APPENDIX H

Fisheries Analysis by Watershed and Tabular Data

This appendix will address specific effects to listed fish populations and their habitats by subbasin, watershed or subwatershed, in which they occur under this project. This analysis is summarized in Table 76 of the DSEIS. Redband trout are Forest Service Region 6 Sensitive species and occur throughout the project area except for some areas on the Fort Rock portion of the Bend/Fort Rock Ranger District where there are no perennial streams or lakes, some areas of the upper Little Deschutes River, and a few other small closed systems that were historically fishless such as Sparks and Hosmer Lakes. Effects analysis for threatened fish species also applies to redband trout, except where effects to redband trout could be greater or different depending on treatment methods. Such effects to redband trout are discussed separately in the FEIS.

Within this appendix, most watershed discussions will center on proximity, probability, magnitude, and distribution. For general discussions on duration, nature, frequency, and timing. Maps of these watersheds, streams, and fish distribution are contained in the fisheries report.

LOWER DESCHUTES WATERSHEDS

Upper Trout Creek

(6th HUC – Headwaters Trout Creek 170703070103, Foley Creek 170703070102, Opal Creek 170703070101)

Streams in this watershed contain steelhead and redband trout (Refer to Fisheries Report for maps). Sites infested with invasive plants are primarily located upstream of known steelhead use. Invasive plant infestations are primarily located along roads with some of the mapped invasive plant sites crossing and running near streams.

Invasive plant species proposed for chemical or manual treatments are spotted knapweed, diffuse knapweed, Russian knapweed, sulphur, medusahead, St. Johnswort, and whitetop. First choice chemicals for treating these species are clopyralid, sulfometuron, metsulfuron and picloram. Picloram should only be used on sulphur-cinquefoil as that is the only effective chemical to really treat this species (Dave Langland, Oregon Dept. of Agriculture, personal communication) Other chemicals are low to moderate risk to fish and aquatic.

Project Element (PE) 1 = Chemical contamination indicator from herbicide application using hand select, spot spray or broadcast spray methods.

Proximity, probability, magnitude, and distribution will be discussed here. Refer to the general discussion starting on page 117of the Fisheries Report for duration, nature, frequency, and timing of effects.

Proximity, Probability and Magnitude: There are four project area units that contain 61 infested invasive plant polygons that total 5.7 acres with the largest at 0.1 acres (Table H-1). Mapped infested invasive plant sites total 0.5 acres in 10 locations within 100 feet of perennial waterbodies (Table H-2). Actual acres of invasive plants to be treated in these 0.5 acres is less than this because they are not all filled with invasive plants; exactly how much less is not known. Potential areas of concern from proposed treatments are listed by subwatershed in Table H-3.

Table H-1. Acres and number of locations infested invasive plant sites occur within specified buffers for intermittent (Int.) streams by subwatershed and total acres and number of infested invasive plant sites by subwatershed. Results represent sites proposed for some form of herbicide treatment.

		Intermittent Stream Info			Total for perennial and intermittent streams in each HUC 6		
HUC6 Name	HUC6 Number	Acres within 100' of Int. Streams	Number of areas 100' from Int. Streams	Acres on Int. Stream Channels	Number of Infested Invasive plant Sites	Total Invasive plant Acres in HUC6	Total Sub-watershed Acres
Opal Creek	170703070101	0.00	0	0.00	3	0.27	11426
Foley Creek	170703070102	0.00	0	0.00	10	0.62	22009
Headwaters Trout Creek	170703070103	0.09	1	0.00	59	4.78	16662
	Totals	**0.09**	**1**	**0.00**	**72**	**5.67**	**50097**

Table H-2. Acres and number of locations infested invasive plant sites occur within specified buffers for perennial streams, rivers, lakes, and springs by subwatershed. Results represent sites proposed for some form of herbicide treatment.

HUC6 Name	HUC6 Number	Acres within 10' of perennial water	Number of areas 10' from perennial water	Acres within 100' of perennial water	Number of areas 100' from perennial water	Acres within 300' of perennial water	Number of areas 300' from perennial water
Opal Creek	170703070101	0.00	0	0.10	1	0.20	2
Foley Creek	170703070102	0.00	0	0.06	2	0.33	6
Headwaters Trout Creek	170703070103	0.03	1	0.34	7	1.50	21
	Totals	0.03	1	0.50	10	2.03	29

Table H-3. All PAU sites for the Upper Trout Creek Watershed by 6th field and potential areas of concern.

6th Field	PAU #	Streams	Infested Areas of Concern
Opal Creek	71-56	Auger Creek	Sites near Auger Creek – see description below.
Foley Creek	71-55	Big Log Creek and Dutchman Creek	Sites along roads – only two within 100 feet of the stream
	71-59	Big Log Creek and Dutchman Creek	None – all sites on ridge
Headwaters Trout Creek	71-55	Cartwright, Potlid, and Trout Creek	Sites are small and scattered with 0.34 acres within 100' of streams in 7 locaitons.

Two of these sites contain sulphur cinquefoil each is 0.1 acre in size and would be treated with picloram. Picloram is known to be toxic to fish. One sulphur cinquefoil site is located approximately 100 feet from Auger Creek and the other approximately 600 feet from Potlid Creek. The small size of

the sites and buffer distances between them and the streams will prevent any adverse affects to fish in these streams. Both intermittent and perennial streams would have buffers depending on application method. The buffer distance between these fish populations and the invasive plant sites would allow time for the herbicides to break down and bind to soils. Because of the small size of the sites and because they are spread throughout three subwatersheds even if a thunderstorm event occurred a few days after application the amounts of herbicide reaching the stream would not be at high enough levels to directly harm or effect fish living downstream. SERA Worksheets results found exposure levels to fish for all first choice herbicides proposed for use to be far below levels of concern. Some indirect effects could occur to algae and macrophytes but these are not expected. If they did occur they would be very localized and infrequent and not at large enough scale that would affect fish or habitat.

It is unlikely detectable amounts of herbicide would reach the stream. If they did levels would not be high enough to cause direct harm to fish. Some short term and very localized effects to algae and macrophytes may occur.

PE 2 = Sedimentation or turbidity cause by removal of invasive plants from hand pulling, herbicide application, or tarping.

Manual Methods (Sedimentation)

Pulling could occur at 1-2 times yearly over all the entire infested invasive plant populations. The effect of pulling scattered plants along roadsides and even within the riparian areas would leave small patches of bare soil until covered with organics from the forest or new vegetation sprouted which could take 1-3 years depending on location. Pulling could occur at anytime during the spring summer or fall in most project areas. In most cases pulling would occur well away from stream channels. Amounts of sediment produced from pulling would be very small and immeasurable against the other actions and natural processes that have occurred or are occurring in the watershed. Pulling invasive plants in these subwatersheds will have no affect on steelhead.

PE 3 = Off channel habitat in the form of instream and overhead cover along stream margins, backwaters, side channels and alcoves.

Temperature - Manual (Hand Pulling), Mechanical (Weed Whacking), Cultural (Tarping) or Herbicide (Herbicide) Methods

This project element would not be affected in these subwatersheds as there are no sites that contribute to shade or overhead cover due to proximity to the streams/water bodies and due to the types of weeds in these subwatersheds.

UPPER DESCHUTES WATERSHED

Upper and Lower Metolius River Watersheds (HUC – Upper Metolius 1707030109 and Lower Metolius 1707030110)

The Upper and Lower Metolius River watersheds contain bull trout and redband trout. The reintroduction of chinook and sockeye salmon is expected in the next five years. At ribbon/reed canary grass sites activities could affect temperature, fine sediment, chemical input, cover and juvenile rearing areas. All other project areas could affect fine sediment and chemical input to these species.

Project Element (PE) 1 = Chemical contamination indicator from herbicide application using hand select, spot spray or broadcast spray methods.

Proximity: Although the infested invasive plant polygons show 2,533 acres for the entire watershed (Table H-4) the professional estimate of actual acres of invasive plants on the ground is much less with only five sites estimated to have more than 10 acres of actual invasive plants, site 15-01 (13.8 acres), site 15-05 (16.9 acres), site 15-12 (32.7 acres), site 15-14 (11.8 acres) and site 15-30 (33.9 acres). All of these larger sites except for the 15-01 site are in the Upper Lake Creek subwatershed or the Fly Creek Subwatershed. Mapped infested invasive plant sites total 74.6 acres in 32 locations within 100 feet of perennial waterbodies (Table H-5). Actual acres of invasive plants to be treated in these 74.6 acres is less than this because they are not all filled with invasive plants, exactly how much less is not known. Potential areas of concern from proposed treatments are listed by subwatershed in Table 25.

Sites in Upper Lake Creek subwatershed currently contain no TES listed fish but reintroduction of salmon and bull trout is likely to occur in Link Creek between Blue and Suttle Lakes. Mapped invasive plant sites are located higher in the watershed well upstream of Blue Lake.

No TE listed fish have been found or are historically documented in Fly Creek but redband trout are present. Anadromous fish migration to perennial sections of Fly Creek would be difficult because of a small 8-10 foot waterfall and the intermittent nature of the stream in the lower 4.4 miles (Dachtler 1998).

Table H-4. Acres and number of locations of infested invasive plant sites that occur within specified buffers for intermittent (Int.) streams by subwatershed and total acres and number of infested invasive plant sites by subwatershed. Results represent sites proposed for some form of herbicide treatment.

		Intermittent Stream Info			Total for perennial and intermittent streams in each HUC 6		
HUC 6 Name	HUC6 Number	Acres within 100' of Int. Streams	Number of areas 100' from Int. Streams	Acres on Int. Stream Channels	Number of Infested Invasive plant Sites	Total Invasive plant Acres in HUC6 (intermittent and perennial streams)	Total Sub-watershed Acres
Dry Creek	170703010901	1.44	1	0.05	4	2.38	12497
Cache Creek	170703010902	0.98	1	0.03	12	126.58	11867
Upper Lake Creek	170703010903	12.79	4	0.31	53	270.52	11136
Lower Lake Creek	170703010904	10.52	3	0.32	30	244.18	10965
Headwaters Metolius River	170703010905	21.57	15	0.67	202	385.55	15501
First Creek	170703010906	5.94	4	0.17	30	122.14	13177
Jack Creek	170703010907	31.86	5	1.07	24	208.00	9207
Canyon Creek	170703010908	28.16	4	0.91	59	272.31	21068
Abbot Creek	170703010909	2.13	3	0.06	23	233.92	6391
Candle Creek	170703010910	0.00	0	0.00	10	61.97	10957
Middle Metolius River	170703011003	27.31	11	0.81	33	279.77	21208
Upper Fly Creek	170703011004	1.62	2	0.00	2	10.35	16406
Lower Fly Creek	170703011005	0.00	0	0.03	41	129.55	16227

Juniper Creek	170703011006	0.00	0	0.00	1	0.10	15088
Lower Metolius River	170703011007	12.85	7	0.40	31	185.91	24301
	Totals	**157.16**	**60**	**4.84**	**555**	**2533.22**	**215997**

Table H- 5. Acres and number of locations infested invasive plant sites occur within specified buffers for perennial streams, rivers, lakes, and springs by subwatershed. Results represent sites proposed for some form of herbicide treatment.

HUC 6 Name	HUC6 Number	Acres within 10' of perennial water	Number of areas 10' from perennial water	Acres within 100' of perennial water	Number of areas 100' from perennial water	Acres within 300' of perennial water	Number of areas 300' from perennial water
Dry Creek	170703010901	0.00	0	0.00	0	0	0
Cache Creek	170703010902	0.00	0	0.00	0	0	0
Upper Lake Creek	170703010903	0.66	7	7.56	18	34.48	24
Lower Lake Creek	170703010904	0.12	2	3.78	6	33.7	11
Headwaters Metolius River	170703010905	117.47	267	120.51	213	124.83	172
First Creek	170703010906	0.54	15	4.74	9	13.29	12
Jack Creek	170703010907	0.00	0	0.00	0	2.22	1
Canyon Creek	170703010908	1.54	8	14.92	18	51.41	28
Abbot Creek	170703010909	0.00	0	0.00	0	0.29	2
Candle Creek	170703010910	0.09	1	2.54	3	8.68	4
Middle Metolius River	170703011003	1.09	7	7.25	10	19.16	11
Upper Fly Creek	170703011004	0.00	0	0.00	0	0	0
Lower Fly Creek	170703011005	1.72	9	16.31	21	37.83	19
Juniper Creek	170703011006	0.00	0	0.00	0	0	0
Lower Metolius River	170703011007	0.32	10	2.80	10	5.53	9
	Totals	123.54	326	180.41	308	331.42	293

Table H-6. All PAU sites in the Upper and Lower Metolius Watershed by 6th field and potential areas of concern.

