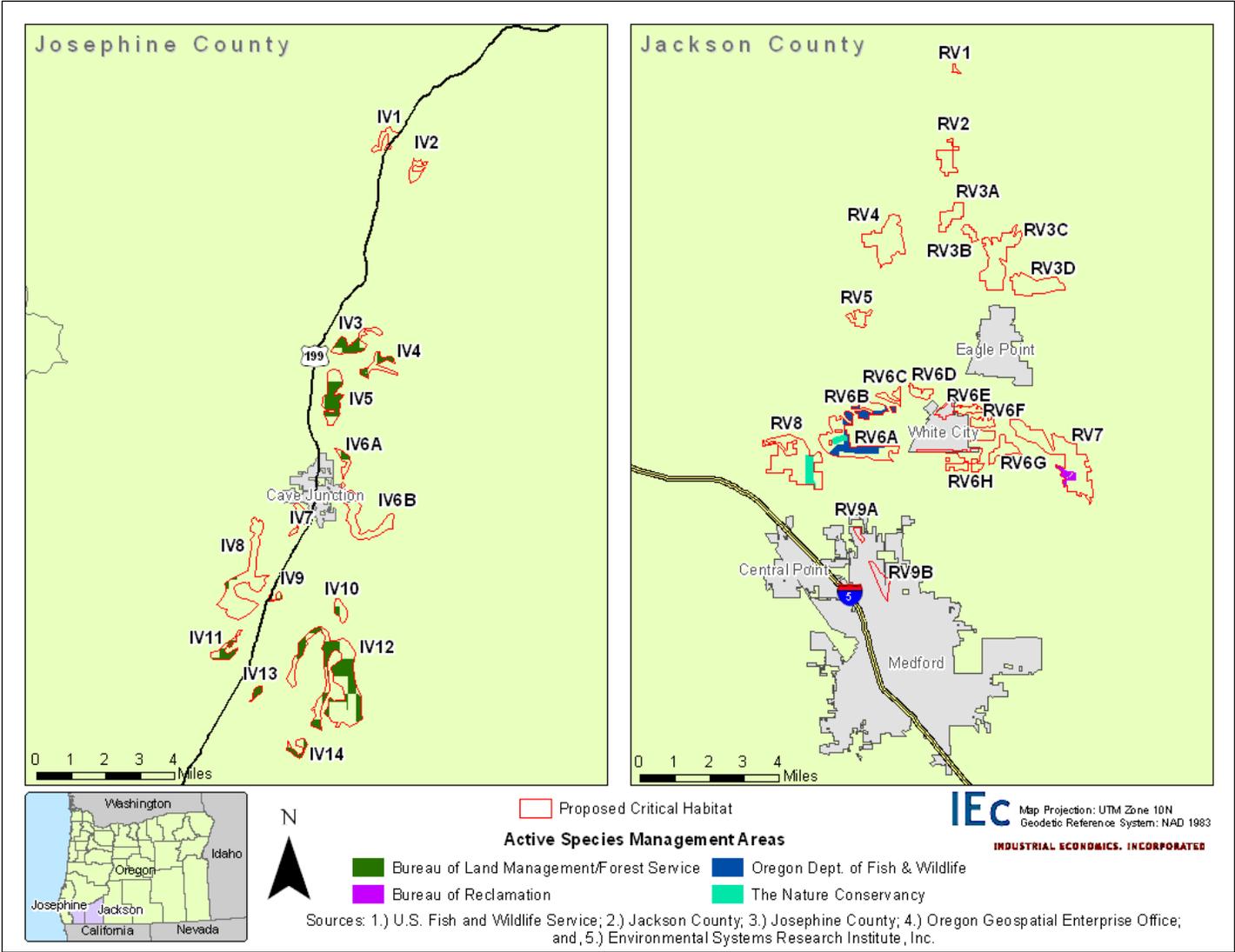
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<sup>118</sup> Based on personal communication with Mark Mousseaux, Botanist, Medford District of the U.S. Bureau of Land Management on October 16, 2009 and Darren Borgias, Ecologist, The Nature Conservancy on November 6, 2009; and, U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Proposed Designation of Critical Habitat for *Limnanthes floccosa* ssp. (Large-Flowered Woolly Meadowfoam) and *Lomatium cookii* (Cook's Lomatium); Proposed Rule, published in the *Federal Register* on Tuesday, July 28, 2009, Vol. 74, No. 143).

<sup>119</sup> Based on personal communication with Mark Mousseaux, Botanist, Medford District of the U.S. Bureau of Land Management on October 16, 2009.

<sup>120</sup> Assumes an average survey cost per acre of \$6.50 based on direct communication with the BLM.

EXHIBIT 5-2 AREAS WITHIN PROPOSED CRITICAL HABITAT WHERE ACTIVE SPECIES MANAGEMENT FOR THE OREGON PLANTS OCCURS



#### 5.1.2 BOR MANAGEMENT ACTIVITIES

131. The BOR actively manages 94 acres of vernal pool habitat within the Agate Lake Resource Area (RV7 subunit).<sup>121</sup> Activities include surveying for the Oregon plants and vernal pool fairy shrimp and experimental prescribed burns and controlled grazing to preserve and enhance vernal pool habitat.<sup>122</sup> Based on direct communication with The Nature Conservancy, which engages in active management for the Oregon plants throughout Jackson and Josephine Counties, annual management costs are estimated to be approximately \$200 per acre.<sup>123</sup> Thus, BOR management costs are estimated to be \$18,800 annually.

#### 5.1.3 OREGON DEPARTMENT OF FISH AND WILDLIFE MANAGEMENT ACTIVITIES

132. The Oregon Department of Fish and Wildlife currently manages 213 acres within the Denman Wildlife Area to enhance and restore vernal pool-mounded prairie habitat (RV6A, RV6B, and RV6C subunits).<sup>124</sup> Such management activities also benefit the Oregon plants present in the area. This analysis applies an average annual management cost of \$200 per acre to estimate annual costs to the Oregon Department of Fish and Wildlife of \$42,600.<sup>125</sup>

#### 5.1.4 THE NATURE CONSERVANCY MANAGEMENT ACTIVITIES

133. The Nature Conservancy manages for the Oregon plants and their habitat within its Agate Desert Preserve (RV6A subunit) and Whetstone Savanna Preserve (RV8 subunit).<sup>126</sup> Approximately 54 acres of the Agate Desert Preserve and 144 acres of the Whetstone Savanna Preserve intersect proposed critical habitat. Management activities include: monitoring for the species, preserving vernal pool habitat through prescribed burns and controlled grazing, fencing known populations of Oregon plants and maintaining educational signs, and management plan development.<sup>127</sup> Annual management costs are

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<sup>121</sup> U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Proposed Designation of Critical Habitat for *Limnanthes floccosa* ssp. (Large-Flowered Woolly Meadowfoam) and *Lomatium cookii* (Cook's Iomatium); Proposed Rule, published in the *Federal Register* on Tuesday, July 28, 2009, Vol. 74, No. 143).

<sup>122</sup> Bureau of Reclamation. 2000. Agate Lake Resource Management Plan. United States Department of the Interior, Bureau of Reclamation, Pacific Northwest Region, Lower Columbia Area Office. Portland, Oregon.

<sup>123</sup> Based on written communication with Darren Borgias, Ecologist, The Nature Conservancy on November 9, 2009. Assumes the BOR management costs are similar to The Nature Conservancy Costs given the similarity in management activities.

<sup>124</sup> U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Proposed Designation of Critical Habitat for *Limnanthes floccosa* ssp. (Large-Flowered Woolly Meadowfoam) and *Lomatium cookii* (Cook's Iomatium); Proposed Rule, published in the *Federal Register* on Tuesday, July 28, 2009, Vol. 74, No. 143).

<sup>125</sup> Based on written communication with Darren Borgias, Ecologist, The Nature Conservancy on November 9, 2009. Assumes the BOR management costs are similar to The Nature Conservancy Costs given the similarity in management activities.

<sup>126</sup> U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Proposed Designation of Critical Habitat for *Limnanthes floccosa* ssp. (Large-Flowered Woolly Meadowfoam) and *Lomatium cookii* (Cook's Iomatium); Proposed Rule, published in the *Federal Register* on Tuesday, July 28, 2009, Vol. 74, No. 143).

<sup>127</sup> Personal communication with Darren Borgias, Ecologist, The Nature Conservancy on November 6, 2009.

estimated to be \$200 per acre.<sup>128</sup> Applying the average annual management cost per acre to the total number of acres managed by The Nature Conservancy in the study area, annual costs to The Nature Conservancy associated with active management for the Oregon plants are estimated to be \$39,600.

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<sup>128</sup> Personal communication with Darren Borgias, Ecologist, The Nature Conservancy on November 9, 2009. Some management activities are completed by volunteers, but there are still costs associated with recruiting, coordinating, and supervising volunteers. Average costs do not include the costs of periodic reseeding efforts.

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## CHAPTER 6 | ACTIVITIES NOT LIKELY TO BE AFFECTED BY CONSERVATION FOR THE OREGON PLANTS

134. Several activities identified as threats to the Oregon plants in the proposed rule are not expected to incur economic impacts (neither baseline nor incremental) following the designation of critical habitat for the Oregon plants. Specifically, agricultural, grazing, recreational, timber harvest, fire management, and mining activities are not expected to implement conservation efforts for the Oregon plants. This chapter describes the extent of these activities within the study area, the threats to the Oregon plants associated with these activities, and the reasons that no impacts to these activities are expected within the study area.

### 6.1 AGRICULTURAL ACTIVITIES

135. Agricultural activities occur on private lands within the study area. Based on zoning data, approximately 128 and 3,200 acres in Josephine and Jackson counties, respectively, support agriculture.<sup>129</sup> Exhibit 6-1 presents the distribution of agricultural lands within the study area. Much of the agricultural land is used for grazing. Agricultural land not being used for grazing is used primarily to grow grapes in Josephine County and fruit trees (pears and apples) in Jackson County.<sup>130</sup>
136. Agricultural development activities, which include leveling, ditching, tilling, stock pond construction, and water impoundment may be threats to the Oregon plants and their habitat.<sup>131</sup> The proposed rule specifically identifies agricultural development as a threat in 11 critical habitat units (RV1, RV2, RV3A-D, RV4, RV5, RV6A-G, RV8, IV1, IV2, IV8, and IV9).

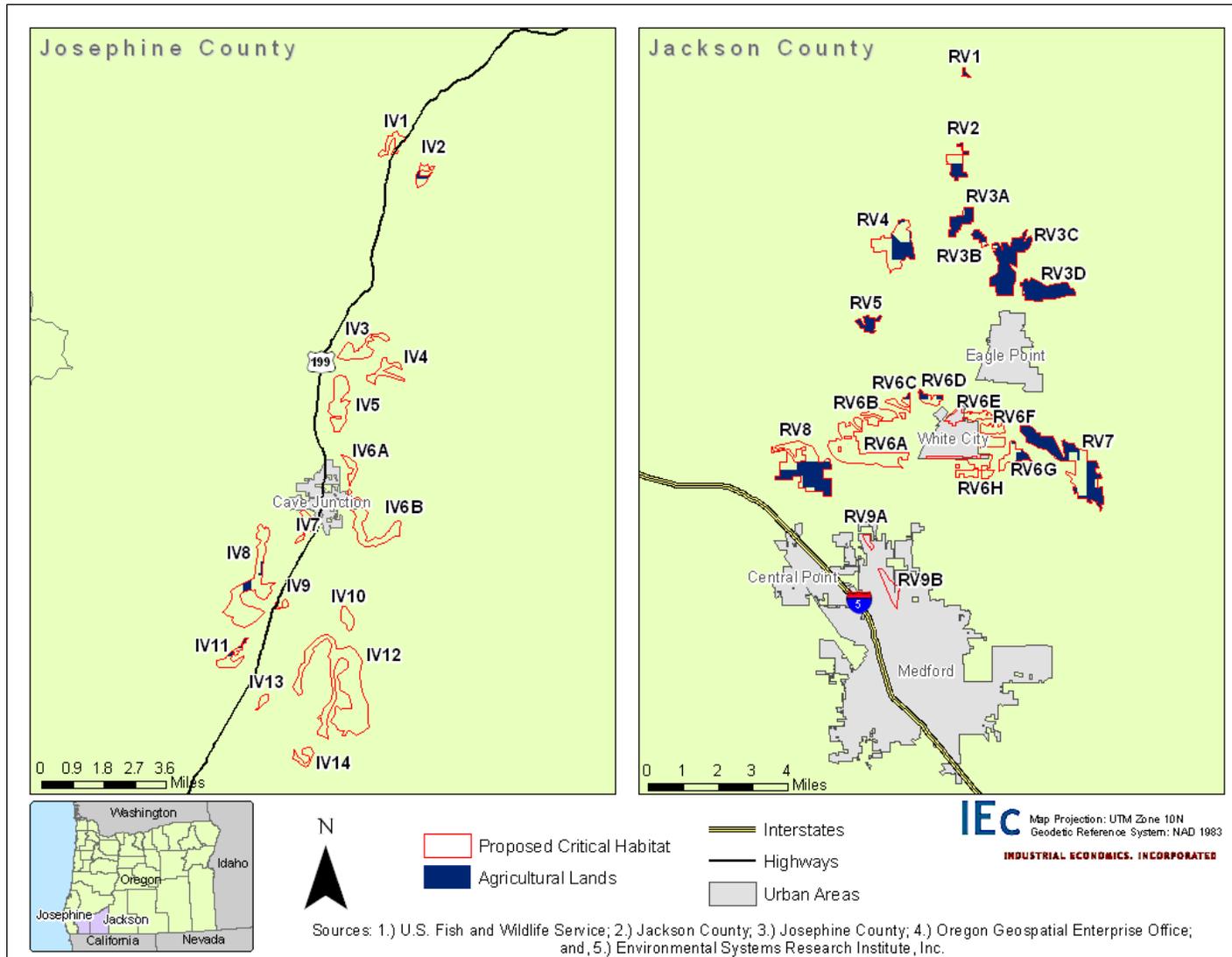
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<sup>129</sup> Based on GIS analysis using zoning data for Josephine and Jackson Counties: Josephine County. 2009. Zoning (Polygon dataset). Accessed online at <http://68.185.2.151/website/data/shapefiles/> on October 5, 2009; and, Jackson County GIS Services. 2005. Jackson County Zoning (Polygon Dataset). Accessed online at <http://www.smartmap.org/downloads.cfm> on October 5, 2009.

