Appendix H – Social-Economics

Restricted Use Alternative Analysis Model

Chapter 2.3.5 Restricted Use Alternative Analysis Model

The Restricted Use Alternative attempts to control weeds over the 10- to 15-year life of the project by using all available treatment methods. Its distinction from the proposed action is that herbicide treatment would not be allowed in riparian and special areas including wilderness, wild and scenic river corridors, municipal watersheds, and within 100 feet of SOLIs. The strategy would be to treat as many infested acres as early as possible. Therefore the initial emphasis is on broadcast herbicide applications in the uplands because broadcast application of herbicide is the most cost effective way to treat the most acres. Once the uplands are treated the emphasis shifts to treating riparian and special areas using manual/mechanical methods. During all years of the project, some of all treatment methods may be used, however the clear strategy emphasizes herbicides early in the project, then progressively moves away from herbicide treatments in favor of manual/mechanical and biocontrol methods as time goes on.

This spreadsheet models the Restricted Use Alternative discussed in section 2.3.5 of chapter 2. Like the Proposed Action, the model begins in year 1 (row 7 of the spreadsheet below) of the project with 22,842 acres of known invasive plant infestations to be treated (column B). In the first year available funding is spent using herbicides to treat approximately 4000 infested acres in the uplands. Years 2 and 3 (row 8 and 9) similarly treat approximately 3200 acres of previously untreated weeds (column E) and 800 acres previously treated (column G). At the same time, a minor acreage of manual/mechanical treatments may also occur in riparian and special areas (see alternative description in 2.3.5). The funding, acres treated and treatment methods in the first three years is virtually the same as the Proposed Action (Alternative B) except that treatment location is entirely in the uplands and not in any special areas, whereas Alternative B may treat in riparian and special areas with herbicides, as well as in the uplands.

Beginning in year 4 (row 10), differences between the Restricted Use Alternative and Alternative B begin to emerge. Sometime during year 4, herbicide treatment of the 11,179 acres of targeted upland areas not previously treated is completed. The herbicide retreatment continues and the remaining budget is spent on treating riparian or special areas using manual/mechanical and biocontrol methods. By year 5 (row 11), project emphasis is shifting from herbicide treatment methods to manual/mechanical methods. Treatment locations are also changing; shifting away from the uplands and focusing on riparian and special areas.

Because manual/mechanical methods cost more per acre, fewer acres can be treated given the same annual project budget. Per acre costs for each treatment method (columns Y – AK) used for this model are detailed in Chapter 2 of this EIS and are used to analyze Alternative B. Besides being more expensive, manual/mechanical methods are also less effective than herbicide treatments. Again the same assumptions of treatment method effectiveness used to analyze Alternative B were used to analyze this alternative. That is, 80 percent effective for herbicide treatments (column H) and 25 percent effective for manual/mechanical treatments (column I) (see Chapter 3.2 of this EIS for a more detailed discussion of effectiveness assumptions).

Initially, acres of weed infestation are reduced suggesting that the project purpose and need of eradicating, containing, and controlling weeds would be accomplished. However beginning in year 5, as herbicide use is curtailed and manual/mechanical methods are emphasized, the trend of weed reduction reverses and acres of weed infestation forestwide begin to increase. Ultimately, by the end of the project the area of weed infestation would roughly double from the present infestation level.

This spreadsheet is an approximation. Its purpose is not to precisely predict acres of weed infestation during the life of the project. Its purpose is to show trends of this alternative compared to the Proposed Action Alternative.