6th Field	PAU	Streams	Infested Areas of Concern
Lower Metolius River	15-12	Spring Creek	Area near mouth of Spring Creek at Road 64 crossing
Lower Metolius River	15-14	Spring Creek	Stream crossings in upper drainage on 1150, 1180, 1190 road systems
Middle Metolius River	15-12	Street Creek	Area near mouth of Street Creek and along 64 Road adjacent to Metolius River, stream crossings on the 64 Road, 1158, and 1190 roads
Upper	15-17	Metolius River	Areas adjacent to road 1499

Metolius River			
Lower Fly Creek	15-12	Fly Creek	Areas adjacent to Fly Creek associated with road 1170-900 no access for T&E species
Lower Fly Creek	15-14	Six Creek Headwaters	Areas adjacent to Six Creek and stream crossings on the 11 and 1150 road Stream crossings or stream adjacent areas on roads 11, 11-800, 1160, 1150, 1140 – no access for T&E species
Upper Fly Creek	15-14	Fly Creek	none
Juniper Creek	75-38		none
Jefferson Creek	no sites		none
Candle Creek	15-02	Cabot Creek	None - ridge top sites none
Candle Creek	15-31	Candle Creek	Areas adjacent to Candle Creek along the 1292 road
Abbot Creek	15-01	Trib to Abbot Creek	Little Montana area and areas close to the 800 spur
Abbot Creek	15-02	Abbot Creek	at Creek crossings on 1280 road
Abbot Creek	15-21	Abbot Creek	Road 12 Dahl Ranch
Canyon Creek	15-01	Brush Creek	Little Montana on and adjacent to 800 spur
Canyon Creek	15-10	Bear Valley Creek, Canyon Creek	at Creek crossings 1230 Rd and spurs
Canyon Creek	15-13	Roaring Creek	Small sites along tributaries and mainstem
Canyon Creek	15-21	Canyon and Brush Creeks	at Creek crossings on the 1230 Rd, 090, 450, 455 spurs
Jack Creek	15-16	Jack Creek	No sites of concern
Jack Creek	15-10	Jack Creek	Small site near Head of Jack Creek on 118 spur
Jack Creek	15-21	Jack Creek	No sites of concern
Jack Creek	15-18	Jack Creek	No sites of concern
First Creek	15-16	First Creek	Spur 910
First Creek	15-18	First Creek	No sites of concern
First Creek	15-20	First Creek	180 spur
First Creek	15-21	First Creek	No sites of concern
First Creek	15-15	First Creek	1210 and 950 roads
Lower Lake Creek	15-05	Lake Creek	Highway 20 Crossing of Lake Creek
Lower Lake Creek	15-07	Lake Creek	No concern areas
Lower Lake Creek	15-09	Lake Creek	Suttle Lake shore areas
Lower Lake Creek	15-15	Lake Creek	No concerns - area around Round Lake and associated roads
Lower Lake Creek	15-18	Lake Creek	Road 1420 - Lake Creek crossing - located on private Land
Lower Lake Creek	15-20	Lake Creek	No sites of concern
Lower Lake Creek		Lake Creek	Road 12 Crossing of Lake Creek
Upper Lake Creek	15-05	Blue Lake/Highway 20	Intermittent tribs to Blue Lake
Upper Lake Creek	15-30	Meadow Lakes areas	none - closed basins
Cache Creek	15-05	Cache Creek	none - intermittent stream
Cache Creek	15-07	Cache Creek	none - intermittent stream
Cache Creek	15-19	Cache Creek	none - intermittent stream
Dry Creek	15-07	Dry Creek	none - intermittent stream

Dry Creek	15-25	Dry Creek	none - intermittent stream
Headwaters Metolius River	15-11	Black Butte Roads	none - no streams
Headwaters Metolius River	15-17	Metolius River	Areas adjacent to Metolius River 1499
Headwaters Metolius River	15-18	Metolius River	No sites of concern
Headwaters Metolius River	15-19	Metolius River	none - Road 14
Headwaters Metolius River	15-21	Metolius River	Lower Bridge Crossing
Headwaters Metolius River	15-32	Metolius River	All sites located in/adjacent to River

The highest concern area in the Upper and Lower Metolius River subwatersheds is site 15-32. The treatment of reed canarygrass/ribbongrass and yellow iris (site 15-32) with aquatic glyphosate or aquatic imazapyr along the Metolius River is one of the largest mapped sites (119.3 acres) with 117.5 acres mapped within 10 feet of the river. A survey conducted in 2006 (USFS 2006 data on file) found approximately 0.9 acres of actual reed canarygrass/ribbongrass and yellow iris plants (Table H-7). Most of the infestation occurs from Lake Creek down to the House of Metolius Private Land (2.7 river miles). Below this point there are a few small scattered patches.

Table H-7. Metolius River reed canary/ribbon grass infestations and other information collected during the 2006 survey.

Reach	Number of Infestations	Total Area ft²	Total Acres	Length of River Bank ft	% of River Bank	% in Slow Water	% Emergent	% on Bank	% on Island or Wood
Lake Cr to House on the Metolius	216	39,950	0.917	3,563	7.586	15.7	42.0	6.9	51.1
Wizard Falls Hatchery to Candle Cr.	13	211	0.005	60	0.132	13.3	60.0	0.0	12.2

Probability and Magnitude

Application methods will include spot spraying for plants on the bank and hand application with a dripless wick for emergent plants along the waters edge and for plants on islands. These methods should keep most of the herbicide out of the water but it is possible some drift could enter the river or some drops could drip from the plants into the water. Glyphosate breaks down fairly rapidly but if a thunderstorm occurred after application residue could also wash into the water.

The Metolius is a large flowing waterbody and dilution should prevent any direct effects to fish in the mainstem and in areas with moderate velocities. Discharge measured below the Camp Sherman Bridge in September of 1999 was 358 cfs (Dachtler 2000). The only area where direct effects might occur would be in alcove and backwater rearing areas that juvenile TE fish often inhabit. These areas are located along the margins, are often shallow and have slow velocities that can be poorly mixed with the other water in the river. The fish habitat survey done by Dachtler (2000) on the upper Metolius River counted 26 alcove and backwater pool habitats in the section from Gorge Campground to Lake Creek. These totaled 13,244 ft² of habitat with depths ranging from 0.3 to 1.3 ft and an average volume of 560 ft³ (15.8 m³).

The following calculation was used to determine what the potential concentration of glyphosate would be in the water and how this could potentially affect bull trout or redband trout. If a patch of reed canarygrass/ribbongrass the same size as the average alcove was treated adjacent to the alcove and half of the applied glyphosate entered the alcove.

Application rate = lbs of active ingredient/acre
Aquatic toxicity level is in Mg/L

Calculations:

Step 1.
(lbs of active ingredient/acre) x (mg/lb) x acre = __Mg
Average aquatic glyphosate application rate = 2 lbs/acre
907,200 Mg /acre x 0.0129 acres = 11,703 Mg

Step 2.
Alcove: (m^2 x m) / (1000 liter/ 1 m^3) = __Liter
For an average alcove: If average alcove volume is 15.86 m^3
15.86 m^3 x (1000 liters/ m^3) = 15,860 liters

Step 3.

Divide Mg by liters to get Mg/L 11,703 Mg/15,860 Liters = 0.74 Mg/L

Step 4.

Multiply by potential herbicide plant wash off fraction (SERA 2003),
for aquatic glyphosate = 0.5
0.74 Mg/L x 0.5 = 0.37 Mg/L

Step 5.

Compare 0.37 Mg/L to toxicity threshold used in this BA
Acute NOEC for Aquatic Glyphosate = 0.1 Mg/L (Tierney et al. 2006)

This analysis shows that the Acute NOEC for aquatic glyphosate is slightly exceeded. However, it is unlikely that half of the applied glyphosate would enter the alcove at one time because the dripless wick application method would apply glyphosate to the plants and much of it would not reach the ground or water. Spot spray would be limited to plants on the bank up to the waters edge and some overspray could occur but even under this application method not all of the glyphosate would enter the water. Glyphosate would also readily adhere to the plants, organic material and soils making this highly unlikely. Dibyendu et al. (1989) found no evidence of lateral movement or surface runoff of glyphosate on an 8◦ slope with clay soils. This analysis assumes that the alcoves would have no water flowing through them and although they are fairly slow moving there is some mixing that occurs with the main river. Water movement through the alcove would rapidly dilute the glyphosate making the duration very short that fish would be exposed to toxicity levels that would produce indirect effects. Michael (2004) reviewed several field studies and found that peak concentrations of herbicide runoff during storm events are short lived, generally lasted from a few minutes to half an hour. Michael (2004) also found spot applications directly to the soil surface resulted in observed concentrations in streams up 0.04Mg/L. This is well below the 0.1 Mg/L used for the acute NOEC for indirect effects (Tierney et al. 2006).

The GLEAMS Driver model was recently developed by SERA (2008) and made available for use during the course of this EIS. The GLEAMS Driver model takes into account many more site specific variables for a site than the SERA Worksheets does. Only rainfall, soils and herbicide

application rate can be changed in the SERA Worksheets while the new GLEAMS Driver model allows for more refined site specific input on soils, precipitation, stream size, stream flow, vegetation, treatment area, hillslope and herbicide application rate. This model was run for a representative small alcove (6 ft wide) with a small amount of flowing water (0.5 cfs) along the Metolius River. Results from the GLEAMS Driver model showed a maximum peak concentration of 0.0003 mg/L of glyphosate that could enter the alcove. This is well below the 0.1 mg/L threshold for olfactory effects to salmonids (Tierny et al. 2006).

The following analysis similar to the previous one was calculated for aquatic imazapyr following the same assumptions:

Application rate = lbs of active ingredient/acre
Aquatic toxicity level is in Mg/L

Calculations:

Step 1.
(lbs of active ingredient/acre) x (mg/lb) x acre = __Mg
Average aquatic imazapyr application rate
= 0.45 lbs/acre = 204,117 Mg /acre x 0.0129 acres = 2,633 Mg

Step 2.
Alcove: (m^2 x m) / (1000 liter/ 1 m^3) = __Liter
For an average alcove: If average alcove volume is 15.86 m^3
15.86 m^3 x (1000 liters/ m^3) = 15,860 liters

Step 3.
Divide Mg by liters to get Mg/L
2,633 Mg/15,860 Liters = 0.17 Mg/L

Step 4.
Multiply by potential herbicide plant wash off fraction (SERA 2004), for aquatic imazapyr = 0.9 0.17 Mg/L x 0.9 = 0.15 Mg/L

Step 5.
Compare 0.15 Mg/L to toxicity threshold used in the USFS Region 6 BA (USDA 2005b) Acute NOEC for aquatic imazapyr = 0.5 Mg/L (USDA 2005b)

This analysis shows that the Acute NOEC for aquatic imazapyr is not exceeded and it is unlikely that a majority of the applied imazapyr would enter the alcove at one time because the dripless wick application method would apply imazapyr to the grass and much of it would not reach the ground or water. This also assumes that the alcoves would have no water flowing through them and although they are fairly slow moving there is some mixing that occurs with the main river.

Triclopyr a high risk herbicide would be used to treat Scotch broom at one site (15-31) in the Candle Creek subwatershed. This species would be treated with spot spray or cut stump application of triclopyr. Site 15-31 is mapped to be 100.4 acres but the professional estimate of actual invasive plant infestation on the ground is only 0.95 acres. The 0.95 acres is a mix of scotch broom and four other invasive plant species. Some of this mapped site is adjacent to Candle Creek but the actual small amount of scotch broom present, the selective application method, the use of the PDFs and large volume of water in Candle Creek for dilution if any triclopyr did reach the water would prevent

any effects to bull trout. Summer low flow measurements from the most recent fish habitat survey was 72 cfs measured in August of 1995 (Houslet and Lovtang 1996).

Indirect effects to fish from aquatic plants or algae being affected by the use of sulfometuron, aquatic imazapyr or aquatic glyphosate could occur but is not expected because it is unlikely that large enough amounts of these herbicides will reach the stream and selective application methods and PDFs (see discussion starting on page 117 of Fisheries Report) that will minimize the risk for water contamination.

Direct effects to TES fish would include disturbance to individuals as a result of walking in or near the water during chemical application. In general, juvenile and adult fish will avoid the presence of human beings and will more than likely swim away from shadows overcast on waterbodies. The possibility of a fish being present in the immediate water column where spot spray or hand wick applications may be taking place up to the water's edge is high in the upper Metolius River. Fry and juveniles tend to avoid faster flows and rear along the shoreline or around large substrate/wood where flow is slower. Fry tend to avoid overcastting shadows as well but can return to their previous location after being disturbed.

Distribution: Sites are located throughout the watersheds (see table H-8) lists all the sites near stream. Most sites are located long distances from TES fish populations which allows for dilution and breakdown of herbicides. The use of PDFs, and the use of moderate and low risk herbicides would prevent any direct effects to fish.

PE 2 = Sedimentation or turbidity caused by removal of invasive plants, from hand pulling, herbicide application, or tarping.

