

Appendix H.5 – Aquatic Resources Environmental Consequences – Tables and Figures (Compared to No Action)

Direct Effects

Upper Arkansas River, Upstream of Pueblo Reservoir

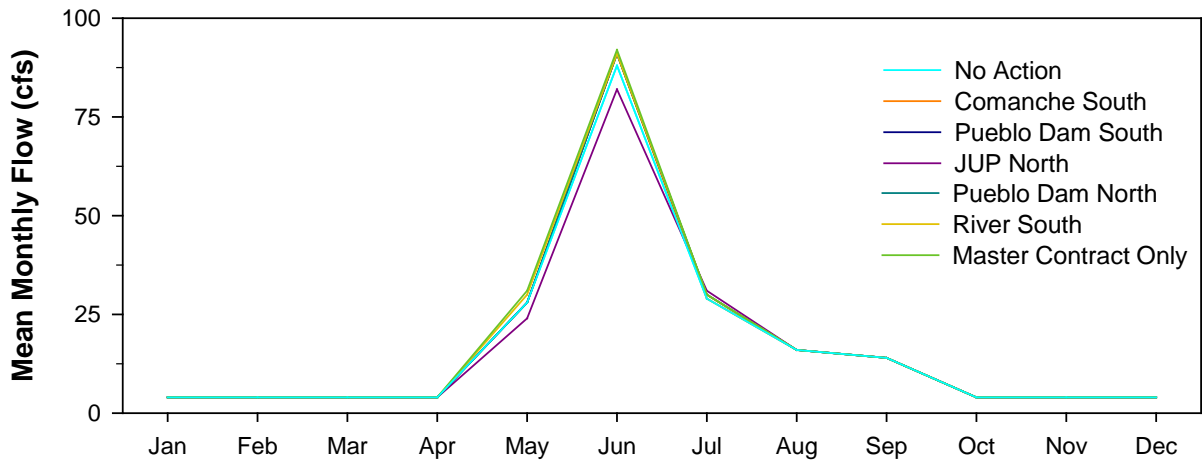


Figure 1. Direct Effects Mean Monthly Streamflow for All Alternatives in Lake Fork Creek

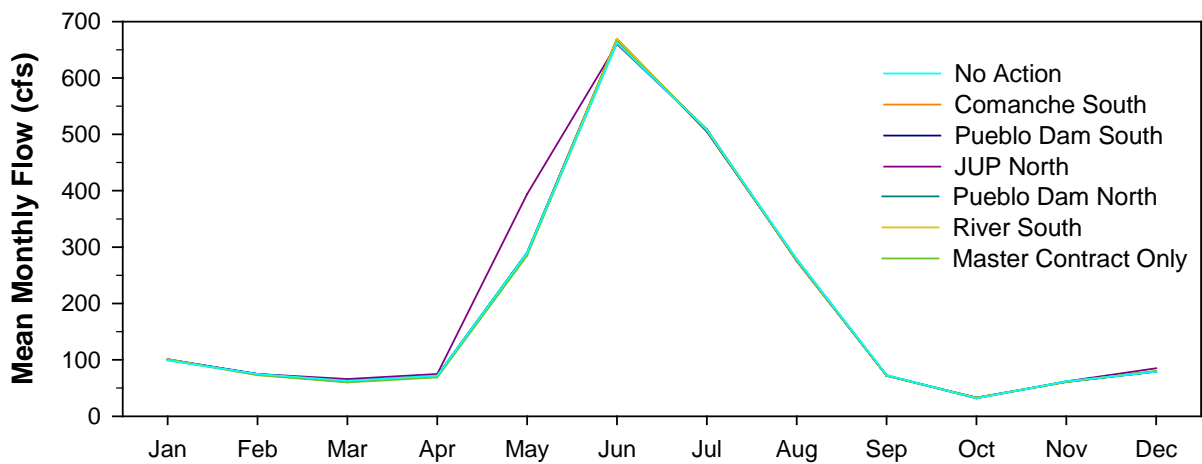


Figure 2. Direct Effects Mean Monthly Streamflow for All Alternatives in Lake Creek

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

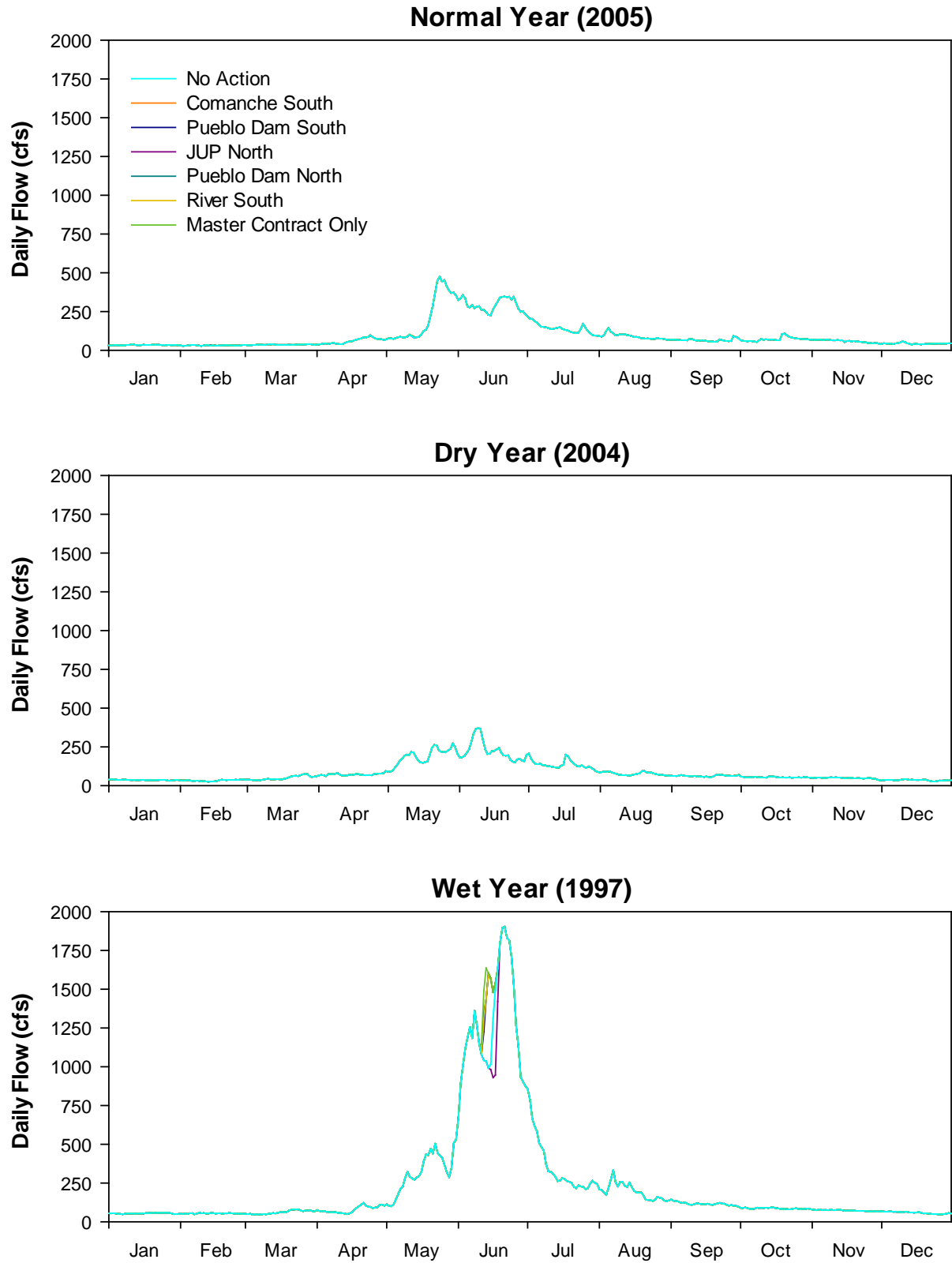


Figure 3. Direct Effects Daily Hydrology for All Alternatives for Segment 1 of the Upper Arkansas River at the Malta Gage

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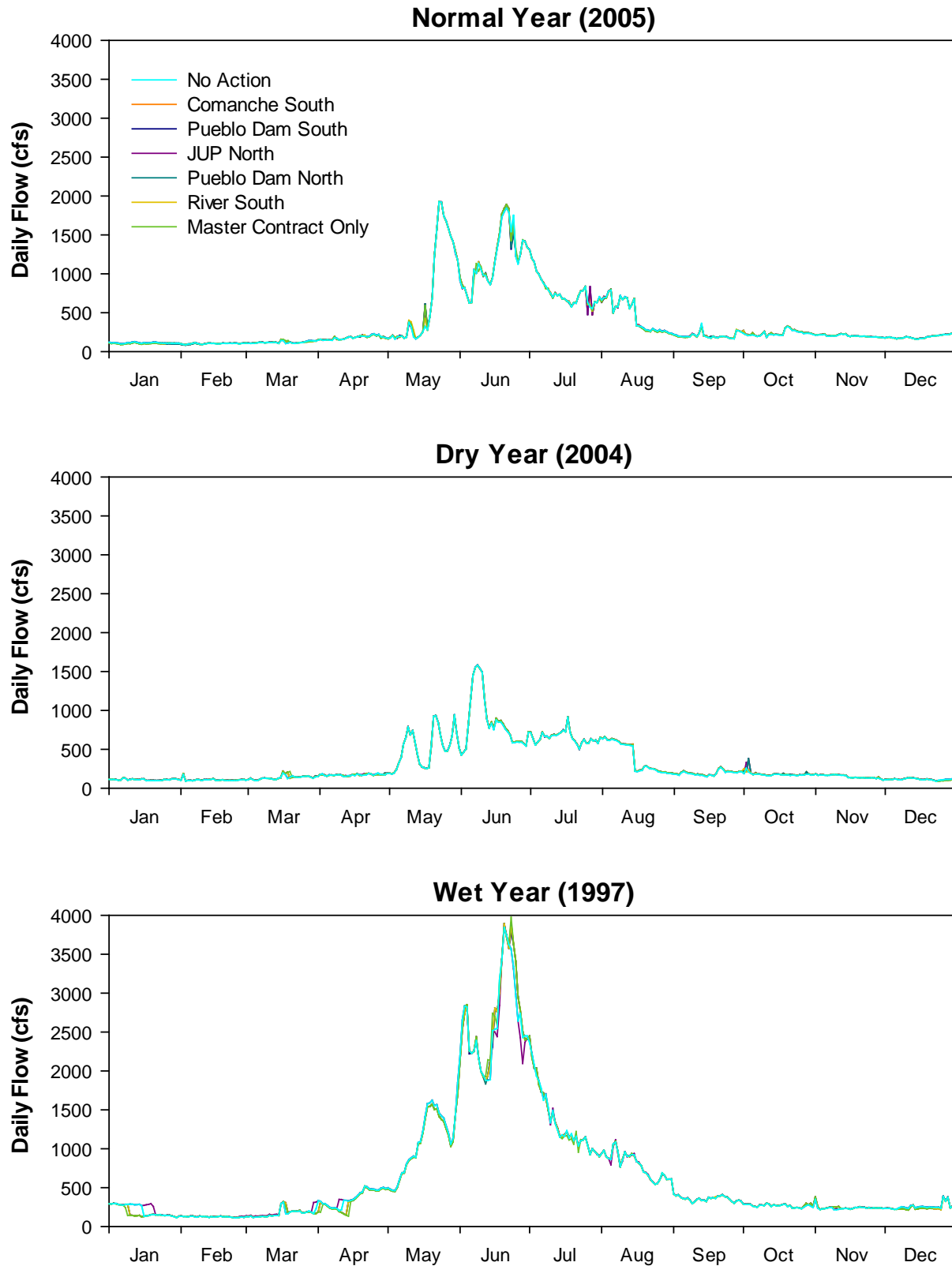


Figure 4. Direct Effects Daily Hydrology for All Alternatives for Segment 2 of the Upper Arkansas River at the Buena Vista Gage

**Arkansas Valley Conduit EIS
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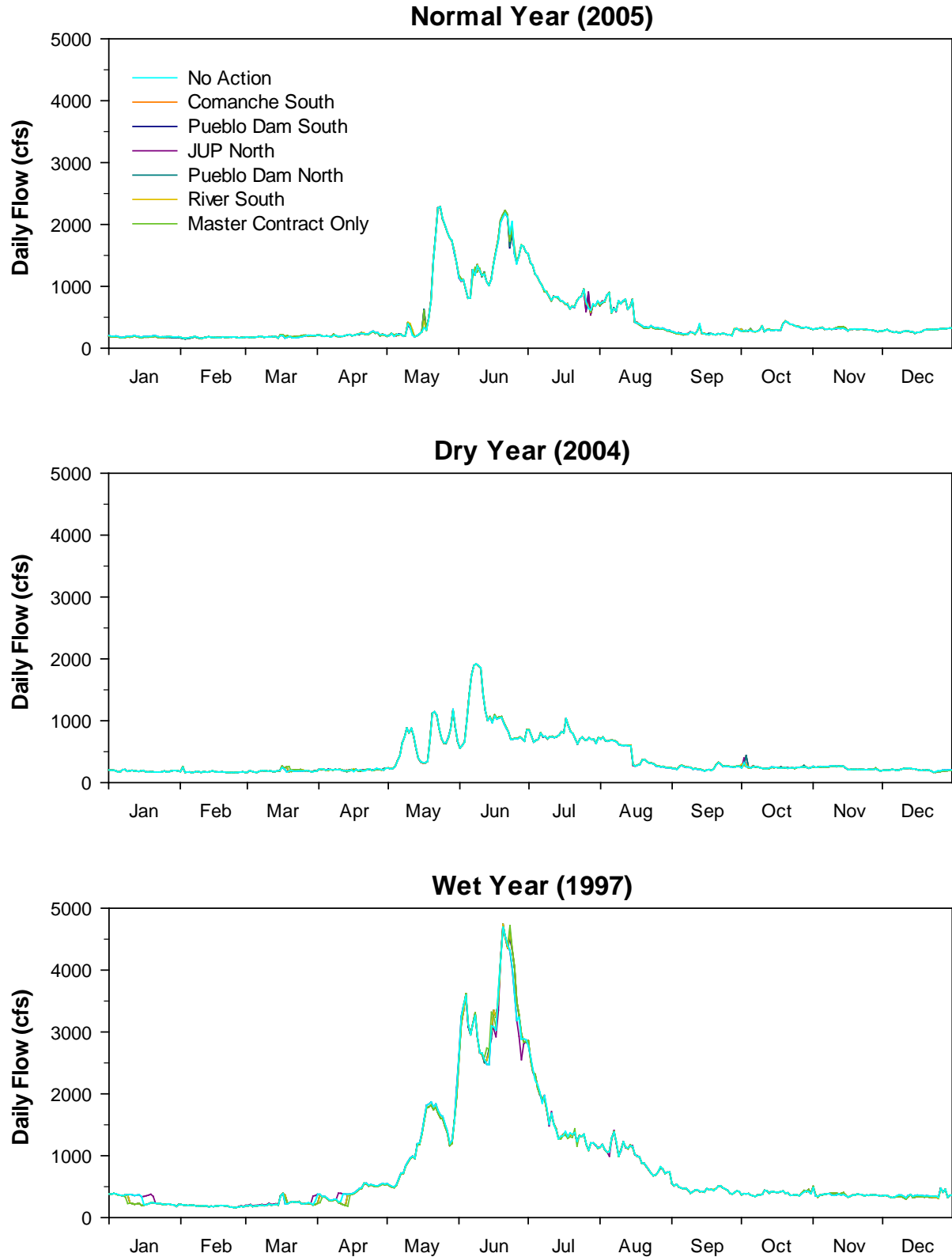


Figure 5. Direct Effects Daily Hydrology for All Alternatives for Segment 3 of the Upper Arkansas River at the Nathrop Gage

**Arkansas Valley Conduit EIS
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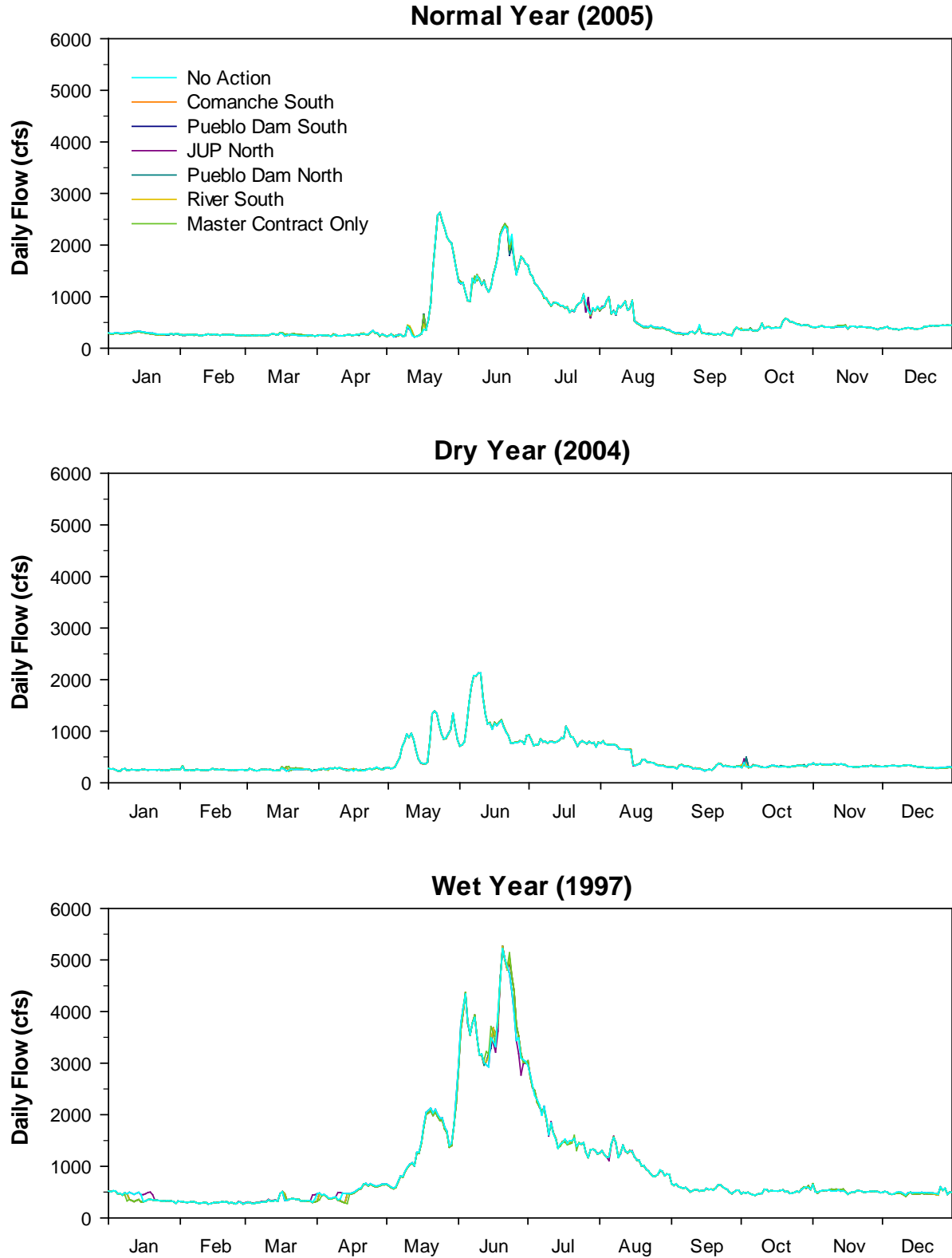


Figure 6. Direct Effects Daily Hydrology for All Alternatives for Segment 4 and Segment 5 of the Upper Arkansas River at the Wellsville Gage

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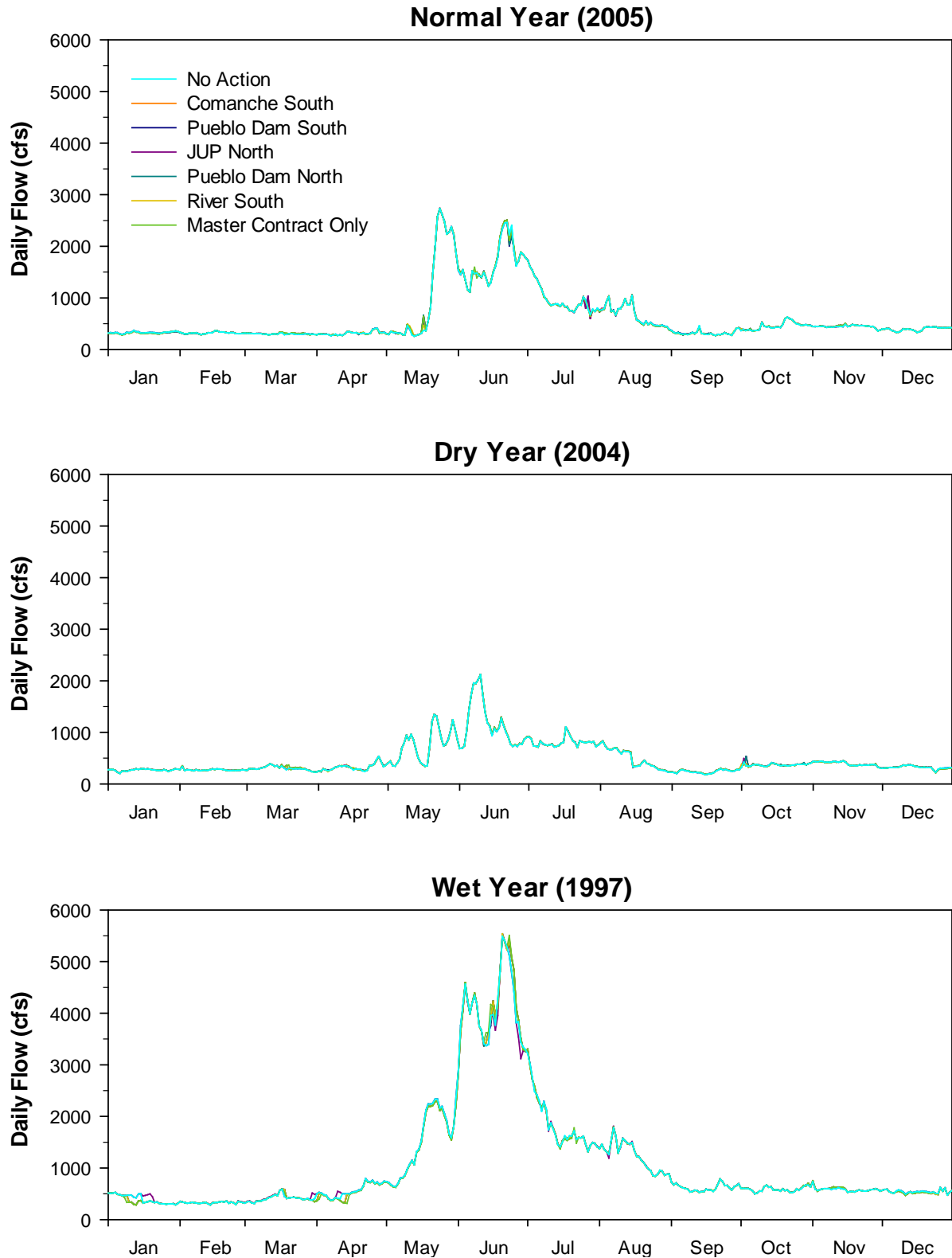


Figure 7. Direct Effects Daily Hydrology for All Alternatives for Segment 6 of the Upper Arkansas River at the Parkdale Gage