<sup>130</sup> U.S. Fish and Wildlife Service. 2006. Draft Recovery Plan for Listed Species of the Rogue Valley Vernal Pool & Illinois Valley Wet Meadow Ecosystems. U.S. Department of the Interior. Fish and Wildlife Service. Region 1. Portland, Oregon.

<sup>131</sup> U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Proposed Designation of Critical Habitat for *Limnanthes floccosa* ssp. (Large-Flowered Woolly Meadowfoam) and *Lomatium cookii* (Cook's lomatium); Proposed Rule, published in the *Federal Register* on Tuesday, July 28, 2009, Vol. 74, No. 143.

EXHIBIT 6-1 THE DISTRIBUTION OF AGRICULTURAL LANDS WITHIN PROPOSED CRITICAL HABITAT AND THE PROPOSED CRITICAL HABITAT UNITS WHERE AGRICULTURAL ACTIVITIES ARE IDENTIFIED AS A THREAT TO THE OREGON PLANTS AND CRITICAL HABITAT



137. To date, no section 7 consultations have occurred regarding agricultural activities within the study area.<sup>132</sup> The Service and the Natural Resource Conservation Service (NRCS) indicate that the lack of section 7 consultations addressing agricultural activities within the study area stems from limited Federal involvement in agricultural activities in Jackson and Josephine Counties.<sup>133</sup> Private agricultural land owners may enroll in three voluntary Federal programs, including, the Grassland Reserve Program, Wetland Reserve Program, and the Environmental Quality Incentives Program (EQIP) run by the NRCS.<sup>134</sup> Enrollment in such programs would require that the NRCS survey an applicant's lands for the presence of threatened and endangered species and determine if the land intersects critical habitat for threatened and endangered species.<sup>135</sup> If a threatened or endangered species or critical habitat is identified on the applicant's land, the NRCS would likely enter into section 7 consultation with the Service. Although landowners have expressed interest in NRCS-administered, voluntary agricultural programs, no landowners are currently enrolled in any NRCS program within the study area or within the entirety of Josephine and Jackson Counties.<sup>136</sup>
138. The fact that no landowners are currently enrolled in voluntary agricultural programs may be related to landowners' desire to avoid potential additional regulation due to section 7 consultation if the Oregon plants or critical habitat for the Oregon plants was present on their land.<sup>137</sup> However, that no landowners are currently enrolled in a voluntary agricultural program in Josephine and Jackson Counties on the whole suggests that landowners may avoid Federal involvement as a general rule or may have determined a lack of need for these programs, independent of the presence of the Oregon plants or their critical habitat.
139. In the case that landowners choose not to enroll in a voluntary program because of the presence of the Oregon plants or their critical habitat, the foregone financial benefits of enrolling in a voluntary agricultural program, which are lost by choosing to not enroll, may be considered an impact of the presence of the listed Oregon plants or their critical habitat. Quantification of these impacts, however, is difficult. The potential financial benefit of enrolling in a voluntary agricultural program is dependant on the amount of funding received and its purpose, which, because no landowner has taken advantage of

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<sup>132</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

<sup>133</sup> Personal communication with: the U.S. Fish and Wildlife Service, Roseburg Field Office on October 7, 2009; and, Nicola Giardina, Resource Conservationist for the Medford Service Center of the Natural Resource Conservation Service on October 7, 2009.

<sup>134</sup> Personal communication with Nicola Giardina, Resource Conservationist for the Medford Service Center of the Natural Resource Conservation Service on October 7, 2009.

<sup>135</sup> 50 CFR Part 402

<sup>136</sup> Personal communication with Nicola Giardina, Resource Conservationist for the Medford Service Center of the Natural Resource Conservation Service on October 7, 2009.

<sup>137</sup> Personal communication with Nicola Giardina, Resource Conservationist for the Medford Service Center of the Natural Resource Conservation Service on October 7, 2009.

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the programs in the region, are both unknown. In the case that landowners are disadvantaged by avoiding Federal programs in order to avoid potential conservation effort recommendations specifically for the Oregon plants and their habitat, this analysis underestimates impacts to agricultural landowners. Any omitted impacts, however, would be expected to be considered baseline as the Service does not anticipate recommending additional conservation measures for the Oregon plants following the designation of critical habitat.<sup>138</sup>

140. Section 404 of the Clean Water Act requires parties to obtain a permit from the U.S. Army Corps of Engineers (USACE) prior to discharging dredge or fill material into “water of the United States.”<sup>139</sup> As defined in Part 232 of the Clean Water Act, however, normal farming, silviculture, and ranching activities, including, plowing, seeding, cultivating, minor drainage, and harvesting for the production of food, fiber, and forest products are exempt from section 404 of the Clean Water Act.<sup>140</sup> One exception to this exemption is the utilization of “deep-ripping” activities.<sup>141</sup> “Deep-ripping” activities within vernal pool habitat always require a permit pursuant to section 404 of the Clean Water Act.<sup>142</sup> Within the study area, ripping is primarily used to convert agricultural lands for development (ripping breaks the impermeable soil layer allowing water to drain and eliminating wetlands). While the issuance of a 404 permit for this activity within the study area would require the USACE to consider the need for section 7 consultation with the Service due to the presence of the Oregon plants and their habitat, this activity has not occurred in the past within the study area and available information does not indicate that this is likely to change in the foreseeable future.<sup>143</sup> It is possible that deep ripping activities are occurring illegally without a 404 permit. However, there is no way to determine the extent of such activities within the study area.
141. Finally, there are no effects to agricultural activities within the study area due to the Oregon plants being State-listed species. Although the presence of State-listed plants on State lands requires a State agency to develop a written evaluation of the potential effects to the plant species associated with the proposed project and consult with the Oregon Department of Agriculture, the regulations do not apply to privately-funded projects

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<sup>138</sup> Written communication with the U.S. Fish and Wildlife Service on October 14, 2009.

<sup>139</sup> U.S. Code. Title 33, 1344.

<sup>140</sup> 40 CFR Part 232

<sup>141</sup> “Deep-ripping” is defined by the U.S. Army Corps of Engineers and the Environmental Protection Agency as the: “mechanical manipulation of the soil to break up or pierce highly compacted, impermeable or slowly permeable subsurface soil layers, or other similar kinds of restrictive soil layers.” From: Department of the Army, U.S. Army Corps of Engineers and United States Environmental Protection Agency. 1996. Regulatory Guidance Letter 96-02: Applicability of Exemptions under Section 404(f) to “Deep-Ripping” Activities in Wetlands. Expires 31 December 2001.

<sup>142</sup> Department of the Army, U.S. Army Corps of Engineers and United States Environmental Protection Agency. 1996. Regulatory Guidance Letter 96-02: Applicability of Exemptions under Section 404(f) to “Deep-Ripping” Activities in Wetlands. Expires 31 December 2001.

<sup>143</sup> Personal communication with Marina Christoffersen and Shelly Hanson, U.S. Army Corps of Engineers on October 26, 2009 and October 28, 2009, respectively.

occurring on private lands, which is characteristic of all agricultural activities within the study area.<sup>144</sup>

## 6.2 GRAZING ACTIVITIES

142. Grazing activities occur on private agricultural lands within the study area. The distribution of agricultural lands is presented in Exhibit 6-1. The extent of grazing activity on this private, agricultural land is unknown. Moderate grazing activity during the spring and summer months is thought to benefit the Oregon plants by limiting competition with grasses, noxious weeds, and non-native plant species. Further, grazing limits forest succession, which would convert the grassy meadows where Oregon plants are found to shrubland and eventually forestland. It is only “incompatible grazing” practices that are considered a threat to the Oregon plants and their habitat. The proposed rule defines “incompatible grazing” practices as intensive grazing activity especially during the late fall and winter when Oregon plant seeds are dispersed. “Incompatible grazing” is considered a threat in each of the units for which agricultural activities are considered a threat plus units RV7 and IV7.<sup>145</sup>
143. Similar to agricultural activities, no consultations have occurred for grazing activities within the study area.<sup>146</sup> Again, this is thought to stem from a lack of Federal involvement in grazing activities within Jackson and Josephine Counties as a whole.<sup>147</sup> Currently, there are no active grazing allotments on Bureau of Land Management (BLM) and U.S. Forest Service (USFS) land within the study area. The last grazing allotment in the Illinois Valley (the majority of Federal land within the study area is located in the Illinois Valley) was pulled five years ago because land was not suitable for grazing.<sup>148</sup> Landowners do not require a section 404 permit pursuant to the Clean Water Act in order to engage in “normal ranching activities,” which include maintenance of stock ponds and water impoundment structures (e.g., dams and dikes) as part of established and ongoing grazing operations.<sup>149</sup> The lack of section 7 consultations for grazing activities within the study area indicates that landowners are not engaging in grazing activities outside of these normal maintenance activities. That is, landowners are not creating new water impoundments or converting lands for grazing, which might require a section 404 permit.

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<sup>144</sup> OAR 603-073.

<sup>145</sup> U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Proposed Designation of Critical Habitat for *Limnanthes floccosa* ssp. (Large-Flowered Woolly Meadowfoam) and *Lomatium cookii* (Cook's Lomatium); Proposed Rule, published in the *Federal Register* on Tuesday, July 28, 2009, Vol. 74, No. 143.

<sup>146</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

<sup>147</sup> Personal communication with: the U.S. Fish and Wildlife Service, Roseburg Field Office on October 7, 2009; and, Nicola Giardina, Resource Conservationist for the Medford Service Center of the Natural Resource Conservation Service on October 7, 2009.

<sup>148</sup> Based on a review of activity plans for the Medford District of the BLM accessed online at: <http://www.blm.gov/or/districts/medford/plans/activityplans.php> on October 27, 2009; and, personal communication with Mark Mousseaux, Medford District BLM Botanist, on October 16, 2009.

<sup>149</sup> 40 CFR Part 232

Given the lack of grazing activities with a Federal nexus, grazing activities are not expected to be affected by the presence of the Oregon plants or their critical habitat.

144. Again, State regulations for State-listed plants do not apply to privately-funded projects on private land. Thus, grazing activities within the study area are not affected by existing State regulations.<sup>150</sup>

### 6.3 TIMBER HARVEST ACTIVITIES

145. Approximately 1,704 acres in Jackson County and 2,577 acres in Josephine County are zoned for timber harvest.<sup>151</sup> Timber harvest activities within the study area are primarily limited to private and Federal lands within the Illinois Valley in Josephine County. In Jackson County, 85 acres of timberland are Federally owned, while 879 acres are privately owned. In Josephine County, 1,447 acres of timberland are Federally owned, while 1,064 acres are privately owned. Although the State engages in timber harvest activities on lands owned or managed by Oregon Department of Forestry (ODF), no ODF lands exist within the study area.<sup>152</sup> State and local lands account for 741 acres of areas zoned for timber harvest in Jackson County and 67 acres of areas zoned for timber harvest in Josephine County.<sup>153</sup> These lands are mainly parks and wildlife management areas where active timber harvest does not occur. Given that timber harvests only occur on Federal and private lands within the study area, regulations associated with the State-listing of the Oregon plants are not applicable as such regulations only apply to projects proposed by State agencies.<sup>154</sup>
146. According to the proposed rule, timber harvest activities are considered a threat to Cook's lomatium and its habitat (no critical habitat for the large flowered woolly meadowfoam is proposed in the Illinois Valley) in five critical habitat units in the Illinois Valley (IV1, IV2, IV3, IV4, and IV5).<sup>155</sup> Timber harvest activities are not identified as a threat to the Oregon plants or their habitat in critical habitat units within the Rogue Valley in Jackson County as timber harvest is limited in these units. Exhibit 6-2 presents the distribution of

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<sup>150</sup> OAR 603-073.

<sup>151</sup> Based on GIS analysis using zoning data for Josephine and Jackson Counties: Josephine County. 2009. Zoning (Polygon dataset). Accessed online at <http://68.185.2.151/website/data/shapefiles/> on October 5, 2009; and, Jackson County GIS Services. 2005. Jackson County Zoning (Polygon Dataset). Accessed online at <http://www.smartmap.org/downloads.cfm> on October 5, 2009.

<sup>152</sup> U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Proposed Designation of Critical Habitat for *Limnanthes floccosa* ssp. (Large-Flowered Woolly Meadowfoam) and *Lomatium cookii* (Cook's lomatium); Proposed Rule, published in the *Federal Register* on Tuesday, July 28, 2009, Vol. 74, No. 143.

<sup>153</sup> Based on GIS analysis using zoning data for Josephine and Jackson Counties: Josephine County. 2009. Zoning (Polygon dataset). Accessed online at <http://68.185.2.151/website/data/shapefiles/> on October 5, 2009; and, Jackson County GIS Services. 2005. Jackson County Zoning (Polygon Dataset). Accessed online at <http://www.smartmap.org/downloads.cfm> on October 5, 2009.

<sup>154</sup> OAR 603-073.

<sup>155</sup> U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Proposed Designation of Critical Habitat for *Limnanthes floccosa* ssp. (Large-Flowered Woolly Meadowfoam) and *Lomatium cookii* (Cook's lomatium); Proposed Rule, published in the *Federal Register* on Tuesday, July 28, 2009, Vol. 74, No. 143.