Sedimentation – Manual (hand pulling) or Cultural Methods (tarping, soil enhancment)

Proximity and Probability: Hand pulling will mostly be in areas away from waterbodies but some individual plants may be pulled next to the stream or on islands. Along the Metolius River some of the emergent ribbon/reed canarygrass will be pulled. Tarping may be used in some locations to kill ribbon/reed canary and effects from this would be similar to pulling with less ground disturbance but larger single patches of soil would be devegetated. Replanting with native vegetation and soil enhancement such as mulching and amendments would be used on areas that were devegetated to help with water retention and in turn promote growth of native vegetation. Soil enhancement would have a beneficial effect on areas that had been treated by returning native vegetation to the site.

Pulling along the Metolius would occur within the project area (15-32) which recent surveys indicate there is approximately one acre of ribbon/reed canary grass, half an acre of which is emergent and suitable for pulling (USFS 2006 data on file). Most of this would occur from Lake Creek down to House of Metolius Private Land (2.7 river miles). Below this point there are fewer scattered populations.

The effect of pulling scattered plants in the uplands and even within the riparian areas would leave small patches of bare soil until covered with organics from the forest or new vegetation sprouted which could take 1-3 years depending on location. Pulling of ribbon/reed canary grass would target emergent plants that have root mats or clumps that are growing on the rivers substrate or on rocks or logs. Most of this sediment is already in the system and would get redistributed locally and to other locations just downstream in a small localized pulse. Some of the sediment would be fine silts that could travel for some distance in the water column before settling out.

Timing: Most sediment would settle and clear in 0-3 hours after pulling occurred at a given location. Pulling could occur at anytime from May 1 to October 31. Areas below bankfull adjacent to waters with TES listed fish such as the Metolius River pulling would happen during the ODFW in-water work period to avoid disturbance to spawners and redds.

Magnitude and Nature: Pulling plants in most project areas will not have a noticeable or measurable effect on fish except in the Metolius River where pulling of ribbon/reed canary grass could disturb both bull trout and redband trout juveniles. Adults of these species primarily use deeper main channel habitats and disturbance to them would not be likely. Disturbance could occur to juvenile fish while pulling plants in the shallows. Fine sediments disturbed from the substrate could affect the ability of fish to see predators and some sediment particles might irritate fish gills. Sediment effects would be localized around where individual clumps or plants were pulled. The youngest life stages of fish would be most vulnerable to the effects of pulling in the Metolius while larger fish would be less affected as they generally do not use the shallower margins.

Pulling invasive plants at all of the project areas will have little to no measurable effect on fish because they are often pulled away from the water and occur in scattered individual locations. The exception is project area 15-32 along the Metolius River where pulling could cause disturbance of substrate sediments and to a lesser extent sediments at the waters edge. These actions could make fish relocate to other areas where they would be more vulnerable to predation. It may also cause some individual fish to stop eating for a short period of time, although fry sometimes will feed on aquatic insects floating in the water column from the disturbance. It is unlikely, but individual fish could get stepped on during the pulling by people standing in the water. Steelhead are not currently present but could stray into the system from recent reintroductions in adjacent watersheds. Turbidity and dissolved oxygen from these activities are not expected to reach levels that could noticeably effect fish survival or behavior.

PE 3 = Off channel habitat in the form of instream and overhead cover along stream margins, backwaters, side channels and alcoves along the Metolius River.

Temperature - Manual (Hand Pulling), Mechanical (Weed Whacking), Cultural (Tarping) or Herbicide (Herbicide) Methods

Proximity and Magnitude: Most invasive plant species to be removed are not riparian dependent species and will occasionally be found only along the edge of water. At sites that contain ribbongrass, reed canarygrass and yellow iris removal of emergent plants may occur that are growing out of the shallows or along the edge of the water. Measurable changes in water temperature from invasive plant removal are not expected (see hydrology section of the EIS). Most invasive plants are small plants under 3 feet tall and do not contribute to overall shading in a forested riparian settings. Most shading comes from native trees and shrubs or from the aspect of adjacent slopes to a given waterbody.

The greatest potential effects from invasive plant removal would be at ribbon/reed canary grass sites. The Metolius River (treatment area 15-32) has the largest ribbon/reed canarygrass site that has only 0.9 acres of actual invasive plants of which approximately 0.5 acres is emergent vegetation that could be pulled easily (USFS 2006 data on file). However, the mapped polygon greatly overestimates the size of this infestation and shows 119 acres at this site.

Duration and Timing: At ribbon/reed canarygrass sites these methods would most likely only occur once per season of any individual plant. The amount of treatment each season will decrease as the

infestation decreases from the subsequent treatments. The duration of invasive plant removal would most likely be short term and range from a one time occurrence to once or twice a year for up to 3 years for the initial treatment. The rate at which native plants would provide shade for areas that plants were removed from through natural recolonization or from replanting of natives is estimated to take between 1 and 5 years. Pulling of invasive plants would occur during times to avoid bull trout spawning activities.

The removal of invasive plants is not expected to contribute to increased temperatures of streams of lakes that could contribute to increased mortality of any fish life stages. Species life histories and appropriately designed ODFW in-water work periods for pulling would avoid the times when more sensitive life stages may be present. Therefore the project will result in a neutral effect for temperature effects to fish and aquatics because most invasive plants are too small and individuals too scattered to provide large amounts of shading. Areas that contain ribbon/reed canarygrass may have some localized reduction of streamside shade but this is not expected to effect measurable changes in temperature requirements for bull trout or other fish for any waterbody this is being proposed near.

Herbicide application would result in a short term loss of cover on Site 15-32 in the Upper and Lower Metolius River watersheds until native plants and shrubs become reestablished. There is a very remote possibility aquatic glyphosate or aquatic imazapyr could enter an alcove and have sublethal effects on juvenile fish, although this is unlikely. The benefits of removing ribbongrass and replacing it with native vegetation outweighs the possibility of affecting a few juvenile fish because native vegetation provides winter cover for the fish while ribbongrass dies back and does not provide cover during the winter. In addition, native vegetation will benefit aquatic invertebrates, providing a food source for the fish, and the Metolius River riparian ecosystem, by maintaining vegetative diversity on the islands and reducing the rate of channel narrowing.

Whychus (formerly Squaw) Creek Subwatersheds (HUC – Upper Whychus Creek 170703010802, Middle Whychus Creek 170703010808, Lower Whychus Creek 170703010809)

Bull trout inhabit the lower mile of Whychus Creek below Alder Springs and redband trout and are found up to near the wilderness boundary. Steelhead and Chinook historically used the creek and steelhead reintroductions started in the spring of 2007 and Chinook reintroductions are expected to start in the spring of 2009. Invasive plants in this area are located along road systems, the stream and surrounding uplands.

Invasive plants in the six project areas proposed for chemical treatment are spotted knapweed, diffuse knapweed, Canada thistle, and medusahead. Some large infestations occur of primarily medusahead and diffuse knapweed. Manual and herbicide methods will be used to treat these species. First choice chemicals for treating these species are clopyralid and sulfometuron. These chemicals are low to moderate risk to fish and aquatics. Chemical and sedimentation effects to fish bearing streams will only be addressed because these are the only two habitat indicators that could effect these fish populations.

Project Element (PE) 1 = Chemical contamination indicator from herbicide application using hand select, spot spray or broadcast spray methods.

Proximity, probability, magnitude, and distribution will be discussed here. Refer to the general discussion starting on page 117 of the Fisheries Report for duration, nature, frequency, and timing of effects.

Proximity, Probability and Magnitude: Although the mapped invasive plant sites show 745 acres (Table H-8) for the three subwatersheds the professional estimate of actual acres of invasive plants on the ground is less than this. Most of the invasive plants acres and acres within 300 feet of perennial fish bearing streams are located in the lower Whychus Subwatershed (Table H-28). The largest site 75-56 has 647 acres of mapped invasive plants but the professional estimate of actual invasive plants on the ground is 143 acres consisting of mainly medusahead and diffuse knapweed. SERA risk assessments found exposure levels to fish for sulfometuron, and clopyralid to be far below levels of concern for forest service programs. This large site located in Lower Whychus Creek subwatershed has the potential for more sediment and herbicide delivery because of the sparse vegetation and steeper slopes that are associated with the canyon walls. Although flows above Alder Springs have been higher in recent years due to more water purchased from irrigators for instream flows they are still well below what would naturally be in the stream and can get below approximately 15 cfs in this section. There is a chance for increased indirect effects to fish because of potentially low summer flows that will have less of a dilution effect on herbicides should they reach water. To ensure there is no chance for detrimental indirect effects herbicide application will be restricted to no more than 10 acres of treated area per year where slopes exceed 10 % within the Whychus Creek canyon, in adjacent intermittent canyons and in areas within 300 feet of perennial streams. Potential areas of concern from proposed treatments are listed by subwatershed in Table H-10.

Table H-8. Acres and number of locations of infested invasive plant sites that occur within specified buffers for intermittent (Int.) streams by subwatershed and total acres and number of infested invasive plant sites by subwatershed. Results represent sites proposed for some form of herbicide treatment.

		Intermittent Stream Info			Total for perennial and intermittent streams in each HUC 6		
HUC6 Name	HUC6 Number	Acres within 100' of Int. Streams	Number of areas 100' from Int. Streams	Acres on Int. Stream Channels	Number of Infested Invasive plant Sites	Total Invasive plant Acres in HUC6 (intermittent and perennial streams)	Total Sub-watershed Acres
Upper Whychus Creek	170703010802	0.00	0	0.00	9	44.21	18291
Middle Whychus Creek	170703010808	0.00	0	0.00	1	47.50	14980
Lower Whychus Creek	170703010809	62.12	5	1.99	15	654.00	20237
	Totals	**62.12**	**5.00**	**1.99**	**25.00**	**745.71**	53508

Table H-9. Acres and number of locations infested invasive plant sites occur within specified buffers for perennial streams, rivers, lakes, and springs by subwatershed. Results represent sites proposed for some form of herbicide treatment.

HUC6 Name	HUC6 Number	Acres within 10' of perennial water	Number of areas 10' from perennial water	Acres within 100' of perennial water	Number of areas 100' from perennial water	Acres within 300' of perennial water	Number of areas 300' from perennial water

Upper Whychus Creek	170703010802	0.48	3	4.71	3	11.38	5
Middle Whychus Creek	170703010808	0.00	0	0.00	0	0	0
Lower Whychus Creek	170703010809	7.59	8	58.34	8	111.42	7
	Totals	**8.07**	**11.00**	**63.05**	**11.00**	**122.80**	**12.00**

There are 11.4 acres of mapped invasive plants within 300 ft of perennial water within the Upper Whychus Subwatershed (Site 15-03), but this area has more vegetation than on the CRNG because it is in a forested setting and the stream is much larger above the irrigation diversions. Average annual flow in Whychus Creek above the irrigation diversions is 105 cfs (USDA 1998). This site will be controlled by manual methods with no herbicide application.

Table H-10. All PAU sites In the Whychus Watershed by 6th field and potential areas of concern

6th Field	PAU #	Streams	Infested Areas of Concern
Upper Whychus Creek	15-03	Whychus Creek	Areas near Sisters along 16 Road and adjacent to Whychus Creek
Upper Whychus Creek	15-22	Pole Creek	None – site 0.5 miles from stream
Upper Whychus Creek	15-24	None	None
Middle Whychus Creek	None	None	None
Lower Whychus Creek	76-56	Whychus Creek	Alder Springs areas and those adjacent to Whychus Creek
Lower Indian Ford	15-04	Indian Ford Creek	At Pine Street Road crossing – no TE habitat or concerns
Lower Indian	15-05	Indian Ford Creek	At Highway 20 Road Crossing – no TE habitat or concerns
Lower Indian	15-11	None	15-11 road and roads around Black Butte.
Upper Indian Ford	15-27	Indian Ford Creek	Glaze Meadow - no TE habitat or concerns
Four Mile Butte	15-25	None	Little Butte – no streams or water
	15-05	none	Highway 242 – no water issues
Upper Trout Creek	15-22	Trout Creek	Trout Creek Swamp – No TE

The concern areas on Whychus Creek are sites 15-03 (manual control methods only) and 76-56 (see discussion above). All other sites are either located away from any streams or are located on streams that do not contribute flow to Whychus Creek in summer and fall when treatments would occur and do not contain TES listed species.

Distribution: Table H-10 lists all the existing sites near Whychus Creek. Most sites are located long distances from fish populations which allows for dilution and breakdown of herbicides. The use of PDFs and the use of moderate and low risk herbicides would prevent any direct effects to TES fish.

PE 2 = Sedimentation or turbidity cause by removal of invasive plants from hand pulling, herbicide application, or tarping.

The effect of pulling scattered plants in the uplands and even within the riparian areas would leave small patches of bare soil until covered with organics from the surrounding vegetation or new vegetation sprouted which could take 1-3 years depending on location. Pulling could occur from May

1 to October 31 in most project areas. Amounts of sediment produced from pulling would be very small and immeasurable against all of the other actions that have occurred in the watershed. Pulling invasive plants in these subwatersheds will have no affect on bull trout, redband trout or reintroduced steelhead or salmon.