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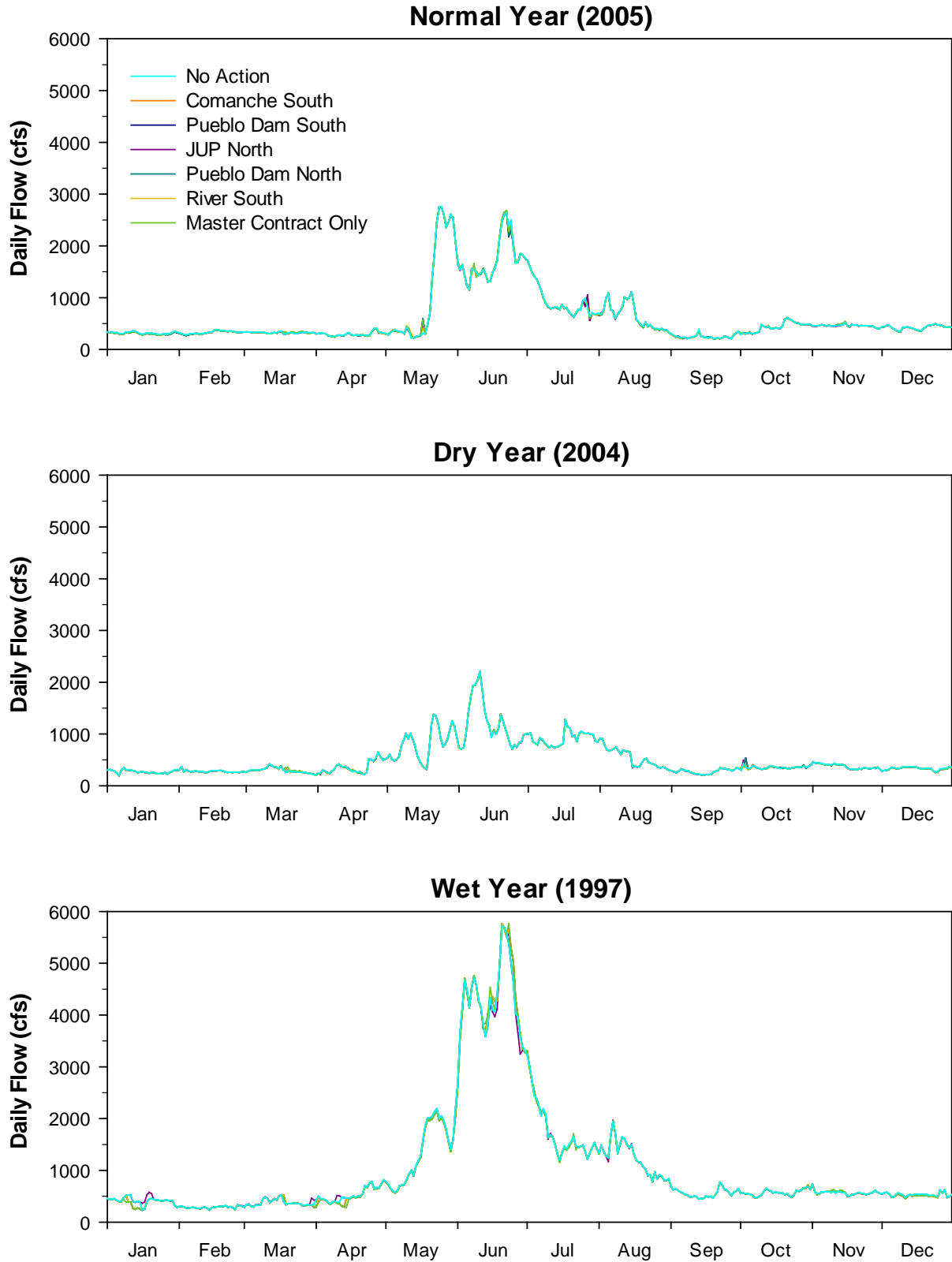


Figure 8. Direct Effects Daily Hydrology for All Alternatives for Segment 7 of the Upper Arkansas River at the Portland Gage

**Arkansas Valley Conduit EIS
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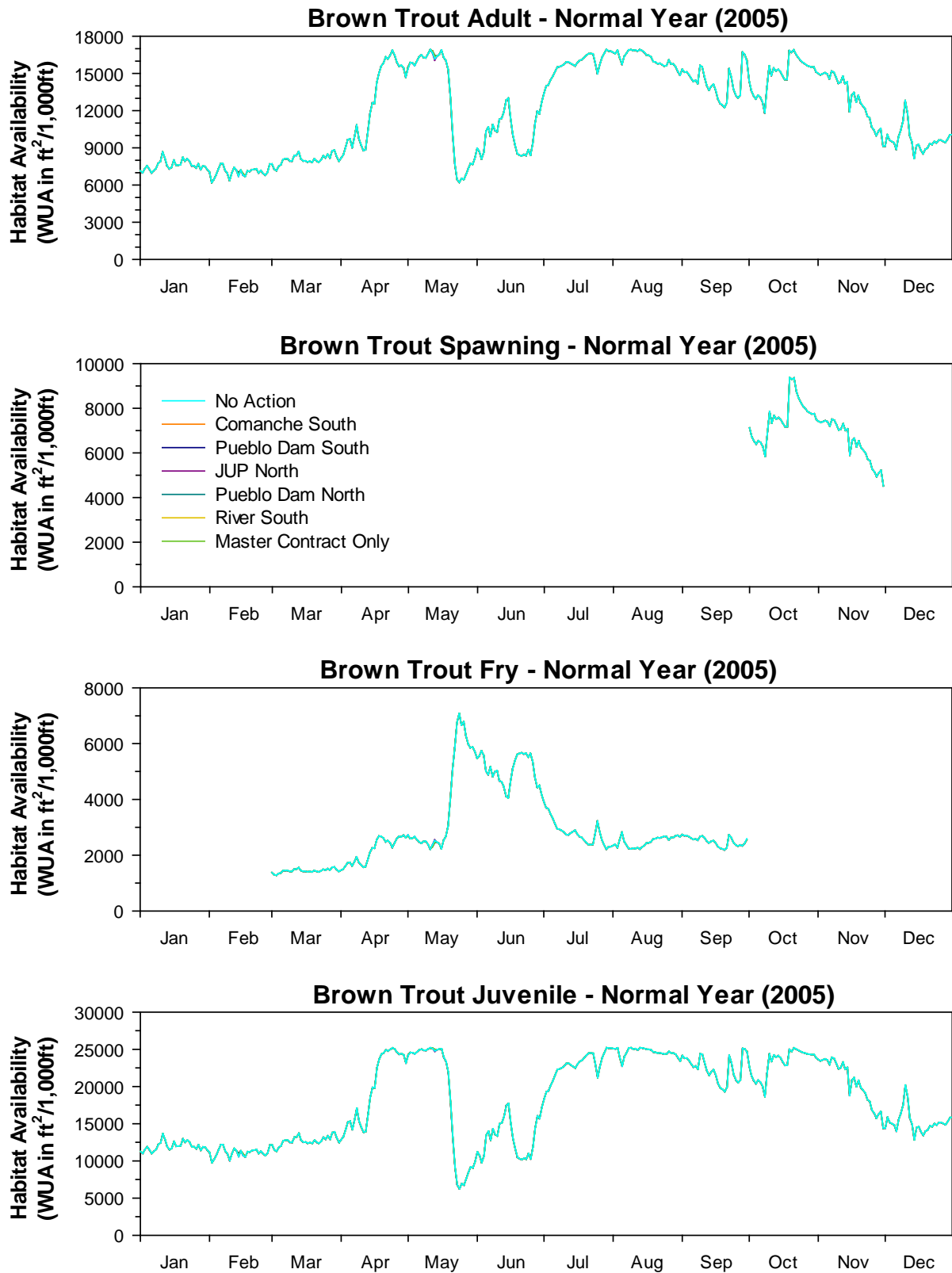


Figure 9. Direct Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 1 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
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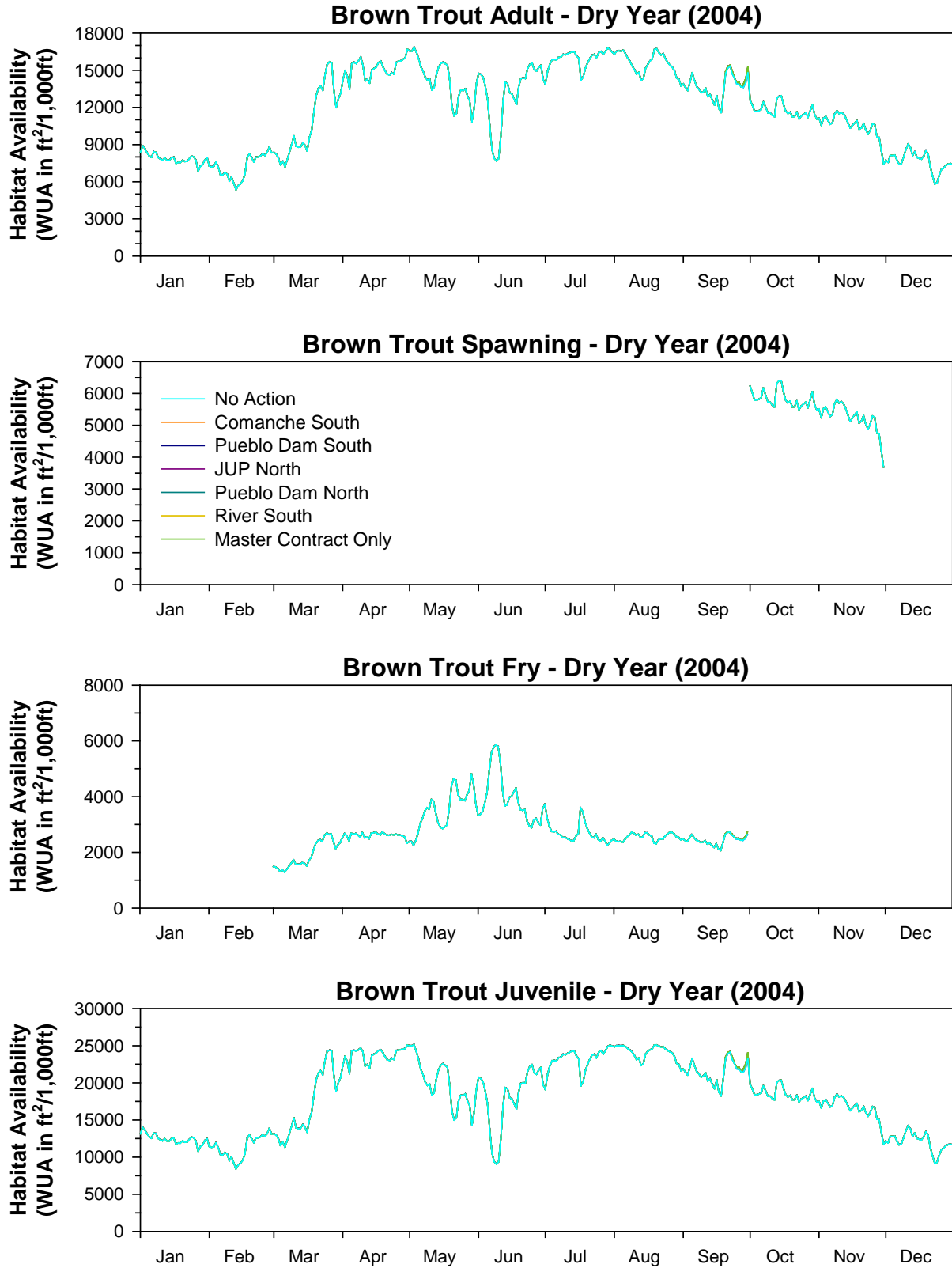


Figure 10. Direct Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 1 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
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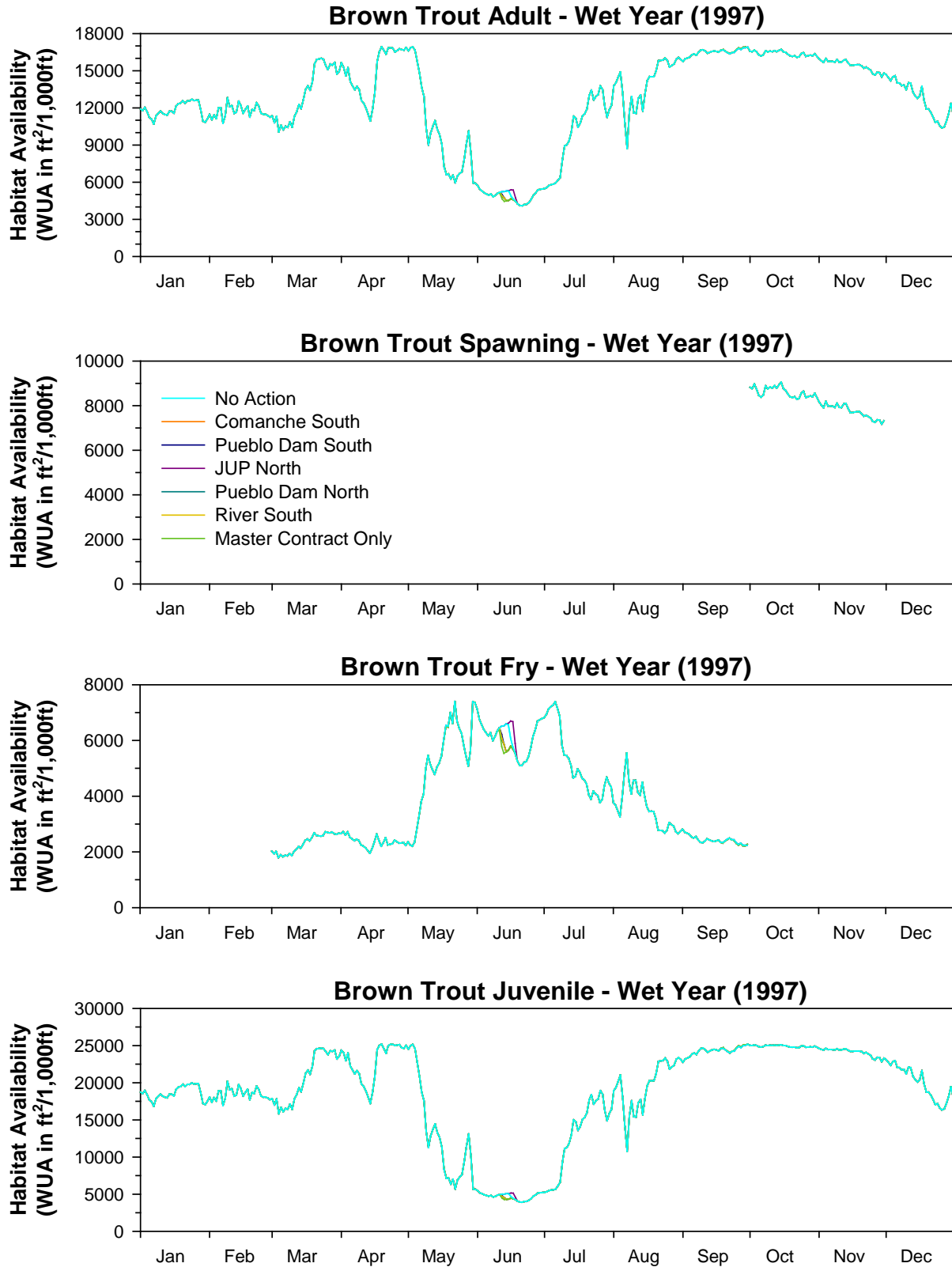


Figure 11. Direct Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 1 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
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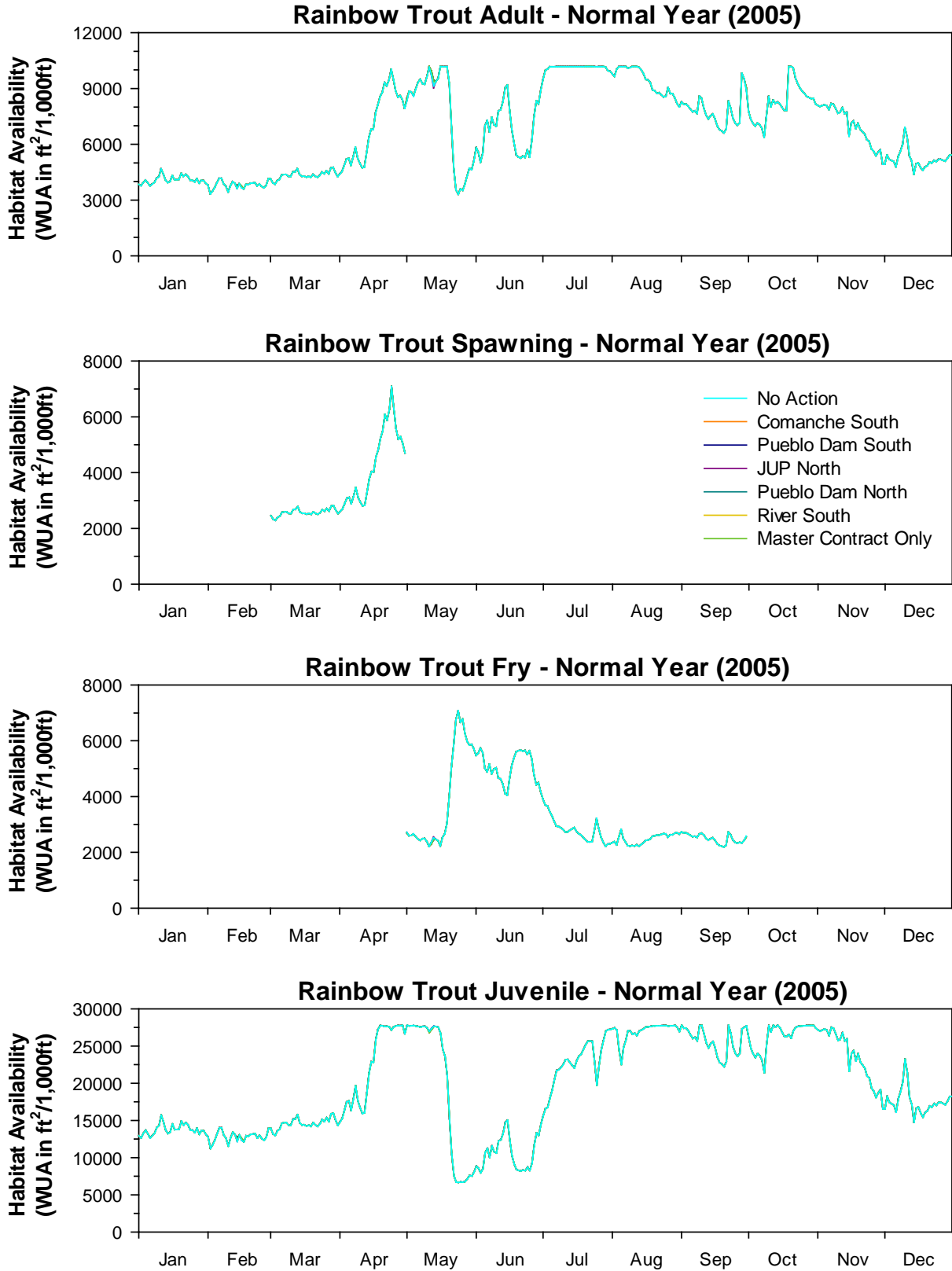


Figure 12. Direct Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 1 of the Upper Arkansas River

Arkansas Valley Conduit EIS
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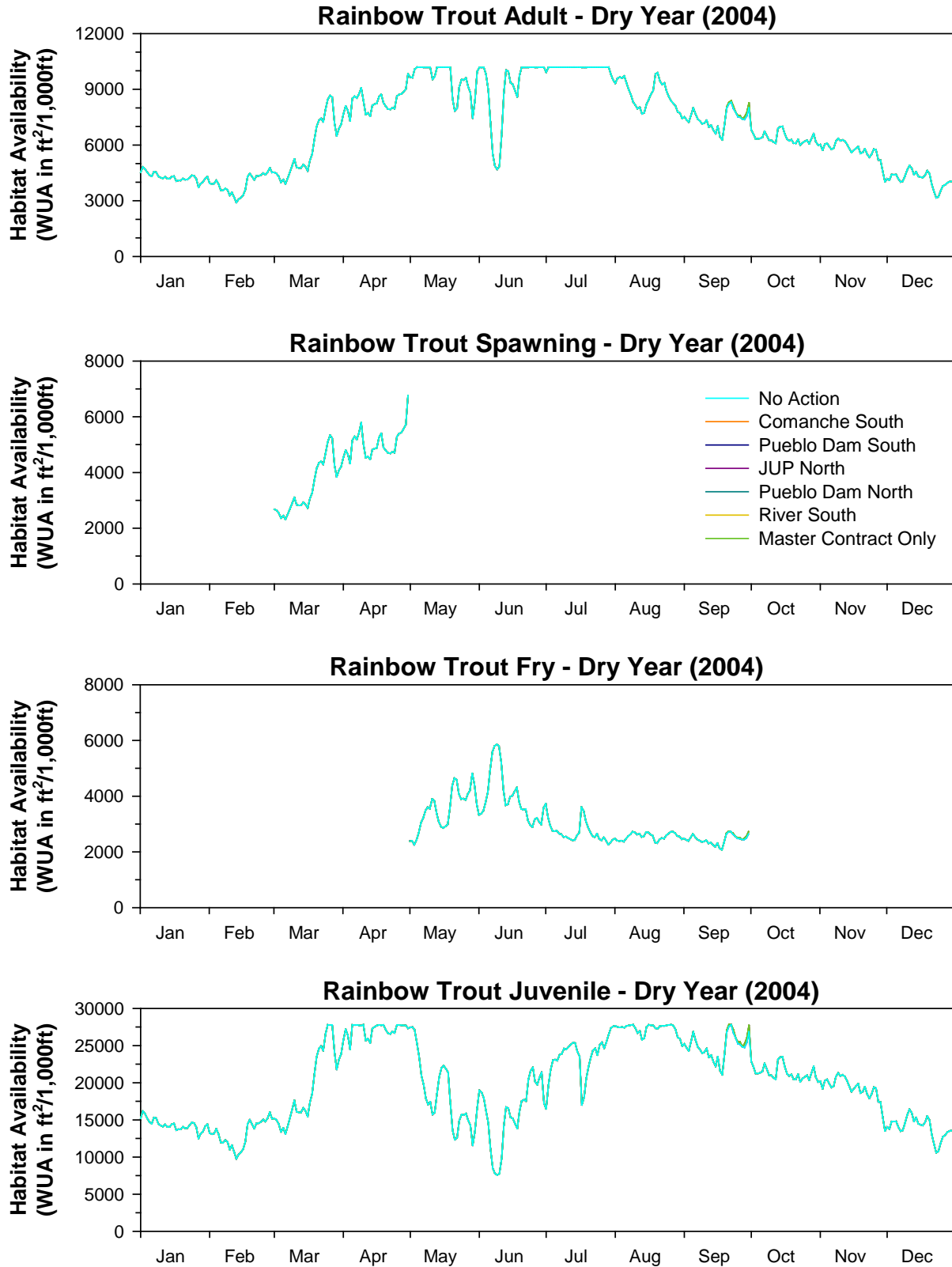


Figure 13. Direct Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 1 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
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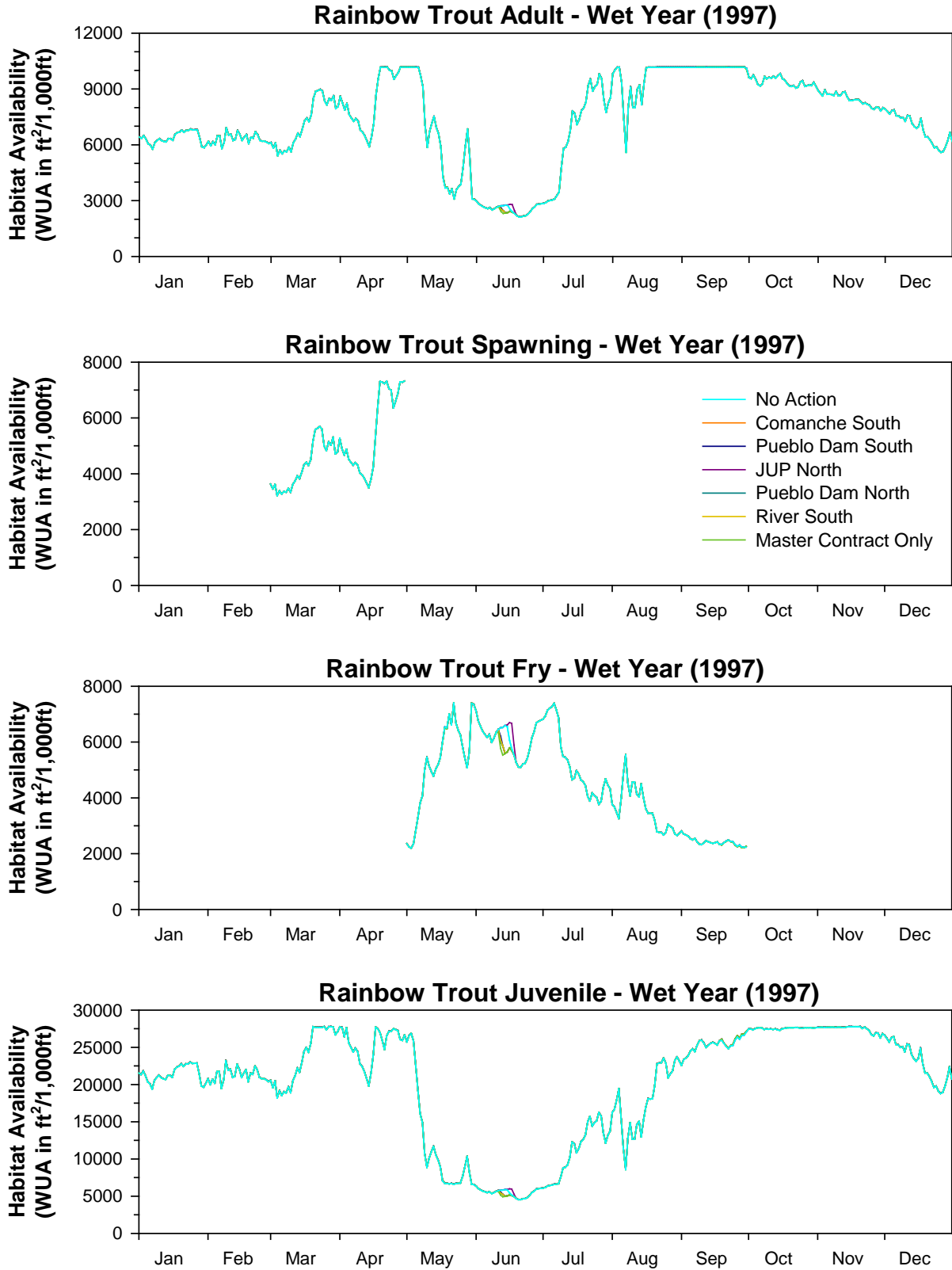