Federal and private timberlands within the study area. Timber harvest activities on Federal and private lands are described in more detail below.

#### 6.3.1 TIMBER HARVEST ACTIVITIES ON FEDERAL LANDS

147. On Federal lands within the study area, timber harvests occur on lands managed by the BLM and USFS. Timber harvests on BLM and USFS lands within the study area are subject to “project design criteria” if field surveys locate Cook’s lomatium or suitable vernal pool habitat within a proposed project area (survey costs are quantified in Chapter 5).<sup>156</sup> Project design criteria are conservation efforts developed by the BLM and USFS to limit impacts to listed species during planned projects.<sup>157</sup> The project design criteria for timber harvest activities include the installation of buffer areas of varying size (depending on the harvest activity) around known plant populations. In particular, no timber harvest is allowed within 25 feet and no heavy equipment is allowed within 100 feet of a plant population boundary.
148. In general, timber harvests occur in forested areas where Cook’s lomatium does not exist. However, some timber harvests occur on the edge of meadows containing Cook’s lomatium or its habitat. In these cases, the edge of a timber harvest abutting a meadow containing a known Cook’s lomatium population may intersect with a buffer area for the species which might result in a reduction in the size or volume of the timber harvest. Because buffer areas for Cook’s lomatium are relatively small (several hundred square feet) compared with the overall size of a timber harvest (several acres) they are only expected to affect the outer edge of a timber harvest area. Thus, reductions in the size or volume of timber harvests due to buffer areas for Cook’s lomatium are expected to be small relative to the overall timber harvest. In most cases, reduced harvest sizes and volumes can be made up by increasing the harvest size or volume in areas where the plants are not present at no additional cost.<sup>158</sup>

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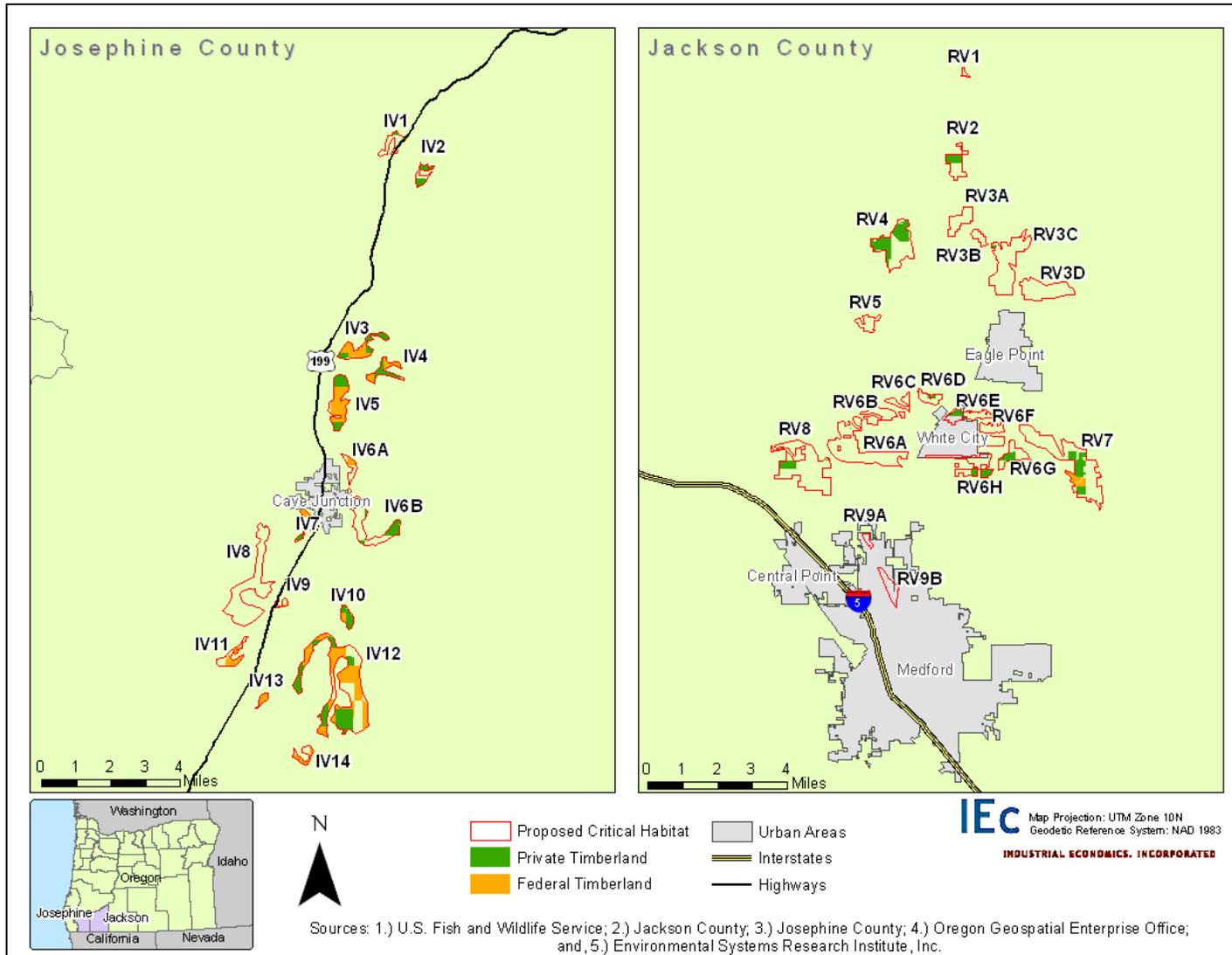
<sup>156</sup> Medford District of the Bureau of Land Management to the U.S. Fish and Wildlife Service. 2008. FY 2009-2013 Programmatic Assessment For Activities that May Affect the listed endangered plant species Gentner’s Fritillary, Cook’s Lomatium, McDonald’s rockcress, and large-flowered woolly meadowfoam (Biological Assessment). Submitted to the Service on August 28, 2008.

<sup>157</sup> U.S. Bureau of Land Management to U.S. Fish and Wildlife Service, “Rogue River/South Coast Biological Assessment FY 04-08 for Activities that may affect listed species in the Rogue River/South Coast Province for Medford District, Bureau of Land Management, Rogue River and Siskiyou National Forests,” July 11, 2003.

<sup>158</sup> Personal communication with Mark Mousseaux, Botanist, Medford District of the U.S. Bureau of Land Management on October 16, 2009.

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EXHIBIT 6-2 DISTRIBUTION OF TIMBERLANDS WITHIN PROPOSED CRITICAL HABITAT BY OWNER-TYPE AND PROPOSED CRITICAL HABITAT UNITS WHERE TIMBER HARVEST ACTIVITIES ARE IDENTIFIED AS A THREAT TO THE OREGON PLANTS AND CRITICAL HABITAT



149. Because the BLM implements project design criteria wherever Cook's lomatium or suitable seasonal wetland habitat for Cook's lomatium is found, there are no areas within proposed critical habitat where project design criteria would not already be implemented during a future project.<sup>159</sup> The BLM does not plan on revising existing project design criteria following the designation of critical habitat. Therefore, timber harvest activities on Federal lands are not expected to incur any incremental impacts.

#### 6.3.2 TIMBER HARVEST ACTIVITIES ON PRIVATE LANDS

150. On private lands, timber harvest activities may require a section 404 permit pursuant to the Clean Water Act from the USACE or a special use permit from the BLM or USFS in order to access private inholdings across Federal lands. Similar to agricultural and grazing activities, "normal timber harvest" activities are exempt from requiring a section 404 permit.<sup>160</sup> To date, no section 7 consultations have occurred for timber harvest projects requiring a 404 permit within the study area indicating that timber harvest activities within the study area are not outside of normal practices.<sup>161</sup>
151. Special use permits are issued by Federal agencies to allow private landowners to access inholdings on Federal land. There have been no section 7 consultations for special use permits required to access private timberlands within Federal lands.<sup>162</sup> Further, the BLM does not anticipate any future special use permits requiring section 7 consultation for the Oregon plants.<sup>163</sup> As all proposed critical habitat is considered occupied by one of the Oregon plants, the designation of critical habitat should not increase the number of future section 7 consultations.<sup>164</sup> Finally, the Service does not anticipate requiring any additional conservation measures for the Oregon plants following the designation of critical habitat.<sup>165</sup> Given the lack of section 7 consultations for timber harvest projects requiring 404 or special use permits and the fact that the rate of future section 7 consultations will not increase following the designation of critical habitat, timber harvest activities on private lands are not expected to be affected by the presence of the Oregon plants or their critical habitat.

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<sup>159</sup> Personal communication with Mark Mousseaux, Botanist, Medford District of the U.S. Bureau of Land Management on October 16, 2009.

<sup>160</sup> 40 CFR Part 232.

<sup>161</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

<sup>162</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

<sup>163</sup> Personal communication with Mark Mousseaux, Botanist, Medford District of the U.S. Bureau of Land Management on October 16, 2009.

<sup>164</sup> Written communication with the U.S. Fish and Wildlife Service on September 14, 2009.

<sup>165</sup> Written communication with the U.S. Fish and Wildlife Service on October 14, 2009.

#### 6.4 FIRE MANAGEMENT ACTIVITIES

152. Fire management activities occur in areas where the potential exists for a wildland fire (i.e., forested, shrubland, and meadow areas) on Federal, State, and private lands within the study area. Fire management activities are typically carried out as part of large Federally-funded projects under the National Forest Plan. In general, threats to the Oregon plants associated with fire management activities include encroachment of woody vegetation and increased interspecies competition due to increased intervals between fires leading to enhanced forest succession. The proposed rule identifies three critical habitat units where fire management activities are a threat to the Oregon plants and their habitat because of either fireline construction or woody vegetative succession (RV7, IV1, and IV2).<sup>166</sup>
153. Fire management activities on Federal lands occur on lands managed by the BLM and USFS. Fire management projects on BLM and USFS land are subject to project design criteria similar to the criteria developed for timber harvest projects on these lands. Project design criteria prohibit fire management activities from occurring within 25 feet of known plant populations although hand slashing is allowed within buffer areas during the dormancy period (late fall and winter). Further, mechanical slashing is prohibited within 100 feet of known plant populations regardless of the time of year.<sup>167</sup>
154. The economic impacts associated with implementing project design criteria for the Oregon plants during fire management projects are expected to be minimal.<sup>168</sup> If anything, the installation of buffer areas reduces fire management costs by reducing the area where fire management can occur; although there may be some costs if fire management projects have to be delayed until the dormancy period for the plants. The real potential for economic impact associated with implementing project design criteria for the Oregon plants stems from increased risk of fire or increased fire severity due to fewer areas receiving fuels management. To date, the risk of wildland fires is not thought to have increased due to the installation of buffer areas for the Oregon plants. Further, there have been section 7 consultations on fire management activities on BLM or USFS land indicating that the project design criteria have provided sufficient protection of the Oregon plants to date.<sup>169</sup> In the future, the Service does not anticipate requiring additional conservation measures for the Oregon plants following the designation of

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<sup>166</sup> U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Proposed Designation of Critical Habitat for *Limnanthes floccosa* ssp. (Large-Flowered Woolly Meadowfoam) and *Lomatium cookii* (Cook's Lomatium); Proposed Rule, published in the *Federal Register* on Tuesday, July 28, 2009, Vol. 74, No. 143.

<sup>167</sup> Medford District of the Bureau of Land Management to the U.S. Fish and Wildlife Service. 2008. FY 2009-2013 Programmatic Assessment For Activities that May Affect the listed endangered plant species Gentner's Fritillary, Cook's Lomatium, McDonald's rockcress, and large-flowered woolly meadowfoam (Biological Assessment). Submitted to the Service on August 28, 2008.

<sup>168</sup> Personal communication with Mark Mousseaux, Botanist, Medford District of the U.S. Bureau of Land Management on October 16, 2009.

<sup>169</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

critical habitat.<sup>170</sup> Therefore, the risk of wildland fire is not expected to increase in the future due to conservation for the Oregon plants.

155. The majority of fire management projects on State and private lands are expected to be Federally-funded and, thus, subject to section 7 consultation for the Oregon plants. To date, there have been no section 7 consultations on fire management projects within the study area.<sup>171</sup> Conservation measures implemented as part of future Federally-funded fire management projects on State and private lands are expected to be subject to similar restrictions as fire management projects on BLM and USFS land. Impacts associated with these conservation measures are expected to stem mainly from increased risk of fire, which as noted previously, has not increased in the past due to the presence of the Oregon plants.
156. Given that the presence of the Oregon plants or their critical habitat is not expected to increase the risk of wildland fire on Federal, State, or private lands within the study area, economic impacts associated with modifications to fire management activities are not quantified in this analysis.

#### 6.5 RECREATIONAL ACTIVITIES

157. The level of recreation activity, including hiking, camping, or off-road vehicle (ORV) use within the study area is unknown. In the case that section 7 consultation on recreational activities, such as building and maintaining trails and campgrounds, resulted in changes to the implementation of these projects or to the level of recreational activity supported by these projects, economic impacts could result. To date, however, there have been no consultations on recreation projects within the study area.<sup>172</sup> Absent information that future recreation projects may be affected, this analysis does not expect recreation activities to experience economic impacts of conservation for the Oregon plants or their habitat.

#### 6.6 MINING ACTIVITIES

158. Surface mining for gold is the major mining activity within the study area.<sup>173</sup> According to current, county zoning data, there are no areas zoned for mining within the Josephine County portion of the study area, and only 76 acres zoned for mining within the Jackson County portion of the study area (54 acres in RV4 and 22 acres in RV8).<sup>174</sup> Personal

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<sup>170</sup> Written communication from the U.S. Fish and Wildlife Service on September 14, 2009 and October 14, 2009.