PE 3 = Off channel habitat in the form of instream and overhead cover along stream margins, backwaters, side channels and alcoves.

Temperature – Manual (hand pulling), Mechanical (weed whacking), Cultural (tarping) or Herbicide Methods.

This project element would not be affected in these subwatersheds as there are no sites that contribute to shade or overhead cover due to proximity to the streams/water bodies and due to the types of invasive plants in these subwatersheds.

Odell Subwatersheds (HUC - Odell Lake 170703010201, Odell Creek 170703010202, Moore Creek 170703010203, and Davis Lake 170703010204)

Bull trout and redband trout have been documented in Trapper Creek, Crystal Creek, Fire Creek, Odell Creek, Maklaks Creek and two unnamed tributaries to Odell Creek. Redband trout are also present in Ranger Creek. Trapper Creek is the primary spawning and rearing stream for Odell Lake bull trout. Invasive plant infestations in this area are located along Highway 58 and the railroad which run along the North and South shores of Odell Lake, respectively. In the Moore Creek subwatersheds invasive plant sites proposed for chemical treatment are mainly located in old timber sale units and are all more than 300 ft from Moore Creek. Moore Creek contains introduced brook trout in the upper end and goes intermittent before reaching Davis Lake. Invasive plant species in the three project areas proposed for chemical treatment are spotted knapweed, diffuse knapweed, Canada thistle, Dalmation toadflax, St Johnswort, butter and eggs, tansy ragwort, bull thistle and Scotch thistle. Manual and herbicide methods will be used to treat these species. First choice chemicals for treating these species are clopyralid, metsulfuron and picloram. These chemicals are low risk to fish except for picloram which is high risk. Chemical and sedimentation effects to fish bearing streams will only be addressed because these are the only two habitat indicators that could effect these fish populations.

Project Element (PE) 1 = Chemical contamination indicator from herbicide application using hand select, spot spray or broadcast spray methods.

Proximity, probability, magnitude, and distribution will be discussed here.

Proximity, Probability and Magnitude: Herbicides would be applied to sites using broadcast, patch broadcast or hand spray application. This would be done once a season, generally in the spring or summer. Although the mapped invasive plants sites show 371 acres (Table H-11) for all the subwatersheds the professional estimate of actual acres of invasive plants on the ground is much less than this.

Table H-11. Acres and number of locations of infested invasive plant sites that occur within specified buffers for intermittent (Int.) streams by subwatershed and total acres and number of infested invasive plant sites by subwatershed. Results represent sites proposed for some form of herbicide treatment.

		Intermittent Stream Info			Total for perennial and intermittent streams in each 6th field HUC		
HUC6 Name	HUC6 Number	Acres within 100' of Int. Streams	Number of areas 100' from Int. Streams	Acres on Int. Stream Channels	Number of Infested Invasive plant Sites	Total Invasive plant Acres in HUC6 (intermittent and perennial streams)	Total Sub-watershed Acres
Odell Lake	170703010201	0.00	0	0.00	49	219.90	23170
Odell Creek	170703010202	0.00	0	0.00	16	56.09	13830
Moore Creek	170703010203	0.00	0	0.00	6	13.59	14748
Davis Lake	170703010204	0.00	0	0.00	4	82.00	22505
	Totals	0.00	0.00	0.00	75.00	371.57	74254

Most of the invasive plant acres and acres within 300 feet of perennial fish bearing streams are located in the Odell Lake subwatershed (Table H-12). Sites 12-02 and 12-16 cross several streams that enter the lake and in several areas come within 300 feet of Odell Lake. Sites 12-02 and 12-16 where estimated to contain 31 and 11 acres of actual invasive plants but are mapped to be 128 and 125 acres, respectively. SERA risk assessments found exposure levels to fish for metsulfuron and clopyralid to be far below levels of concern for forest service programs so treatment of species with these herbicides should have no direct effects on redband or bull trout. Site 12-16 is located approximately 270 feet from Trapper Creek the primary spawning and rearing stream for bull trout and it does not cross any intermittent tributaries that feed into it. Calculations using the SERA Worksheets indicated that because of the high rainfall rates and porous soils there was a risk for direct effects to fish from the use of picloram at the highest application rate. There was also a risk of indirect effects to algae and macrophytes from using chlorsulfuron at typical or high application rates. To mitigate these risks chlorsulfuron will not be allowed for use and picloram will only be allowed for use up to the typical application rate. Potential areas of concern from proposed treatments are listed by subwatershed in Table H-13.

Table H-12. Acres and number of locations infested invasive plant sites occur within specified buffers for perennial streams, rivers, lakes, and springs by subwatershed. Results represent sites proposed for some form of herbicide treatment.

HUC6 Name	HUC6 Number	Acres within 10' of perennial water	Number of areas 10' from perennial water	Acres within 100' of perennial water	Number of areas 100' from perennial water	Acres within 300' of perennial water	Number of areas 300' from perennial water
Odell Lake	170703010201	0.95	14	10.67	27	68.87	34
Odell Creek	170703010202	0.30	5	2.77	7	7.15	9
Moore Creek	170703010203	0.00	0	0.00	0	0	0
Davis Lake	170703010204	0.00	0	0.00	0	0	0
	Totals	1.25	19.00	13.44	34.00	76.02	43.00

Table H-13. All PAU sites in the Wickiup Watershed by 6th field and potential areas of concern.

6th Field	PAU #	Streams	Infested Areas of Concern
Odell Lake	12-02	North Odell Lake Streams	ROW along Highway 58
Odell Lake	12-16	Trapper Creek and Crystal Creek	ROW along Railroad
Odell Creek	12-02	Odell Creek	ROW along Highway 58 at Odell Creek Crossing
Odell Creek	12-11	None	None
Moore Creek	12-01	None	None
Davis Lake	12-12	Davis Lake	None due to bio control of Canada thistle along north shoreline of Davis

Indirect effects to fish from reducing amounts of aquatic plants or algae by the use of sulfometuron or metsulfuron could occur but the amount would be localized and short term as it is unlikely that large enough amounts of these herbicides will reach the stream because of selective application methods and PDFs that will minimize the risk for water contamination.

Distribution: Sites are located throughout the watersheds. Table H-13 lists all the sites near streams. Most sites are located long distances from TE fish populations which allows for dilution and breakdown of herbicides. The use of PDFs, and the use of moderate and low risk herbicides would prevent any direct effects to TES fish.

PE 2 = Sedimentation or turbidity cause by removal of invasive plants from hand pulling, herbicide application, or tarping.

The effect of pulling scattered plants in the uplands and even within the riparian areas would leave small patches of bare soil until covered with organics from the grasslands or new vegetation sprouted which could take 1-3 years depending on location. Pulling above bankfull would occur from May 1 to October 31. Amounts of sediment produced from pulling would be very small and immeasurable against natural processes or all of the other actions that have occurred or are occurring in the subwatersheds. Pulling of invasive plants in these subwatersheds will have no effect on bull trout or redband trout.

Timing: Most sediment would settle and clear in 0-3 hours after pulling occurred at a given location. Pulling could occur at anytime from May 1 to October 31. Areas below bankfull adjacent to waters with TES listed fish bearing waters would happen during the ODFW in-water work period to avoid disturbance to spawners and redds.

PE 3 = Off channel habitat in the form of instream and overhead cover along stream margins, backwaters, side channels and alcoves.

Temperature - Manual (Hand Pulling), Mechanical (Weed Whacking), Cultural (Tarping) or Herbicide (Herbicide) Methods

This project element would not be affected in these subwatersheds as there are no sites that contribute to shade or overhead cover due to proximity to the streams/water bodies and due to the types of invasive plants in these subwatersheds.

McKay Creek and Allen Creek Subwatersheds (HUC –170703050501 and 170703050502)

Mckay Creek currently contains redband trout and juvenile MCR steelhead. Juvenile MCR steelhead were reintroduced into McKay Creek in May 2008, so effects to MCR steelhead will be analyzed.

Invasive plant species in the five project areas proposed for chemical treatment are spotted knapweed, diffuse knapweed, whitetop, field bindweed, houndstongue, St. Johnswort, sulphur cinquefoil, blessed milkthistle, medusahead and scotch broom. Manual and herbicide methods will be used to treat these species. First choice chemicals for treating these species are clopyralid, chlorsulfuron, metsulfuron, sulfometuron, triclopyr, and picloram. These chemicals are low to moderate risk to fish and aquatics except for picloram and triclopyr which are high risk. Chemical and sedimentation effects to fish bearing streams will only be addressed because these are the only two habitat indicators that could effect this population.

Project Element (PE) 1 = Chemical contamination indicator from herbicide application using hand select, spot spray or broadcast spray methods.

Proximity, probability, magnitude, and distribution will be discussed here.

Proximity, Probability and Magnitude: Invasive plant infestations in this area are all are primarily along road systems that run up the valley bottoms of Mckay Creek, Little Mckay Creek and Allan Creek. There are 17.9 acres of infested invasive plant sites with 13 of these acres within 300 feet of fish bearing streams (Tables H-14 & H-15). These sites are scattered in 221 small infestations that range in size from 0.002 acres to 0.19 acres. Herbicides would be applied to sites using broadcast, patch broadcast or hand spray application. This would be done once a season from May 1 to October 31. Potential areas of concern from proposed treatments are listed by subwatershed in Table H-16.

Table H-14. Acres and number of locations of infested invasive plant sites that occur within specified buffers for intermittent (Int.) streams by subwatershed and total acres and number of infested invasive plant sites by subwatershed. Results represent sites proposed for some form of herbicide treatment.

		Intermittent Stream Info			Total for perennial and intermittent streams in each HUC 6		
HUC6 Name	HUC6 Number	Acres within 100' of Int. Streams	Number of areas 100' from Int. Streams	Acres on Int. Stream Channels	Number of Infested Invasive plant Sites	Total Invasive plant Acres in HUC6 (intermittent and perennial streams)	Total Sub-watershed Acres
Upper McKay Creek	170703050501	0.43	8	0.02	216	17.43	20472
Allen Creek	170703050502	0.00	0	0.00	5	0.48	18251
	Totals	0.43	8.00	0.02	221.00	17.91	38723

Table H-15. Acres and number of locations infested invasive plant sites occur within specified buffers for perennial streams, rivers, lakes, and springs by subwatershed. Results represent sites proposed for herbicide treatment.

HUC6 Name	HUC6 Number	Acres within 10' of perennial water	Number of areas 10' from perennial water	Acres within 100' of perennial water	Number of areas 100' from perennial water	Acres within 300' of perennial water	Number of areas 300' from perennial water
Upper McKay Creek	170703050501	0.33	21	5.41	92	12.72	148
Allen Creek	170703050502	0.00	0	0.07	2	0.28	3
	Totals	0.33	21.00	5.48	94.00	13.00	151.00

Table H-16. All PAU sites in the McKay Watershed by 6th field and potential areas of concern

6th Field	PAU #	Streams	Infested Areas of Concern	Fish Species
Upper McKay Creek	71-48	McKay, Little McKay, Tribs	Infestations of knapweeds, thistles, bindweed and others along roads and at some road crossings.	Steelhead, Redband Trout
Upper McKay Creek	71-59	Very upper, intermittent reaches of Little McKay	None - 1.0 intermittent miles upstream of potential steelhead habitat	Steelhead, Redband Trout
Allen Creek	71-58	Allen Creek and Fall Creek	Confluence of Allen and Fall Creeks – sites total are <0.3 acres – potential steelhead stream	Steelhead, Redband Trout

SERA risk assessments found exposure levels to fish for sulfometuron, metsulfuron, clopyralid and sulfometuron to be below levels of concern for forest service programs. Although sites are near fish bearing streams sites are small and scattered throughout the subwatersheds the majority of sites on USFS lands are in the Upper Mckay subwatershed. The scattered nature of these small infestations, the herbicides used and the PDFs to protect aquatic resources should prevent any direct effects to fish population.

Picloram and triclopyr can be toxic to fish. Triclopyr may be used to treat Scotch broom. Field bindweed and sulphur cinquefoil are the invasive plant species to be treated with picloram. They are found at 13 sites with each site less than 0.1 acres. One site with Scotch broom is proposed to be treated with triclopyr. The site is 0.03 acres in size and plants will most likely be spot sprayed or cut and then painted with herbicide. This site is approximately 1,700 feet away from a perennial stream.

Indirect effects to fish from aquatic plants or algae being affected by the use of sulfometuron and chlorsulfuron could occur but should be localized and short term as it is unlikely that large enough amounts of these herbicides will reach the stream to effect the food chain for fish because of selective application methods and PDFs that will minimize the risk for water contamination.

The sites that are to be treated with high risk herbicides are small and scattered therefore effects should be negated with the use of PDFs and application methods. It is very unlikely that detectable amounts of picloram and triclopyr would reach a stream because of the small size of sites with these species and PDFs. There could be possible indirect effects to aquatic algae and macrophytes from herbicides but these are expected to be short term and localized.