Figure 14. Direct Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 1 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
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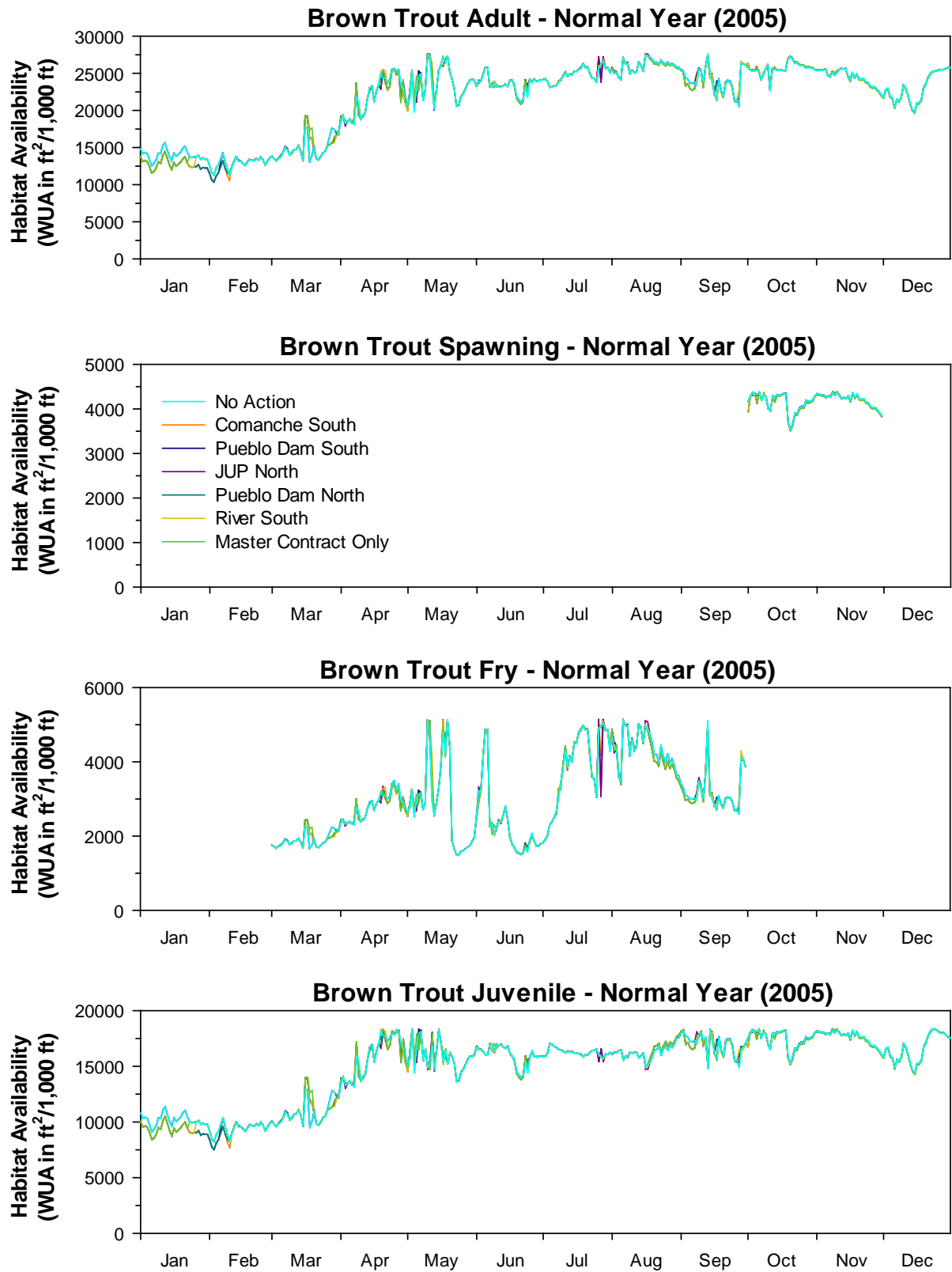


Figure 15. Direct Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 2 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
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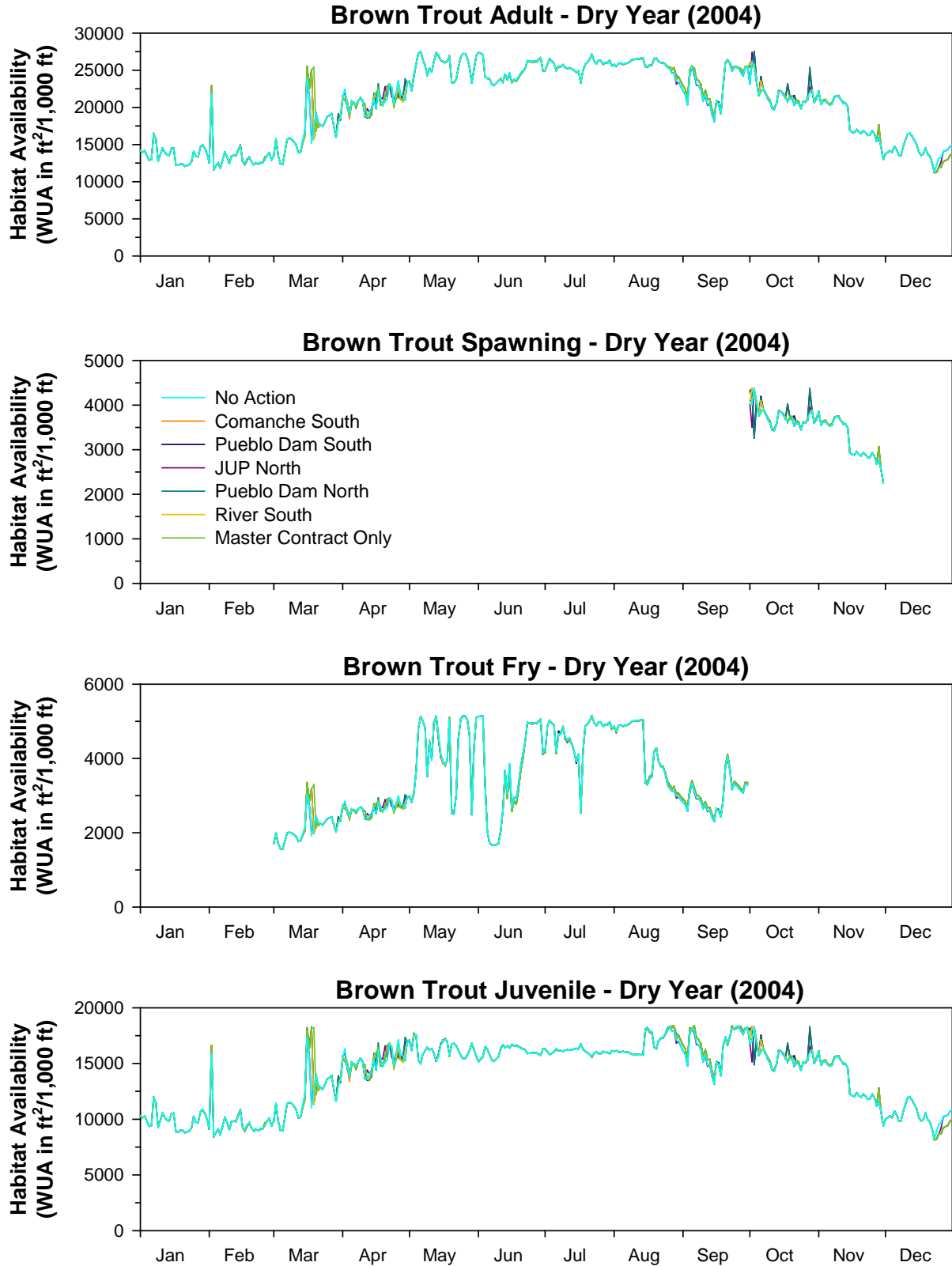


Figure 16. Direct Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 2 of the Upper Arkansas River

Arkansas Valley Conduit EIS
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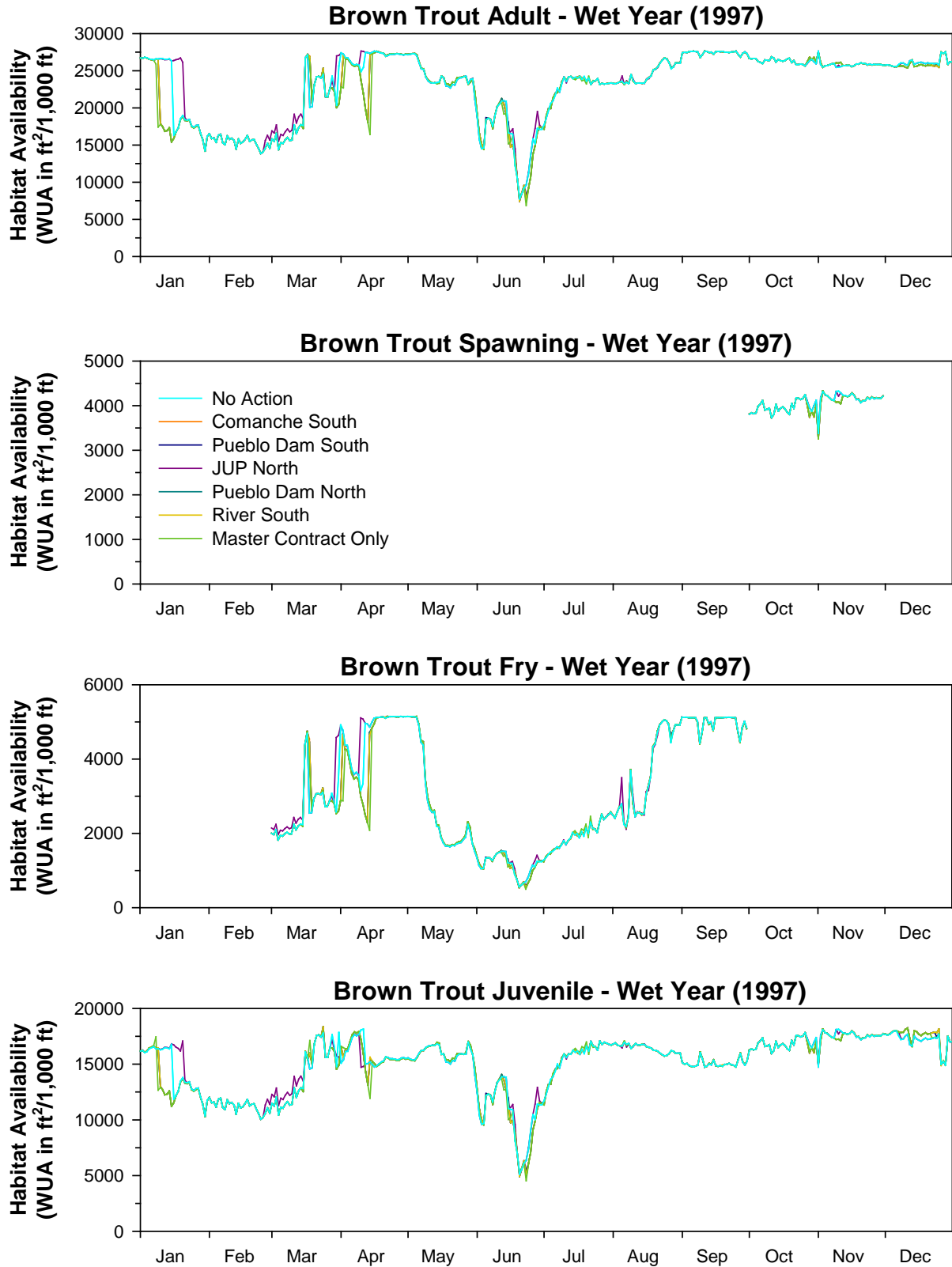


Figure 17. Direct Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 2 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
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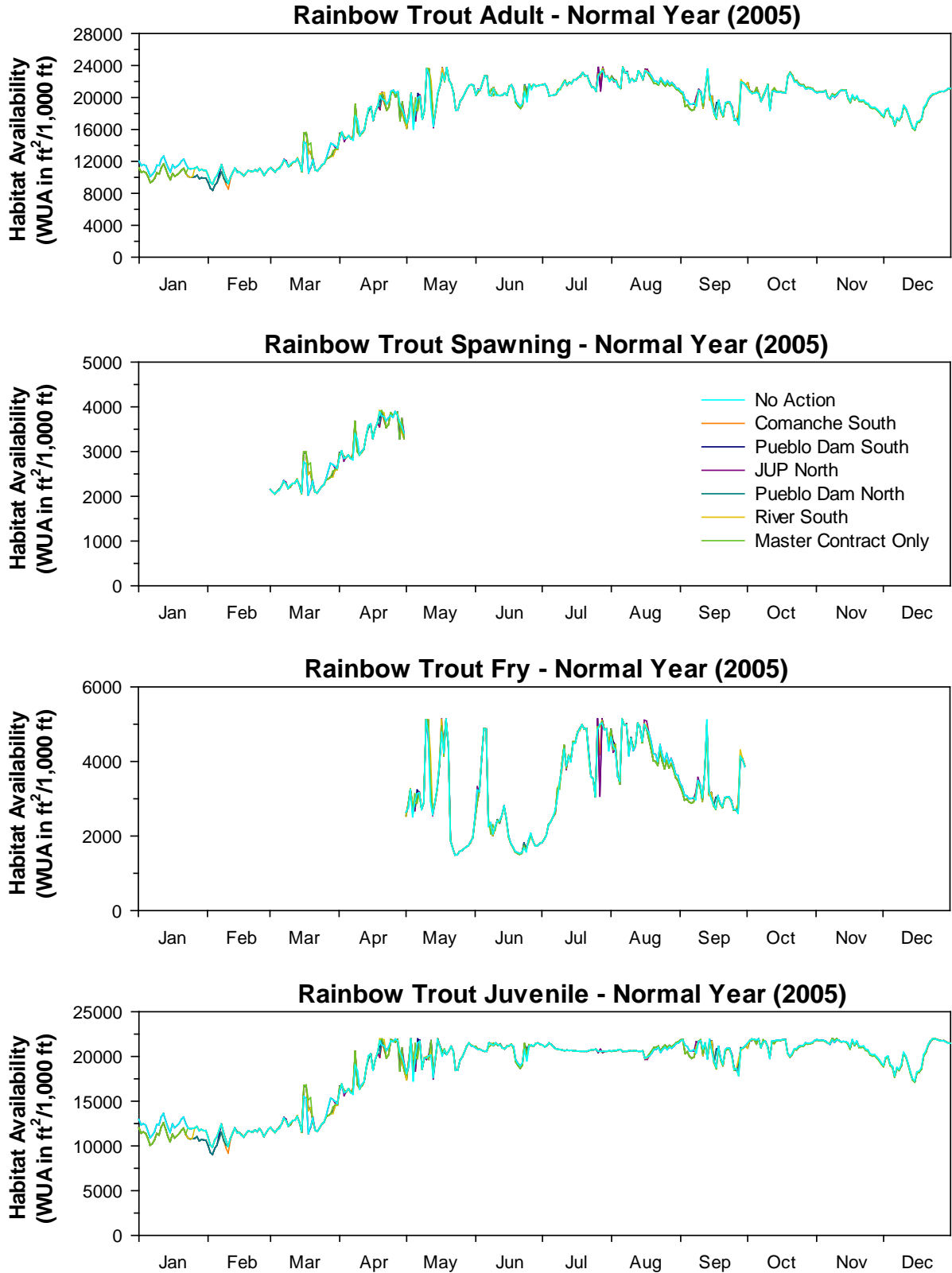


Figure 18. Direct Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 2 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
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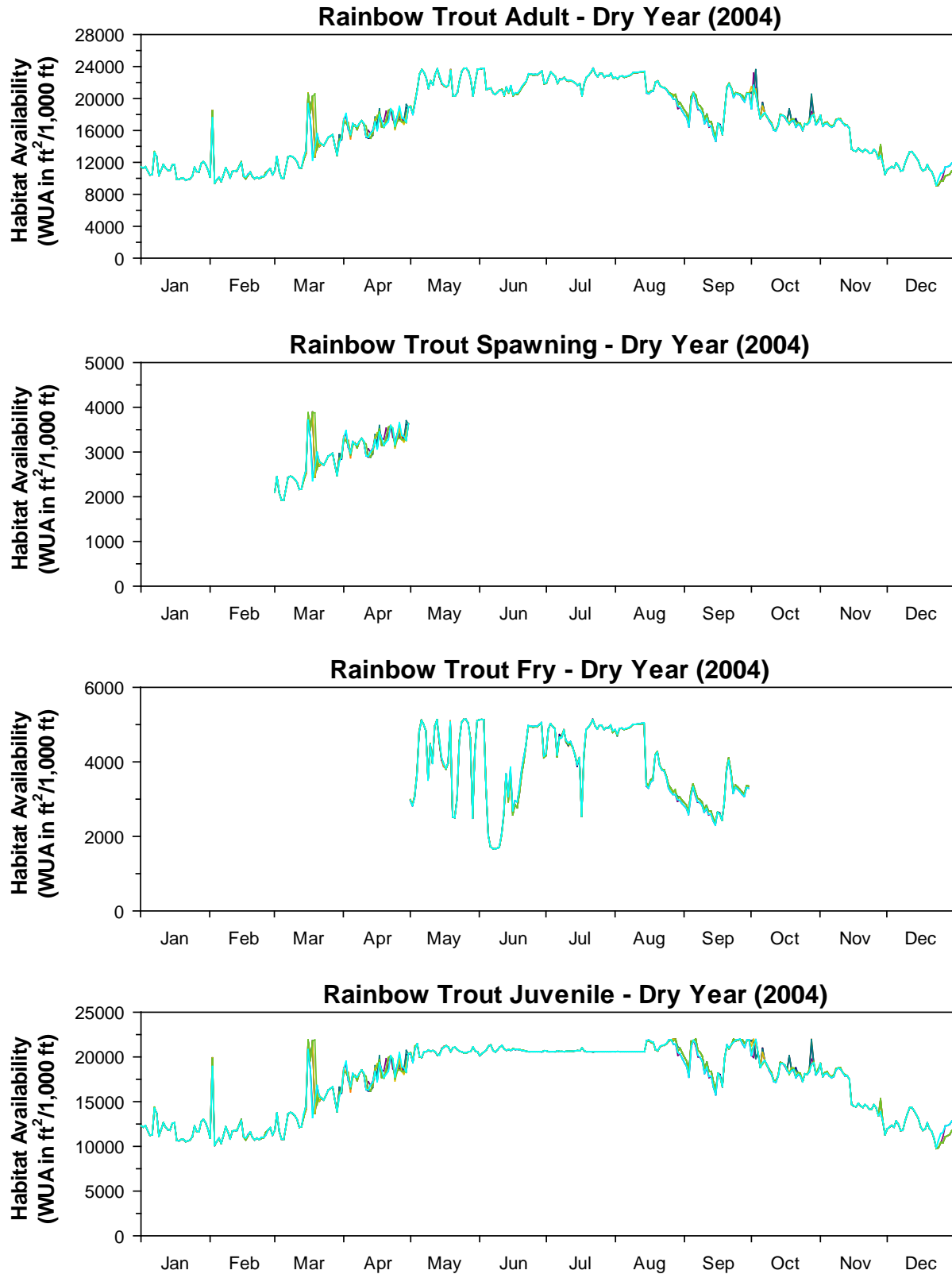


Figure 19. Direct Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 2 of the Upper Arkansas River

Arkansas Valley Conduit EIS
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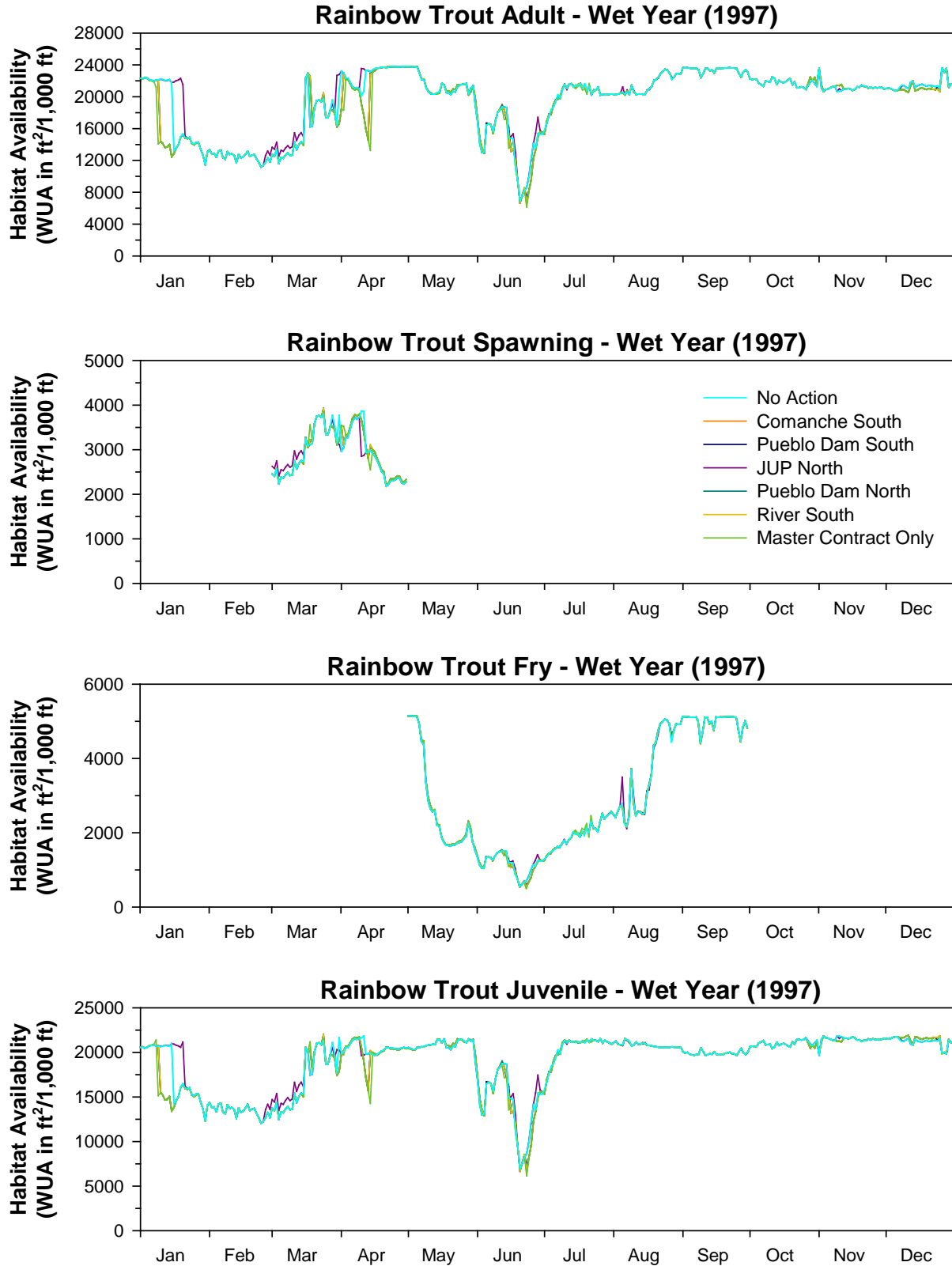


Figure 20. Direct Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 2 of the Upper Arkansas River