<sup>171</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

<sup>172</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

<sup>173</sup> Personal communication with the U.S. Fish and Wildlife Service on August 19, 2009.

<sup>174</sup> Based on GIS analysis using zoning data for Josephine and Jackson Counties: Josephine County, 2009. Zoning (Polygon dataset). Accessed online at <http://68.185.2.151/website/data/shapefiles/> on October 5, 2009; and, Jackson County GIS

communication with the BLM indicates that there are a number of existing mining claims on BLM land within the study area in Josephine County.<sup>175</sup> Specifically, the BLM estimates that 37 percent of all known Cook's lomatium population areas on BLM land are within existing mining claims. Potential therefore exists for gold mining activities to be affected by conservation for the Oregon plants and their critical habitat.

159. Additionally, phytomining operations for nickel have occurred in the vicinity of proposed critical habitat in the past.<sup>176</sup> Phytomining is the extraction of rare metals through the cultivation and harvest of hyperaccumulator plants that naturally extract the metals-of-interest from the soil. This section describes conventional mining activities on private and BLM land, separately, as well as phytomining activities on both private and public lands.

#### 6.6.1 CONVENTIONAL MINING ACTIVITIES ON PRIVATE LANDS

160. On private lands, mining activities are subject to section 404 of the Clean Water Act preventing the discharge of dredge or fill material into wetlands.<sup>177</sup> If a section 404 permit is required for a mining project on private lands, the project must avoid impacts to wetland areas or mitigate for unavoidable impacts. The need for a 404 permit may also trigger section 7 consultation if an endangered or threatened species is present within the project area. To date, there has been one formal section 7 consultation addressing the potential effects of a mining project on the Oregon plants within the study area (on lands zoned for mining in RV8).<sup>178</sup>
161. Given the limited amount of private land within the study area zoned for mining and the fact that only one mining project has occurred to date on these lands, the potential for future mining projects on private lands to be impacted by the presence of the Oregon plants is considered low. Further, any impacts to future mining activities on private lands within the study area would be baseline impacts as the Service expects that the conservation efforts implemented to avoid impacting known populations of the Oregon plants during mining activities will provide sufficient protection of Oregon plants critical habitat.<sup>179</sup> Thus, this analysis does not quantify impacts to mining activities on private lands. To the extent that future mining activities on private lands within the study area

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Services. 2005. Jackson County Zoning (Polygon Dataset). Accessed online at <http://www.smartmap.org/downloads.cfm> on October 5, 2009.

<sup>175</sup> Personal communication with Mark Mousseaux and Kirby Bean of the U.S. Bureau of Land Management on October 16, 2009 and October 19, 2009, respectively.

<sup>176</sup> Letter from Viridian Resources, L.L.C. to the Service. Public comment on the Economic Analysis of Critical Habitat Designation for the Large-Flowered Woolly Meadowfoam and Cook's Lomatium (Draft Report prepared for the U.S. Fish and Wildlife Service by Industrial Economics, Incorporated on December 4, 2009). February 12, 2010 (Document ID: FWS-R1-ES-2009-0046-0019.1).

<sup>177</sup> U.S. Code. Title 33, 1344.

<sup>178</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

<sup>179</sup> Written communication with the U.S. Fish and Wildlife Service on September 14, 2009 and October 14, 2009.

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are impacted by the presence of the Oregon plants, this analysis underestimates baseline impacts to mining activities.

#### 6.6.2 CONVENTIONAL MINING ACTIVITIES ON BLM LAND

162. On BLM land, mining operations require a notice or a plan of operation be submitted to the BLM prior to the onset of mining activity.<sup>180</sup> If a mining operation is proposed within an “area of critical environmental concern” then a plan of operation must be prepared and go through a full environmental review including a NEPA analysis and section 7 consultation, if any endangered or threatened species or their critical habitat are present. All BLM areas containing known populations of the Oregon plants are considered “areas of critical environmental concern.”<sup>181</sup> Thus, any mining project on BLM land would require the development of a plan of operation and section 7 consultation with the Service. To date, there have been no section 7 consultations for mining activities on BLM land.<sup>182</sup> This indicates that there has been no mining activity on BLM land within the study area despite a number of existing mining claims. In general, mining activity levels are determined by a number of factors including, gold prices, environmental regulations, and existing technology.<sup>183</sup> One reason for the lack of mining activity on BLM land in the study area is that the existing claims in the study area were heavily mined at the turn of the century, so there may be limited gold present at the sites.
163. The additional environmental regulation that existing claims areas in the study area are subject to may also cause reductions in mining activity. For any mining project within the study area, the BLM would require surveys for the Oregon plants.<sup>184</sup> If the plants were found within the project area, mining activities would have to be altered to protect existing plant populations. In many cases, this might mean precluding mining activities from specific areas within the proposed project area.<sup>185</sup> Given that all proposed critical habitat areas are considered occupied by one of the Oregon plants, all mining projects on BLM land within the study area would be required to avoid plant areas.<sup>186</sup>
164. One miner did contact the BLM in the last year about expanding an existing mining operation into one of his mining claims within the study area. However, no plan of operation has been submitted to the Service to date. It is unclear whether this miner has decided not to pursue his claim or is still planning on submitting a plan of operation. If

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<sup>180</sup> 43 CFR Part 3809

<sup>181</sup> Personal communication with Kirby Bean, Mining Specialist, U.S. Bureau of Land Management on October 19, 2009.

<sup>182</sup> Based on a review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

<sup>183</sup> Personal communication with Kirby Bean, Mining Specialist, U.S. Bureau of Land Management on October 19, 2009.

<sup>184</sup> Medford District of the Bureau of Land Management to the U.S. Fish and Wildlife Service. 2008. FY 2009-2013 Programmatic Assessment For Activities that May Affect the listed endangered plant species Gentner’s Fritillary, Cook’s Lomatium, McDonald’s rockcress, and large-flowered woolly meadowfoam (Biological Assessment). Submitted to the Service on August 28, 2008.

<sup>185</sup> Personal communication with Kirby Bean, Mining Specialist, U.S. Bureau of Land Management on October 19, 2009.

<sup>186</sup> Written communication with the U.S. Fish and Wildlife Service on September 14, 2009.

the miner did decide to not pursue his claim, it may be due to the environmental regulation that mining claims are subject to within the study area. Given the number of factors that may cause a miner to not pursue an active claim within the study area, this analysis does not attempt to quantify impacts associated with not pursuing active mining claims within the study area. If miners are avoiding existing claims within the study area due to the potential additional environmental regulation, the impacts resulting from foregone profits from mining operations within these areas may be attributable to conservation for the Oregon plants. However, any such impacts would be baseline impacts, as the Service anticipates any conservation efforts they would recommend to avoid jeopardy to the Oregon plants would be sufficiently protective of critical habitat.<sup>187</sup> To the extent that miners are not pursuing active claims within the study area due to the presence of the Oregon plants, this analysis underestimates baseline economic impacts to mining activities.

#### 6.6.3 PHYTOMINING OPERATIONS ON PRIVATE AND PUBLIC LANDS

165. A comment from Viridian Resources, L.L.C. on the draft version of this analysis noted that it should include information on impacts of critical habitat designation on phytomining activities. In the past, experimental phytomining operations have occurred in the vicinity of proposed critical habitat for the Oregon plants.<sup>188</sup> The goal of these operations was the extraction of nickel from serpentine soils through the use of hyperaccumulator plants. Two species of yellowtuft (*Alyssum murale* and *Alyssum corsicum*) were cultivated for phytomining purposes.<sup>189</sup> Due to the spread of these species beyond cultivated areas into sensitive plant habitats, both yellowtuft species were placed on the Oregon Noxious Weed Quarantine List by the Oregon Department of Agriculture (ODA) pursuant to OAR 603-052-1200 in 2009.<sup>190</sup> As quarantined noxious weeds, the entry of the plants into Oregon, as well as the transport, purchase, sale, or propagation of the plants within Oregon is prohibited.<sup>191</sup>
166. As the planting of both yellowtuft species is currently prohibited under State regulations, potential economic costs of precluding the activity are not associated with the designation of critical habitat for the Oregon plants. The removal of yellowtuft species due to their listing as State noxious weeds will benefit the Oregon plants and their critical habitat by reducing inter-species competition.<sup>192</sup> However, the removal of the plants would occur

<sup>187</sup> U.S. Fish and Wildlife Service Memorandum to Industrial Economics, Inc. September 14, 2009. Economic Analysis Memorandum Regarding Proposed Critical Habitat Designation for *Limnanthes floccosa* ssp. *grandiflora* and *Lomatium cookii*.

<sup>188</sup> Letter from Viridian Resources LLC to the Service. Public comment on the Economic Analysis of Critical Habitat Designation for the Large-Flowered Woolly Meadowfoam and Cook's Lomatium (Draft Report prepared for the U.S. Fish and Wildlife Service by Industrial Economics, Incorporated on December 4, 2009). February 12, 2010 (Document ID: FWS-R1-ES-2009-0046-0019.1).

<sup>189</sup> The presence of *Alyssum* is listed as a threat to the Oregon plants in 74 FR 37314.

<sup>190</sup> Personal communication with Tim Butler, Noxious Weed Control Program Supervisor, Oregon Department of Agriculture on March 8, 2010.

<sup>191</sup> Oregon Administrative Rules. Oregon Department of Agriculture 603-052-1200. Quarantine; Noxious Weeds.

<sup>192</sup> Personal communication with the Service on March 4, 2010.

even absent the designation of critical habitat for the Oregon plants. According to ODA, the listing of the yellowtuft species as noxious weeds was well under way prior to the publication of the proposed critical habitat rule.

167. While critical habitat for the Oregon plants did not result in the statewide prohibition of the yellowtuft species, the effects on Oregon plant populations were considered when listing the yellowtuft species as noxious weeds.<sup>193</sup> Precluding phytomining activity does provide a conservation benefit to the Oregon plants. The economic impacts of precluding phytomining within the proposed critical habitat area, however, are considered baseline impacts and, as such, not related to the outcome of the critical habitat rulemaking.

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<sup>193</sup> Personal communication with Tim Butler, Noxious Weed Control Program Supervisor, Oregon Department of Agriculture on March 8, 2010.

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## CHAPTER 7 | ECONOMIC BENEFITS

168. Characterization of the potential economic benefits of critical habitat designation for the Oregon plants provides context to the cost analyses presented in the preceding chapters. This chapter first describes the categories of economic benefit that may derive from the conservation of species and habitats, and discusses the research methods that economists employ to quantify these benefits. Next, this chapter summarizes Oregon plants conservation efforts described in Chapters 3, 4, and 5 of this report and links them with potential categories of economic benefit that may derive from their implementation. This chapter does not, however, attempt to quantify the potential baseline and incremental benefits described.

**7.1 CATEGORIES OF BENEFIT RELATING TO SPECIES AND HABITAT CONSERVATION**

169. The primary goal of listing a species is to conserve and recover the species and its habitat (as with critical habitat). Various economic benefits, measured in terms of social welfare or regional economic performance, may also result from species and habitat conservation. The benefits of species and habitat conservation can be placed into two broad categories: (1) those associated with the primary goal of species conservation, and (2) those that derive from the habitat conservation efforts to achieve this primary goal.

170. Because a purpose of the Act is to provide for the conservation of endangered and threatened species, the benefits of actions taken under the Act are often measured in terms of the value placed by the public on species preservation (e.g., avoidance of extinction, and/or increase in a species' population). Such social welfare values for a species may reflect both use and non-use values for the species and habitat. Use values derive from a direct use for a species, such as commercial harvesting or recreational wildlife-viewing opportunities. Non-use values are not derived from direct use of the species, but instead reflect the utility the public derives from knowledge that a species continues to exist (e.g., existence or bequest values).

171. As a result of actions taken to preserve endangered and threatened species, such as habitat management, various other benefits may accrue to the public. Conservation efforts for species and habitat may result in improved environmental quality, which in turn may have collateral human health or recreational use benefits. In addition, conservation efforts undertaken for the benefit of a threatened or endangered species may enhance shared habitat for other wildlife. Such benefits may be a direct result of modifications to projects, or may be collateral to such actions. For example, a section 7 consultation may result in the installation of buffer strips around wetlands, in order to reduce sedimentation due to construction activities. A reduction in sediment load may directly benefit water

quality, while the presence of buffer strips may also provide the collateral benefits of preserving habitat for terrestrial species and enhancing nearby residential property values (e.g., preservation of open space).

172. Economists apply a variety of methodological approaches in estimating both use and non-use values for species and for habitat improvements, including stated preference and revealed preference methods. Stated preference techniques include the contingent valuation method and conjoint analysis or contingent ranking methods. In simplest terms, these methods employ survey techniques, asking respondents to state what they would be willing to pay for a resource or for programs designed to protect that resource. A substantial literature has developed that describes the application of this technique to the valuation of natural resource assets.
173. More specific to use values for species or habitats, revealed preference techniques examine individuals' behavior in markets in response to changes in environmental or other amenities, i.e., people "reveal" their value by their behavior. For example, travel cost models are frequently applied to value access to recreational opportunities, as well as to value changes in the quality and characteristics of these opportunities. Basic travel cost models are rooted in the idea that the value of a recreation resource can be estimated by analyzing the travel and time costs incurred by individuals visiting the site. Another revealed preference technique is hedonic analysis, which is often employed to determine the effect of specific site characteristics on property values.