ESTIMATED ANNUAL ACRES OF TREATMENT												ESTIMATED ACRES BY TREATMENT BY METHOD						ESTIMATED ACRES BY TREATMENT BY METHOD						ESTIMATED COST BY TREATMENT METHOD							ESTIMATED COST BY TREATMENT METHOD							Estimated Inventory and Effectiveness Monitoring Costs	**Total Estimated Annual Costs**
Year	Total Remaining Untreated Acres	Total Remaining Untreated Upland Acres	Total Remaining Non-Upland Acres	Upland Acres Treated First time	Non-Upland Acres Treated (First Time)	Total acres retreated	Acres Retreated (c = 20% of prior year's e)	Acres Retreated (Manual. Mechanical, 75% of prior year M/M treatments)	Total Acres Treated (c+d)	Remaining Untreated Acres (b-c)	Estimated Acres of spread (Est. 10 % of untreated acres and 5% of treated areas) (.10*f+.05*(.2*e))	Acres of Manual/Mechanical and or Herbicide Treatment (e*16.899 %)	Acres of Herbicide - spot (e*3.984 %)	Acres of Manual only treatments (e*0.306%)	Acres of Biocontrol .Manual, Mechanical, Chemical (e*0.263 %)	Acres of Biocontrol (e*0.376 %)	Acres of Aerial (e*23.785 %)	Acres of Manual/Mechanical and or Herbicide Treatment (e*39.077 %)	Acres of Herbicide - spot (e*6.948 %)	Acres of Manual only treatments (e*0.179%)	Acres of Biocontrol .Manual, Mechanical, Chemical (e*0%)	Acres of Biocontrol (e*8.182 %)	Acres of Aerial (e*0%)	Acres of Manual/Mechanical and or Herbicide Treatment (i*$313)	Acres of Herbicide - spot (j*$350)	Acres of Manual only treatments (l*$340	Acres of Biocontrol, Manual, Mechanical, Chemical (l*$70)	Acres of Biocontrol (m*$70)	Acres of Aerial (n*$42)	Total Cost of Treatments by Year	Acres of Manual/Mechanical and or Herbicide Treatment (i*$124)	Acres of Herbicide - spot (j*$147)	Acres of Manual only treatments (l*$340	Acres of Biocontrol. Manual, Mechanical, Chemical (l*$70)	Acres of Biocontrol (m*$70)	Acres of Aerial (n*$42)	Total Cost of Treatments by Year		
Average Annual Acres of Treatment G=1st 6 years, H= remaining years						**4000**	***2400***					***Percentages above must total to 100 percent.***																											
1	22,842	11,179	11,663	4,000		0	0	0	4,000	22,842	2,324	676	159	12	11	15	951	1,563	278	7	0	327	0	$211,575	$55,776	$4,162	$736	$1,053	$39,959	$313,261	$193,822	$40,854	$2,434	$0	$22,910	$0	$260,020	$188,000	**$761,281**
2	21,166	7,579	12,829	3,200		800	800	0	4,000	21,166	2,157	676	159	12	11	15	951	1,563	278	7	0	327	0	$211,575	$55,776	$4,162	$736	$1,053	$39,959	$313,261	$193,822	$40,854	$2,434	$0	$22,910	$0	$260,020	$188,000	**$761,281**
3	20,123	4,739	14,112	3,200		800	800	0	4,000	20,123	2,052	676	159	12	11	15	951	1,563	278	7	0	327	0	$211,575	$55,776	$4,162	$736	$1,053	$39,959	$313,261	$193,822	$40,854	$2,434	$0	$22,910	$0	$260,020	$188,000	**$761,281**
4	18,975	1,899	15,523	1,899	780	800	800	0	3,479	18,195	1,854	511	108	229	7	13	720	1,109	188	311	0	285	0	$159,850	$37,635	$77,701	$497	$916	$30,238	$306,836	$137,552	$27,566	$105,601	$0	$19,926	$0	$290,645	$163,513	**$760,994**
5	18,930	230	16,296	230	1,350	1,125	540	585	2,705	17,580	1,785	266	31	549	2	10	377	436	53	760	0	221	0	$83,108	$10,733	$186,592	$142	$712	$15,816	$297,102	$54,092	$7,861	$258,365	$0	$15,491	$0	$335,809	$127,121	**$760,033**