Arkansas Valley Conduit EIS
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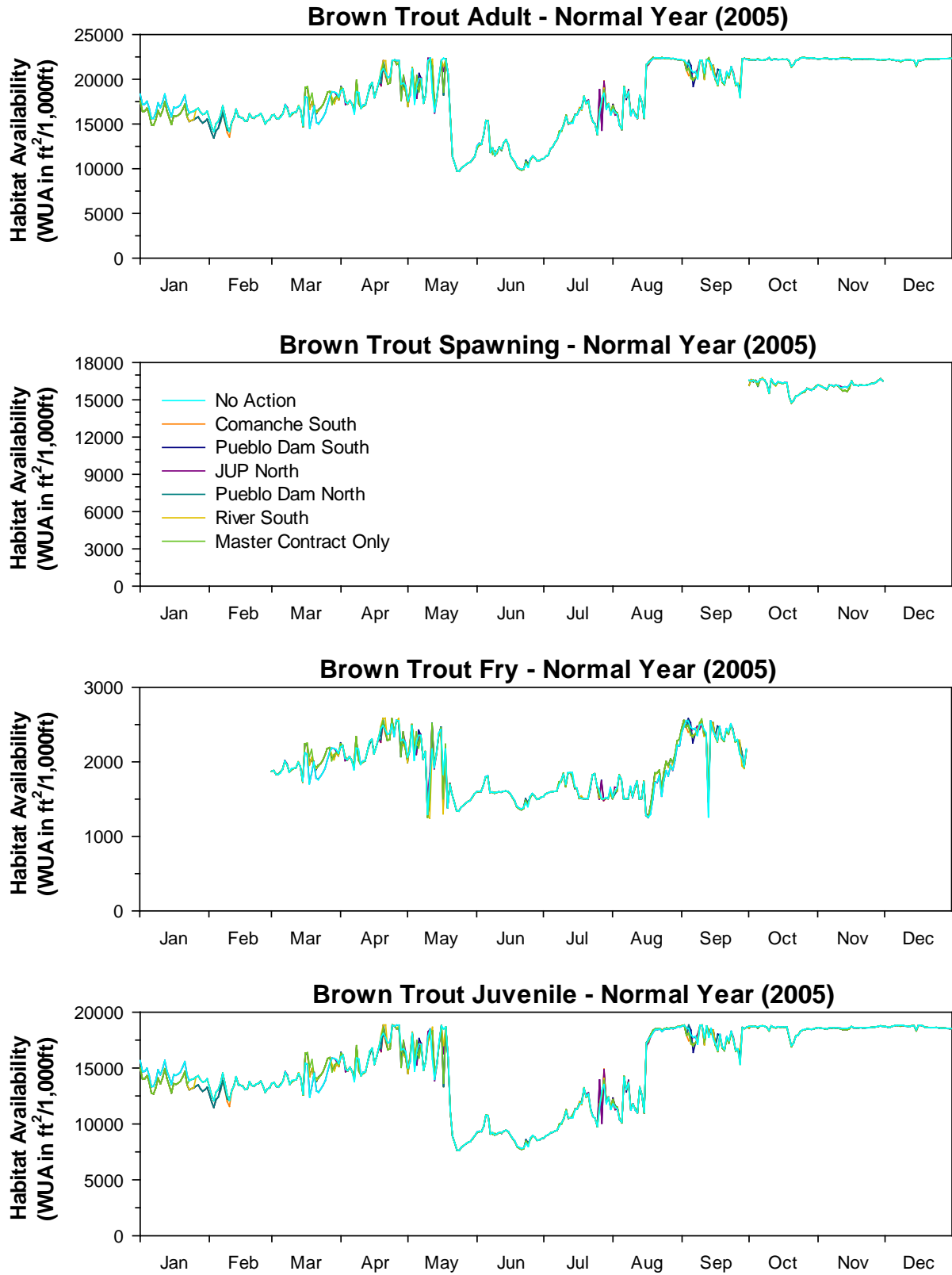


Figure 21. Direct Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 3 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
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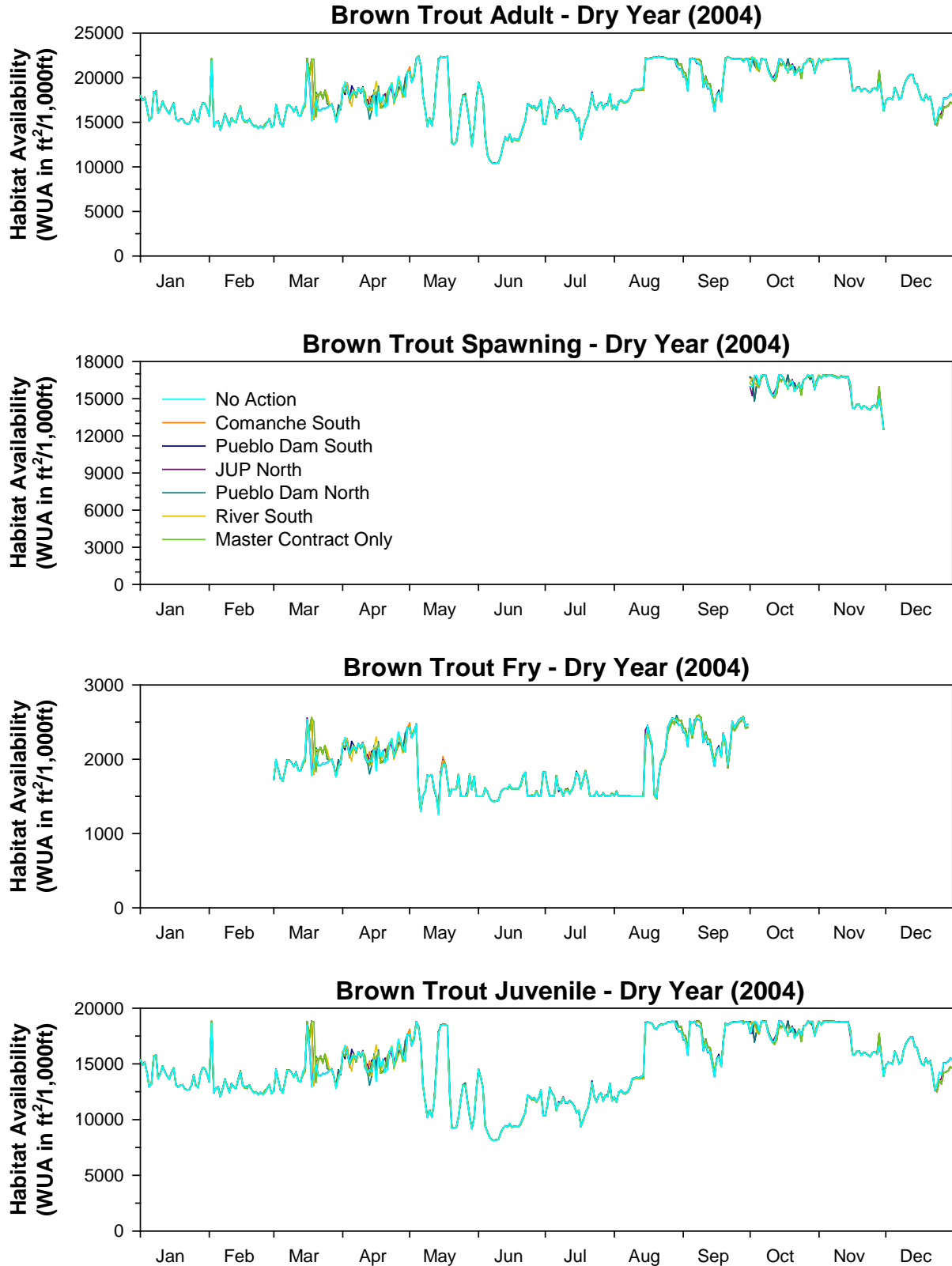


Figure 22. Direct Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 3 of the Upper Arkansas River

Arkansas Valley Conduit EIS
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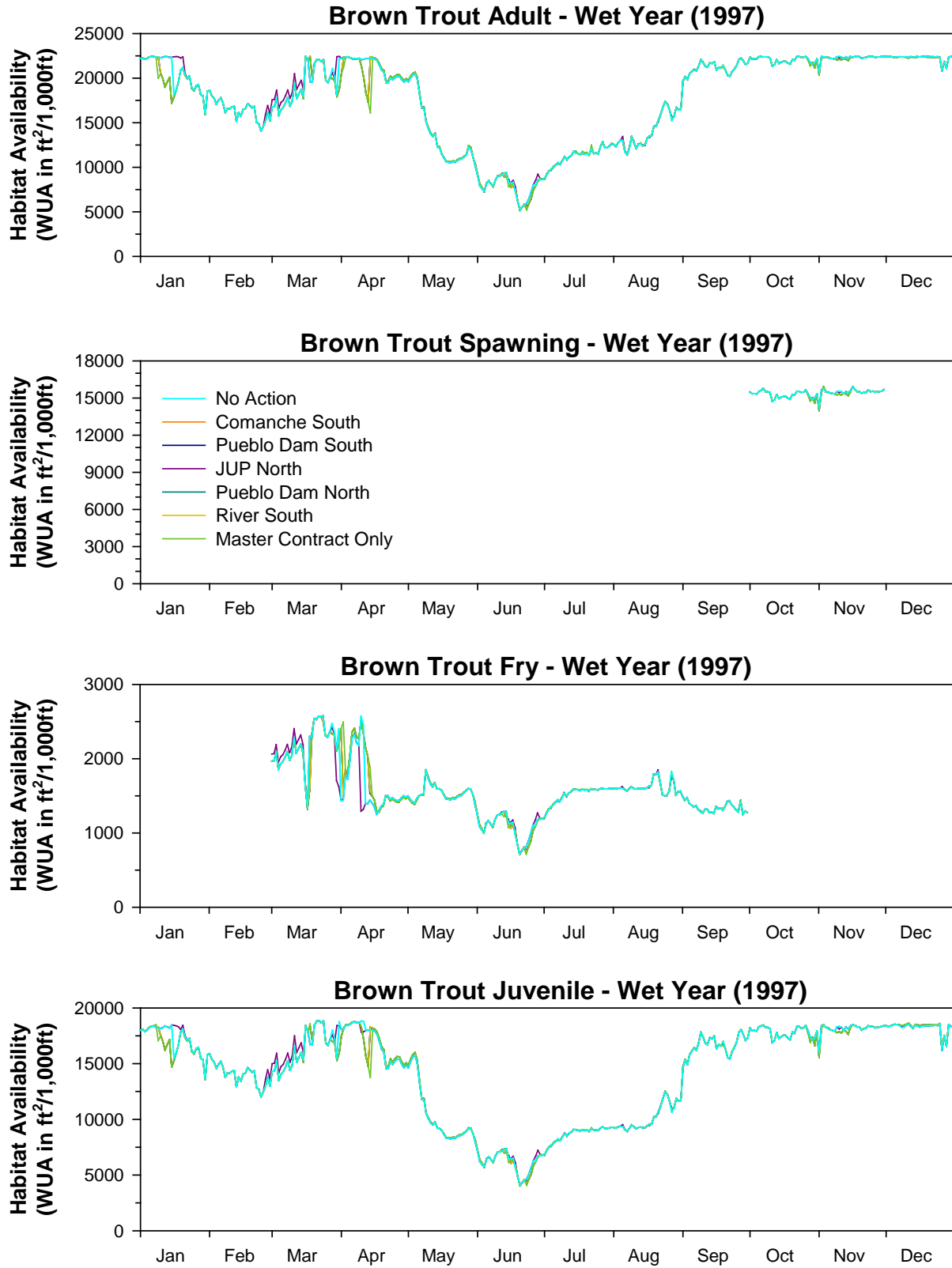


Figure 23. Direct Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 3 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
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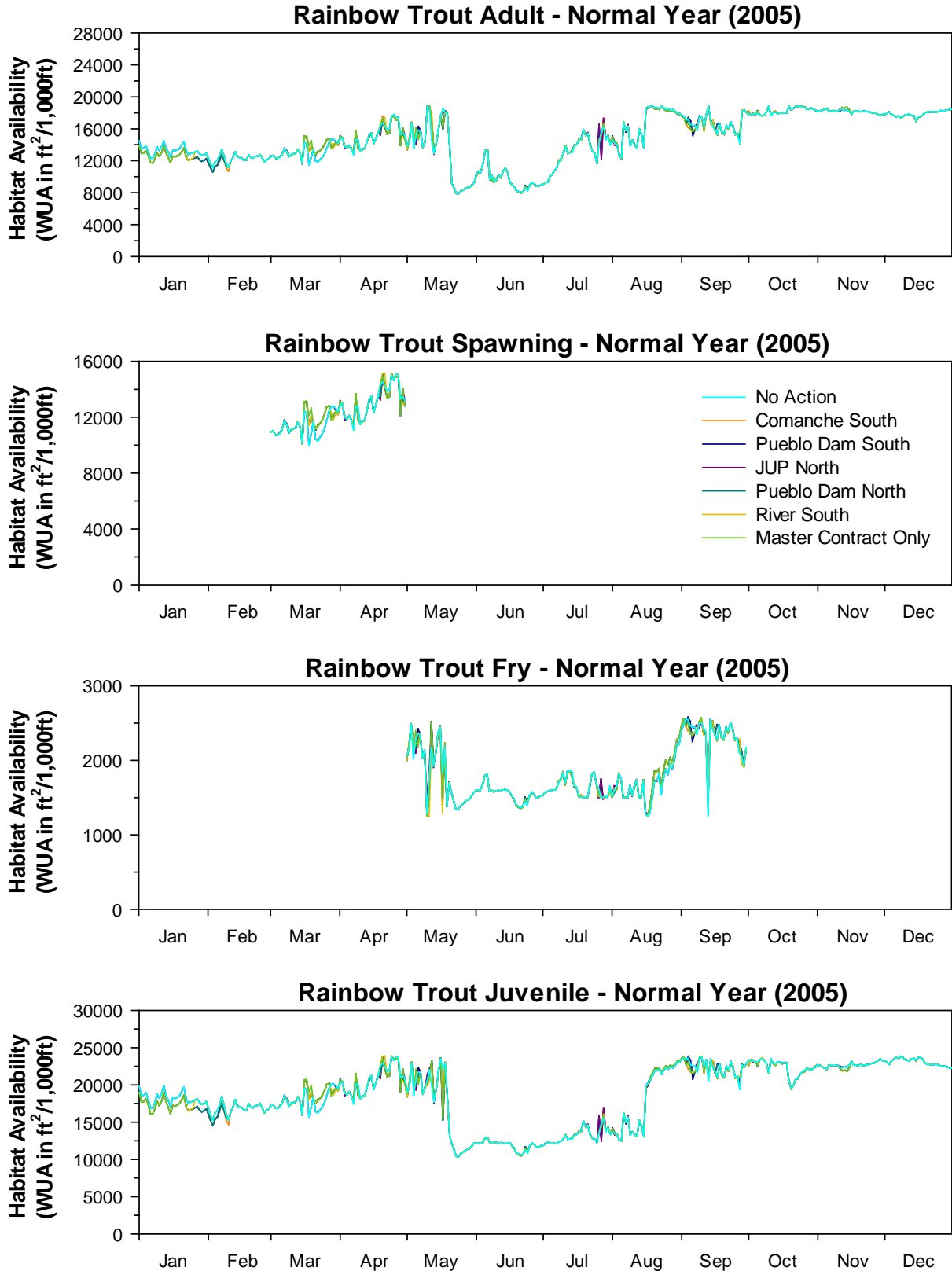


Figure 24. Direct Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 3 of the Upper Arkansas River

Arkansas Valley Conduit EIS
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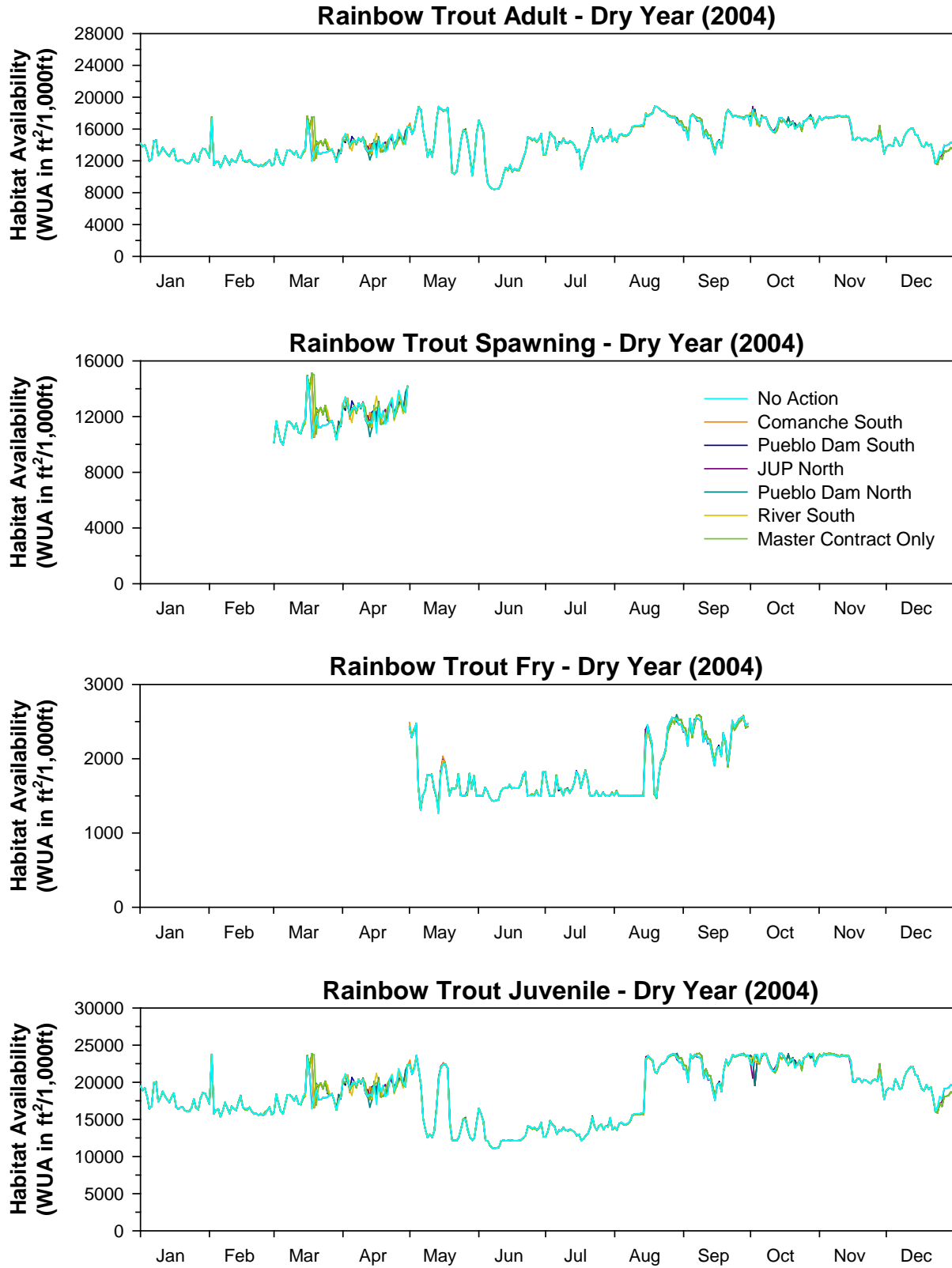


Figure 25. Direct Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 3 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
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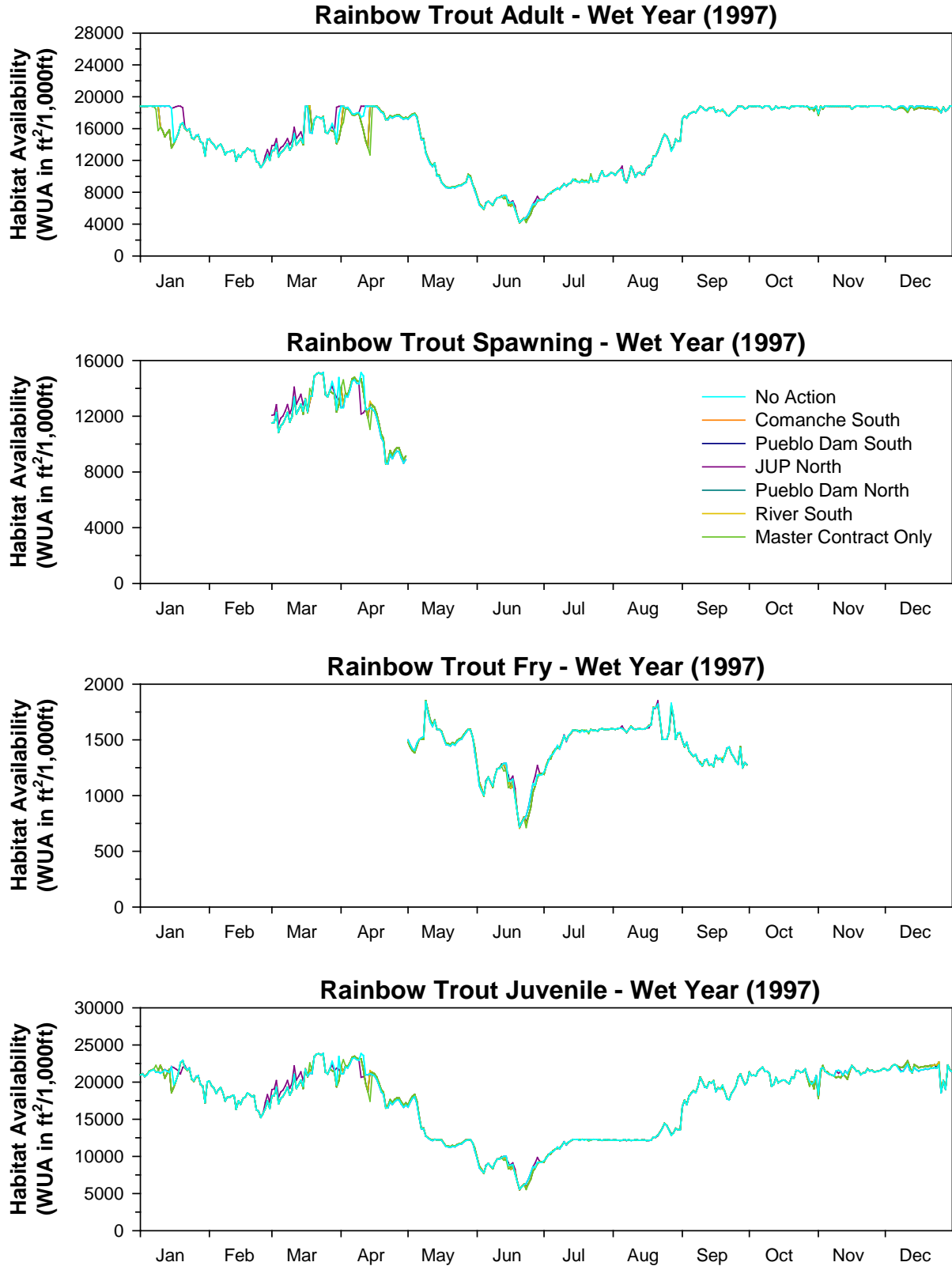


Figure 26. Direct Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 3 of the Upper Arkansas River

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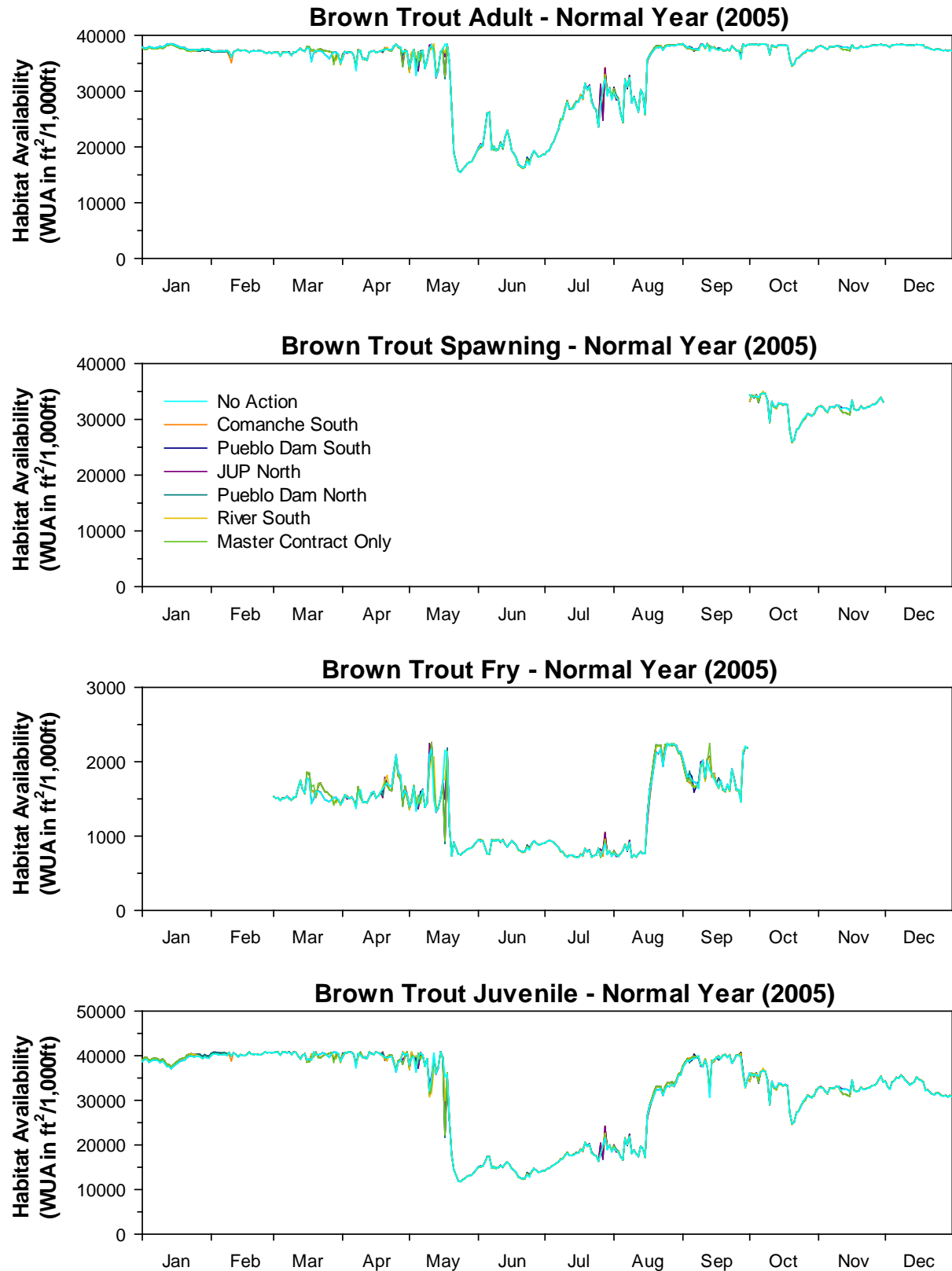