## 7.2 POTENTIAL BENEFITS OF OREGON PLANTS CONSERVATION

174. This section describes the categories of potential benefits that may result from Oregon plants conservation efforts within the study area. Exhibit 7-1 summarizes potential benefits associated with the specific Oregon plants conservation described in Chapters 3, 4, and 5 of this report. The first column summarizes Oregon plants conservation efforts by activity. The second column identifies potential categories of benefits that may derive from implementation of these conservation actions. A description of these categories of benefit is provided below. The final columns of the exhibit identify the subunits in which baseline or incremental benefits may occur. Whether the benefits deriving from the conservation actions are baseline or incremental depends on the reason for implementing the action. As described in Chapters 3, 4 and 5 of this report, all conservation efforts for the Oregon plants quantified in this analysis are part of the economic baseline. That is, the critical habitat designation is not expected to result in additional conservation for the species.
175. The categories of economic benefit that may derive from the Oregon plants conservation actions described in this report include:
- **Improved water quality:** Offsetting development by establishing mitigation areas may improve water quality within and adjacent to the mitigation areas. Water quality improvements may in turn have human health and human use (e.g., recreation) benefits.

- **Property value benefits:** Open space or decreased density of development resulting from Oregon plants conservation (e.g., establishing mitigation areas to be managed for the conservation of the species) may increase adjacent or nearby property values.
- **Aesthetic benefits:** Social welfare gains may be associated with enhanced aesthetic quality of habitat. Preferences for aesthetic improvements may be measured through increased willingness-to-pay to visit a habitat region for recreation or increased visitation. To the extent that establishing mitigation areas for the plants improves the aesthetic quality of an area, benefits may therefore accrue.
- **Educational benefits:** Surveying of project areas for the Oregon plants may offer educational benefits in that more is known about the species and where populations exist. This knowledge could help direct future conservation efforts.
- **Regional economic benefits:** To the extent that improved water quality, increased open space, aesthetic benefits, or increased knowledge of the Oregon plants and their habitat lead to an increase in visitation to the region (e.g., for recreation such as hiking or wildlife-viewing), the economy and employment may benefit from increased regional spending.

In addition to these categories of potential benefit, all of the conservation efforts described in Exhibit 7-1 are related to the broader conservation and recovery of the Oregon plants. For example, mitigation area establishment is undertaken to offset unavoidable impacts to vernal pool habitat, which support Oregon plant populations. All conservation actions therefore relate to the maintenance or enhancement of the use and non-use value (e.g., existence value) that the public may hold specifically for the Oregon plants. Further, many of the conservation efforts undertaken for the Oregon plants may also result in improvements to ecosystem health that are shared by other, coexisting species (e.g., the vernal pool fairy shrimp). The maintenance or enhancement of use and non-use values for these other species, or for biodiversity in general, may also result from Oregon plants conservation actions.

EXHIBIT 7-1 OREGON PLANTS CONSERVATION ACTIONS AND POTENTIAL ASSOCIATED BENEFITS

CONSERVATION ACTION	POTENTIAL ASSOCIATED BENEFITS	APPLICABLE SUBUNITS			
		BASELINE BENEFIT		INCREMENTAL BENEFIT	
		LOW SCENARIO	HIGH SCENARIO	LOW SCENARIO	HIGH SCENARIO
<b>DEVELOPMENT</b>					
Minimization of erosion and sedimentation in vernal pool habitats	<ul style="list-style-type: none"> <li>Improved water quality</li> </ul>				
Mitigation area establishment and development	<ul style="list-style-type: none"> <li>Improved water quality</li> <li>Increased property value due decreased density of development</li> <li>Aesthetic benefits due to open space preservation</li> <li>Regional economic benefits associated with increased human-use value (e.g., increased tourism)</li> </ul>	RV6A-H, RV8, & RV9A-B	RV6A-H, RV8, RV9A-B, IV6A-B, IV7, IV8, IV9, & IV10		Incremental impacts limited to administrative costs.
Mitigation area monitoring and management	<ul style="list-style-type: none"> <li>Educational benefit associated with knowing location and status of plant populations</li> <li>Regional economic benefits associated with increased human-use value (e.g., increased tourism)</li> </ul>				
<b>TRANSPORTATION ACTIVITIES</b>					
Special Management Area management plan development					Incremental impacts limited to administrative costs.
Habitat enhancement	<ul style="list-style-type: none"> <li>Aesthetic benefit associated with improved roadside areas</li> </ul>	RV6A, B, C, E, IV6B, & IV9			
Monitoring	<ul style="list-style-type: none"> <li>Educational benefit associated with knowing location and status of plant populations</li> </ul>				
Mitigation/conservation bank establishment and development	<ul style="list-style-type: none"> <li>Improved water quality</li> <li>Aesthetic benefits due to open space preservation</li> <li>Regional economic benefits associated with increased human-use value (e.g., increased tourism)</li> </ul>	RV8			
<b>SPECIES MANAGEMENT</b>					
Active management (e.g., removal of noxious weeds from vernal pool habitat)	<ul style="list-style-type: none"> <li>Aesthetic benefit associated with improved habitat areas</li> </ul>	RV6A-C, RV7, RV8			Incremental impacts limited to administrative costs.
Surveying	<ul style="list-style-type: none"> <li>Educational benefit associated with knowing location and status of plant populations</li> </ul>	IV1, IV3, IV4, IV5, IV6A-B, IV8, IV9, IV10, IV11, IV12, IV13, & IV14			

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5 U.S.C. § 601 et seq.

16 U.S.C. §1533(b)(2).

40 CFR Part 230.1-7.

40 CFR Part 232

43 CFR Part 3809

50 CFR Part 402

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## APPENDIX A | SMALL BUSINESS ANALYSIS AND ENERGY IMPACTS ANALYSIS

1. This appendix considers the extent to which incremental impacts of critical habitat designation for the Oregon plants may be borne by small entities and the energy industry. The analysis presented in Section A.1 is conducted pursuant to the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996. Information for this analysis was gathered from the Small Business Administration (SBA), the Service, and from interviews with stakeholders contacted in the development of the economic analysis. The energy analysis in Section A.2 is conducted pursuant to Executive Order No. 13211.
2. The analyses of impacts to small entities and the energy industry rely on the estimated incremental impacts resulting from the proposed critical habitat designation. The incremental impacts of the rulemaking are most relevant for the small business and energy impacts analyses because they reflect costs that may be avoided or reduced based on decisions regarding the composition of the final rule. The baseline impacts associated with the listing of the Oregon plants and other Federal, State, and local regulations and policies, as quantified in Chapters 3, 4, and 5 of this report, are expected to occur regardless of the outcome of this rulemaking. The only incremental impacts forecast in this analysis are administrative costs of consultation, as quantified by activity in Chapters 3, 4, and 5.

### A.1 SBREFA ANALYSIS

3. When a Federal agency proposes regulations, the RFA requires the agency to prepare and make available for public comment an analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions as defined by the RFA).<sup>1</sup> No initial regulatory flexibility analysis is required if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the RFA to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have significant economic impact on a substantial number of small entities. To assist in this process, this appendix provides a screening level analysis of the potential for Oregon plants critical habitat to affect small entities.

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<sup>1</sup> 5 U.S.C. § 601 et seq.

4. To ensure broad consideration of impacts on small entities, the Service has prepared this small business analysis without first making the threshold determination in the proposed rule regarding whether the proposed critical habitat designation could be certified as not having a significant economic impact on a substantial number of small entities. This small business analysis will therefore inform the Service’s threshold determination.

**A.1.1 REQUIREMENTS OF SBREFA ANALYSIS**

5. This analysis is intended to improve the Service's understanding of the potential effects of the proposed rule on small entities and to identify opportunities to minimize these impacts in the final rulemaking. The Act requires the Service to designate critical habitat for threatened and endangered species to the maximum extent prudent and determinable. Section 4(b)(2) of the Act requires that the Service designate critical habitat “on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security, and any other relevant impact, of specifying any particular areas as critical habitat.” The Secretary’s discretion is limited as (s)he may not exclude areas if so doing “will result in the extinction of the species.”
6. Three types of small entities are defined in the RFA:
  - **Small Business** - Section 601(3) of the RFA defines a small business as having the same meaning as small business concern under section 3 of the Small Business Act. This includes any firm that is independently owned and operated and is not dominant in its field of operation. The SBA has developed size standards to carry out the purposes of the Small Business Act, and those size standards can be found in 13 CFR 121.201. The size standards are matched to NAICS industries. The SBA definition of a small business applies to a firm’s parent company and all affiliates as a single entity.
  - **Small Governmental Jurisdiction** - Section 601(5) defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with a population of less than 50,000. Special districts may include those servicing irrigation, ports, parks and recreation, sanitation, drainage, soil and water conservation, road assessment, etc. When counties have populations greater than 50,000, those municipalities of fewer than 50,000 can be identified using population reports. Other types of small government entities are not as easily identified under this standard, as they are not typically classified by population.
  - **Small Organization** - Section 601(4) defines a small organization as any not-for-profit enterprise that is independently owned and operated and not dominant in its field. Small organizations may include private hospitals, educational institutions, irrigation districts, public utilities, agricultural co-ops, etc.
7. The courts have held that the RFA/SBREFA requires Federal agencies to perform a regulatory flexibility analysis of forecast impacts to small entities that are directly regulated. In the case of *Mid-Tex Electric Cooperative, Inc., v. Federal Energy Regulatory Commission (FERC)*, FERC proposed regulations affecting the manner in

which generating utilities incorporated construction work in progress in their rates. The generating utilities that expected to be regulated were large businesses; however, their customers -- transmitting utilities such as electric cooperatives -- included numerous small entities. In this case, the court agreed that FERC simply authorized large electric generators to pass these costs through to their transmitting and retail utility customers, and FERC could therefore certify that small entities were not directly impacted within the definition of the RFA.<sup>2</sup>

8. Similarly, *American Trucking Associations, Inc. v. Environmental Protection Agency* (EPA) addressed a rulemaking in which EPA established a primary national ambient air quality standard for ozone and particulate matter.<sup>3</sup> The basis of EPA's RFA/SBREFA certification was that this standard did not directly regulate small entities; instead, small entities were indirectly regulated through the implementation of state plans that incorporated the standards. The court found that, while EPA imposed regulation on states, it did not have authority under this rule to impose regulations directly on small entities and therefore small entities were not directly impacted within the definition of the RFA.
9. The SBA in its guidance on how to comply with the RFA recognizes that consideration of indirectly affected small entities is not required by the RFA, but encourages agencies to perform a regulatory flexibility analysis even when the impacts of its regulation are indirect.<sup>4</sup> "If an agency can accomplish its statutory mission in a more cost-effective manner, the Office of Advocacy [of the SBA] believes that it is good public policy to do so. The only way an agency can determine this is if it does not certify regulations that it knows will have a significant impact on small entities even if the small entities are regulated by a delegation of authority from the Federal agency to some other governing body."<sup>5</sup>
10. The regulatory mechanism through which critical habitat protections are enforced is section 7 of the Act, which directly regulates only those activities carried out, funded, or permitted by a Federal agency. By definition, Federal agencies are not considered small entities, although the activities they may fund or permit may be proposed or carried out by small entities. Given the SBA guidance described above, this analysis considers the extent to which this designation could potentially affect small entities, regardless of whether these entities would be directly regulated by the Service through the proposed rule or by a delegation of impact from the directly regulated entity.

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<sup>2</sup> 773 F. 2d 327 (D.C. Cir. 1985).

<sup>3</sup> 175 F. 3d 1027, 1044 (D.C. Cir. 1999).

<sup>4</sup> Small Business Administration, Office of Advocacy. May 2003. A Guide for Government Agencies: How to Comply with the Regulatory Flexibility Act, pg. 20.

<sup>5</sup> *Ibid.*, pg. 21.

### A.1.2 DISCUSSION OF IMPACTS TO SMALL ENTITIES

11. This screening analysis focuses on small entities that may bear the incremental impacts of this rulemaking quantified in Chapters 3, 4, and 5 of this economic analysis. As detailed in these chapters, this analysis does not forecast any incremental impacts beyond additional administrative costs associated with considering adverse modification during future section 7 consultations. Small entities may participate in section 7 consultation regarding the Oregon plants as a third party (the primary consulting parties being the Service and the Federal action agency) and may spend additional time and effort considering potential critical habitat issues. These incremental administrative costs of consultation borne by third parties are the subject of this SBREFA analysis.<sup>6</sup>
12. Chapters 3, 4, and 5 of this analysis forecast consultations for development, transportation, and species conservation and management activities, as follows.
  - **Development.** Future consultations on development are forecast to be triggered by the need for a section 404 permit pursuant to the Clean Water Act, which requires section 7 consultation if a project may affect a listed species. The U.S. Army Corps of Engineers (USACE) is the consulting Federal agency on consultations for section 404 permits. Future consultations for 404 permits would also include third parties, such as private developers or county agencies. Private developers may be considered small entities if their annual income is less than \$7.0 million. This analysis assumes that consultation costs will be borne by developers as an additional project expense, rather than by landowners who would experience consultation costs as a land value loss.<sup>7</sup>
  - **Transportation.** As described in Chapter 4, all incremental impacts are forecast to be incurred by the Service and the Oregon Department of Transportation, which, as a State agency, is not considered small.
  - **Species management conservation.** Chapter 5 describes that all incremental impacts are forecast to be borne by the U.S. Bureau of Land Management, a Federal agency and the Service. As a result, no incremental impacts are expected to be borne by small entities.
13. As incremental impacts to development activities are the only incremental impacts that may be borne by small entities, the remainder of this analysis focuses on development.

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<sup>6</sup> Incremental administrative costs of consultation that would be borne by the Federal action agency and the Service are not relevant to this screening analysis as these entities (Federal agencies) are not small.

<sup>7</sup> If there is a large amount of land available for development outside of proposed critical habitat areas, incremental administrative costs of consultation may be borne by landowners rather than developers. Some landowners within the study area are expected qualify as small entities, however they are not addressed in this analysis. The assumption that incremental impacts will be borne by developers is applicable in this analysis given that much of the developable areas around White City fall within proposed critical habitat. Thus, there are few areas outside of critical habitat that would allow for the expansion of White City beyond its current boundaries. To the extent that incremental impacts are borne by landowners rather than developers, this analysis estimates the effects of incremental impacts to the wrong small businesses (i.e., small developers rather than small landowners).