6	20,486	50	16,605	50	825	1,605	154	1,451	2,480	19,661	1,991	194	8	643	1	9	276	239	14	893	0	203	0	$60,659	$2,843	$218,769	$38	$653	$11,597	$294,558	$29,639	$2,083	$303,503	$0	$14,205	$0	$349,429	$116,568	**$760,556**
7	22,426	13	17,513	13	660	1,748	41	1,707	2,421	21,766	2,201	175	2	669	0	9	249	187	4	928	0	198	0	$54,694	$746	$227,344	$10	$637	$10,476	$293,906	$23,139	$546	$315,531	$0	$13,864	$0	$353,080	$113,771	**$760,758**
8	23,967	3	18,689	3	611	1,786	11	1,775	2,400	23,357	2,360	169	1	674	0	9	242	172	1	935	0	196	0	$53,018	$195	$229,108	$3	$632	$10,161	$293,117	$21,389	$143	$318,014	$0	$13,746	$0	$353,292	$112,800	**$759,209**
9	25,716	1	20,036	1	607	1,792	3	1,789	2,400	25,110	2,535	168	0	677	0	9	241	169	0	939	0	196	0	$52,698	$51	$230,090	$1	$632	$10,101	$293,572	$20,978	$37	$319,386	$0	$13,746	$0	$354,147	$112,800	**$760,519**
10	27,645	0	21,523	0	602	1,798	1	1,797	2,400	27,043	2,728	168	0	677	0	9	240	168	0	940	0	196	0	$52,614	$13	$230,347	$0	$632	$10,086	$293,692	$20,870	$10	$319,745	$0	$13,746	$0	$354,370	$112,800	**$760,862**
11	29,771	0	23,163	0	600	1,799	0	1,799	2,400	29,171	2,941	168	0	678	0	9	240	168	0	941	0	196	0	$52,592	$4	$230,415	$0	$632	$10,081	$293,723	$20,842	$3	$319,839	$0	$13,746	$0	$354,429	$112,800	**$760,952**
12	32,112	0	24,969	0	600	1,800	0	1,800	2,400	31,511	3,175	168	0	678	0	9	240	168	0	941	0	196	0	$52,586	$1	$230,432	$0	$632	$10,080	$293,731	$20,835	$1	$319,863	$0	$13,746	$0	$354,444	$112,800	**$760,976**
13	34,687	0	26,956	0	600	1,800	0	1,800	2,400	34,087	3,433	168	0	678	0	9	240	168	0	941	0	196	0	$52,585	$0	$230,437	$0	$632	$10,080	$293,733	$20,833	$0	$319,870	$0	$13,746	$0	$354,448	$112,800	**$760,982**
14	37,519	0	29,141	0	600	1,800	0	1,800	2,400	36,919	3,716	168	0	678	0	9	240	168	0	941	0	196	0	$52,584	$0	$230,438	$0	$632	$10,080	$293,734	$20,832	$0	$319,871	$0	$13,746	$0	$354,449	$112,800	**$760,983**
15	40,635	0	31,545	0	600	1,800	0	1,800	2,400	40,035	4,028	168	0	678	0	9	240	168	0	941	0	196	0	$52,584	$0	$230,438	$0	$632	$10,080	$293,734	$20,832	$0	$319,872	$0	$13,746	$0	$354,450	$112,800	**$760,984**
16	44,063	0	34,190	0	600	1,800	0	1,800	2,400	43,463	4,370	168	0	678	0	9	240	168	0	941	0	196	0	$52,584	$0	$230,438	$0	$632	$10,080	$293,734	$20,832	$0	$319,872	$0	$13,746	$0	$354,450	$112,800	**$760,984**
17	47,833	0	37,099	0	600	1,800	0	1,800	2,400	47,233	4,747	168	0	678	0	9	240	168	0	941	0	196	0	$52,584	$0	$230,438	$0	$632	$10,080	$293,734	$20,832	$0	$319,872	$0	$13,746	$0	$354,450	$112,800	**$760,984**
18	51,980	0	40,298	0	600	1,800	0	1,800	2,400	51,380	5,162	168	0	678	0	9	240	168	0	941	0	196	0	$52,584	$0	$230,438	$0	$632	$10,080	$293,734	$20,832	$0	$319,872	$0	$13,746	$0	$354,450	$112,800	**$760,984**
19	56,542	0	43,818	0	600	1,800	0	1,800	2,400	55,942	5,618	168	0	678	0	9	240	168	0	941	0	196	0	$52,584	$0	$230,438	$0	$632	$10,080	$293,734	$20,832	$0	$319,872	$0	$13,746	$0	$354,450	$112,800	**$760,984**
20	61,560	0	47,690	0	600	1,800	0	1,800	2,400	60,960	6,120	168	0	678	0	9	240	168	0	941	0	196	0	$52,584	$0	$230,438	$0	$632	$10,080	$293,734	$20,832	$0	$319,872	$0	$13,746	$0	$354,450	$112,800	**$760,984**