Figure 27. Direct Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 4 of the Upper Arkansas River

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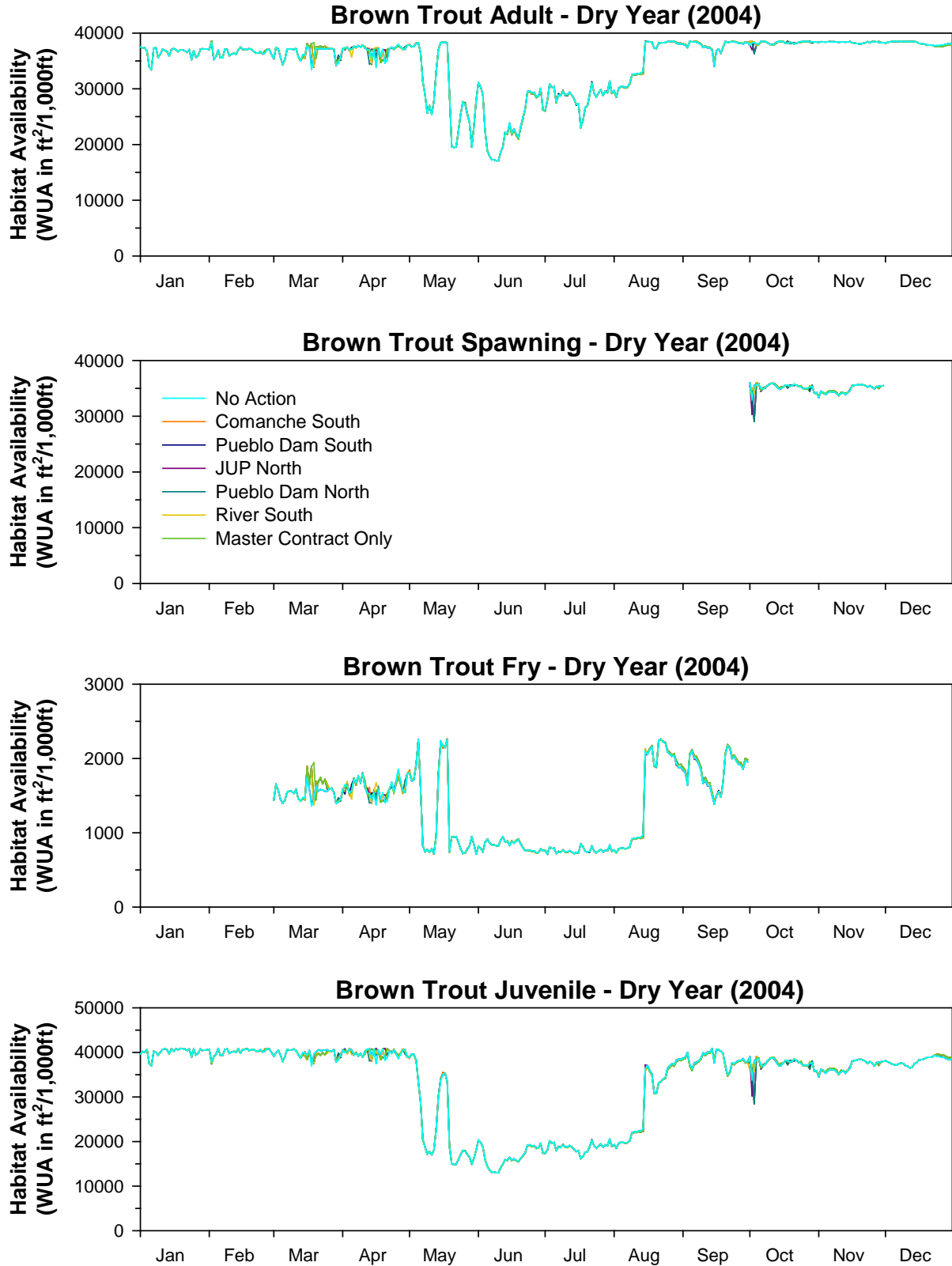


Figure 28. Direct Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 4 of the Upper Arkansas River

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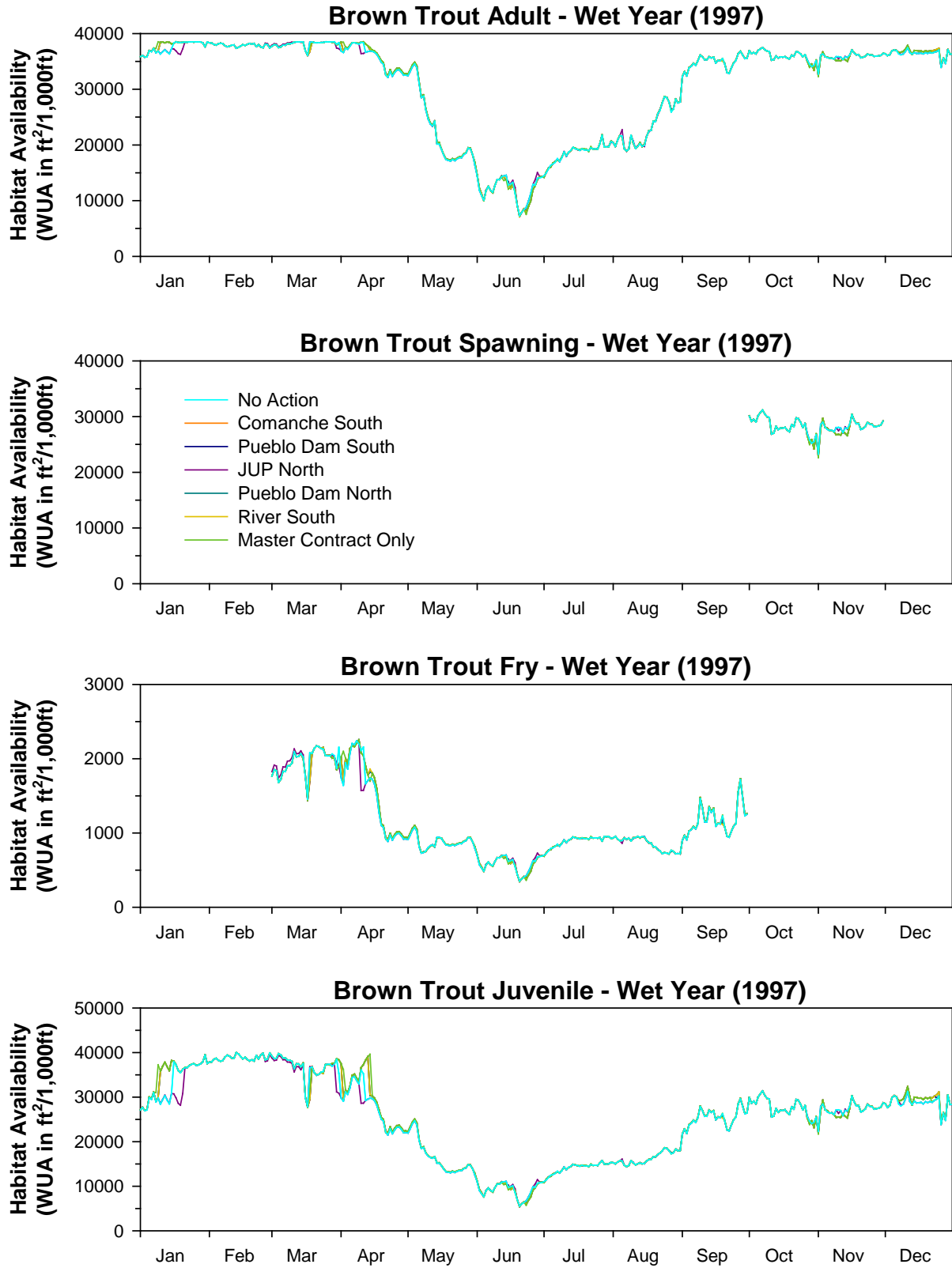


Figure 29. Direct Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 4 of the Upper Arkansas River

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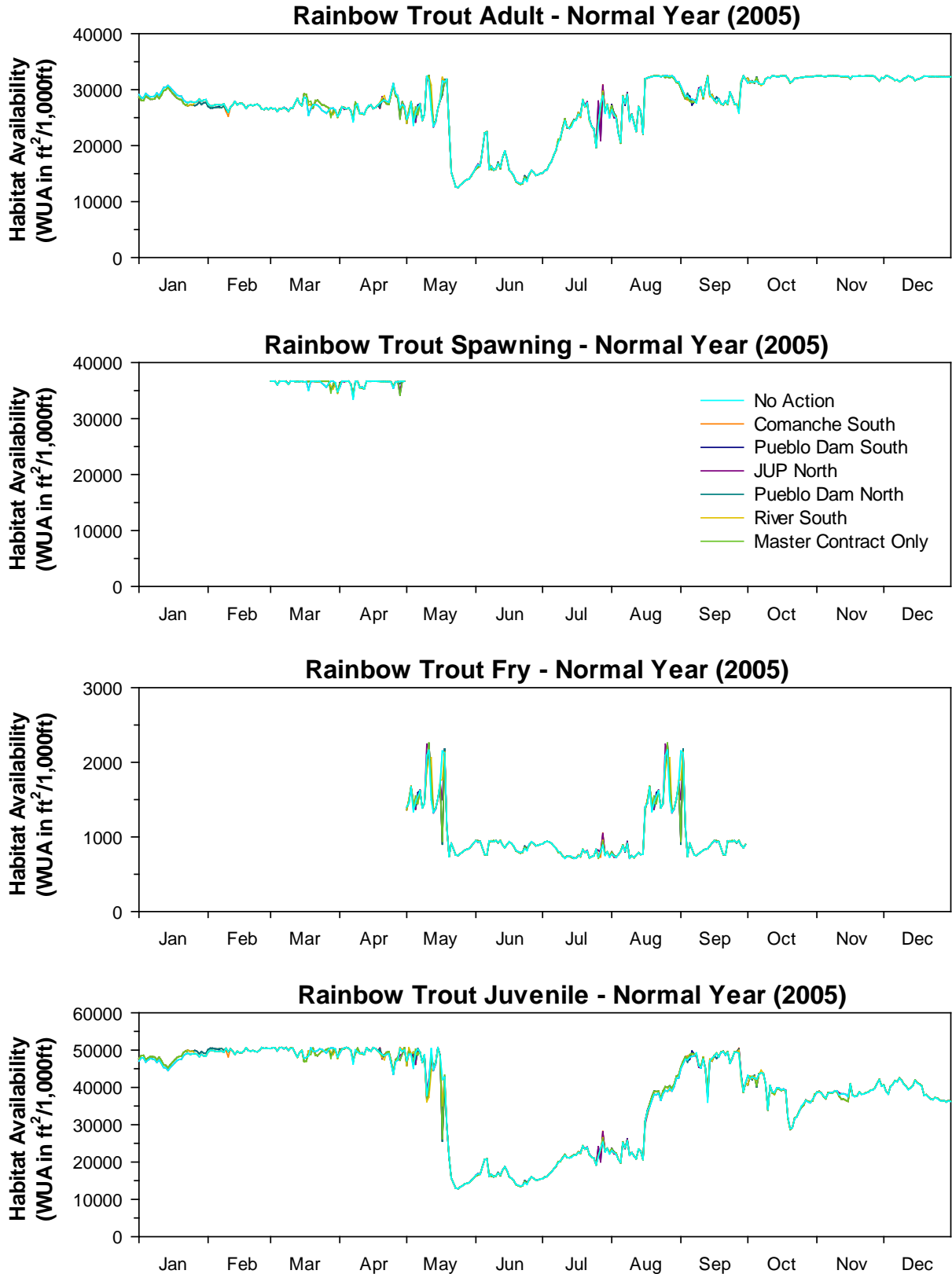


Figure 30. Direct Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 4 of the Upper Arkansas River

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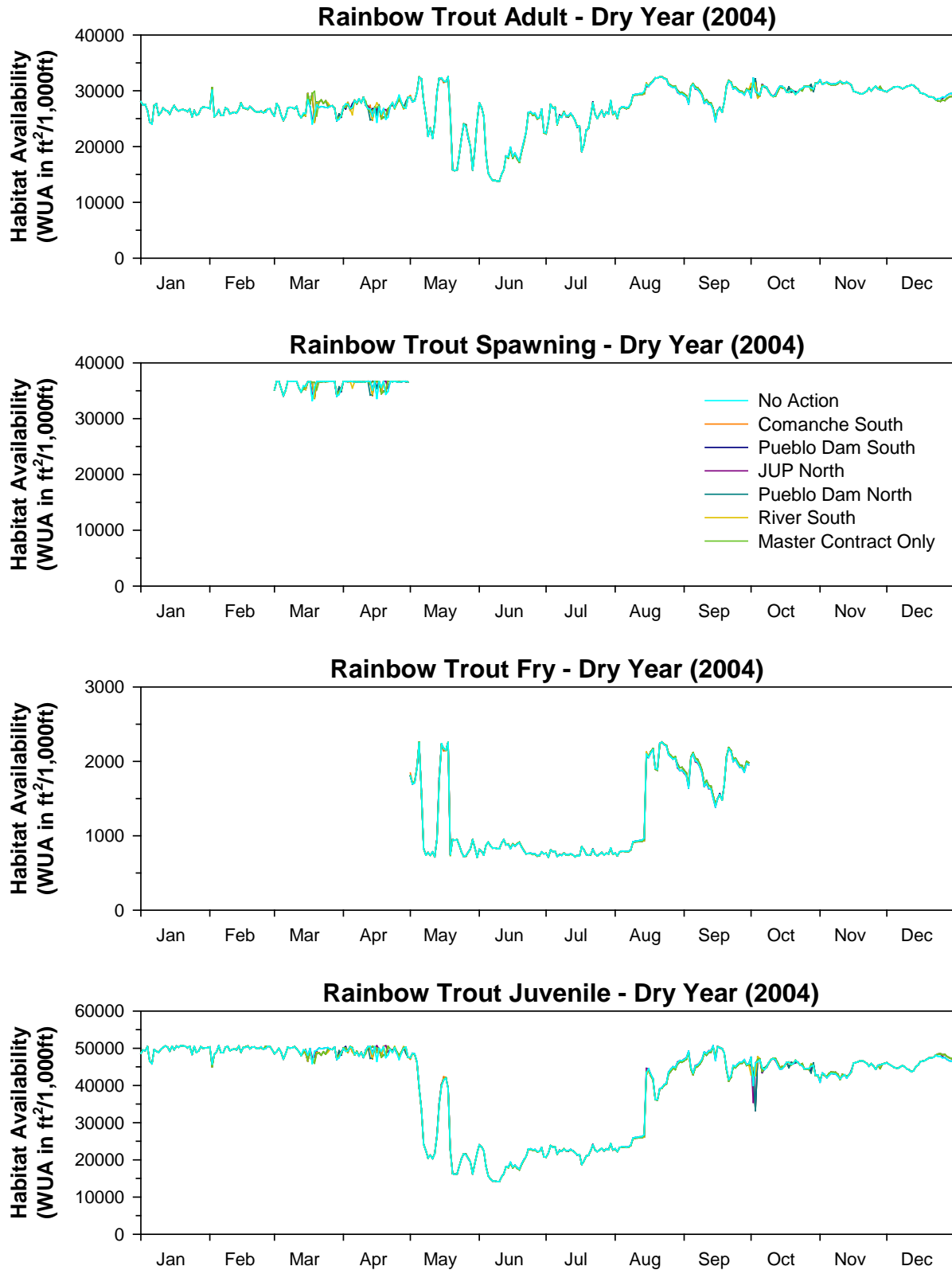


Figure 31. Direct Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 4 of the Upper Arkansas River

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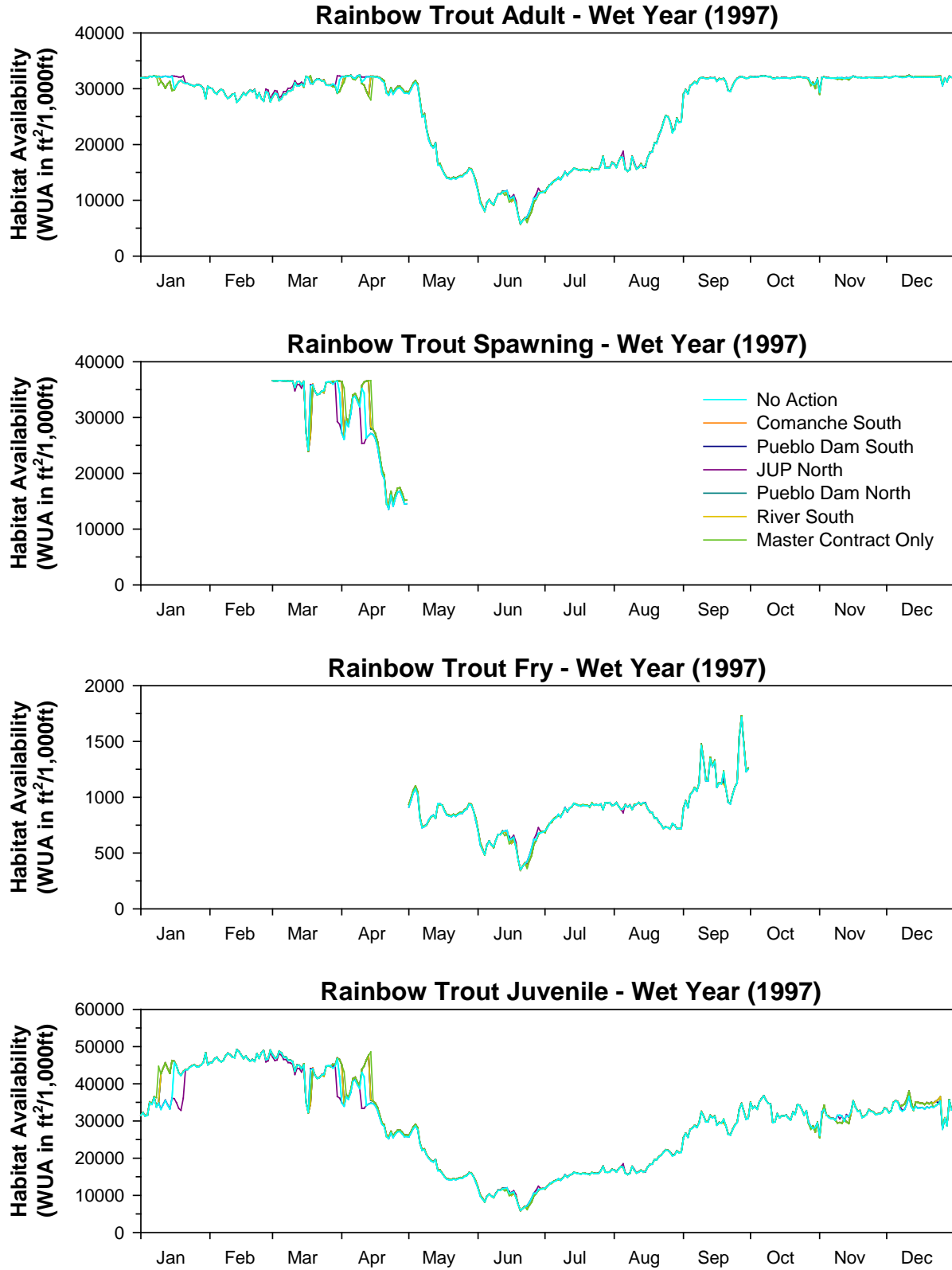


Figure 32. Direct Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 4 of the Upper Arkansas River

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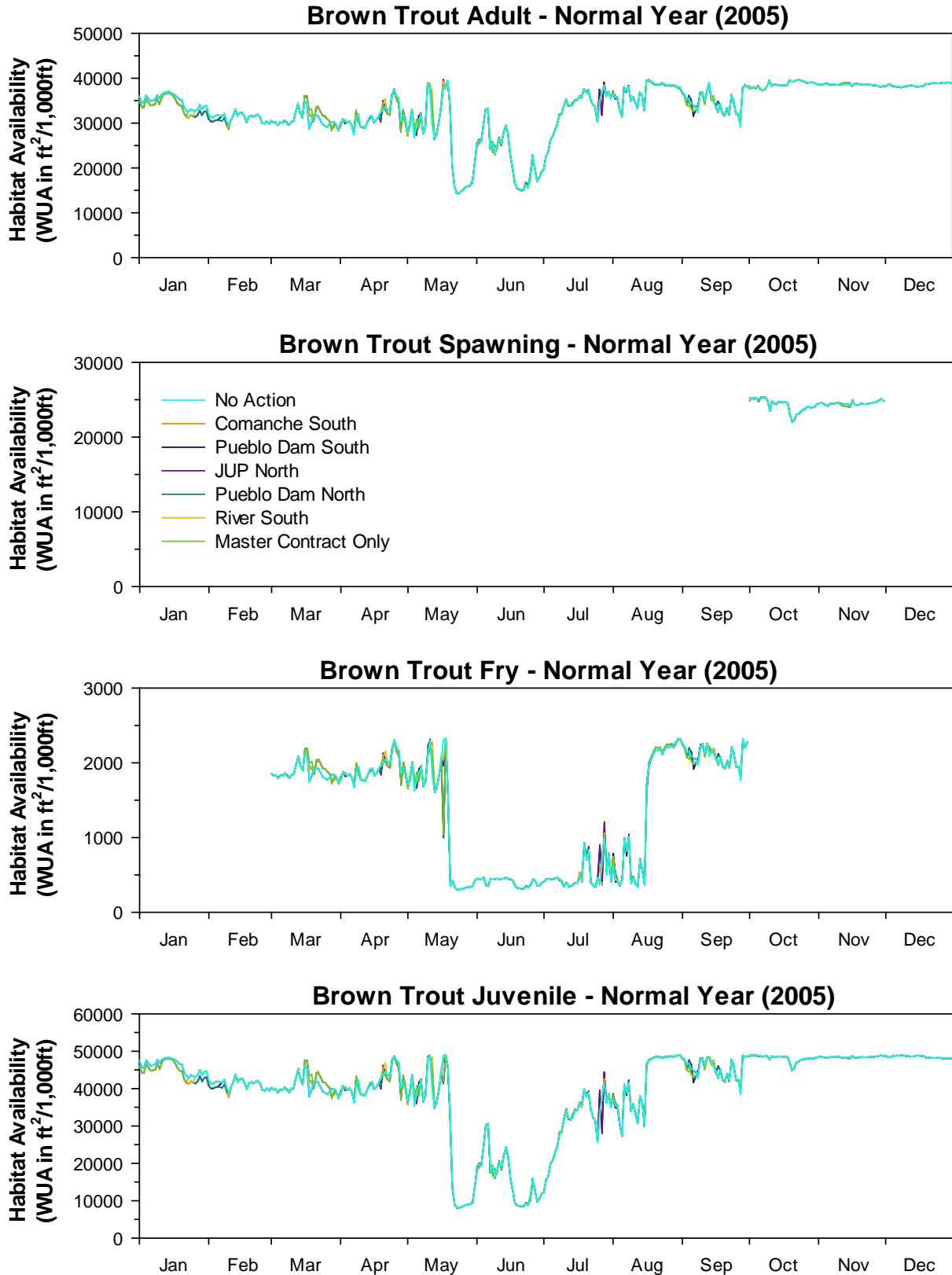


Figure 33. Direct Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 5 of the Upper Arkansas River