14. Based on the forecast low scenario for future development activity (as described in Chapter 3), approximately 1.13 development projects are expected to occur annually within the study area. Based on the forecast high scenario for future development activity (as described in Chapter 3), approximately 6.55 development projects are expected to occur annually within the study area. This analysis assumes that all future development projects within the study area will require formal section 7 consultation triggered by the need for a section 404 permit pursuant to the Clean Water Act. Thus, 1.13 formal consultations are forecast to occur annually under the low scenario, while 6.55 formal consultations are forecast to occur annually under the high scenario.
15. Applying the third party costs of addressing adverse modification during formal section 7 consultation (\$875 as described in Exhibit 2-2) to the number of forecast consultations annually, this analysis estimates that the present value of incremental third party costs is equal to \$11,200 for all small entities combined under the low impact scenario and \$65,000 under the high impact scenario (applying a seven percent discount rate).<sup>8</sup> In terms of annualized impacts, these present values translate to \$1,050 for all small entities under the low impact scenario and \$6,140 under the high impact scenario (applying a seven percent discount rate).
16. Third parties involved in past development consultations have included Jackson County and private developers. The population of Jackson County was approximately 201,000 in 2008; thus, Jackson County exceeds the small governmental jurisdiction population threshold of 50,000 people.<sup>9</sup> Private developers have included local development companies such as Galpin and Associates and commercial entities such as Amy's Kitchen, Inc.<sup>10</sup> Forecast consultations on development projects are expected to include Jackson County agencies, local private developers, and relatively-large commercial entities as contained in the consultation history.
17. To the extent that forecast consultations include Jackson County agencies or large commercial entities, incremental administrative costs will not be borne by small entities. However, a large portion of forecast consultations for development activities are expected to include local private developers, which may be small entities depending on their annual revenues. In the past, development projects within the study area have included site preparation such as leveling of land, filling of wetlands, and excavation in addition to building construction. Therefore, land subdivision, which includes excavating land and preparing it for future residential, commercial, and industrial construction, is identified as

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<sup>8</sup> Annual costs are estimated by multiplying the forecast number of annual consultations for development activities under the low and high scenarios and the third party costs associated with addressing adverse modification on future section 7 consultations. Low impacts = (1.13 consultations) x (\$875). High impacts = (6.55 consultations) x (\$875).

<sup>9</sup> U.S. Census Bureau. 2009. Table 1: Annual Estimates of the Resident Population for Counties of Oregon: April 1, 2000 to July 1, 2008 (CO-EST2008-01-41). Population Division, U.S. Census Bureau. March 19, 2009.

<sup>10</sup> Review of the consultation history for the Oregon plants from 2002 through 2009 provided by the Service on August 13, 2009.

the most-applicable-industry to capture local private developers that may bear incremental administrative costs due to the designation of critical habitat.<sup>11</sup>

18. Exhibit A-1 presents the results of a Dun and Bradstreet search for the number of land subdivision companies within Jackson and Josephine Counties and the number of these companies that are small, applying an annual revenue threshold of \$7.0 million. As described in Exhibit A-1, roughly 99 percent of land subdivision companies within Jackson and Josephine Counties are small entities.<sup>12</sup> Absent information on the specific third parties that may be involved in future development consultations, this analysis conservatively assumes that all of the entities involved in future consultation efforts are small land subdivision companies.
19. Exhibit A-1 describes potentially affected land subdivision businesses, highlighting the relevant small business threshold. The threshold marks the high end annual revenues expected for any potentially affected small businesses. The Exhibit highlights that expected annual impacts to the land subdivision industry (\$1,050 under the low impact scenario and \$6,140 under the high impact scenario) are significantly less than the maximum annual revenues that could be generated by a single small land subdivision entity (\$7.0 million). Annual revenues of small development companies within the study area are expected to be similar to the annual revenues for Galpin and Associates (a small land subdivision company identified in the consultation history), which are equal to \$910,000 as reported by Dun and Bradstreet.<sup>13</sup>

**EXHIBIT A-1 SUMMARY OF POTENTIAL IMPACTS ON INDIVIDUAL SMALL DEVELOPMENT BUSINESSES**

ITEM		VALUE
Industry and NAICS Code		Land Subdivision (NAICS code 237210)
Small Entity Size Standard		\$7.0 million
Number of Entities in Study Area		95
Number of Small Entities in Study Area		94
Percent of Total Entities that are "Small"		99%
Annualized Incremental Economic Impacts to Small Entities (7 percent discount)	Low	\$1,050
	High	\$6,140
Source: Dialog search of File 516, Dun and Bradstreet, "Duns Market Identifiers," on November 23, 2009.		

20. While 95 land subdivision companies operate within the counties containing critical habitat, the number of these that may be involved in development projects subject to consultation for the Oregon plants is unknown. The estimated annualized impact may be

<sup>11</sup> U.S. Census Bureau. 2007. NAICS Definition. Accessed online at: <http://www.census.gov/eos/www/naics/> on November 30, 2009.

<sup>12</sup> Dialog search of File 516, Dun and Bradstreet, "Duns Market Identifiers," on November 23, 2009.

<sup>13</sup> Dialog search of File 516, Dun and Bradstreet, "Duns Market Identifiers," on December 1, 2009.

borne by one company or distributed across many. If all impacts were borne by a single small development company, the estimated annualized impact would represent less than one percent of total annual revenues under both the low and high impact scenarios (assuming average annual revenues for a small development company of \$910,000).

**A.2 POTENTIAL IMPACTS TO THE ENERGY INDUSTRY**

21. Pursuant to Executive Order No. 13211, “Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use,” issued May 18, 2001, Federal agencies must prepare and submit a “Statement of Energy Effects” for all “significant energy actions.” The purpose of this requirement is to ensure that all Federal agencies “appropriately weigh and consider the effects of the Federal Government’s regulations on the supply, distribution, and use of energy.”<sup>14</sup>
22. The Office of Management and Budget provides guidance for implementing this Executive Order, outlining nine outcomes that may constitute “a significant adverse effect” when compared with the regulatory action under consideration:
  - Reductions in crude oil supply in excess of 10,000 barrels per day (bbls);
  - Reductions in fuel production in excess of 4,000 barrels per day;
  - Reductions in coal production in excess of 5 million tons per year;
  - Reductions in natural gas production in excess of 25 million Mcf per year;
  - Reductions in electricity production in excess of 1 billion kilowatts-hours per year or in excess of 500 megawatts of installed capacity;
  - Increases in energy use required by the regulatory action that exceed the thresholds above;
  - Increases in the cost of energy production in excess of one percent;
  - Increases in the cost of energy distribution in excess of one percent; or
  - Other similarly adverse outcomes.<sup>15</sup>
23. As none of these criteria is relevant to this analysis, energy-related impacts associated with conservation actions within the potential critical habitat are not expected.

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<sup>14</sup> Memorandum For Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance For Implementing E.O. 13211, M-01-27, Office of Management and Budget, July 13, 2001, <http://www.whitehouse.gov/omb/memoranda/m01-27.html>.

<sup>15</sup> Memorandum For Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance For Implementing E.O. 13211, M-01-27, Office of Management and Budget, July 13, 2001, <http://www.whitehouse.gov/omb/memoranda/m01-27.html>.

**APPENDIX B | THREE PERCENT DISCOUNT RATE EXHIBITS**

1. This appendix summarizes the costs of Oregon plants conservation efforts quantified in Chapters 3 through 5 of this report applying an alternative real discount rate of three percent (the main text of the report applies a real discount rate of seven percent). This analysis employs standard discounting techniques to calculate the present value of economic impacts that are expected to occur at different points in time. Consistent with the main analysis, this appendix focuses on quantified estimates of economic impacts to development, transportation, and species management activities within the proposed critical habitat area.
2. Exhibits B-1 and B-2 summarize the distribution of estimated baseline and incremental economic impacts by subunit, respectively. The exhibits provide estimates of the present value impacts and annualized impacts described in Chapters 3 through 5 of this report employing both a three percent and a seven percent real discount rate. Exhibits B-3 through B-6 present estimated baseline and incremental economic impacts by subunit and economic activity applying a real discount rate of three percent. Finally, Exhibits B-7 and B-8 present the distribution of baseline and incremental impacts by economic activity under the low and high end scenarios applying a real discount rate of three percent.

EXHIBIT B-1 FORECAST BASELINE IMPACTS OF OREGON PLANTS CONSERVATION (2010-2029, 2009 DOLLARS)

SUBUNIT	3% DISCOUNT RATE				7% DISCOUNT RATE			
	PRESENT VALUE IMPACT		ANNUALIZED IMPACTS		PRESENT VALUE IMPACT		ANNUALIZED IMPACTS	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
RV1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV3A	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV3B	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV3C	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV3D	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV6A	\$2,180,000	\$44,300,000	\$147,000	\$2,980,000	\$1,640,000	\$32,800,000	\$154,000	\$3,100,000
RV6B	\$355,000	\$3,250,000	\$23,900	\$218,000	\$268,000	\$2,410,000	\$25,300	\$227,000
RV6C	\$15,800	\$28,700	\$1,060	\$1,930	\$13,900	\$23,400	\$1,310	\$2,210
RV6D	\$126,000	\$3,780,000	\$8,480	\$254,000	\$93,400	\$2,800,000	\$8,810	\$264,000
RV6E	\$622,000	\$17,700,000	\$41,800	\$1,190,000	\$465,000	\$13,100,000	\$43,900	\$1,230,000
RV6F	\$906,000	\$27,200,000	\$60,900	\$1,830,000	\$670,000	\$20,100,000	\$63,300	\$1,900,000
RV6G	\$142,000	\$4,260,000	\$9,560	\$287,000	\$105,000	\$3,150,000	\$9,930	\$298,000
RV6H	\$558,000	\$16,700,000	\$37,500	\$1,120,000	\$413,000	\$12,400,000	\$39,000	\$1,170,000
RV7	\$288,000	\$288,000	\$19,400	\$19,400	\$213,000	\$213,000	\$20,100	\$20,100
RV8	\$1,410,000	\$29,100,000	\$94,900	\$1,960,000	\$1,050,000	\$21,500,000	\$99,000	\$2,030,000
RV9A	\$758,000	\$758,000	\$50,900	\$50,900	\$626,000	\$626,000	\$59,100	\$59,100
RV9B	\$2,660,000	\$2,660,000	\$179,000	\$179,000	\$2,200,000	\$2,200,000	\$208,000	\$208,000
IV1	\$9	\$9	\$1	\$1	\$6	\$6	\$1	\$1
IV2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
IV3	\$9,000	\$9,000	\$605	\$605	\$6,400	\$6,400	\$604	\$604
IV4	\$5,170	\$5,170	\$348	\$348	\$3,680	\$3,680	\$347	\$347
IV5	\$14,700	\$14,700	\$988	\$988	\$10,500	\$10,500	\$987	\$987
IV6A	\$1,710	\$6,170,000	\$115	\$415,000	\$1,220	\$4,560,000	\$115	\$431,000
IV6B	\$14,900	\$30,700,000	\$1,000	\$2,070,000	\$12,300	\$22,700,000	\$1,160	\$2,150,000
IV7	\$0	\$2,260,000	\$0	\$152,000	\$0	\$1,670,000	\$0	\$158,000
IV8	\$1,530	\$20,800,000	\$103	\$1,400,000	\$1,090	\$15,400,000	\$103	\$1,460,000
IV9	\$7,970	\$1,680,000	\$535	\$113,000	\$6,620	\$1,250,000	\$625	\$118,000
IV10	\$1,410	\$109,000	\$95	\$7,310	\$1,000	\$80,400	\$95	\$7,590
IV11	\$4,660	\$4,660	\$314	\$314	\$3,320	\$3,320	\$313	\$313
IV12	\$39,900	\$39,900	\$2,680	\$2,680	\$28,400	\$28,400	\$2,680	\$2,680
IV13	\$2,160	\$2,160	\$145	\$145	\$1,540	\$1,540	\$145	\$145
IV14	\$3,420	\$3,420	\$230	\$230	\$2,430	\$2,430	\$230	\$230
<b>Total</b>	<b>\$10,100,000</b>	<b>\$212,000,000</b>	<b>\$681,000</b>	<b>\$14,200,000</b>	<b>\$7,830,000</b>	<b>\$157,000,000</b>	<b>\$739,000</b>	<b>\$14,800,000</b>

Note: Totals may not sum due to rounding.