PE 2 = Sedimentation or turbidity caused by removal of invasive plants from hand pulling, herbicide application, or tarping.

Manual Methods (Sedimentation)

In most project areas hand pulling will be used on small patches of invasive plants, where there are only a few scattered individuals distributed over a large area or in sensitive areas where the potential effects of hand pulling outweigh the potential effects of herbicide application. Hand pulling will mostly be in areas away from waterbodies but some individual plants may be pulled next to or in the bankfull channel.

Pulling invasive plants would leave small patches of bare soil until covered with organics or new populations. The effect of pulling scattered plants in the uplands and even within the vegetation sprouted which could take 1-3 years depending on location. Pulling could occur above bankfull from May 1 to October 31. Amounts of sediment produced from pulling would be very small and immeasurable against all of the other actions that have occurred in the watershed. Pulling invasive plants in these subwatersheds will have no affect on steelhead or redband trout.

PE 3 = Off channel habitat in the form of instream and overhead cover along stream margins, backwaters, side channels and alcoves.

Temperature - Manual (Hand Pulling), Mechanical (Weed Whacking), Cultural (Tarping) or Herbicide (Herbicide) Methods

This project element would not be affected in these subwatersheds as there are no sites that contribute to shade or overhead cover due to proximity to the streams/water bodies and due to the types of invasive plants in these subwatersheds.

LOWER JOHN DAY SUBBASIN

Bridge Creek Watershed

(6TH HUC - Headwaters Bridge Creek 170702040301, Upper Bridge Creek 170702040303, Upper Bridge Bear Creek 170702040304, West Branch Bridge Creek 170702040302)

Streams in this watershed contain steelhead and redband trout. Infested weed sites are located upstream of know steelhead use. Invasive plants proposed for chemical or manual treatments are spotted knapweed, yellow starthistle, sulphur cinquefoil, medusahead, St. Johnswort, field bindweed, houndstongue and lesser burdock. First choice chemicals for treating these species are clopyralid, sulfometuron, metsulfuron and picloram. Picloram should only be used on sulphur cinquefoil as that is the only effective chemical to really treat this species (Dave Langland, Oregon Dept. of Agriculture, personal communication). Picloram is a high risk chemical to fish while the other chemicals are low to moderate risk to fish and aquatics. Invasive plant sites are primarily located along roads with project areas crossing and running near streams. Chemical and sedimentation effects to fish in perennial streams will only be addressed because these are the only two habitat indicators that could affect fish with these invasive plant species and treatment methods.

Project Element (PE) 1 = Chemical contamination indicator from herbicide application using hand select, spot spray or broadcast spray methods.

Proximity, Probability and Magnitude:

Herbicide Application (Herbicide Contamination)

There are 13 project areas that contain 94 infested invasive plant polygons that total 290 acres (Table H-17). Mapped infested invasive plant sites total 19 acres in 6 locations within 100 feet of perennial waterbodies (Table H-18). Actual acres of invasive plants to be treated in these 74.6 acres is less than this because they are not all filled with invasive plants, exactly how much less is not known. Potential areas of concern from proposed treatments are listed by subwatershed in Table H-19.

Table H-17. Acres and number of locations infested invasive plant sites occur within specified buffers for intermittent (Int.) streams by subwatershed and total acres and number of infested invasive plant sites by subwatershed. Results represent sites proposed for some form of herbicide treatment.

		Intermittent Stream Info			Total for perennial and intermittent streams in each HUC 6		
HUC6 Name	HUC6 Number	Acres within 100' of Int. Streams	Number of areas 100' from Int. Streams	Acres on Int. Stream Channels	Number of Infested Invasive plant Sites	Total Invasive plant Acres in HUC6 (intermittent and perennial steams)	Total Sub-watershed Acres
Headwaters Bridge Creek	170702040301	0.00	0	0.00	4	1.23	28608
West Branch Bridge Creek	170702040302	6.46	1	0.23	76	257.41	25399
Upper Bridge Creek	170702040303	0.43	1	0.01	3	26.84	25978
Upper Bridge Bear Creek	170702040304	0.10	3	0.00	35	2.33	16850
Middle Bridge Bear Creek	170702040305	0.00	0	0.00	21	1.71	21537
	Totals	6.99	5.00	0.24	139.00	289.52	118373

Table H-18. Acres and number of locations infested invasive plant sites occur within specified buffers for perennial streams, rivers, lakes, and springs by subwatershed. Results represent sites proposed for some form of herbicide treatment.

HUC6 Name	HUC6 Number	Acres within 10' of perennial water	Number of areas 10' from perennial water	Acres within 100' of perennial water	Number of areas 100' from perennial water	Acres within 300' of perennial water	Number of areas 300' from perennial water
Headwaters Bridge Creek	170702040301	0.00	0	0.00	0	0.10	1
West Branch Bridge Creek	170702040302	1.71	6	18.37	9	58.86	20
Upper Bridge Creek	170702040303	0.00	0	0.00	0	0.00	0
Upper Bridge Bear Creek	170702040304	0.00	0	0.50	10	1.71	27

Middle Bridge Bear Creek	170702040305	0.00	0	0.00	0	0.16	2
	Totals	1.71	6.00	18.87	19.00	60.83	50.00

Table H-19. All PAU sites in the Bridge Creek Watershed by 6th field and potential areas of concern.

6th Field	PAU #	Streams	Infested Areas of Concern
Headwaters Bridge Creek	71-10	Bridge Creek	None – located 1.0 miles above intermittent stream to steelhead habitat
Headwaters Bridge Creek	71-14	Bridge Creek	None – located 0.6 miles above intermittent stream to steelhead habitat
Headwaters Bridge Creek	71-23	Bridge Creek	None – located 1.0 miles above intermittent stream to steelhead habitat
West Branch Bridge Creek	71-16	West Branch Bridge Creek, Camp Creek	None – nearest site is 1.3 miles above steelhead habitat
West Branch Bridge Creek	71-32	West Branch Bridge Creek, Camp Creek	None – nearest site is 1.3 miles above steelhead habitat
West Branch Bridge Creek	71-33	West Branch Bridge Creek, Camp Creek	None – nearest site is 1.5 miles above steelhead habitat
Upper Bridge Creek	71-15	Bridge Creek	None – located 2.0 miles above intermittent stream to steelhead habitat
Upper Bridge Bear Creek	71-06	Bear Creek	None – located 2.5 miles above steelhead habitat
Upper Bridge Bear Creek	71-50	Bear Creek	None – located 1.0 miles above steelhead habitat
Upper Bridge Bear Creek	71-56	Bear Creek	None – located 3.0 miles above steelhead habitat
Middle Bridge Bear Creek	71-32	Dodds Creek	None – sites located at least 1.0 miles upstream of steelhead habitat

The largest site (71-16) at 243 acres was professionally estimated to have only 9.8 acres of actual invasive plants. It crosses two perennial streams with known steelhead use to occur approximately 1.3 miles downstream. It contains houndstongue which is typically treated with metsulfuron. The other two sites (71-10 and 71-32) over 10 acres were professionally estimated to have only 5.5 and 4.5 acres of actual invasive plants. Site 71-10 is approximately 650 ft to a non fish bearing perennial stream. It has yellow starthistle and medusahead and will be treated with clopyralid and metsulfuron. Site 71-32 crosses a non fish bearing perennial stream that is located approximately 1.3 miles upstream of a known steelhead stream. It has houndstongue and will be treated with metsulfuron.

Thirteen sites contain sulphur cinquefoil and one site has field bindweed, each site is less than 0.1 acre in size and all total 1.3 acres. The 1st choice herbicide for these species is picloram, which is known to be toxic to fish. Some of these sites are located along upper Bear Creek and NF Bear Creek and the closest site to known steelhead usage is approximately 1.4 miles downstream.

The small size of the sites to be treated with picloram and long distance between them and steelhead streams will prevent any adverse affects to steelhead in these streams. Both intermittent and perennial streams would have buffers depending on herbicide and application method. The buffer distance between these fish populations and the invasive plant sites would allow time for the herbicides to break down and bind to soils. Because of the small size of the picloram sites and because they are spread throughout the subwatersheds even if a thunderstorm event occurred a few days after application the amounts of herbicide reaching the stream would likely not be at high

enough levels to harm or effect fish living downstream. The SERA Worksheets found exposure levels to fish for picloram, clopyralid, sulfometuron, metsulfuron and clopyralid to be far below levels of concern in this watershed. These herbicides could cause some slight, localized indirect effects to aquatic algae and macrophytes but this is not expected to be at a large enough scale that it would cause changes in fish behavior or survival.

PE 2 = Sedimentation or turbidity caused by removal of invasive plants from hand pulling, herbicide application, or tarping.

Manual Methods (Sedimentation)

Hand pulling will mostly be in areas away from waterbodies but some individual plants may be pulled next to perennial streams or in intermittent channels. The effect of pulling scattered plants along roadsides and even within the riparian areas would leave small patches of bare soil until covered with organics from the forest or new vegetation sprouted which could take 1-3 years depending on location. Pulling above bankfull could occur at anytime from May 1 to October 31. Amounts of sediment produced from pulling would be very small and immeasurable against the other actions that have occurred in the watershed. Pulling invasive plants in these subwatersheds will have no affect on steelhead or redband trout.

PE 3 = Off channel habitat in the form of instream and overhead cover along stream margins, backwaters, side channels and alcoves.

Temperature - Manual (Hand Pulling), Mechanical (Weed Whacking), Cultural (Tarping) or Herbicide (Herbicide) Methods

This project element would not be affected in these subwatersheds as there are no sites that contribute to shade or overhead cover due to proximity to the streams/water bodies and due to the types of weeds in these subwatersheds.

UPPER JOHN DAY WATERSHEDS

Mountain Creek, Rock Creek, Upper Middle John Day, and the Lower South Fork Watersheds (HUC - 1707020113, 1707020114, 1707020112, 1707020105)

Streams in this watershed contain steelhead and redband trout. Infested invasive plant sites are located upstream of known steelhead use. Invasive plant species identified for chemical or manual treatments are spotted knapweed, yellow starthistle, sulphur, medusahead, St. Johns wart, field bindweed, houndstongue, Himalayan blackberry and lesser burdock. First choice chemicals for treating these species are clopyralid, sulfometuron, metsulfuron, triclopyr and picloram. Picloram should only be used on sulphur cinquefoil as that is the only effective chemical to really treat this species (Dave Langland, Oregon Dept. of Agriculture, personal communication). Picloram is high risk to fish while the other chemicals are low to moderate risk to fish and aquatics. Weed infestations are primarily located along roads with project areas crossing and running near streams. Chemical and sedimentation effects to fish in perennial streams will only be addressed because these are the only two habitat indicators that could affect fish with these invasive plant species and treatment methods.

Project Element (PE) 1 = Chemical contamination indicator from herbicide application using hand select, spot spray or broadcast spray methods.

Proximity, probability, magnitude, and distribution will be discussed here. Refer to the general discussion starting on page 117 of the Fisheries Report for duration, nature, frequency, and timing of effects.

Proximity, Probability and Magnitude:

There are 13 project areas that contain 79 infested invasive plant polygons that total 22.3 acres (Table H-20). Mapped infested invasive plant sites total 12.2 acres in 23 locations within 100 feet of perennial waterbodies (Table H-21). Actual acres of invasive plants to be treated in these is less than this because they are not all filled with invasive plants, exactly how much less is not known. The largest site (71-16) at 243 acres was estimated to have only 9.8 acres of actual invasive plants. Potential areas of concern from proposed treatments are listed by subwatershed in Table H-22.

There are 5 sites at the mouth of Black Canyon Creek, adjacent to the trailhead, which are within 10 feet of Black Canyon Creek and South Fork of the John Day River (72-53). In addition there is one site (72-06) located directly adjacent to a steelhead stream which is Mac Creek. This knapweed infestation is approximately 0.1 acres in size and is proposed to be treated with clopyralid. The next closest sites (72-10) to steelhead streams are located approximately 80 to 90 feet from NF Wind Creek and these are both approximately 0.1 acres in size. Proposed herbicides to treat invasive plants at these sites are chlorsulfuron and clopyralid. A 0.75 acre site (78-42) containing Himalayan blackberry is located approximately 150 ft from Cottonwood Creek and is proposed to be treated with aquatic approved triclopyr at the typical application rate. The next closest sites to steelhead streams are two sites estimated to each be 0.1 acres in size that are located approximately 600 to 700 feet from Badger Creek and SF Wind Creek. These are proposed to be treated with sulfometuron and chlorsulfuron. All other sites in the Upper John Day Watershed are located over 1,000 ft away from occupied steelhead streams.

Both intermittent and perennial streams would have buffers depending on herbicide and application method. The buffer distance between these fish populations and the invasive plant sites would allow time for the herbicides to break down and bind to soils. Because of the small size of most sites and because they are spread throughout the subwatersheds even if a thunderstorm event occurred a few days after application the amounts of herbicide reaching the stream would not be at high enough levels to harm or effect fish living downstream. The SERA Worksheets indicated exposure levels to fish for triclopyr, chlorsulfuron, sulfometuron, metsulfuron and clopyralid to be far below levels of concern in this watershed. It is unlikely high enough amounts of herbicide would reach the stream to harm fish or change their behavior.