21	67,080	0	51,949	0	600	1,800	0	1,800	2,400	66,480	6,672	168	0	678	0	9	240	168	0	941	0	196	0	$52,584	$0	$230,438	$0	$632	$10,080	$293,734	$20,832	$0	$319,872	$0	$13,746	$0	$354,450	$112,800	**$760,984**
22	73,153	0	56,634	0	600	1,800	0	1,800	2,400	72,553	7,279	168	0	678	0	9	240	168	0	941	0	196	0	$52,584	$0	$230,438	$0	$632	$10,080	$293,734	$20,832	$0	$319,872	$0	$13,746	$0	$354,450	$112,800	**$760,984**
23	79,832	0	61,787	0	600	1,800	0	1,800	2,400	79,232	7,947	168	0	678	0	9	240	168	0	941	0	196	0	$52,584	$0	$230,438	$0	$632	$10,080	$293,734	$20,832	$0	$319,872	$0	$13,746	$0	$354,450	$112,800	**$760,984**
24	87,179	0	67,456	0	600	1,800	0	1,800	2,400	86,579	8,682	168	0	678	0	9	240	168	0	941	0	196	0	$52,584	$0	$230,438	$0	$632	$10,080	$293,734	$20,832	$0	$319,872	$0	$13,746	$0	$354,450	$112,800	**$760,984**
25	95,261	0	73,692	0	600	1,800	0	1,800	2,400	94,661	9,490	168	0	678	0	9	240	168	0	941	0	196	0	$52,584	$0	$230,438	$0	$632	$10,080	$293,734	$20,832	$0	$319,872	$0	$13,746	$0	$354,450	$112,800	**$760,984**
26	104,151	0	80,551	0	600	1,800	0	1,800	2,400	103,551	10,379	168	0	678	0	9	240	168	0	941	0	196	0	$52,584	$0	$230,438	$0	$632	$10,080	$293,734	$20,832	$0	$319,872	$0	$13,746	$0	$354,450	$112,800	**$760,984**
27	113,930	0	88,096	0	600	1,800	0	1,800	2,400	113,330	11,357	168	0	678	0	9	240	168	0	941	0	196	0	$52,584	$0	$230,438	$0	$632	$10,080	$293,734	$20,832	$0	$319,872	$0	$13,746	$0	$354,450	$112,800	**$760,984**
28	124,687	0	96,396	0	600	1,800	0	1,800	2,400	124,087	12,433	168	0	678	0	9	240	168	0	941	0	196	0	$52,584	$0	$230,438	$0	$632	$10,080	$293,734	$20,832	$0	$319,872	$0	$13,746	$0	$354,450	$112,800	**$760,984**
29	136,520	0	105,525	0	600	1,800	0	1,800	2,400	135,920	13,616	168	0	678	0	9	240	168	0	941	0	196	0	$52,584	$0	$230,438	$0	$632	$10,080	$293,734	$20,832	$0	$319,872	$0	$13,746	$0	$354,450	$112,800	**$760,984**
30	149,536	0	115,568	0	600	1,800	0	1,800	2,400	148,936	14,918	168	0	678	0	9	240	168	0	941	0	196	0	$52,584	$0	$230,438	$0	$632	$10,080	$293,734	$20,832	$0	$319,872	$0	$13,746	$0	$354,450	$112,800	**$760,984**
31	163,853	0	126,615	0	600	1,800	0	1,800	2,400	163,253	16,349	168	0	678	0	9	240	168	0	941	0	196	0	$52,584	$0	$230,438	$0	$632	$10,080	$293,734	$20,832	$0	$319,872	$0	$13,746	$0	$354,450	$112,800	**$760,984**
32	179,603	0	138,766	0	600	1,800	0	1,800	2,400	179,003	17,924	168	0	678	0	9	240	168	0	941	0	196	0	$52,584	$0	$230,438	$0	$632	$10,080	$293,734	$20,832	$0	$319,872	$0	$13,746	$0	$354,450	$112,800	**$760,984**
33	196,927	0	152,133	0	600	1,800	0	1,800	2,400	196,327	19,657	168	0	678	0	9	240	168	0	941	0	196	0	$52,584	$0	$230,438	$0	$632	$10,080	$293,734	$20,832	$0	$319,872	$0	$13,746	$0	$354,450	$112,800	**$760,984**
					19,235	53,654			72,888		Total acres	7,543	627	19,743	41	321	10,719	11,034	1,094	27,366	0	6,994	0						$9,768,437								$11,323,149		
											Cost by m	$2,360,809	$219,549	$6,712,486	$2,899	$22,500	$450,194	$1,368,274	$160,813	$9,304,458	$0	$489,604	$0									Total treatment costs	$21,091,586		Total monitoring costs	$3,425,759		
																																				Total Cost of Treatments and Mor		**$24,517,345**
																															Per Acre Cost of Manual/Mechanical and/or Herbicide assumes 90% Herbicide and 10% Manual Mechar							