EXHIBIT B-2 FORECAST INCREMENTAL IMPACTS OF OREGON PLANTS CONSERVATION (2010-2029, 2009 DOLLARS)

SUBUNIT	3% DISCOUNT RATE				7% DISCOUNT RATE			
	PRESENT VALUE IMPACT		ANNUALIZED IMPACTS		PRESENT VALUE IMPACT		ANNUALIZED IMPACTS	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
RV1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV3A	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV3B	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV3C	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV3D	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV4	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV5	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV6A	\$28,700	\$109,000	\$1,930	\$7,310	\$21,700	\$80,800	\$2,050	\$7,630
RV6B	\$2,500	\$7,990	\$168	\$537	\$1,950	\$6,020	\$185	\$568
RV6C	\$335	\$360	\$23	\$24	\$298	\$316	\$28	\$30
RV6D	\$2,250	\$9,190	\$151	\$618	\$1,670	\$6,800	\$157	\$642
RV6E	\$11,200	\$43,600	\$755	\$2,930	\$8,420	\$32,300	\$795	\$3,050
RV6F	\$16,200	\$66,000	\$1,090	\$4,440	\$12,000	\$48,800	\$1,130	\$4,610
RV6G	\$2,540	\$10,400	\$171	\$697	\$1,880	\$7,670	\$177	\$724
RV6H	\$9,960	\$40,700	\$669	\$2,730	\$7,370	\$30,100	\$695	\$2,840
RV7	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
RV8	\$22,100	\$74,700	\$1,480	\$5,020	\$17,600	\$56,500	\$1,660	\$5,340
RV9A	\$955	\$955	\$64	\$64	\$789	\$789	\$75	\$75
RV9B	\$3,360	\$3,360	\$226	\$226	\$2,780	\$2,780	\$262	\$262
IV1	\$3	\$3	\$0	\$0	\$2	\$2	\$0	\$0
IV2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
IV3	\$2,830	\$2,830	\$190	\$190	\$2,010	\$2,010	\$189	\$189
IV4	\$1,630	\$1,630	\$109	\$109	\$1,150	\$1,150	\$109	\$109
IV5	\$4,620	\$4,620	\$311	\$311	\$3,280	\$3,280	\$309	\$309
IV6A	\$537	\$15,500	\$36	\$1,040	\$381	\$11,500	\$36	\$1,080
IV6B	\$13	\$74,700	\$1	\$5,020	\$9	\$55,200	\$1	\$5,210
IV7	\$0	\$5,490	\$0	\$369	\$0	\$4,060	\$0	\$384
IV8	\$482	\$51,200	\$32	\$3,440	\$342	\$37,800	\$32	\$3,570
IV9	\$188	\$4,260	\$13	\$287	\$133	\$3,150	\$13	\$297
IV10	\$442	\$703	\$30	\$47	\$314	\$507	\$30	\$48
IV11	\$1,470	\$1,470	\$99	\$99	\$1,040	\$1,040	\$99	\$99
IV12	\$12,500	\$12,500	\$842	\$842	\$8,890	\$8,890	\$839	\$839
IV13	\$679	\$679	\$46	\$46	\$482	\$482	\$46	\$46
IV14	\$1,070	\$1,070	\$72	\$72	\$763	\$763	\$72	\$72
<b>Total</b>	<b>\$127,000</b>	<b>\$542,000</b>	<b>\$8,510</b>	<b>\$36,500</b>	<b>\$95,200</b>	<b>\$403,000</b>	<b>\$8,990</b>	<b>\$38,000</b>

Note: Totals may not sum due to rounding.

**EXHIBIT B-3 FORECAST BASELINE IMPACTS OF OREGON PLANTS CONSERVATION ON DEVELOPMENT ACTIVITIES (2010-2029, THREE PERCENT DISCOUNT RATE, 2009 DOLLARS)**

SUBUNIT	PRESENT VALUE IMPACTS		ANNUALIZED IMPACTS	
	LOW	HIGH	LOW	HIGH
RV6A	\$1,450,000	\$43,600,000	\$97,700	\$2,930,000
RV6B	\$99,900	\$2,990,000	\$6,710	\$201,000
RV6C	\$444	\$13,300	\$30	\$895
RV6D	\$126,000	\$3,780,000	\$8,480	\$254,000
RV6E	\$588,000	\$17,600,000	\$39,500	\$1,180,000
RV6F	\$906,000	\$27,200,000	\$60,900	\$1,830,000
RV6G	\$142,000	\$4,260,000	\$9,560	\$287,000
RV6H	\$558,000	\$16,700,000	\$37,500	\$1,120,000
RV8	\$956,000	\$28,700,000	\$64,300	\$1,930,000
RV9A	\$758,000	\$758,000	\$50,900	\$50,900
RV9B	\$2,660,000	\$2,660,000	\$179,000	\$179,000
IV6A	\$0	\$6,170,000	\$0	\$415,000
IV6B	\$0	\$30,700,000	\$0	\$2,060,000
IV7	\$0	\$2,260,000	\$0	\$152,000
IV8	\$0	\$20,800,000	\$0	\$1,400,000
IV9	\$0	\$1,680,000	\$0	\$113,000
IV10	\$0	\$107,000	\$0	\$7,220
<b>Total</b>	<b>\$8,250,000</b>	<b>\$210,000,000</b>	<b>\$555,000</b>	<b>\$14,100,000</b>
Note: Totals may not sum due to rounding.				

**EXHIBIT B-4 FORECAST INCREMENTAL IMPACTS OF OREGON PLANTS CONSERVATION ON DEVELOPMENT ACTIVITIES (2010-2029, THREE PERCENT DISCOUNT RATE, 2009 DOLLARS)**

SUBUNIT	PRESENT VALUE IMPACTS		ANNUALIZED IMPACTS	
	LOW	HIGH	LOW	HIGH
RV6A	\$25,900	\$106,000	\$1,740	\$7,120
RV6B	\$1,780	\$7,280	\$120	\$489
RV6C	\$8	\$32	\$1	\$2
RV6D	\$2,250	\$9,190	\$151	\$618
RV6E	\$10,500	\$42,800	\$705	\$2,880
RV6F	\$16,200	\$66,000	\$1,090	\$4,440
RV6G	\$2,540	\$10,400	\$171	\$697
RV6H	\$9,960	\$40,700	\$669	\$2,730
RV8	\$17,100	\$69,700	\$1,150	\$4,680
RV9A	\$955	\$955	\$64	\$64
RV9B	\$3,360	\$3,360	\$226	\$226
IV6A	\$0	\$15,000	\$0	\$1,010
IV6B	\$0	\$74,700	\$0	\$5,020
IV7	\$0	\$5,490	\$0	\$369
IV8	\$0	\$50,700	\$0	\$3,410
IV9	\$0	\$4,080	\$0	\$274
IV10	\$0	\$261	\$0	\$18
<b>Total</b>	<b>\$90,500</b>	<b>\$506,000</b>	<b>\$6,080</b>	<b>\$34,000</b>
Note: Totals may not sum due to rounding.				

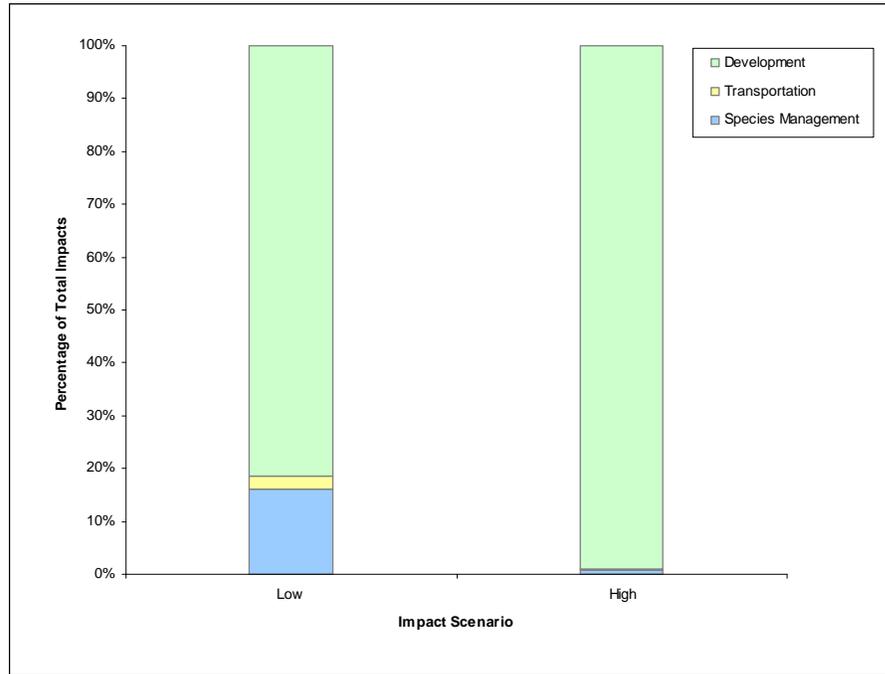
**EXHIBIT B-5 FORECAST BASELINE AND INCREMENTAL IMPACTS OF OREGON PLANTS  
CONSERVATION ON TRANSPORTATION ACTIVITIES (2010-2029, THREE PERCENT  
DISCOUNT RATE, 2009 DOLLARS)**

SUBUNIT	BASELINE IMPACTS		INCREMENTAL IMPACTS	
	PRESENT VALUE IMPACTS	ANNUALIZED IMPACTS	PRESENT VALUE IMPACTS	ANNUALIZED IMPACTS
RV6A	\$135,000	\$9,070	\$2,790	\$187
RV6B	\$32,800	\$2,200	\$713	\$48
RV6C	\$15,100	\$1,010	\$327	\$22
RV6E	\$34,300	\$2,310	\$746	\$50
RV8	\$15,000	\$1,010	\$5,000	\$336
IV6B	\$14,900	\$998	\$0	\$0
IV9	\$7,370	\$495	\$0	\$0
<b>Total</b>	<b>\$254,000</b>	<b>\$17,100</b>	<b>\$9,580</b>	<b>\$644</b>
Note: Totals may not sum due to rounding.				

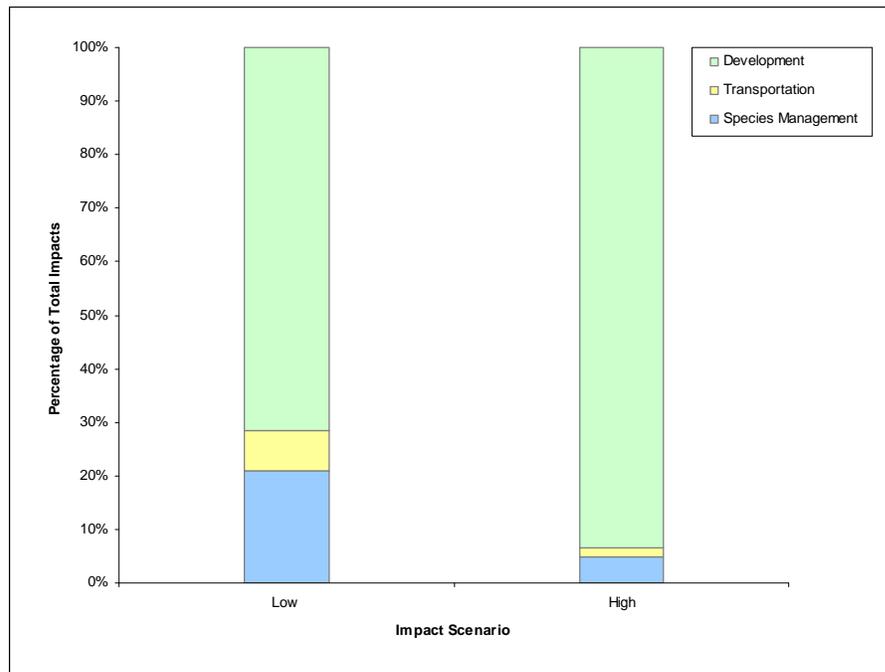
**EXHIBIT B-6 FORECAST BASELINE AND INCREMENTAL IMPACTS OF OREGON PLANTS  
CONSERVATION ON SPECIES MANAGEMENT ACTIVITIES (2010-2029, THREE  
PERCENT DISCOUNT RATE, 2009 DOLLARS)**

SUBUNIT	BASELINE IMPACTS		INCREMENTAL IMPACTS	
	PRESENT VALUE IMPACTS	ANNUALIZED IMPACTS	PRESENT VALUE IMPACTS	ANNUALIZED IMPACTS
RV6A	\$595,000	\$40,000	\$0	\$0
RV6B	\$223,000	\$15,000	\$0	\$0
RV6C	\$284	\$19	\$0	\$0
RV7	\$288,000	\$19,400	\$0	\$0
RV8	\$441,000	\$29,700	\$0	\$0
IV1	\$9	\$1	\$3	\$0
IV3	\$9,000	\$605	\$2,830	\$190
IV4	\$5,170	\$348	\$1,630	\$109
IV5	\$14,700	\$988	\$4,620	\$311
IV6A	\$1,710	\$115	\$537	\$36
IV6B	\$43	\$3	\$13	\$1
IV8	\$1,530	\$103	\$482	\$32
IV9	\$598	\$40	\$188	\$13
IV10	\$1,410	\$95	\$442	\$30
IV11	\$4,660	\$314	\$1,470	\$99
IV12	\$39,900	\$2,680	\$12,500	\$842
IV13	\$2,160	\$145	\$679	\$46
IV14	\$3,420	\$230	\$1,070	\$72
<b>Total</b>	<b>\$1,630,000</b>	<b>\$110,000</b>	<b>\$26,500</b>	<b>\$1,780</b>
Note: Totals may not sum due to rounding.				

**EXHIBIT B-7 RELATIVE CONTRIBUTION OF ECONOMIC ACTIVITIES TO FORECAST BASELINE IMPACTS (2010-2029, THREE PERCENT DISCOUNT RATE)**



**EXHIBIT B-8 RELATIVE CONTRIBUTION OF ECONOMIC ACTIVITIES TO FORECAST INCREMENTAL IMPACTS (2010-2029, THREE PERCENT DISCOUNT RATE)**



**APPENDIX C | UNDISCOUNTED IMPACTS BY ECONOMIC ACTIVITY**

1. This appendix summarizes undiscounted impacts by year for each economic activity. These details are provided in accordance with OMB guidelines for developing benefit and cost estimates. OMB directs the analysis to: “include separate schedules of the monetized benefits and costs that show the type and timing of benefits and costs, and express the estimates in this table in constant, undiscounted dollars.”<sup>1</sup> For this analysis, this applies to the cost estimates for future years. Circular A-4 directs that future estimates of value should be presented in undiscounted terms. This is an important way to clarify future costs. For example, if a program will cost \$10,000 ten years in the future, that future cost estimate should be noted as such to clarify what the cost estimate is in that year.
2. Exhibits C-1 through C-6 summarize the undiscounted costs associated with Oregon plants conservation efforts organized by economic activity. Exhibits C-1 and C-2 describe potential undiscounted baseline and incremental impacts, respectively, to development activities (as described in Chapter 3). Similarly, Exhibits C-3 and C-4 describe potential undiscounted baseline and incremental to transportation activities (Chapter 4). Finally, Exhibits C-5 and C-6 present potential undiscounted baseline and incremental impacts to species management activities (Chapter 5).