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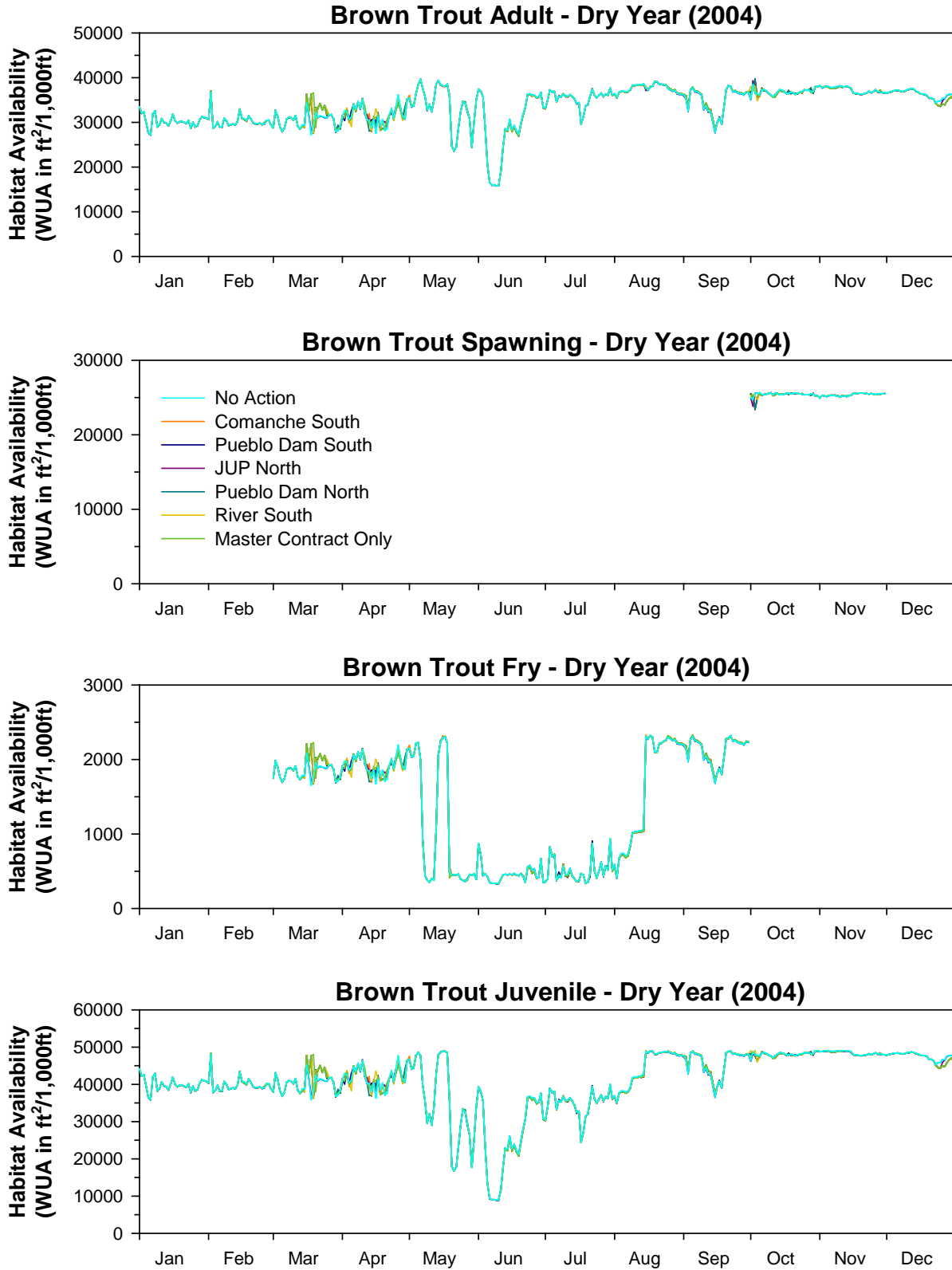


Figure 34. Direct Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 5 of the Upper Arkansas River

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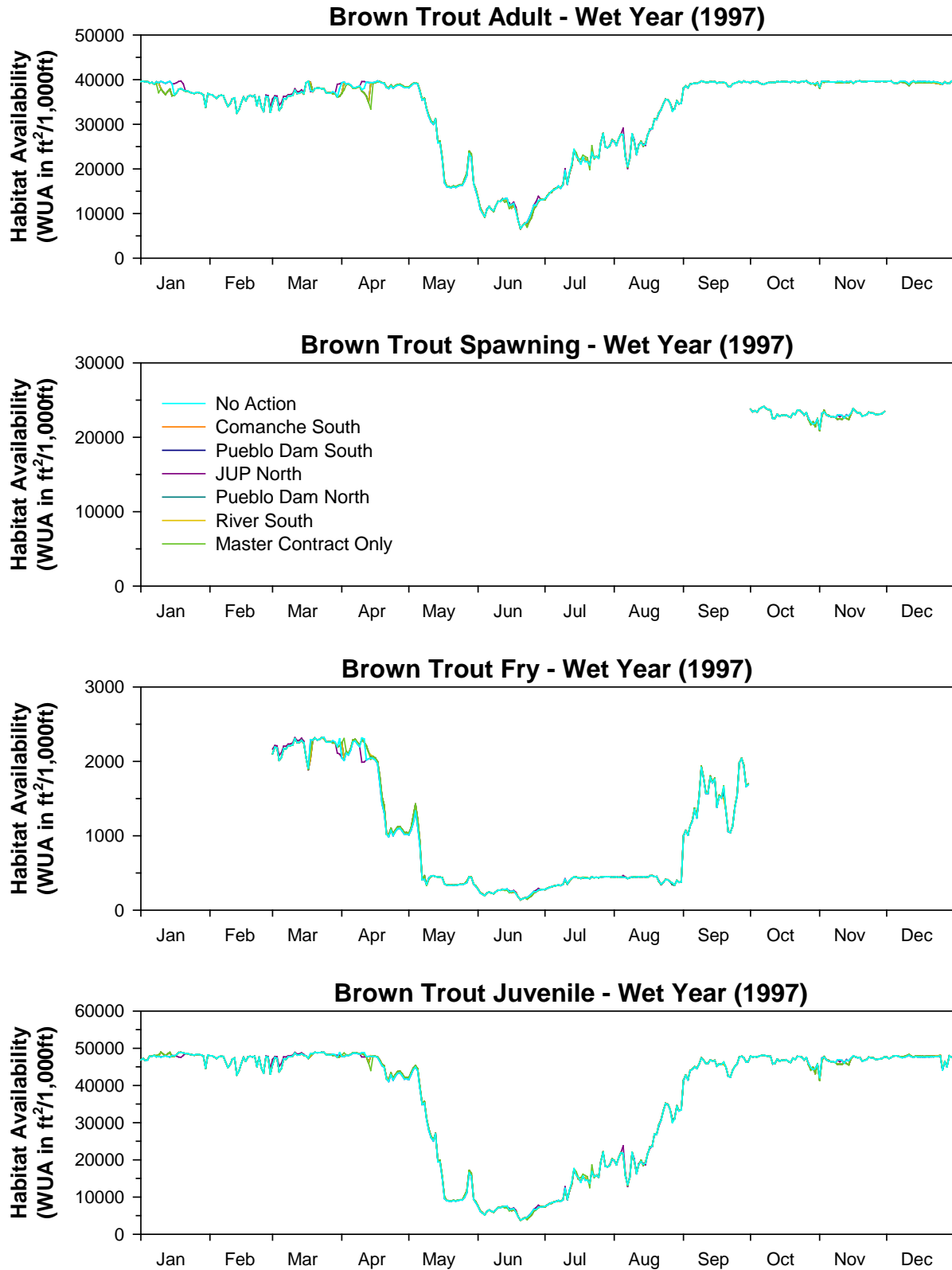


Figure 35. Direct Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 5 of the Upper Arkansas River

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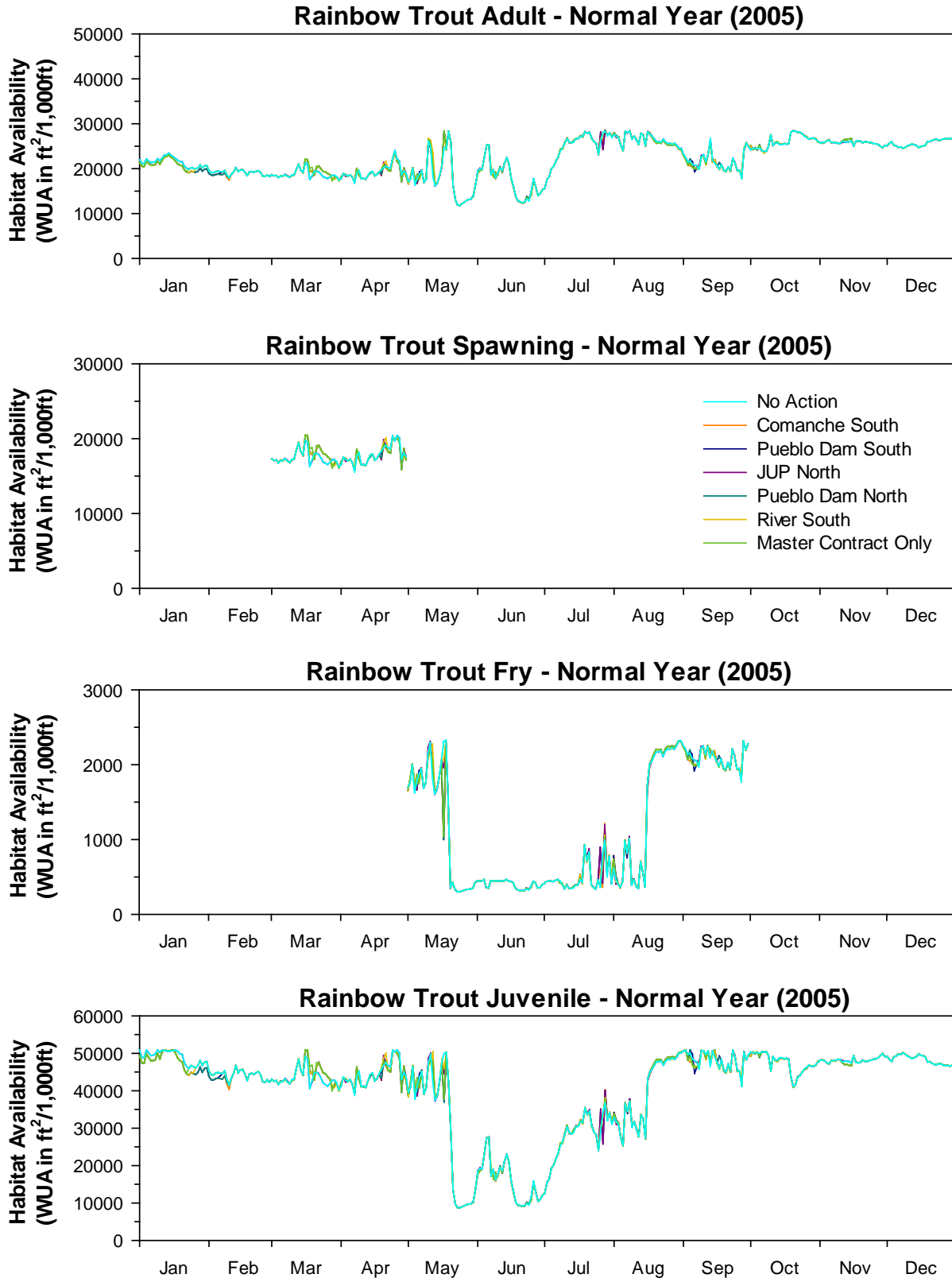


Figure 36. Direct Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 5 of the Upper Arkansas River

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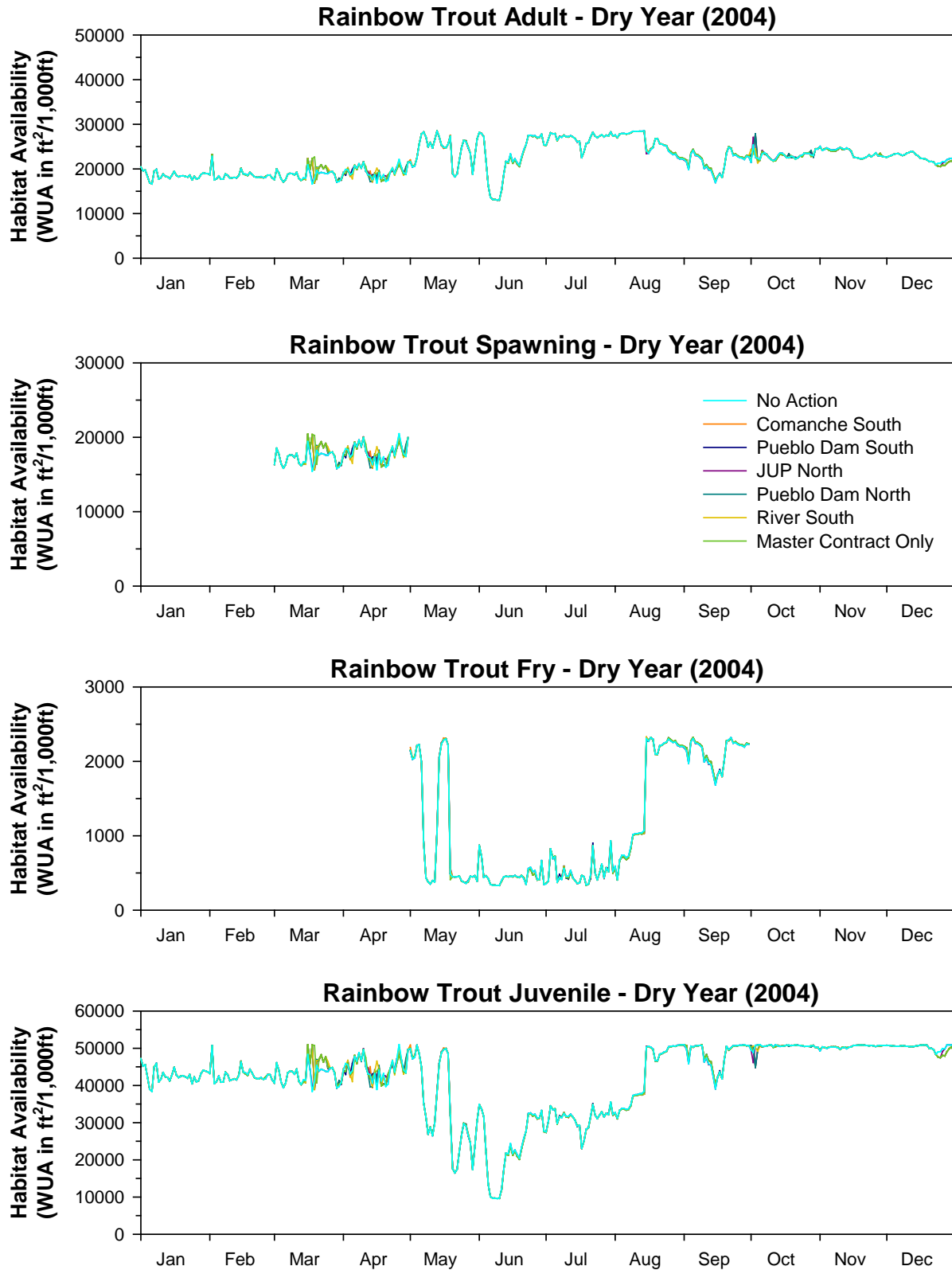


Figure 37. Direct Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 5 of the Upper Arkansas River

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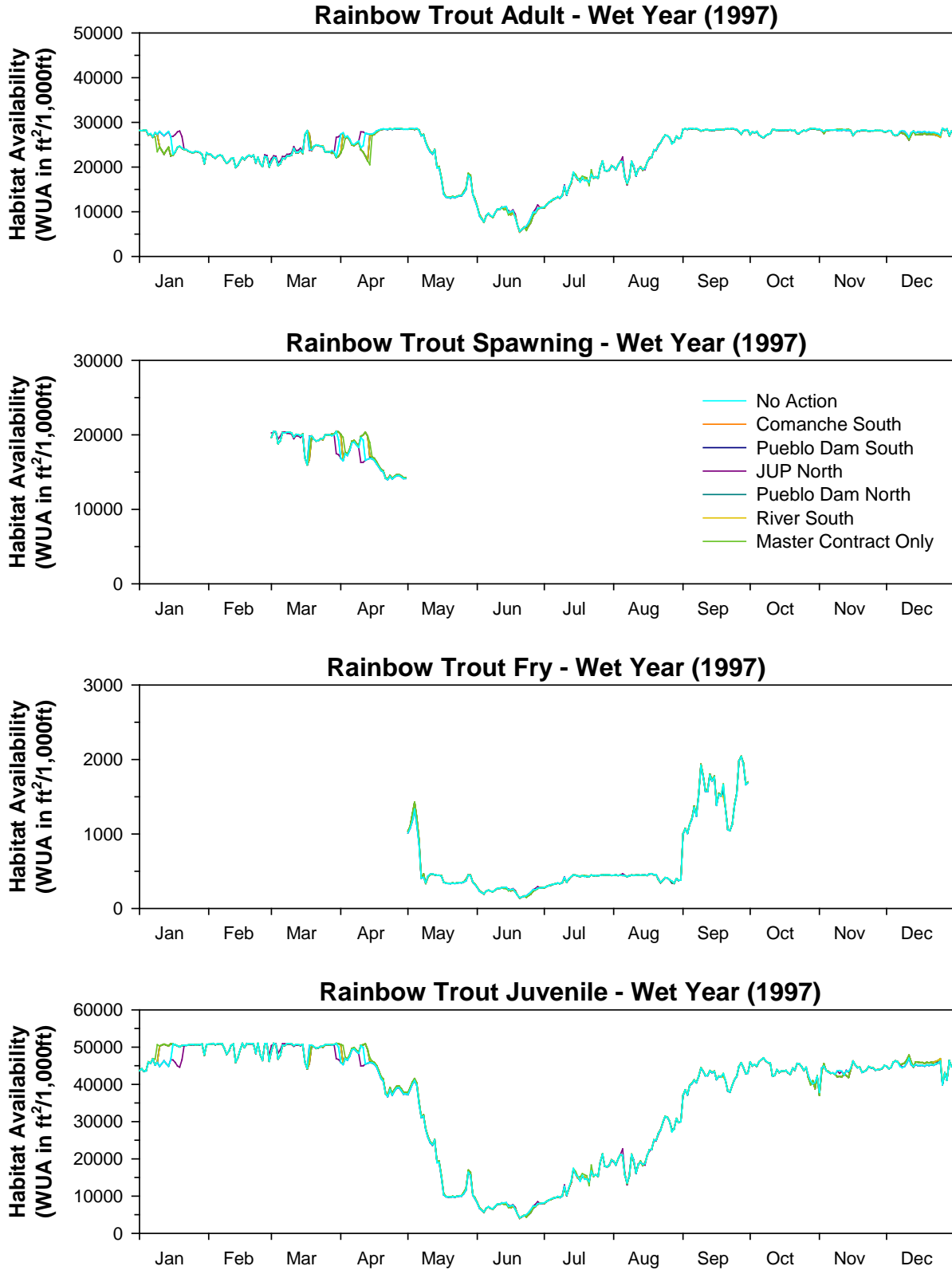


Figure 38. Direct Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 5 of the Upper Arkansas River

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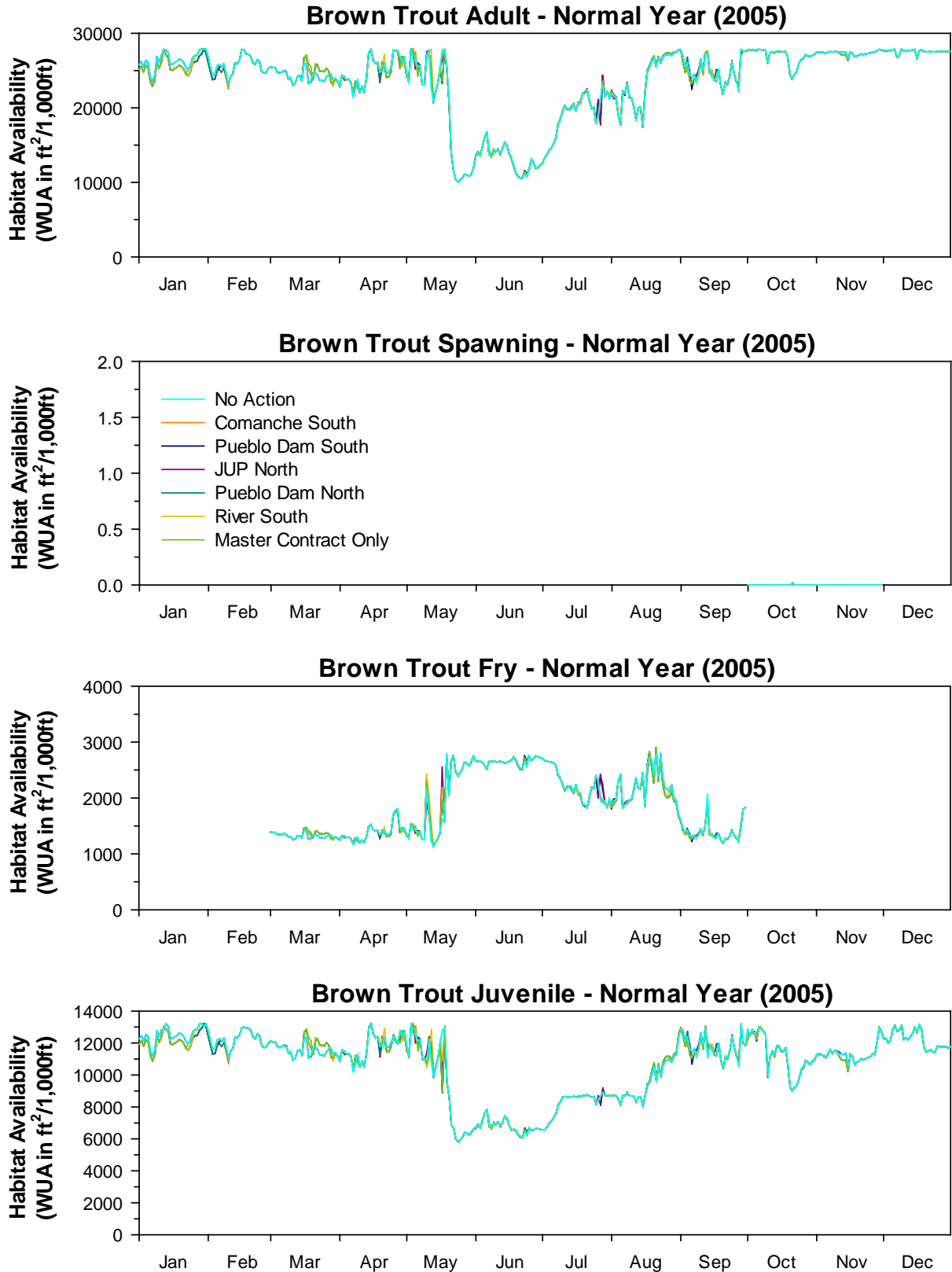


Figure 39. Direct Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 6 of the Upper Arkansas River

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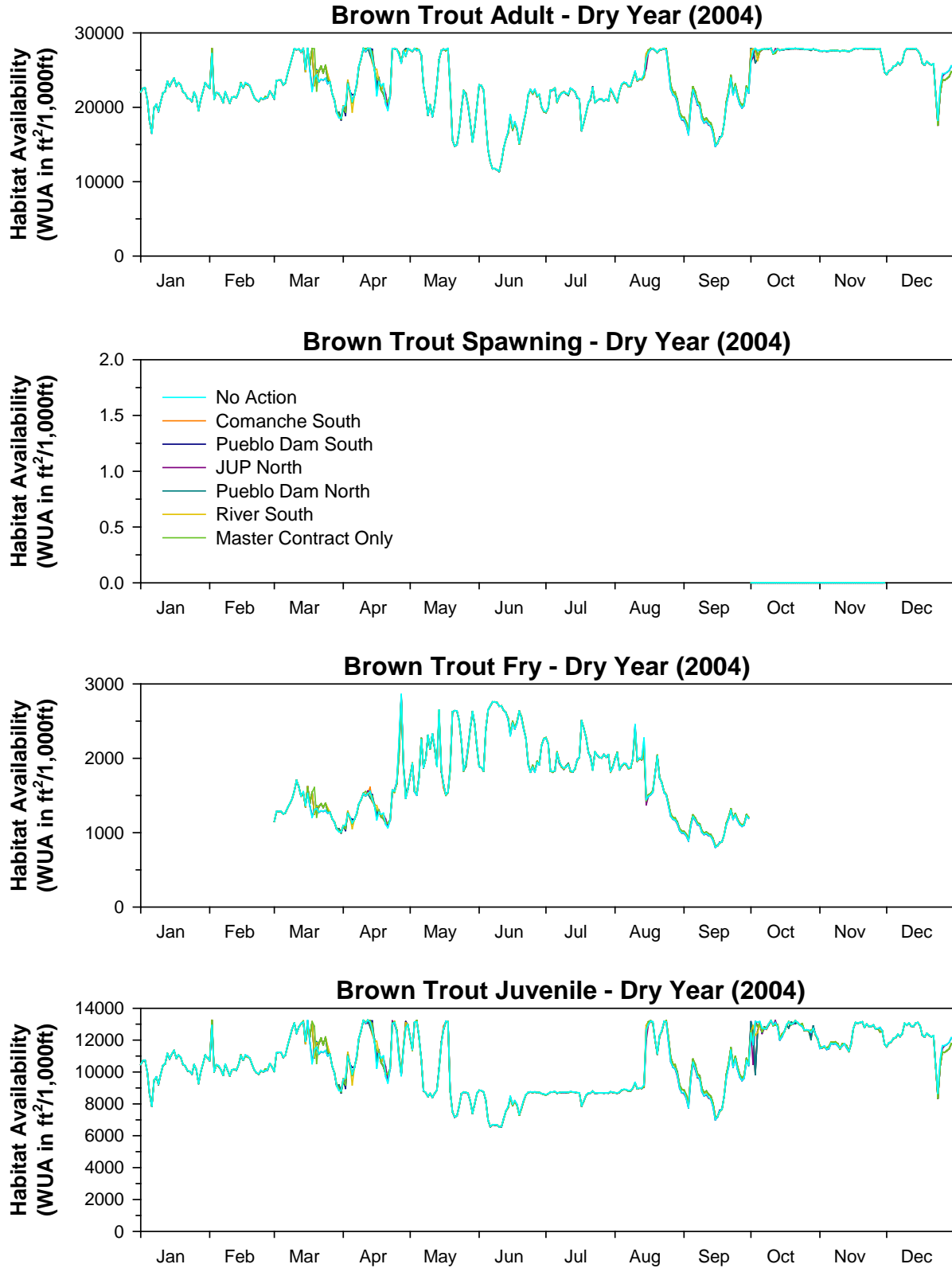