Table H-20. Acres and number of locations infested invasive plant sites occur within specified buffers for intermittent (Int.) streams by subwatershed and total acres and number of infested invasive plant sites by subwatershed. Results represent sites proposed for some form of herbicide treatment.

		Intermittent Stream Info			Total for perennial and intermittent streams in each HUC 6		
HUC6 Name	HUC6 Number	Acres within 100' of Int. Streams	Number of areas 100' from Int. Streams	Acres on Int. Stream Channels	Number of Infested Invasive plant Sites	Total Invasive plant Acres in HUC6	Total Sub-watershed Acres
Wind Creek	170702010501	0.00	0	0.00	6	0.49	17589
Corner Creek Black Pine Creek	170702010502	0.10	1	0.00	15	9.31	18746
Black Canyon Creek	170702010503	0.00	0	0.00	13	2.69	20826
Jackass Creek	170702010504	0.00	0	0.00	3	2.30	17621
Cottonwood Creek	170702011202	0.00	0	0.00	7	1.46	19363

Upper Middle Mountain Creek	170702011301	0.00	0	0.00	8	1.05	26402
Middle Mountain Creek	170702011302	0.00	0	0.00	7	1.99	34850
Upper Rock Creek	170702011401	0.12	2	0.00	20	2.98	31271
	Totals	0.22	3	0.00	79	22.27	186668

Table H-21. Acres and number of locations infested invasive plant sites occur within specified buffers for perennial streams, rivers, lakes, and springs by subwatershed. Results represent sites proposed for some form of herbicide treatment.

HUC6 Name	HUC6 Number	Acres within 10' of perennial water	Number of areas 10' from perennial water	Acres within 100' of perennial water	Number of areas 100' from perennial water	Acres within 300' of perennial water	Number of areas 300' from perennial water
Wind Creek	170702010501	0.00	0	0.01	1	0.20	2
Corner Creek Black Pine Creek	170702010502	2.80	9	9.00	11	9.21	14
Black Canyon Creek	170702010503	0.00	0	0.00	0	0.00	0
Jackass Creek	170702010504	1.21	10	2.51	7	2.69	3
Cottonwood Creek	170702011202	0.03	1	0.47	1	0.75	1
Upper Middle Mountain Creek	170702011301	0.00	0	0.00	0	0.00	0
Middle Mountain Creek	170702011302	0.01	1	0.10	1	0.85	2
Upper Rock Creek	170702011401	0.00	0	0.10	2	0.30	4
	Totals	4.05	21	12.19	23	14.00	26

Table H-22. All PAU sites by 5th field, 6th field and potential areas of concern.

5th Field	6th Field	PAU #	Streams	Infested Areas of Concern
Lower South Fork John Day	Wind Creek	72-10	North Fork Wind Creek	Two sites located 80-90 feet from the stream and 0.1 acres each
Lower South Fork John Day	Wind Creek	72-01	Trib to South Fork Wind	None – 2 miles above steelhead habitat
Lower South Fork John Day	Wind Creek	72-09	Trib to North Fork Wind	None – 3 miles above steelhead habitat
Lower South Fork John Day	Corner Creek Black Pine Creek	72-10	Intermittent tribs to South Fork John Day	None – all sites 2+ miles above steelhead habitat on intermittent tribs.
Lower South Fork John Day	Black Canyon Creek	None	None	None
Lower South Fork John Day	Jackass Creek	72-53	Jackass Creek	Five invasive plant sites of concern located within 10 feet of streams
Upper Middle John Day	Cottonwood Creek	72-48	Cottonwood Creek	Site is located 150 feet from Cottonwood Creek – Himalayan Blackberry
Upper Middle John Day	Cottonwood Creek	72-07	Trib to Cottonwood Creek	None – sites are located along road 38 and spurs and are a minimum of 1.0 miles from steelhead habitat
Mountain Creek	Upper Middle Mountain Creek	71-42	Indian Creek	None – Sites are 1.5 miles above steelhead habitat
Mountain Creek	Upper Middle Mountain Creek	71-67	Badger Creek	4 Medusahead sites all <0.1 acres – closest site is 0.25 miles from Badger Creek
Mountain Creek	Middle Mountain Creek	72-06	Mac Creek	Site is located directly adjacent to Mac Creek - 0.1 acres of knapweed
Mountain Creek	Middle Mountain Creek	72-36	Trib to Mac Creek	None - Two sites in Barnhouse Campground treatment area. Canada thistle -
Mountain Creek	Middle Mountain Creek	72-61	Keeton Creek	None – Located 1.0 mile above steelhead habitat.
Rock Creek	Upper Rock Creek	72-07	Rock Creek	Sites located along 38 and 3820 road. No sites closer than 700 feet from Rock Creek
Rock Creek	Upper Rock Creek	72-49	Rock Creek	None – sites are located 0.5 miles from Rock Creek

PE 2 = Sedimentation or turbidity caused by removal of invasive plants from hand pulling, herbicide application, or tarping.

Manual Methods (Sedimentation)

In most project areas hand pulling will be used on small patches of invasive plants, where there are only a few scattered individuals distributed over a large area or in sensitive areas where the potential effects of hand pulling outweigh the potential effects of herbicide application. Hand pulling will mostly be in areas away from waterbodies but some individual plants may be pulled next to perennial streams or in intermittent channels.

The effect of pulling scattered plants along roadsides and even within the riparian areas would leave small patches of bare soil until covered with organics from the forest or new vegetation sprouted which could take 1-3 years depending on location. Pulling above bankfull could occur anytime from May 1 to October 31. Amounts of sediment produced from pulling would be very small and immeasurable against the other actions that have occurred in the watershed. Pulling invasive plants in these subwatersheds will have no affect on steelhead or redband trout.

PE 3 = Off channel habitat in the form of instream and overhead cover along stream margins, backwaters, side channels and alcoves.

Temperature - Manual (Hand Pulling), Mechanical (Weed Whacking), Cultural (Tarping) or Herbicide (Herbicide) Methods

This project element would not be affected in these subwatersheds as there are no sites that contribute to shade or overhead cover due to proximity to the streams/water bodies and due to the types of invasive plants in these subwatersheds.

Table H- 23. Road miles in RR/RHCA and in invasive plant treatment area by subwatershed.

Watershed Name	Subwatershed Unit Name	Miles of Road
MIDDLE SOUTH FORK JOHN DAY	PINE CREEK	0.3
MIDDLE SOUTH FORK JOHN DAY	SUNFLOWER CREEK	7.6
LOWER SOUTH FORK JOHN DAY	WIND CREEK	3.7
LOWER SOUTH FORK JOHN DAY	CORNER CREEK/BLACK PINE CREEK	0.2
LOWER SOUTH FORK JOHN DAY	BLACK CANYON CREEK	0.6
MOUNTAIN CREEK	MIDDLE MOUNTAIN CREEK	1.2
ROCK CREEK	UPPER ROCK CREEK	3.3
BRIDGE CREEK	HEADWATERS BRIDGE CREEK	1.4
BRIDGE CREEK	WEST BRANCH BRIDGE CREEK	7.1
BRIDGE CREEK	UPPER BRIDGE CREEK	0.5
BRIDGE CREEK	UPPER BRIDGE BEAR CREEK	14.8
BRIDGE CREEK	MIDDLE BRIDGE BEAR CREEK	0.0
CRANE PRAIRIE	SODA CREEK	1.9
CRANE PRAIRIE	QUINN CREEK	0.8
CRANE PRAIRIE	ELK LAKE	1.6
CRANE PRAIRIE	LAVA LAKES	3.5
CRANE PRAIRIE	CULTUS CREEK	0.5
CRANE PRAIRIE	DEER CREEK	0.5
CRANE PRAIRIE	CULTUS RIVER	0.7
CRANE PRAIRIE	CHARLTON CREEK	0.5
CRANE PRAIRIE	CRANE PRAIRIE	0.3
WICKIUP	ODELL LAKE	5.0
WICKIUP	ODELL CREEK	1.7
WICKIUP	DAVIS LAKE	1.4
WICKIUP	BROWNS CREEK	0.6
WICKIUP	DAVIS CREEK	0.2
WICKIUP	WICKIUP	0.5
FALL RIVER	DUTCHMAN CREEK	2.1
FALL RIVER	SPRING RIVER	0.4
FALL RIVER	FALL RIVER	0.7
FALL RIVER	PRINGLE FALLS	1.5
FALL RIVER	BATES BUTTE	0.5
PILOT BUTTE	COYOTE SPRING	4.2
PILOT BUTTE	BENHAM FALLS	2.1
PILOT BUTTE	BESSIE BUTTE	0.1
PILOT BUTTE	LAVA ISLAND FALLS	1.5
TUMALO CREEK	UPPER TUMALO CREEK	3.1
TUMALO CREEK	LOWER TUMALO CREEK	1.8
DEEP CANYON	THREE CREEK	1.3
DEEP CANYON	TRIANGLE HILL	0.2
SQUAW CREEK	UPPER SQUAW CREEK	2.1
SQUAW CREEK	UPPER TROUT CREEK	1.9
SQUAW CREEK	UPPER INDIAN FORD	0.3

Watershed Name	Subwatershed Unit Name	Miles of Road
SQUAW CREEK	LOWER TROUT CREEK	0.3
SQUAW CREEK	LOWER INDIAN FORD	0.5
SQUAW CREEK	LOWER SQUAW CREEK	1.5
UPPER METOLIUS RIVER	DRY CREEK	0.7
UPPER METOLIUS RIVER	CACHE CREEK	0.5
UPPER METOLIUS RIVER	UPPER LAKE CREEK	11.6
UPPER METOLIUS RIVER	LOWER LAKE CREEK	3.3
UPPER METOLIUS RIVER	HEADWATERS METOLIUS RIVER	3.9
UPPER METOLIUS RIVER	FIRST CREEK	11.6
UPPER METOLIUS RIVER	JACK CREEK	4.0
UPPER METOLIUS RIVER	CANYON CREEK	6.9
UPPER METOLIUS RIVER	ABBOT CREEK	2.8
UPPER METOLIUS RIVER	CANDLE CREEK	0.6
LOWER METOLIUS RIVER	UPPER METOLIUS RIVER	6.2
LOWER METOLIUS RIVER	MIDDLE METOLIUS RIVER	5.9
LOWER METOLIUS RIVER	UPPER FLY CREEK	0.6
LOWER METOLIUS RIVER	LOWER FLY CREEK	3.0
LOWER METOLIUS RIVER	LOWER METOLIUS RIVER	4.7
LAKE BILLY CHINOOK	STEVENS CANYON	0.0
LAKE BILLY CHINOOK	CARCASS CANYON	0.4
LAKE BILLY CHINOOK	GENEVA	0.1
UPPER LITTLE DESCHUTES RIVER	LITTLE ODELL CREEK	0.1
UPPER LITTLE DESCHUTES RIVER	BUNNY BUTTE	1.1
UPPER LITTLE DESCHUTES RIVER	GILCHRIST JUNCTION	0.2
CRESCENT CREEK	LOWER BIG MARSH CREEK	0.1
CRESCENT CREEK	CRESCENT LAKE	3.3
CRESCENT CREEK	COLD CREEK	2.5
CRESCENT CREEK	MIDDLE CRESCENT CREEK	1.5
LITTLE WALKER MOUNTAIN	NORTH PAUNINA	0.3
LONG PRAIRIE	BEAL	0.1
LOWER LITTLE DESCHUTES RIVER	UPPER PAULINA CREEK	0.4
LOWER LITTLE DESCHUTES RIVER	LOWER PAULINA CREEK	0.2
SOUTH FORK BEAVER CREEK	LOWER SOUTH FORK BEAVER CREEK	0.0
UPPER BEAVER CREEK	BEAVERDAM CREEK	1.5
UPPER BEAVER CREEK	POWELL CREEK	2.4
UPPER BEAVER CREEK	SUGAR CREEK	0.5
PAULINA CREEK	UPPER PAULINA CREEK	8.9
PAULINA CREEK	DRY PAULINA CREEK	5.7
LOWER BEAVER CREEK	NORTH WOLF CREEK	0.9
LOWER BEAVER CREEK	WOLF CREEK	13.1
CROOKED RIVER ABOVE NORTH FORK	MAURY CREEK	1.7
CAMP CREEK	INDIAN CREEK	2.1
CAMP CREEK	LOWER CAMP CREEK	0.1
UPPER NORTH FORK CROOKED RIVER	GRAY CREEK	0.0
UPPER NORTH FORK CROOKED RIVER	ELLIOTT CREEK	1.7