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<sup>1</sup> Office of Management and Budget, Circular A-4, September 17, 2003, p. 18). The reference to “constant” dollars indicates that the effects of general price level inflation (the tendency of all prices to increase over time) should be removed through the use of an inflation adjustment index.

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**EXHIBIT C-1 UNDISCOUNTED BASELINE IMPACTS TO DEVELOPMENT ACTIVITIES BY SUBUNIT,  
YEAR, AND IMPACT SOURCE (2009 DOLLARS)**

SUBUNIT	IMPACT		FREQUENCY	DESCRIPTION
	LOW	HIGH		
RV6A	\$268	\$1,090	Annual (2010-2029)	Actions taken to minimize adverse impacts of development activity
	\$89,500	\$2,820,000		Mitigation area establishment, development, and long-term management/monitoring
	\$5,080	\$20,700		Administrative costs of section 7 consultation
RV6B	\$18	\$75	Annual (2010-2029)	Actions taken to minimize adverse impacts of development activity
	\$6,150	\$194,000		Mitigation area establishment, development, and long-term management/monitoring
	\$349	\$1,420		Administrative costs of section 7 consultation
RV6C	\$0	\$0	Annual (2010-2029)	Actions taken to minimize adverse impacts of development activity
	\$27	\$863		Mitigation area establishment, development, and long-term management/monitoring
	\$2	\$6		Administrative costs of section 7 consultation
RV6D	\$23	\$95	Annual (2010-2029)	Actions taken to minimize adverse impacts of development activity
	\$7,770	\$245,000		Mitigation area establishment, development, and long-term management/monitoring
	\$441	\$1,800		Administrative costs of section 7 consultation
RV6E	\$108	\$442	Annual (2010-2029)	Actions taken to minimize adverse impacts of development activity
	\$36,200	\$1,140,000		Mitigation area establishment, development, and long-term management/monitoring
	\$2,050	\$8,380		Administrative costs of section 7 consultation
RV6F	\$167	\$682	Annual (2010-2029)	Actions taken to minimize adverse impacts of development activity
	\$55,800	\$1,760,000		Mitigation area establishment, development, and long-term management/monitoring
	\$3,170	\$12,900		Administrative costs of section 7 consultation
RV6G	\$26	\$107	Annual (2010-2029)	Actions taken to minimize adverse impacts of development activity
	\$8,760	\$276,000		Mitigation area establishment, development, and long-term management/monitoring
	\$497	\$2,030		Administrative costs of section 7 consultation
RV6H	\$103	\$420	Annual (2010-2029)	Actions taken to minimize adverse impacts of development activity
	\$34,400	\$1,080,000		Mitigation area establishment, development, and long-term management/monitoring
	\$1,950	\$7,960		Administrative costs of section 7 consultation
RV8	\$176	\$719	Annual (2010-2029)	Actions taken to minimize adverse impacts of development activity
	\$58,900	\$1,860,000		Mitigation area establishment, development, and long-term management/monitoring
	\$3,340	\$13,600		Administrative costs of section 7 consultation
RV9A	\$869,000		One-Time (2015)	Mitigation area establishment and development
	\$1,430		Annual (2016-2020)	Long-term management/monitoring of mitigation area
	\$3,320		One-Time (2015)	Administrative costs of section 7 consultation
RV9B	\$3,050,000		One-Time (2015)	Mitigation area establishment and development

SUBUNIT	IMPACT		FREQUENCY	DESCRIPTION
	LOW	HIGH		
	\$5,030		Annual (2016-2020)	Long-term management/monitoring of mitigation area
	\$11,700		One-Time (2015)	Administrative costs of section 7 consultation
IV6A	\$0	\$155	Annual (2010-2029)	Actions taken to minimize adverse impacts of development activity
	\$0	\$399,000		Mitigation area establishment, development, and long-term management/monitoring
	\$0	\$2,930		Administrative costs of section 7 consultation
IV6B	\$0	\$771	Annual (2010-2029)	Actions taken to minimize adverse impacts of development activity
	\$0	\$1,990,000		Mitigation area establishment, development, and long-term management/monitoring
	\$0	\$14,600		Administrative costs of section 7 consultation
IV7	\$0	\$57	Annual (2010-2029)	Actions taken to minimize adverse impacts of development activity
	\$0	\$146,000		Mitigation area establishment, development, and long-term management/monitoring
	\$0	\$1,080		Administrative costs of section 7 consultation
IV8	\$0	\$523	Annual (2010-2029)	Actions taken to minimize adverse impacts of development activity
	\$0	\$1,350,000		Mitigation area establishment, development, and long-term management/monitoring
	\$0	\$9,920		Administrative costs of section 7 consultation
IV9	\$0	\$42	Annual (2010-2029)	Actions taken to minimize adverse impacts of development activity
	\$0	\$109,000		Mitigation area establishment, development, and long-term management/monitoring
	\$0	\$798		Administrative costs of section 7 consultation
IV10	\$0	\$3	Annual (2010-2029)	Actions taken to minimize adverse impacts of development activity
	\$0	\$6,950		Mitigation area establishment, development, and long-term management/monitoring
	\$0	\$51		Administrative costs of section 7 consultation

**EXHIBIT C-2 UNDISCOUNTED BASELINE IMPACTS TO DEVELOPMENT ACTIVITIES BY SUBUNIT, YEAR, AND IMPACT SOURCE (2009 DOLLARS)**

SUBUNIT	IMPACT		FREQUENCY	DESCRIPTION
	LOW	HIGH		
RV6A	\$1,690	\$6,910	Annual (2010-2029)	Administrative costs of section 7 consultation
RV6B	\$116	\$475		
RV6C	\$1	\$2		
RV6D	\$147	\$600		
RV6E	\$685	\$2,790		
RV6F	\$1,060	\$4,310		
RV6G	\$166	\$676		
RV6H	\$650	\$2,650		
RV8	\$1,110	\$4,550		
RV9A	\$1,110		One-Time (2015)	
RV9B	\$3,890			
IV6A	\$0	\$978	Annual (2010-2029)	
IV6B	\$0	\$4,870		
IV7	\$0	\$359		
IV8	\$0	\$3,310		
IV9	\$0	\$266		
IV10	\$0	\$17		

**EXHIBIT C-3    UNDISCOUNTED BASELINE IMPACTS TO TRANSPORTATION ACTIVITIES BY SUBUNIT,  
YEAR, AND IMPACT SOURCE (2009 DOLLARS)**

SUBUNIT	IMPACT	FREQUENCY	DESCRIPTION
RV6A	\$805	Periodic (2011-2013, 2015-2017, and every 2 years beginning in 2019)	Monitoring for species within Special Management Areas
	\$818	Periodic (2010 and 2011)	Developing management actions for species to include in HCP
	\$1,000	One-Time (2010)	Developing management plans for species within Special Management Areas
	\$383	Periodic (2011, 2015, 2019, 2023, 2027)	Enhancing habitat within Special Management Areas
	\$126,000	One-Time (2013)	Conservation/mitigation bank credit withdrawal
	\$9,140		Administrative costs of section 7 consultation
RV6B	\$78	Periodic (2011-2013, 2015-2017, and every 2 years beginning in 2019)	Monitoring for species within Special Management Areas
	\$132	Periodic (2010 and 2011)	Developing management actions for species to include in HCP
	\$78	One-Time (2010)	Developing management plans for species within Special Management Areas
	\$47	Periodic (2011, 2015, 2019, 2023, 2027)	Enhancing habitat within Special Management Areas
	\$32,100	One-Time (2013)	Conservation/mitigation bank credit withdrawal
	\$2,340		Administrative costs of section 7 consultation
RV6C	\$36	Periodic (2011-2013, 2015-2017, and every 2 years beginning in 2019)	Monitoring for species within Special Management Areas
	\$61	Periodic (2010 and 2011)	Developing management actions for species to include in HCP
	\$36	One-Time (2010)	Developing management plans for species within Special Management Areas
	\$22	Periodic (2011, 2015, 2019, 2023, 2027)	Enhancing habitat within Special Management Areas
	\$14,800	One-Time (2013)	Conservation/mitigation bank credit withdrawal
	\$1,070		Administrative costs of section 7 consultation
RV6E	\$82	Periodic (2011-2013, 2015-2017, and every 2 years beginning in 2019)	Monitoring for species within Special Management Areas
	\$139	Periodic (2010 and 2011)	Developing management actions for species to include in HCP
	\$82	One-Time (2010)	Developing management plans for species within Special Management Areas
	\$49	Periodic (2011, 2015, 2019, 2023, 2027)	Enhancing habitat within Special Management Areas
	\$33,600	One-Time (2013)	Conservation/mitigation bank credit withdrawal
	\$2,450		Administrative costs of section 7 consultation
RV8	\$15,000	One-Time (2010)	Administrative costs of section 7 consultation
IV6B	\$1,000	Periodic (2011-2013, 2015-2017, and every 2 years beginning in 2019)	Monitoring for species within Special Management Areas
	\$1,800	Periodic (2010 and 2011)	Developing management actions for species to include in HCP
	\$1,200	One-Time (2010)	Developing management plans for species within Special Management Areas

SUBUNIT	IMPACT	FREQUENCY	DESCRIPTION
	\$200	Periodic (2011, 2015, 2019, 2023, 2027)	Enhancing habitat within Special Management Areas
IV9	\$400	Periodic (2011-2013, 2015-2017, and every 2 years beginning in 2019)	Monitoring for species within Special Management Areas
	\$1,400	Periodic (2010 and 2011)	Developing management actions for species to include in HCP
	\$100	One-Time (2010)	Developing management plans for species within Special Management Areas
	\$200	Periodic (2011, 2015, 2019, 2023, 2027)	Enhancing habitat within Special Management Areas

**EXHIBIT C-4 UNDISCOUNTED INCREMENTAL IMPACTS TO TRANSPORTATION ACTIVITIES BY SUBUNIT, YEAR, AND IMPACT SOURCE (2009 DOLLARS)**

SUBUNIT	IMPACT	FREQUENCY	DESCRIPTION
RV6A	\$3,050	One-Time (2013)	Administrative costs of section 7 consultation
RV6B	\$779		
RV6C	\$358		
RV6E	\$815		
RV8	\$5,000	One-Time (2010)	

**EXHIBIT C-5 UNDISCOUNTED BASELINE IMPACTS TO SPECIES MANAGEMENT ACTIVITIES BY SUBUNIT, YEAR, AND IMPACT SOURCE (2009 DOLLARS)**

SUBUNIT	IMPACT	FREQUENCY	DESCRIPTION
RV6A	\$38,800	Annual (2010-2029)	Managing habitat for the species
RV6B	\$14,500		
RV6C	\$19		
RV7	\$18,800		
RV8	\$28,800		
IV1	\$3	Periodic (2013, 2018, 2023, 2028)	Administrative costs of section 7 consultation
IV3	\$34	Annual (2010-2029)	Surveying for the species
	\$2,850	Periodic (2013, 2018, 2023, 2028)	Administrative costs of section 7 consultation
IV4	\$19	Annual (2010-2029)	Surveying for the species
	\$1,640	Periodic (2013, 2018, 2023, 2028)	Administrative costs of section 7 consultation
IV5	\$55	Annual (2010-2029)	Surveying for the species
	\$4,660	Periodic (2013, 2018, 2023, 2028)	Administrative costs of section 7 consultation
IV6A	\$6	Annual (2010-2029)	Surveying for the species
	\$542	Periodic (2013, 2018, 2023, 2028)	Administrative costs of section 7 consultation
IV6B	\$14	Periodic (2013, 2018, 2023, 2028)	Administrative costs of section 7 consultation
IV8	\$6	Annual (2010-2029)	Surveying for the species
	\$486	Periodic (2013, 2018, 2023, 2028)	Administrative costs of section 7 consultation
IV9	\$2	Annual (2010-2029)	Surveying for the species
	\$190	Periodic (2013, 2018, 2023, 2028)	Administrative costs of section 7 consultation
IV10	\$5	Annual (2010-2029)	Surveying for the species
	\$446	Periodic (2013, 2018, 2023, 2028)	Administrative costs of section 7 consultation
IV11	\$16	Annual (2010-2029)	Surveying for the species
	\$1,490	Periodic (2013, 2018, 2023, 2028)	Administrative costs of section 7 consultation
IV12	\$149	Annual (2010-2029)	Surveying for the species
	\$12,600	Periodic (2013, 2018, 2023, 2028)	Administrative costs of section 7 consultation
IV13	\$8	Annual (2010-2029)	Surveying for the species
	\$685	Periodic (2013, 2018, 2023, 2028)	Administrative costs of section 7 consultation
IV14	\$13	Annual (2010-2029)	Surveying for the species
	\$1,080	Periodic (2013, 2018, 2023, 2028)	Administrative costs of section 7 consultation

**EXHIBIT C-6    UNDISCOUNTED INCREMENTAL IMPACTS TO SPECIES MANAGEMENT ACTIVITIES BY SUBUNIT, YEAR, AND IMPACT SOURCE (2009 DOLLARS)**

SUBUNIT	IMPACT	FREQUENCY	DESCRIPTION
IV1	\$1	Periodic (2013, 2018, 2023, 2028)	Administrative costs of section 7 consultation
IV3	\$951		
IV4	\$547		
IV5	\$1,550		
IV6A	\$181		
IV6B	\$4		
IV8	\$162		
IV9	\$63		
IV10	\$149		
IV11	\$495		
IV12	\$4,210		
IV13	\$228		
IV14	\$362		