Watershed Name	Subwatershed Unit Name	Miles of Road
UPPER NORTH FORK CROOKED RIVER	HOWARD CREEK	6.6
UPPER NORTH FORK CROOKED RIVER	JOHNSON CREEK	2.9
UPPER NORTH FORK CROOKED RIVER	HEADWATERS NORTH FORK CROOKED RIVER	0.1
UPPER NORTH FORK CROOKED RIVER	PETERSON CREEK	0.1
UPPER NORTH FORK CROOKED RIVER	PORTER CREEK	0.2
UPPER NORTH FORK CROOKED RIVER	LOWER BIG SUMMIT PRAIRIE	4.1
DEEP CREEK	JACKSON CREEK	8.9
DEEP CREEK	LITTLE SUMMITT PRAIRIE CREEK	9.9
DEEP CREEK	LOWER DEEP CREEK	11.8
LOWER NORTH FORK CROOKED RIVER	UPPER NORTH FORK CANYON	4.7
UPPER CROOKED RIVER	LOST CREEK	1.6
UPPER CROOKED RIVER	DRAKE CREEK	2.1
UPPER CROOKED RIVER	PINE CREEK	2.9
UPPER CROOKED RIVER	NEWSOME CREEK	9.0
UPPER CROOKED RIVER	UPPER HORSE HEAVEN CREEK	0.4
BEAR CREEK	HEADWATERS BEAR CREEK	9.0
BEAR CREEK	UPPER BEAR CREEK	0.1
BEAR CREEK	LITTLE BEAR CREEK	1.1
UPPER OCHOCO CREEK	HEADWATERS OCHOCO CREEK	14.0
UPPER OCHOCO CREEK	UPPER MARKS CREEK	13.1
UPPER OCHOCO CREEK	LOWER MARKS CREEK	15.4
UPPER OCHOCO CREEK	DUNCAN CREEK	6.2
MILL CREEK	UPPER MILL CREEK	5.1
MILL CREEK	LOWER MILL CREEK	5.7
LOWER OCHOCO CREEK	VEASIE CREEK	0.1
MCKAY CREEK	UPPER MCKAY CREEK	14.8
MCKAY CREEK	ALLEN CREEK	0.7
BADLANDS	KOTZMAN	0.1
CROOKED RIVER VALLEY	LONE PINE CREEK	2.5
CROOKED RIVER VALLEY	MCALLISTER SLOUGH	0.4
CROOKED RIVER GRASSLAND	UPPER CROOKED RIVER GORGE	0.2
CROOKED RIVER GRASSLAND	LOWER CROOKED RIVER GORGE	0.2
HEADWATERS DESCHUTES RIVER	LAKE SIMTUSTUS	0.0
WILLOW CREEK	UPPER WILLOW CREEK	0.1
WILLOW CREEK	RIMROCK SPRING	2.1
WILLOW CREEK	MIDDLE WILLOW CREEK	2.2
WILLOW CREEK	DRY CANYON	2.5
WILLOW CREEK	LOWER WILLOW CREEK	0.2
UPPER TROUT CREEK	OPAL CREEK	2.5
UPPER TROUT CREEK	FOLEY CREEK	3.4
UPPER TROUT CREEK	HEADWATERS TROUT CREEK	7.2
MUD SPRINGS CREEK	UPPER MUD SPRINGS CREEK	3.5
MUD SPRINGS CREEK	SAGEBRUSH CREEK	0.6
	Total	**380.2**

Table H-24. Number of stream crossings by roads within infested invasive plant treatment sites on class 1, 2 and 3 TES fish steam.

HUC	XING WITHOUT TES	XING WITH TES	TOTAL XINGS
170702010304 - SUNFLOWER CREEK	3	12	15
170702010501 - WIND CREEK		5	5
170702010503 - BLACK CANYON CREEK	2	1	3
170702011302 - MIDDLE MOUNTAIN CREEK	2	1	3
170702011401 - UPPER ROCK CREEK		4	4
170702040301 - HEADWATERS BRIDGE CREEK	3	1	4
170702040302 - WEST BRANCH BRIDGE CREEK	13		13
170702040304 - UPPER BRIDGE BEAR CREEK	18	6	24
170703010101 - SODA CREEK	6		6
170703010102 - QUINN CREEK	4		4
170703010103 - ELK LAKE	2		2
170703010104 - LAVA LAKES		5	5
170703010105 - CULTUS CREEK		2	2
170703010106 - DEER CREEK		2	2
170703010107 - CULTUS RIVER		1	1
170703010108 - CHARLTON CREEK	1		1
170703010201 - ODELL LAKE	15	2	17
170703010202 - ODELL CREEK	1	1	2
170703010205 - BROWNS CREEK	1		1
170703010207 - WICKIUP		1	1
170703010306 - BATES BUTTE		1	1
170703010402 - COYOTE SPRING	1		1
170703010501 - UPPER TUMALO CREEK		5	5
170703010802 - UPPER SQUAW CREEK	2		2
170703010803 - UPPER TROUT CREEK	1	1	2
170703010807 - LOWER INDIAN FORD		2	2
170703010809 - LOWER SQUAW CREEK		2	2
170703010903 - UPPER LAKE CREEK	6		6
170703010904 - LOWER LAKE CREEK		2	2
170703010905 - HEADWATERS METOLIUS RIVER	2	4	6
170703010906 - FIRST CREEK		1	1
170703010907 - JACK CREEK		2	2
170703010908 - CANYON CREEK	7	3	10
170703010909 - ABBOT CREEK		2	2
170703011003 - MIDDLE METOLIUS RIVER	1	2	3
170703011005 - LOWER FLY CREEK	1	1	2
170703020105 - GILCHRIST JUNCTION	1		1
170703020204 - CRESCENT LAKE		1	1
170703020205 - COLD CREEK	3	4	7
170703020206 - MIDDLE CRESCENT CREEK		2	2
170703020703 - LOWER PAULINA CREEK	1		1
170703030801 - BEAVERDAM CREEK		1	1
170703030802 - POWELL CREEK	1	6	7
170703030803 - SUGAR CREEK	1	1	2
170703030901 - UPPER PAULINA CREEK	24	3	27
170703030902 - DRY PAULINA CREEK	3	6	9
170703031001 - NORTH WOLF CREEK	1	2	3
170703031002 - WOLF CREEK		11	11
170703040103 - MAURY CREEK		3	3

170703040201 - INDIAN CREEK	6	1	7
170703040302 - ELLIOTT CREEK	2	3	5
170703040303 - HOWARD CREEK	5	8	13
170703040304 - JOHNSON CREEK		11	11
170703040308 - LOWER BIG SUMMIT PRAIRIE	1	2	3
170703040401 - JACKSON CREEK	1	5	6
170703040402 - LITTLE SUMMITT PRAIRIE CREEK	1	5	6
170703040403 - LOWER DEEP CREEK	5	10	15
170703040501 - UPPER NORTH FORK CANYON		4	4
170703040601 - LOST CREEK		1	1
170703040602 - DRAKE CREEK	5	2	7
170703040603 - PINE CREEK	3	1	4
170703040604 - NEWSOME CREEK	2	7	9
170703040605 - UPPER HORSE HEAVEN CREEK	2	1	3
170703040701 - HEADWATERS BEAR CREEK	8	7	15
170703050201 - HEADWATERS OCHOCO CREEK	8	25	33
170703050203 - UPPER MARKS CREEK	13	18	31
170703050204 - LOWER MARKS CREEK	17	20	37
170703050205 - DUNCAN CREEK	7	13	20
170703050301 - UPPER MILL CREEK	3	7	10
170703050302 - LOWER MILL CREEK	2	3	5
170703050501 - UPPER MCKAY CREEK	5	15	20
170703050502 - ALLEN CREEK		1	1
170703051004 - LONE PINE CREEK	1		1
170703051005 - MCALLISTER SLOUGH	2		2
170703060201 - UPPER WILLOW CREEK		1	1
170703060202 - RIMROCK SPRING	2		2
170703060203 - MIDDLE WILLOW CREEK	7		7
170703060204 - DRY CANYON	3		3
170703070101 - OPAL CREEK	4	2	6
170703070102 - FOLEY CREEK	3	3	6
170703070103 - HEADWATERS TROUT CREEK	10	8	18
Totals	**255**	**296**	**551**

Table H- 25. Subwatersheds with infested weed sites 300 feet or greater distance from Class 1, 2, or 3 streams and perennial lakes and ponds and reservoirs.

WATERSHED NAME	SUBWATERSHED NAME	HUC6
LONG PRAIRIE	BEAL	170703020605
UPPER BEAVER CREEK	BEAVERDAM CREEK	170703030801
PILOT BUTTE	BESSIE BUTTE	170703010406
PINE	BIG HOLE	171200050601
WICKIUP	BROWNS CREEK	170703010205
UPPER LITTLE DESCHUTES RIVER	BUNNY BUTTE	170703020104
MC CARTY	BUTTE WELL	171200050504
LAKE BILLY CHINOOK	CARCASS CANYON	170703011102
DEVILS GARDEN	CHINA HAT	171200050701
UPPER CROOKED RIVER	CONANT CREEK	170703040608
LITTLE WALKER MOUNTAIN	CORRAL SPRINGS	170703020501
WICKIUP	DAVIS LAKE	170703010204
DEEP CANYON	DEEP CANYON	170703010604
DEVILS GARDEN	DOME	171200050702
UPPER METOLIUS RIVER	DRY CREEK	170703010901
MC CARTY	DRY CREEK	171200050503

WATERSHED NAME	SUBWATERSHED NAME	HUC6
FALL RIVER	DUTCHMAN CREEK	170703010301
CRANE PRAIRIE	ELK LAKE	170703010103
UPPER NORTH FORK CROOKED RIVER	ELLIOTT CREEK	170703040302
SQUAW CREEK	FOURMILE BUTTE	170703010804
LAKE BILLY CHINOOK	GENEVA	170703011103
UPPER LITTLE DESCHUTES RIVER	GILCHRIST	170703020106
LONG PRAIRIE	GREEN BUTTE	170703020602
PILOT BUTTE	GREEN MOUNTAIN	170703010405
SQUAW CREEK	HEADWATERS SQUAW CREEK	170703010801
UPPER LITTLE DESCHUTES RIVER	HEMLOCK CREEK	170703020102
UPPER DRY RIVER	HORSE RIDGE	170703050709
LOWER DRY RIVER	HUNTER	170703050803
LONG PRAIRIE	IPSOOT BUTTE	170703020604
LOWER METOLIUS RIVER	JUNIPER CREEK	170703011006
LOWER LITTLE DESCHUTES RIVER	KAWAK BUTTE WEST	170703020705
BADLANDS	KOTZMAN	170703050604
HEADWATERS DESCHUTES RIVER	LAKE SIMTUSTUS	170703060103
LOWER LITTLE DESCHUTES RIVER	LAPINE	170703020704
BEAR CREEK	LITTLE BEAR CREEK	170703040705
UPPER LITTLE DESCHUTES RIVER	LITTLE ODELL CREEK	170703020103
LITTLE WALKER MOUNTAIN	LITTLE WALKER MOUNTAIN	170703020504
CAMP CREEK	LOWER CAMP CREEK	170703040205
CROOKED RIVER GRASSLAND	LOWER CROOKED RIVER GORGE	170703051102
LONG PRAIRIE	LOWER LONG PRAIRIE	170703020609
SOUTH FORK BEAVER CREEK	LOWER SOUTH FORK BEAVER CR	170703030704
WILLOW CREEK	LOWER WILLOW CREEK	170703060205
BRIDGE CREEK	MIDDLE BRIDGE BEAR CREEK	170702040305
UPPER DRY RIVER	MILLICAN EAST	170703050706
LONG PRAIRIE	MOFFITT BUTTE	170703020603
PILOT BUTTE	MOKST BUTTE WEST	170703010401
WICKIUP	MOORE CREEK	170703010203
UPPER BEAVER CREEK	NORTH FORK BEAVER CREEK	170703030804
LITTLE WALKER MOUNTAIN	NORTH PAUNINA	170703020503
BADLANDS	OBSERVATORY RIDGE	170703050606
PINE	OOSKAN BUTTE	171200050603
LONG PRAIRIE	PAULINA PEAK SOUTH	170703020608
UPPER NORTH FORK CROOKED RIVER	PETERSON CREEK	170703040306
PINE	PINE LAKE	171200050604
UPPER DRY RIVER	PINE MOUNTAIN	170703050707
DEVILS GARDEN	PORCUPINE	171200050704
UPPER NORTH FORK CROOKED RIVER	PORTER CREEK	170703040307
BADLANDS	POTHOLES	170703050605
LOWER DRY RIVER	REYNOLDS POND	170703050805
DEVILS GARDEN	SIXTEEN BUTTE	171200050703
CRANE PRAIRIE	SODA CREEK	170703010101
FALL RIVER	SPRING RIVER	170703010303
LAKE BILLY CHINOOK	STEVENS CANYON	170703011101
LOWER DRY RIVER	STOOKEY	170703050804
LOWER LITTLE DESCHUTES RIVER	SUGAR PINE BUTTE	170703020706
LONG PRAIRIE	SURVEYORS LAVA FLOW	170703020607
UPPER DRY RIVER	TEEPEE DRAW	170703050708
DEEP CANYON	THREE CREEK	170703010601
DEEP CANYON	TRIANGLE HILL	170703010602
BRIDGE CREEK	UPPER BRIDGE CREEK	170702040303
CROOKED RIVER GRASSLAND	UPPER CROOKED RIVER GORGE	170703051101

WATERSHED NAME	SUBWATERSHED NAME	HUC6
LOWER METOLIUS RIVER	UPPER FLY CREEK	170703011004
MOUNTAIN CREEK	UPPER MOUNTAIN CREEK	170702011301
MUD SPRINGS CREEK	UPPER MUD SPRINGS CREEK	170703070401
PRINEVILLE RESERVOIR	UPPER PRINEVILLE RESERVOIR	170703040801
SALT CREEK/WILLAMETTE RIVER	UPPER SALT CREEK	170900010301
LOWER OCHOCO CREEK	VEASIE CREEK	170703050402
LOWER LITTLE DESCHUTES RIVER	WICKIUP JUNCTION	170703020701

Table H-26. Infested weed site acres and high risk road crossing sites for class 1, 2 and 3 streams, perennial lakes ponds and reservoirs by subwatershed. Subwatersheds with TE steelhead or bull trout are in bold.

Subwatershed Number and Name	Acres Within 100 ft of Class 1 Streams	Acres Within 100 ft of Class 2 Streams	Acres Within 100 ft of Class 3 Streams	Acres Within 100 ft Lakes	Acres 300 ft Around Road xings	Total Weed Site Acres in Aquatic Influence Zone	Total Acres of Subwatershed	Total Weed Acres in the Subwatershed	% of Subwatershed in Weed Acres
170702010303 - PINE CREEK			0.0				21107.0	0.6	0.00
170702010304 - SUNFLOWER CREEK		0.1	0.3			0.4	18546.5	11.8	0.06
170702010501 - WIND CREEK							17588.6	0.5	0.00
170702010502 - CORNER CREEK/BLACK PINE CREEK	7.5					7.5	18745.7	9.3	0.05
170702010504 - JACKASS CREEK	2.3					2.3	17620.7	2.7	0.02
170702011202 - COTTONWOOD CREEK	0.5					0.5	19363.0	1.4	0.01
170702011302 - MIDDLE MOUNTAIN CREEK		0.1				0.1	34850.4	2.0	0.01
170702011401 - UPPER ROCK CREEK		0.1	0.0			0.1	31271.1	2.9	0.01
170702040301 - HEADWATERS BRIDGE CREEK					0.1	0.1	28608.4	1.2	0.00
170702040302 - WEST BRANCH BRIDGE CREEK		6.1	11.6		12.5	30.1	25399.0	257.3	1.01
170702040304 - UPPER BRIDGE BEAR CREEK	0.1	0.4	0.1		0.2	0.7	16850.0	2.2	0.01
170703010101 - SODA CREEK				0.0			23332.7	5.6	0.02
170703010102 - QUINN CREEK				0.8		0.8	13257.7	3.3	0.02
170703010104 - LAVA LAKES	2.5			14.4	0.1	17.1	26874.7	31.2	0.12
170703010105 - CULTUS CREEK	0.4				0.7	1.1	22651.9	1.1	0.00

Subwatershed Number and Name	Acres Within 100 ft of Class 1 Streams	Acres Within 100 ft of Class 2 Streams	Acres Within 100 ft of Class 3 Streams	Acres Within 100 ft Lakes	Acres 300 ft Around Road xings	Total Weed Site Acres in Aquatic Influence Zone	Total Acres of Subwatershed	Total Weed Acres in the Subwatershed	% of Subwatershed in Weed Acres
170703010107 - CULTUS RIVER	0.1				0.2	0.3	13289.4	0.8	0.01
170703010108 - CHARLTON CREEK		0.6		2.1		2.7	18940.4	10.6	0.06
170703010109 - CRANE PRAIRIE	0.3			22.4		22.7	25284.9	25.8	0.10
170703010201 - ODELL LAKE		8.4	0.8	1.5	13.9	24.6	23170.1	219.9	0.95
170703010202 - ODELL CREEK	1.8	1.0			3.6	6.4	13830.3	56.1	0.41
170703010206 - DAVIS CREEK				4.3		4.3	17638.7	50.6	0.29
170703010207 - WICKIUP	0.5			8.1		8.6	26963.6	11.8	0.04
170703010305 - PRINGLE FALLS	4.7					4.7	16854.9	21.5	0.13
170703010306 - BATES BUTTE	0.2				0.5	0.7	11243.5	1.5	0.01
170703010402 - COYOTE SPRING	0.3					0.3	15537.2	120.2	0.77
170703010403 - BENHAM FALLS	0.2					0.2	22900.0	73.4	0.32
170703010406 - BESSIE BUTTE				0.0			47956.4	151.7	0.32
170703010407 - LAVA ISLAND FALLS	0.1					0.1	29267.4	132.9	0.45
170703010501 - UPPER TUMALO CREEK	2.2	0.1			0.6	2.9	20744.1	5.7	0.03
170703010502 - LOWER TUMALO CREEK	0.1					0.1	16967.5	3.6	0.02
170703010802 - UPPER SQUAW CREEK			4.7		0.7	5.5	18290.5	44.2	0.24
170703010803 - UPPER TROUT CREEK		10.3			1.0	11.3	12105.0	44.8	0.37
170703010807 - LOWER INDIAN FORD		4.6			3.6	8.3	23659.9	276.1	1.17
170703010809 - LOWER SQUAW CREEK	55.9				4.1	60.0	20237.0	654.0	3.23
170703010903 - UPPER LAKE CREEK		3.0	2.3	1.1	2.5	8.8	11136.1	270.5	2.43
170703010904 - LOWER LAKE CREEK		1.3		2.5	1.8	5.6	10965.4	244.2	2.23
170703010905 - HEADWATERS	116.9	3.2	1.5		2.8	124.4	15501.3	435.4	2.81

Subwatershed Number and Name	Acres Within 100 ft of Class 1 Streams	Acres Within 100 ft of Class 2 Streams	Acres Within 100 ft of Class 3 Streams	Acres Within 100 ft Lakes	Acres 300 ft Around Road xings	Total Weed Site Acres in Aquatic Influence Zone	Total Acres of Subwatershed	Total Weed Acres in the Subwatershed	% of Subwatershed in Weed Acres
METOLIUS RIVER									
170703010906 - FIRST CREEK	4.7				0.8	5.5	13177.3	122.1	0.93
170703010908 - CANYON CREEK	3.8	1.7	0.1		3.8	9.4	21068.4	272.3	1.29
170703010910 - CANDLE CREEK	3.3					3.3	10956.7	62.9	0.57
170703011002 - UPPER METOLIUS RIVER	10.8		1.0			11.8	31553.5	184.0	0.58
170703011003 - MIDDLE METOLIUS RIVER	3.6		2.8		4.0	10.4	21208.1	279.8	1.32
170703011005 - LOWER FLY CREEK	6.0	10.3			0.5	16.8	16226.5	129.5	0.80
170703011007 - LOWER METOLIUS RIVER		2.8		0.0		2.8	24301.0	185.7	0.76
170703011102 - CARCASS CANYON				0.5		0.5	16128.0	677.4	4.20
170703020202 - LOWER BIG MARSH CREEK	0.4					0.4	19535.8	2.7	0.01
170703020204 - CRESCENT LAKE	2.2			44.7	0.9	47.8	17589.5	176.4	1.00
170703020205 - COLD CREEK	3.9	6.3			9.8	20.1	13435.5	133.3	0.99
170703020206 - MIDDLE CRESCENT CREEK	2.0				2.3	4.3	18051.4	120.3	0.67
170703020702 - UPPER PAULINA CREEK				5.2		5.2	13290.2	5.6	0.04
170703020703 - LOWER PAULINA CREEK	1.3				0.6	1.9	19554.1	11.9	0.06
170703030802 - POWELL CREEK		2.0	0.7		2.7	5.4	20096.6	11.2	0.06
170703030803 - SUGAR CREEK	2.0				0.5	2.5	10351.6	5.0	0.05
170703030901 - UPPER PAULINA CREEK		14.2	113.1	6.5	12.7	146.6	18083.0	616.0	3.41
170703030902 - DRY PAULINA		8.2	9.7	1.5	2.0	21.3	15860.2	222.2	1.40

Subwatershed Number and Name	Acres Within 100 ft of Class 1 Streams	Acres Within 100 ft of Class 2 Streams	Acres Within 100 ft of Class 3 Streams	Acres Within 100 ft Lakes	Acres 300 ft Around Road xings	Total Weed Site Acres in Aquatic Influence Zone	Total Acres of Subwatershed	Total Weed Acres in the Subwatershed	% of Subwatershed in Weed Acres
CREEK									
170703031002 - WOLF CREEK	0.6	4.1			0.2	4.9	21525.3	22.6	0.10
170703040103 - MAURY CREEK		0.2				0.2	19195.8	2.3	0.01
170703040201 - INDIAN CREEK		0.3				0.3	12414.2	1.6	0.01
170703040303 - HOWARD CREEK		0.2				0.2	11706.2	0.6	0.01
170703040304 - JOHNSON CREEK		0.5			0.1	0.5	18399.1	0.6	0.00
170703040306 - PETERSON CREEK				0.4		0.4	16814.7	22.0	0.13
170703040401 - JACKSON CREEK		0.1				0.1	24237.6	27.2	0.11
170703040402 - LITTLE SUMMITT PRAIRIE CREEK	0.1		0.1			0.2	16601.1	1.0	0.01
170703040403 - LOWER DEEP CREEK	0.8	0.6	0.3		0.2	1.8	14577.7	23.6	0.16
170703040501 - UPPER NORTH FORK CANYON		0.1				0.1	19690.8	8.4	0.04
170703040601 - LOST CREEK		0.1				0.1	20388.0	0.2	0.00
170703040602 - DRAKE CREEK		3.4			2.1	5.6	10346.7	33.5	0.32
170703040603 - PINE CREEK		0.1				0.1	29909.0	0.4	0.00
170703040604 - NEWSOME CREEK		0.3				0.3	21125.3	6.2	0.03
170703040605 - UPPER HORSE HEAVEN CREEK			1.4		2.1	3.5	18731.2	43.6	0.23
170703040701 - HEADWATERS BEAR CREEK		0.5	0.2		0.2	1.0	23377.2	3.2	0.01
170703050201 - HEADWATERS OCHOCO CREEK	0.2	0.3	0.0		0.5	0.9	16124.6	8.0	0.05
170703050203 - UPPER MARKS CREEK	0.3	0.1			0.1	0.4	20560.6	6.3	0.03
170703050204 - LOWER MARKS CREEK	0.6	0.1			0.1	0.8	18236.2	6.5	0.04
170703050205 - DUNCAN CREEK			0.1		0.9	1.0	22510.0	9.1	0.04

Subwatershed Number and Name	Acres Within 100 ft of Class 1 Streams	Acres Within 100 ft of Class 2 Streams	Acres Within 100 ft of Class 3 Streams	Acres Within 100 ft Lakes	Acres 300 ft Around Road xings	Total Weed Site Acres in Aquatic Influence Zone	Total Acres of Subwatershed	Total Weed Acres in the Subwatershed	% of Subwatershed in Weed Acres
170703050301 - UPPER MILL CREEK	0.4	0.3	0.1		0.1	0.9	21460.0	1.2	0.01
170703050302 - LOWER MILL CREEK	0.1		0.0		0.2	0.3	24540.2	1.5	0.01
170703050501 - UPPER MCKAY CREEK	1.0	4.1	0.3		0.7	6.1	20471.6	16.8	0.08
170703050502 - ALLEN CREEK		0.1			0.2	0.3	18251.5	0.5	0.00
170703051005 - MCALLISTER SLOUGH			22.1		8.1	30.2	34276.0	734.6	2.14
170703060201 - UPPER WILLOW CREEK		0.6			0.4	0.9	30758.3	49.6	0.16
170703060202 - RIMROCK SPRING		0.8	33.0	2.4	7.5	43.7	11085.2	1374.5	12.40
170703060203 - MIDDLE WILLOW CREEK			25.3		11.8	37.1	20726.4	181.6	0.88
170703060204 - DRY CANYON		7.5		5.0	4.6	17.0	34023.1	146.4	0.43
170703070101 - OPAL CREEK		0.1				0.1	11425.6	0.3	0.00
170703070102 - FOLEY CREEK		0.1				0.1	22008.7	0.6	0.00
170703070103 - HEADWATERS TROUT CREEK	0.2		0.1		0.4	0.7	16662.2	4.6	0.03
Total Weed Site Acres in Aquatic Zone	244.5	109.2	231.8	123.4	130.2	839.1	1731178.7	9145.6	0.53