Figure 40. Direct Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 6 of the Upper Arkansas River

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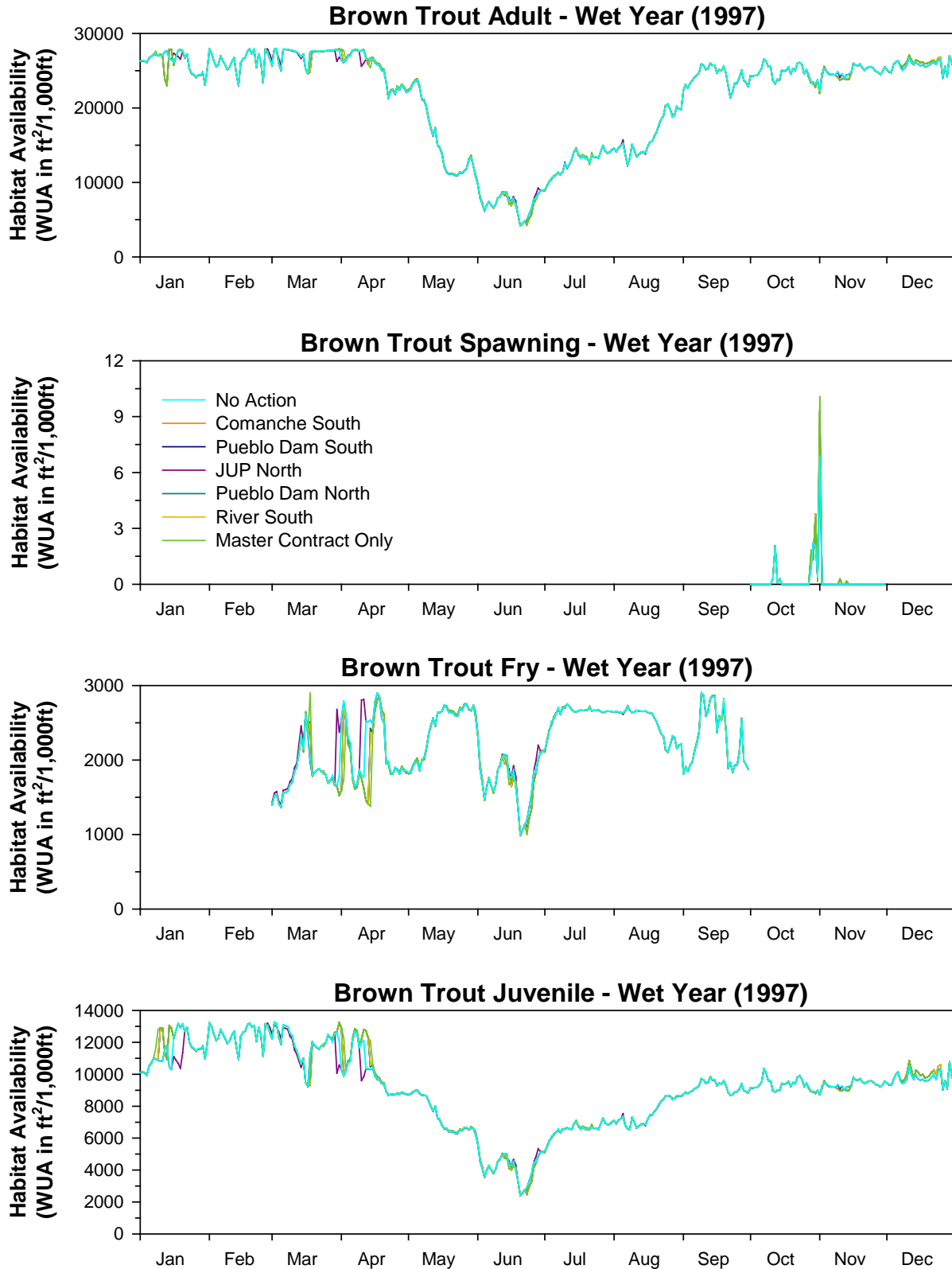


Figure 41. Direct Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 6 of the Upper Arkansas River

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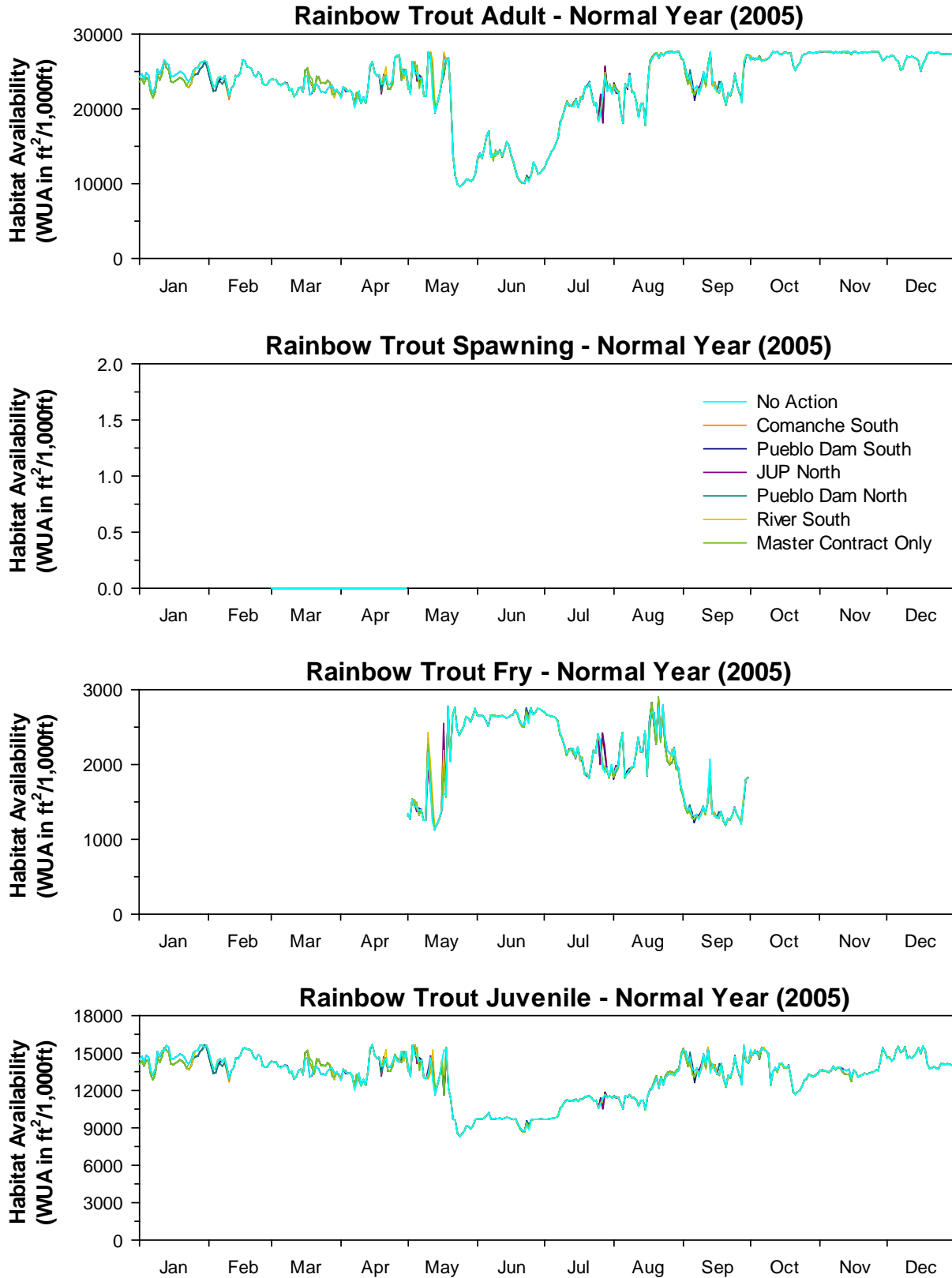


Figure 42. Direct Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 6 of the Upper Arkansas River

Arkansas Valley Conduit EIS
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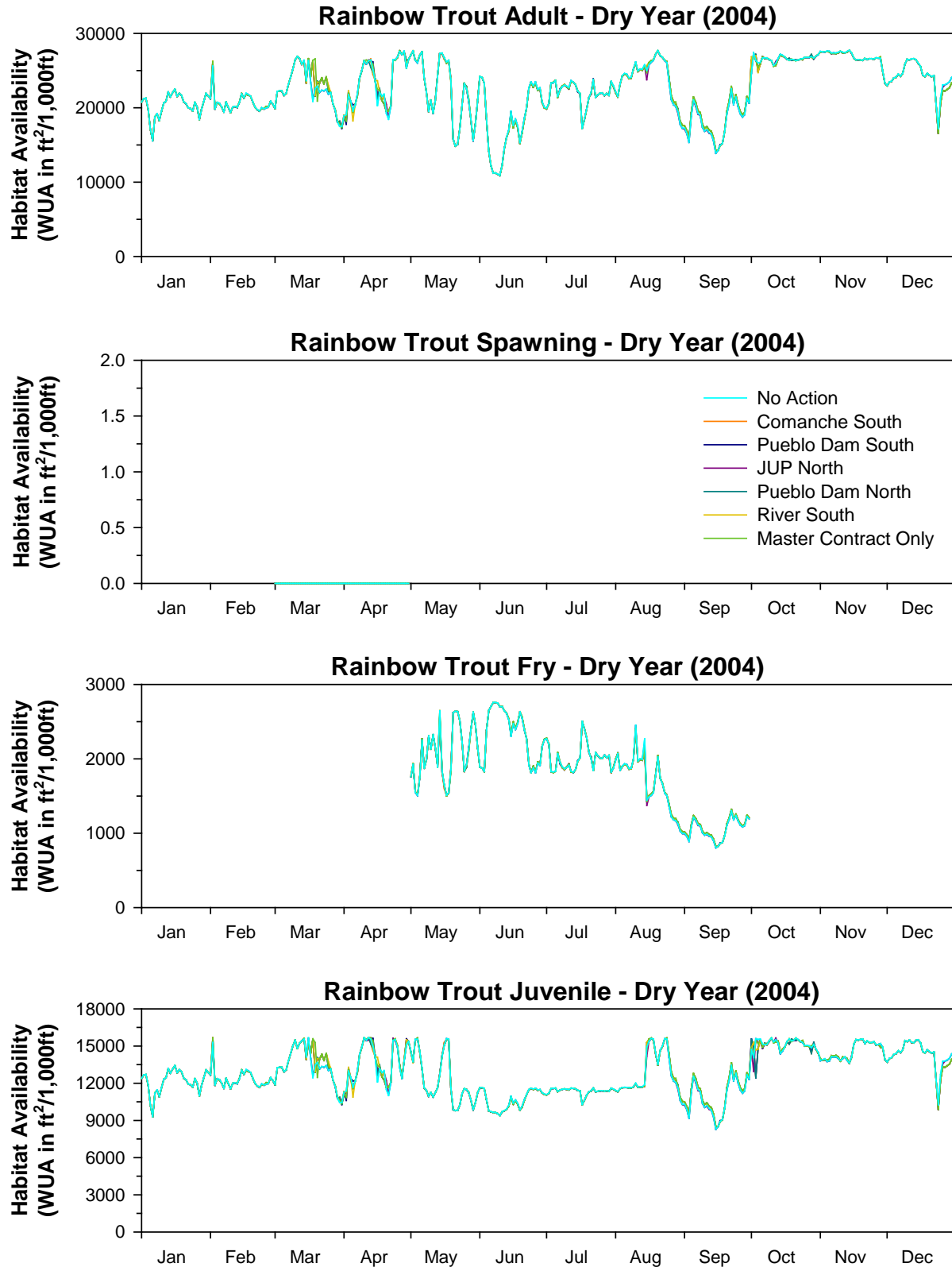


Figure 43. Direct Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 6 of the Upper Arkansas River

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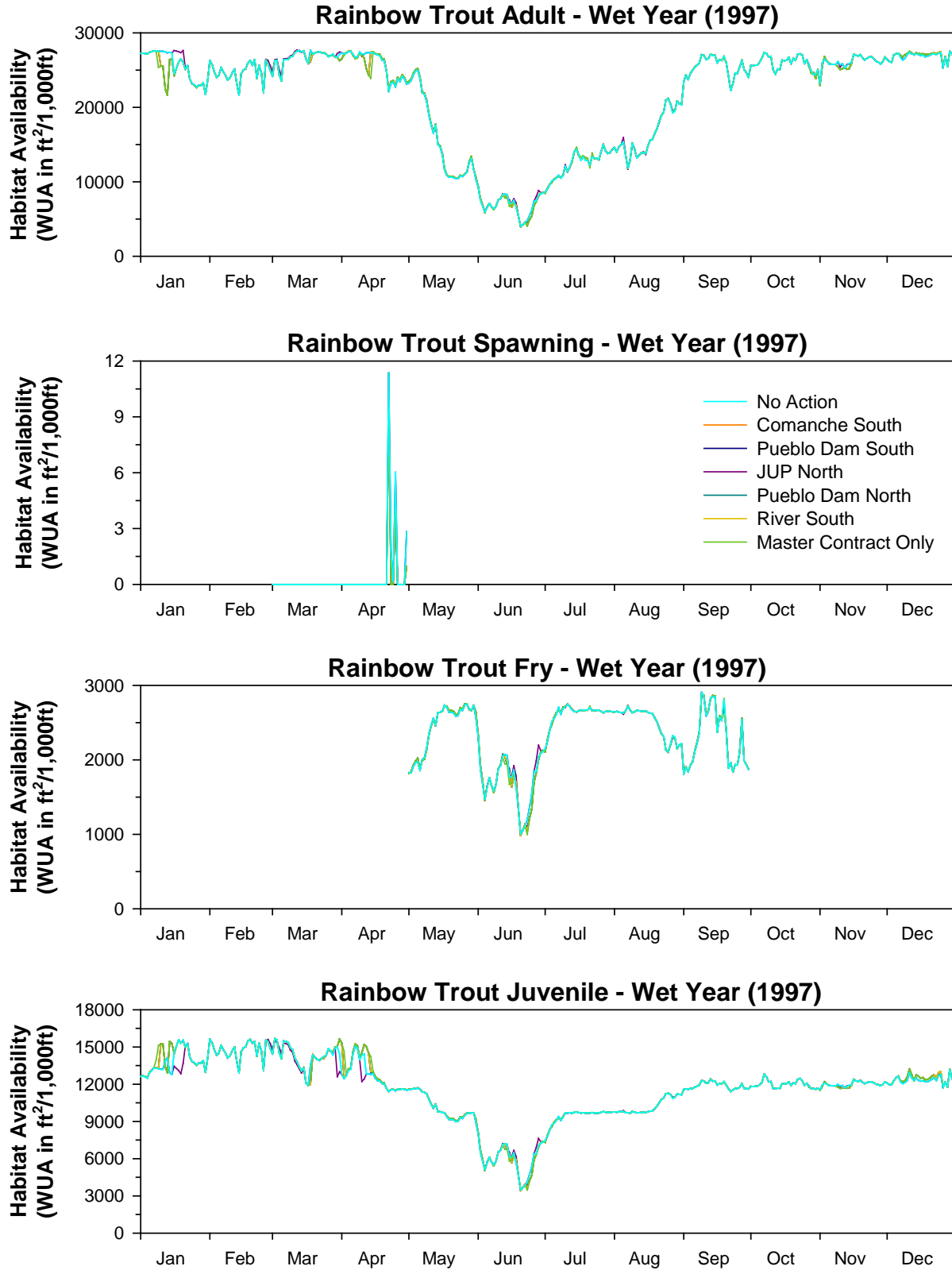









Figure 44. Direct Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 6 of the Upper Arkansas River








Arkansas Valley Conduit EIS

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Table 1. Direct Effects Summary of the Percent Change in Minimum Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 1

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	6,188	6,188	6,188	6,188	6,188	6,188	6,188
spawning	4,518	4,518	4,518	4,518	4,518	4,518	4,518
fry	1,278	1,278	1,278	1,278	1,278	1,278	1,278
juvenile	6,223	6,223	6,223	6,223	6,223	6,223	6,223
Rainbow trout							
adult	3,323	3,323	3,323	3,323	3,323	3,323	3,323
spawning	2,291	2,291	2,291	2,291	2,291	2,291	2,291
fry	2,188	2,188	2,188	2,188	2,188	2,188	2,188
juvenile	6,678	6,678	6,678	6,678	6,678	6,678	6,678
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	0%	0%	0%	0%	0%	0%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	0%	0%	0%	0%	0%	0%
juvenile	--	0%	0%	0%	0%	0%	0%
Rainbow trout							
adult	--	0%	0%	0%	0%	0%	0%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	0%	0%	0%	0%	0%	0%
juvenile	--	0%	0%	0%	0%	0%	0%
Dry Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	5,380	5,380	5,380	5,380	5,380	5,380	5,380
spawning	3,687	3,687	3,687	3,687	3,687	3,687	3,687
fry	1,290	1,290	1,290	1,290	1,290	1,290	1,290
juvenile	8,469	8,469	8,469	8,469	8,469	8,469	8,469
Rainbow trout							
adult	2,908	2,908	2,908	2,908	2,908	2,908	2,908
spawning	2,313	2,313	2,313	2,313	2,313	2,313	2,313
fry	2,074	2,074	2,074	2,074	2,074	2,074	2,074
juvenile	7,574	7,574	7,574	7,574	7,574	7,574	7,574
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	0%	0%	0%	0%	0%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	0%	0%	0%	0%	0%	0%
juvenile	--	0%	0%	0%	0%	0%	0%








**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Species/Life Stage						
Rainbow trout						
adult	--	0%	0%	0%	0%	0%
spawning	--	0%	0%	0%	0%	0%
fry	--	0%	0%	0%	0%	0%
juvenile	--	0%	0%	0%	0%	0%
Wet Year						
Minimum Habitat Availability (WUA in ft²/1,000 ft)						
Brown trout						
adult	4,096	4,096	4,096	4,096	4,096	4,096
spawning	7,174	7,174	7,174	7,174	7,174	7,174
fry	1,795	1,795	1,795	1,795	1,795	1,795
juvenile	3,919	3,919	3,919	3,919	3,919	3,919
Rainbow trout						
adult	2,138	2,138	2,138	2,138	2,138	2,138
spawning	3,217	3,217	3,217	3,217	3,217	3,217
fry	2,204	2,204	2,204	2,204	2,204	2,204
juvenile	4,566	4,566	4,566	4,566	4,566	4,566
Change in Minimum Habitat Availability (%) Compared to No Action Alternative						
Brown trout						
adult	--	0%	0%	0%	0%	0%
spawning	--	0%	0%	0%	0%	0%
fry	--	0%	0%	0%	0%	0%
juvenile	--	0%	0%	0%	0%	0%
Rainbow trout						
adult	--	0%	0%	0%	0%	0%
spawning	--	0%	0%	0%	0%	0%
fry	--	0%	0%	0%	0%	0%
juvenile	--	0%	0%	0%	0%	0%








Arkansas Valley Conduit EIS

Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 2. Direct Effects Summary of the Percent Change in Median Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 1

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	12,134	12,134	12,134	12,134	12,134	12,134	12,134
spawning	7,177	7,177	7,177	7,177	7,177	7,177	7,177
fry	2,544	2,544	2,544	2,544	2,544	2,544	2,544
juvenile	18,293	18,293	18,293	18,293	18,293	18,293	18,293
Rainbow trout							
adult	6,976	6,976	6,976	6,976	6,976	6,976	6,976
spawning	2,786	2,786	2,786	2,786	2,786	2,786	2,786
fry	2,661	2,660	2,660	2,660	2,660	2,660	2,660
juvenile	19,346	19,346	19,346	19,346	19,346	19,346	19,346
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	0%	0%	0%	0%	0%	0%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	0%	0%	0%	0%	0%	0%
juvenile	--	0%	0%	0%	0%	0%	0%
Rainbow trout							
adult	--	0%	0%	0%	0%	0%	0%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
juvenile	--	0%	0%	0%	0%	0%	0%
Dry Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	12,492	12,492	12,492	12,492	12,492	12,492	12,492
spawning	5,581	5,581	5,581	5,581	5,581	5,581	5,581
fry	2,628	2,628	2,628	2,628	2,628	2,628	2,628
juvenile	18,472	18,472	18,472	18,472	18,472	18,472	18,472
Rainbow trout							
adult	6,998	6,998	6,998	6,998	6,998	6,998	6,998
spawning	4,534	4,534	4,534	4,534	4,534	4,534	4,534
fry	2,682	2,685	2,685	2,682	2,685	2,685	2,685
juvenile	20,256	20,256	20,256	20,256	20,256	20,256	20,256
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	0%	0%	0%	0%	0%	0%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	0%	0%	0%	0%	0%	0%
juvenile	--	0%	0%	0%	0%	0%	0%








**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

							
Species/Life Stage	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Rainbow trout							
adult	--	0%	0%	0%	0%	0%	0%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	<1%	<1%	0%	<1%	<1%	<1%
juvenile	--	0%	0%	0%	0%	0%	0%
Wet Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	12,925	12,925	12,925	12,925	12,925	12,925	12,925
spawning	8,283	8,283	8,283	8,283	8,283	8,283	8,283
fry	3,130	3,130	3,130	3,130	3,130	3,130	3,130
juvenile	19,749	19,749	19,749	19,749	19,749	19,749	19,749
Rainbow trout							
adult	7,575	7,575	7,575	7,575	7,575	7,575	7,575
spawning	4,522	4,522	4,522	4,522	4,522	4,522	4,522
fry	4,563	4,563	4,563	4,563	4,563	4,563	4,563
juvenile	22,040	22,040	22,040	22,040	22,040	22,040	22,040
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	0%	0%	0%	0%	0%	0%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	0%	0%	0%	0%	0%	0%
juvenile	--	0%	0%	0%	0%	0%	0%
Rainbow trout							
adult	--	0%	0%	0%	0%	0%	0%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	0%	0%	0%	0%	0%	0%
juvenile	--	0%	0%	0%	0%	0%	0%








Arkansas Valley Conduit EIS

Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 3. Direct Effects Summary of the Percent Change in Minimum Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 2

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	11,328	10,369	10,369	11,328	10,369	11,324	11,324
spawning	3,551	3,517	3,517	3,551	3,517	3,517	3,515
fry	1,490	1,491	1,491	1,491	1,491	1,490	1,491
juvenile	8,232	7,536	7,536	8,232	7,536	8,229	8,229
Rainbow trout							
adult	9,153	8,378	8,378	9,153	8,378	9,149	9,149
spawning	2,031	2,054	2,054	2,031	2,054	2,054	2,054
fry	1,490	1,491	1,491	1,491	1,491	1,490	1,491
juvenile	9,850	9,016	9,016	9,850	9,016	9,846	9,846
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	-8%	-8%	0%	-8%	<-1%	<-1%
spawning	--	<-1%	<-1%	<-1%	<-1%	<-1%	-1%
fry	--	<1%	<1%	<1%	<1%	<-1%	<1%
juvenile	--	-8%	-8%	0%	-8%	<-1%	<-1%
Rainbow trout							
adult	--	-8%	-8%	0%	-8%	<-1%	<-1%
spawning	--	1%	1%	0%	1%	1%	1%
fry	--	<1%	<1%	<1%	<1%	<-1%	<1%
juvenile	--	-8%	-8%	0%	-8%	<-1%	<-1%
Dry Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	11,294	11,200	11,200	11,297	11,200	11,200	11,200
spawning	2,254	2,253	2,253	2,254	2,253	2,253	2,253
fry	1,567	1,566	1,566	1,567	1,566	1,566	1,566
juvenile	8,208	8,139	8,139	8,210	8,139	8,139	8,139
Rainbow trout							
adult	9,125	9,049	9,049	9,128	9,049	9,049	9,049
spawning	1,920	1,919	1,919	1,920	1,919	1,919	1,919
fry	1,659	1,660	1,660	1,659	1,660	1,660	1,660
juvenile	9,820	9,738	9,738	9,823	9,738	9,738	9,738
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<-1%	<-1%	<1%	<-1%	<-1%	<-1%
spawning	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
fry	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
juvenile	--	<-1%	<-1%	<1%	<-1%	<-1%	<-1%








Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

							
Species/Life Stage	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Rainbow trout							
adult	--	<-1%	<-1%	<1%	<-1%	<-1%	<-1%
spawning	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<-1%	<-1%	<1%	<-1%	<-1%	<-1%
Wet Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	7,740	7,384	7,436	7,872	7,376	7,436	6,858
spawning	3,378	3,254	3,254	3,383	3,253	3,254	3,260
fry	560	534	538	569	533	538	496
juvenile	5,125	4,890	4,925	5,213	4,884	4,925	4,542
Rainbow trout							
adult	6,915	6,597	6,644	7,033	6,590	6,644	6,128
spawning	2,183	2,216	2,202	2,185	2,202	2,203	2,173
fry	560	534	538	569	533	538	496
juvenile	6,925	6,607	6,654	7,043	6,600	6,654	6,136
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	-5%	-4%	2%	-5%	-4%	-11%
spawning	--	-4%	-4%	<1%	-4%	-4%	-4%
fry	--	-5%	-4%	2%	-5%	-4%	-11%
juvenile	--	-5%	-4%	2%	-5%	-4%	-11%
Rainbow trout							
adult	--	-5%	-4%	2%	-5%	-4%	-11%
spawning	--	2%	<1%	<1%	<1%	<1%	<-1%
fry	--	-5%	-4%	2%	-5%	-4%	-11%
juvenile	--	-5%	-4%	2%	-5%	-4%	-11%








Arkansas Valley Conduit EIS

Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 4. Direct Effects Summary of the Percent Change in Median Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 2

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	23,640	23,417	23,568	23,716	23,437	23,446	23,534
spawning	4,259	4,228	4,228	4,250	4,227	4,227	4,231
fry	2,930	2,895	2,910	2,895	2,893	2,897	2,897
juvenile	16,103	16,099	16,112	16,082	16,132	16,132	16,108
Rainbow trout							
adult	19,660	19,570	19,612	19,744	19,576	19,660	19,659
spawning	2,771	2,867	2,867	2,773	2,867	2,867	2,860
fry	3,188	3,167	3,169	3,194	3,164	3,192	3,192
juvenile	20,564	20,516	20,562	20,563	20,555	20,553	20,559
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<-1%	<-1%	<1%	<-1%	<-1%	<-1%
spawning	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
fry	--	-1%	<-1%	-1%	-1%	-1%	-1%
juvenile	--	<-1%	<1%	<-1%	<1%	<1%	<1%
Rainbow trout							
adult	--	<-1%	<-1%	<1%	<-1%	0%	<-1%
spawning	--	3%	3%	<1%	3%	3%	3%
fry	--	<-1%	<-1%	<1%	<-1%	<1%	<1%
juvenile	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
Dry Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	21,077	21,252	21,240	21,187	21,243	21,321	21,185
spawning	3,598	3,602	3,602	3,595	3,602	3,625	3,618
fry	3,172	3,243	3,242	3,173	3,242	3,242	3,274
juvenile	15,222	15,317	15,325	15,243	15,317	15,317	15,312
Rainbow trout							
adult	17,030	17,171	17,162	17,119	17,164	17,227	17,118
spawning	2,974	2,955	2,964	2,992	2,955	2,962	3,036
fry	4,034	3,995	3,995	4,034	3,995	3,995	3,995
juvenile	18,326	18,479	18,468	18,422	18,471	18,538	18,421
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<1%	<1%	1%	<1%
spawning	--	<1%	<1%	<-1%	<1%	<1%	<1%
fry	--	2%	2%	<1%	2%	2%	3%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%








Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only	
Species/Life Stage							
Rainbow trout							
adult	--	<1%	<1%	<1%	<1%	1%	<1%
spawning	--	<-1%	<-1%	<1%	<-1%	<-1%	2%
fry	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
juvenile	--	<1%	<1%	<1%	<1%	1%	<1%
Wet Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	25,472	24,326	24,329	25,633	24,329	24,329	24,247
spawning	4,121	4,082	4,082	4,120	4,082	4,082	4,078
fry	2,568	2,576	2,576	2,576	2,577	2,576	2,574
juvenile	15,920	15,892	15,909	15,945	15,909	15,907	15,906
Rainbow trout							
adult	21,122	20,959	20,970	21,171	20,959	20,959	20,959
spawning	2,918	2,943	2,943	2,918	2,943	2,943	2,806
fry	2,368	2,373	2,373	2,368	2,373	2,373	2,413
juvenile	20,568	20,562	20,562	20,568	20,561	20,560	20,560
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	-5%	-4%	<1%	-4%	-4%	-5%
spawning	--	<-1%	<-1%	<-1%	<-1%	<-1%	-1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<-1%	<-1%	<1%	<-1%	<-1%	<-1%
Rainbow trout							
adult	--	<-1%	<-1%	<1%	<-1%	<-1%	<-1%
spawning	--	<1%	<1%	0%	<1%	<1%	-4%
fry	--	<1%	<1%	<-1%	<1%	<1%	2%
juvenile	--	<-1%	<-1%	<1%	<-1%	<-1%	<-1%








Arkansas Valley Conduit EIS

Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 5. Direct Effects Summary of the Percent Change in Minimum Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 3

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	9,714	9,727	9,727	9,705	9,727	9,717	9,717
spawning	14,802	14,746	14,746	14,802	14,747	14,747	14,743
fry	1,253	1,252	1,252	1,279	1,250	1,241	1,251
juvenile	7,621	7,631	7,631	7,614	7,631	7,624	7,624
Rainbow trout							
adult	7,880	7,891	7,891	7,873	7,891	7,883	7,883
spawning	9,965	10,117	10,117	10,018	10,117	10,117	10,117
fry	1,253	1,252	1,252	1,279	1,250	1,241	1,251
juvenile	10,377	10,391	10,391	10,367	10,391	10,380	10,380
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<-1%	<1%	<1%	<1%
spawning	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
fry	--	<-1%	<-1%	2%	<-1%	<-1%	<-1%
juvenile	--	<1%	<1%	<-1%	<1%	<1%	<1%
Rainbow trout							
adult	--	<1%	<1%	<-1%	<1%	<1%	<1%
spawning	--	2%	2%	<1%	2%	2%	2%
fry	--	<-1%	<-1%	2%	<-1%	<-1%	<-1%
juvenile	--	<1%	<1%	<-1%	<1%	<1%	<1%
Dry Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	10,392	10,397	10,397	10,392	10,397	10,397	10,397
spawning	12,535	12,533	12,533	12,535	12,533	12,533	12,533
fry	1,262	1,307	1,308	1,305	1,307	1,287	1,283
juvenile	8,153	8,157	8,157	8,153	8,157	8,157	8,157
Rainbow trout							
adult	8,430	8,434	8,434	8,430	8,434	8,434	8,434
spawning	9,996	9,993	9,993	9,996	9,993	9,993	9,993
fry	1,262	1,307	1,308	1,305	1,307	1,287	1,283
juvenile	11,101	11,107	11,107	11,101	11,107	11,107	11,107
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
fry	--	4%	4%	3%	4%	2%	2%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%








Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

							
Species/Life Stage	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Rainbow trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
fry	--	4%	4%	3%	4%	2%	2%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%
Wet Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	5,227	5,144	5,144	5,263	5,144	5,144	5,183
spawning	14,194	13,965	13,963	14,208	13,962	13,963	13,962
fry	720	708	708	725	708	708	714
juvenile	4,101	4,035	4,035	4,129	4,035	4,035	4,066
Rainbow trout							
adult	4,240	4,173	4,173	4,270	4,173	4,173	4,204
spawning	8,590	8,793	8,706	8,590	8,705	8,714	8,566
fry	720	708	708	725	708	708	714
juvenile	5,584	5,495	5,495	5,622	5,495	5,495	5,536
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	-2%	-2%	<1%	-2%	-2%	<-1%
spawning	--	-2%	-2%	<1%	-2%	-2%	-2%
fry	--	-2%	-2%	<1%	-2%	-2%	<-1%
juvenile	--	-2%	-2%	<1%	-2%	-2%	<-1%
Rainbow trout							
adult	--	-2%	-2%	<1%	-2%	-2%	<-1%
spawning	--	2%	1%	0%	1%	1%	<-1%
fry	--	-2%	-2%	<1%	-2%	-2%	<-1%
juvenile	--	-2%	-2%	<1%	-2%	-2%	<-1%








Arkansas Valley Conduit EIS

Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 6. Direct Effects Summary of the Percent Change in Median Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 3

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	18,095	17,964	17,997	18,221	18,026	17,990	17,961
spawning	16,179	16,172	16,172	16,184	16,170	16,173	16,182
fry	1,845	1,877	1,877	1,839	1,877	1,877	1,877
juvenile	15,329	15,072	15,059	15,322	15,068	15,121	15,058
Rainbow trout							
adult	14,588	14,789	14,742	14,609	14,814	14,812	14,674
spawning	11,982	12,116	12,057	11,861	12,117	12,116	12,113
fry	1,669	1,646	1,638	1,665	1,643	1,638	1,647
juvenile	19,417	19,076	18,988	19,356	19,077	19,092	19,071
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<-1%	<-1%	<1%	<-1%	<-1%	<-1%
spawning	--	<-1%	<-1%	<1%	<-1%	<-1%	<1%
fry	--	2%	2%	<-1%	2%	2%	2%
juvenile	--	-2%	-2%	<-1%	-2%	-1%	-2%
Rainbow trout							
adult	--	1%	1%	<1%	2%	2%	<1%
spawning	--	1%	<1%	-1%	1%	1%	1%
fry	--	-1%	-2%	<-1%	-2%	-2%	-1%
juvenile	--	-2%	-2%	<-1%	-2%	-2%	-2%
Dry Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	17,610	17,671	17,647	17,666	17,618	17,673	17,687
spawning	16,197	16,257	16,260	16,219	16,264	16,311	16,305
fry	1,830	1,832	1,838	1,837	1,823	1,832	1,838
juvenile	14,542	14,615	14,600	14,642	14,600	14,600	14,615
Rainbow trout							
adult	14,493	14,501	14,501	14,485	14,501	14,530	14,523
spawning	11,672	12,062	11,962	11,811	11,891	12,113	12,144
fry	1,608	1,607	1,607	1,608	1,608	1,608	1,608
juvenile	18,392	18,495	18,468	18,515	18,459	18,473	18,515
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	<1%	<1%	<1%	<1%	<1%	<1%
fry	--	<1%	<1%	<1%	<-1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%








Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Rainbow trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	3%	2%	1%	2%	4%	4%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%
Wet Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	19,754	19,707	19,691	19,907	19,691	19,691	19,669
spawning	15,465	15,431	15,431	15,461	15,431	15,431	15,431
fry	1,505	1,510	1,509	1,502	1,510	1,512	1,513
juvenile	15,765	15,611	15,611	15,946	15,611	15,611	15,568
Rainbow trout							
adult	16,512	15,720	15,720	17,180	15,720	15,720	15,674
spawning	12,485	12,615	12,615	12,655	12,614	12,606	12,508
fry	1,471	1,476	1,476	1,477	1,476	1,476	1,476
juvenile	18,948	18,903	18,903	19,176	18,903	18,948	18,865
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	<1%	<1%	<1%	<1%	<1%	<1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	1%	<1%	<1%	-1%
Rainbow trout							
adult	--	-5%	-5%	4%	-5%	-5%	-5%
spawning	--	1%	1%	1%	1%	<1%	<1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	1%	<1%	0%	<1%








Arkansas Valley Conduit EIS

Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 7. Direct Effects Summary of the Percent Change in Minimum Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 4

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	15,500	15,521	15,521	15,483	15,521	15,505	15,505
spawning	26,103	25,894	25,894	26,103	25,895	25,895	25,884
fry	712	715	715	712	713	711	715
juvenile	11,803	11,820	11,820	11,791	11,820	11,807	11,807
Rainbow trout							
adult	12,510	12,528	12,528	12,497	12,528	12,514	12,514
spawning	33,495	34,537	34,032	33,929	34,132	34,032	34,102
fry	712	715	715	712	713	711	715
juvenile	12,844	12,862	12,862	12,830	12,862	12,848	12,848
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<-1%	<1%	<1%	<1%
spawning	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
fry	--	<1%	<1%	<1%	<1%	<-1%	<1%
juvenile	--	<1%	<1%	<-1%	<1%	<1%	<1%
Rainbow trout							
adult	--	<1%	<1%	<-1%	<1%	<1%	<1%
spawning	--	3%	2%	1%	2%	2%	2%
fry	--	<1%	<1%	<1%	<1%	<-1%	<1%
juvenile	--	<1%	<1%	<-1%	<1%	<1%	<1%
Dry Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	17,094	17,104	17,104	17,094	17,104	17,104	17,104
spawning	32,965	29,065	29,071	30,355	29,071	33,632	33,209
fry	712	711	711	712	711	711	711
juvenile	13,018	13,025	13,025	13,018	13,025	13,025	13,025
Rainbow trout							
adult	13,797	13,805	13,805	13,798	13,805	13,805	13,805
spawning	33,227	33,614	33,719	34,003	33,719	33,717	34,067
fry	712	711	711	712	711	711	711
juvenile	14,166	14,173	14,173	14,166	14,173	14,173	14,173
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	-12%	-12%	-8%	-12%	2%	<1%
fry	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%








Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Species/Life Stage						
Rainbow trout						
adult	--	<1%	<1%	<1%	<1%	<1%
spawning	--	1%	1%	2%	1%	3%
fry	--	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%
Wet Year						
Minimum Habitat Availability (WUA in ft²/1,000 ft)						
Brown trout						
adult	7,263	7,123	7,123	7,325	7,123	7,123
spawning	23,268	22,769	22,765	23,346	22,762	22,765
fry	351	344	344	354	344	344
juvenile	5,531	5,424	5,424	5,578	5,424	5,424
Rainbow trout						
adult	5,862	5,749	5,749	5,912	5,749	5,749
spawning	13,592	14,307	14,307	13,592	14,307	14,307
fry	351	344	344	354	344	344
juvenile	6,019	5,902	5,902	6,070	5,902	5,902
Change in Minimum Habitat Availability (%) Compared to No Action Alternative						
Brown trout						
adult	--	-2%	-2%	<1%	-2%	-2%
spawning	--	-2%	-2%	<1%	-2%	-2%
fry	--	-2%	-2%	<1%	-2%	-2%
juvenile	--	-2%	-2%	<1%	-2%	-2%
Rainbow trout						
adult	--	-2%	-2%	<1%	-2%	-2%
spawning	--	5%	5%	0%	5%	5%
fry	--	-2%	-2%	<1%	-2%	-2%
juvenile	--	-2%	-2%	<1%	-2%	-2%








Arkansas Valley Conduit EIS

Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 8. Direct Effects Summary of the Percent Change in Median Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 4

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	37,259	37,250	37,250	37,259	37,247	37,258	37,289
spawning	32,257	32,211	32,211	32,266	32,208	32,197	32,220
fry	1,471	1,480	1,481	1,469	1,481	1,481	1,475
juvenile	34,610	34,495	34,495	34,607	34,481	34,484	34,526
Rainbow trout							
adult	27,714	27,609	27,632	27,851	27,600	27,711	27,795
spawning	36,643	36,656	36,652	36,637	36,652	36,650	36,637
fry	932	932	933	933	932	933	932
juvenile	41,044	40,883	40,883	41,040	40,863	40,867	40,926
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<-1%	<-1%	<-1%	<-1%	<-1%	<1%
spawning	--	<-1%	<-1%	<1%	<-1%	<-1%	<-1%
fry	--	<1%	<1%	<-1%	<1%	<1%	<1%
juvenile	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
Rainbow trout							
adult	--	<-1%	<-1%	<1%	<-1%	<-1%	<1%
spawning	--	<1%	<1%	<-1%	<1%	<1%	<-1%
fry	--	<-1%	<1%	<1%	<-1%	<1%	<-1%
juvenile	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
Dry Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	37,138	37,138	37,150	37,135	37,138	37,175	37,138
spawning	35,251	35,185	35,232	35,271	35,239	35,238	35,239
fry	1,445	1,443	1,448	1,452	1,442	1,448	1,445
juvenile	37,843	37,845	37,845	37,871	37,831	37,845	37,886
Rainbow trout							
adult	27,275	27,584	27,584	27,302	27,559	27,584	27,559
spawning	36,637	36,627	36,628	36,650	36,628	36,624	36,628
fry	877	878	878	877	878	878	878
juvenile	45,873	45,841	45,841	45,835	45,802	45,807	45,859
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<-1%	<1%	<1%	<1%
spawning	--	<-1%	<-1%	<1%	<-1%	<-1%	<-1%
fry	--	<-1%	<1%	<1%	<-1%	<1%	<-1%
juvenile	--	<1%	<1%	<1%	<-1%	<1%	<1%








Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Species/Life Stage						
Rainbow trout						
adult	--	1%	1%	<1%	1%	1%
spawning	--	<1%	<1%	<1%	<1%	<1%
fry	--	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%
Wet Year						
Median Habitat Availability (WUA in ft²/1,000 ft)						
Brown trout						
adult	35,768	35,757	35,755	35,744	35,750	35,754
spawning	28,170	28,206	28,206	28,172	28,206	28,206
fry	932	936	935	933	935	935
juvenile	26,945	26,916	26,910	26,881	26,899	26,907
Rainbow trout						
adult	30,532	30,342	30,342	30,550	30,342	30,342
spawning	34,087	34,442	34,442	31,986	34,435	34,442
fry	892	891	891	891	891	891
juvenile	31,358	31,323	31,315	31,279	31,301	31,311
Change in Median Habitat Availability (%) Compared to No Action Alternative						
Brown trout						
adult	--	<1%	<1%	<1%	<1%	<1%
spawning	--	<1%	<1%	<1%	<1%	<1%
fry	--	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%
Rainbow trout						
adult	--	<1%	<1%	<1%	<1%	-1%
spawning	--	1%	1%	-6%	1%	2%
fry	--	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%








Arkansas Valley Conduit EIS

Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 9. Direct Effects Summary of the Percent Change in Minimum Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 5

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	14,285	14,305	14,305	14,270	14,305	14,290	14,290
spawning	22,159	22,069	22,069	22,159	22,069	22,070	22,065
fry	301	301	301	300	301	301	301
juvenile	8,041	8,052	8,052	8,032	8,052	8,043	8,044
Rainbow trout							
adult	11,803	11,820	11,820	11,791	11,820	11,807	11,807
spawning	15,575	16,060	15,825	15,777	15,872	15,825	15,858
fry	301	301	301	300	301	301	301
juvenile	8,704	8,717	8,717	8,695	8,717	8,707	8,707
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<-1%	<1%	<1%	<1%
spawning	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
fry	--	<1%	<1%	<-1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<-1%	<1%	<1%	<1%
Rainbow trout							
adult	--	<1%	<1%	<-1%	<1%	<1%	<1%
spawning	--	3%	2%	1%	2%	2%	2%
fry	--	<1%	<1%	<-1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<-1%	<1%	<1%	<1%
Dry Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	15,755	15,764	15,764	15,755	15,764	15,764	15,764
spawning	24,754	23,404	23,406	23,847	23,406	24,760	24,847
fry	331	332	332	331	332	332	332
juvenile	8,868	8,873	8,873	8,868	8,873	8,873	8,873
Rainbow trout							
adult	13,018	13,025	13,025	13,018	13,025	13,025	13,025
spawning	15,451	15,631	15,679	15,812	15,680	15,679	15,841
fry	331	332	332	331	332	332	332
juvenile	9,600	9,605	9,605	9,600	9,605	9,605	9,605
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	-5%	-5%	-4%	-5%	<1%	<1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%








**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Rainbow trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	1%	1%	2%	1%	1%	3%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%
Wet Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	6,694	6,565	6,565	6,751	6,565	6,565	6,725
spawning	21,105	20,939	20,937	21,131	20,936	20,937	20,885
fry	141	138	138	142	138	138	142
juvenile	3,768	3,695	3,695	3,800	3,695	3,695	3,786
Rainbow trout							
adult	5,531	5,424	5,424	5,578	5,424	5,424	5,557
spawning	13,958	14,086	14,086	13,958	14,086	14,086	14,086
fry	141	138	138	142	138	138	142
juvenile	4,079	4,000	4,000	4,113	4,000	4,000	4,098
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	-2%	-2%	<1%	-2%	-2%	<1%
spawning	--	<-1%	<-1%	<1%	<-1%	<-1%	-1%
fry	--	-2%	-2%	<1%	-2%	-2%	<1%
juvenile	--	-2%	-2%	<1%	-2%	-2%	<1%
Rainbow trout							
adult	--	-2%	-2%	<1%	-2%	-2%	<1%
spawning	--	<1%	<1%	0%	<1%	<1%	<1%
fry	--	-2%	-2%	<1%	-2%	-2%	<1%
juvenile	--	-2%	-2%	<1%	-2%	-2%	<1%








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Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 10. Direct Effects Summary of the Percent Change in Median Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 5

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	34,263	33,904	33,990	34,278	33,999	34,067	33,990
spawning	24,499	24,483	24,483	24,502	24,482	24,478	24,486
fry	1,784	1,795	1,795	1,782	1,795	1,795	1,788
juvenile	42,780	42,369	42,369	43,048	42,358	42,673	42,979
Rainbow trout							
adult	21,868	21,657	21,657	21,868	21,664	21,662	21,631
spawning	17,289	17,338	17,378	17,276	17,372	17,375	17,358
fry	563	568	566	575	576	567	566
juvenile	45,319	44,948	44,975	45,318	44,992	45,186	45,344
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	-1%	<-1%	<1%	<-1%	<-1%	<-1%
spawning	--	<-1%	<-1%	<1%	<-1%	<-1%	<-1%
fry	--	<1%	<1%	<-1%	<1%	<1%	<1%
juvenile	--	<-1%	<-1%	<1%	<-1%	<-1%	<1%
Rainbow trout							
adult	--	<-1%	<-1%	0%	<-1%	<-1%	-1%
spawning	--	<1%	<1%	<-1%	<1%	<1%	<1%
fry	--	<1%	<1%	2%	2%	<1%	<1%
juvenile	--	<-1%	<-1%	<-1%	<-1%	<-1%	<1%
Dry Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	35,191	35,113	35,139	35,147	35,112	35,139	35,191
spawning	25,444	25,404	25,406	25,433	25,406	25,408	25,435
fry	1,752	1,749	1,756	1,761	1,749	1,756	1,752
juvenile	41,278	41,700	41,660	41,458	41,700	41,750	41,655
Rainbow trout							
adult	22,363	22,452	22,452	22,342	22,452	22,436	22,432
spawning	17,603	17,636	17,680	17,612	17,636	17,788	17,609
fry	702	705	705	705	705	705	705
juvenile	43,929	44,215	44,215	44,069	44,151	44,351	43,970
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<-1%	<-1%	<-1%	<-1%	<-1%	<1%
spawning	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
fry	--	<-1%	<1%	<1%	<-1%	<1%	<-1%
juvenile	--	1%	<1%	<1%	1%	1%	<1%








Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

							
Species/Life Stage	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Rainbow trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	<1%	<1%	<1%	<1%	1%	<1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%
Wet Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	37,683	37,238	37,285	37,981	37,285	37,285	37,102
spawning	23,044	23,059	23,059	23,045	23,059	23,059	23,045
fry	448	448	448	448	448	448	448
juvenile	46,280	45,962	45,962	46,331	45,962	45,962	45,962
Rainbow trout							
adult	25,367	24,595	24,595	26,498	24,595	24,595	24,469
spawning	19,026	19,225	19,225	18,296	19,225	19,225	19,250
fry	434	435	435	434	435	435	436
juvenile	43,436	43,409	43,403	43,376	43,393	43,400	43,385
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	-1%	-1%	<1%	-1%	-1%	-2%
spawning	--	<1%	<1%	<1%	<1%	<1%	<1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%
Rainbow trout							
adult	--	-3%	-3%	4%	-3%	-3%	-4%
spawning	--	1%	1%	-4%	1%	1%	1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%








Arkansas Valley Conduit EIS

Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 11. Direct Effects Summary of the Percent Change in Minimum Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 6

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	10,048	10,062	10,062	10,037	10,062	10,051	10,051
spawning	0	0	0	0	0	0	0
fry	1,129	1,150	1,150	1,126	1,150	1,145	1,146
juvenile	5,796	5,804	5,804	5,790	5,804	5,798	5,798
Rainbow trout							
adult	9,613	9,626	9,626	9,603	9,626	9,616	9,616
spawning	0	0	0	0	0	0	0
fry	1,129	1,150	1,150	1,126	1,150	1,145	1,146
juvenile	8,300	8,312	8,312	8,291	8,312	8,303	8,303
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<-1%	<1%	<1%	<1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	2%	2%	<-1%	2%	1%	1%
juvenile	--	<1%	<1%	<-1%	<1%	<1%	<1%
Rainbow trout							
adult	--	<1%	<1%	<-1%	<1%	<1%	<1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	2%	2%	<-1%	2%	1%	1%
juvenile	--	<1%	<1%	<-1%	<1%	<1%	<1%
Dry Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	11,339	11,345	11,344	11,339	11,344	11,343	11,343
spawning	0	0	0	0	0	0	0
fry	800	821	822	800	821	821	821
juvenile	6,541	6,544	6,544	6,541	6,544	6,543	6,543
Rainbow trout							
adult	10,848	10,854	10,853	10,848	10,853	10,852	10,852
spawning	0	0	0	0	0	0	0
fry	800	821	822	800	821	821	821
juvenile	8,267	8,479	8,489	8,266	8,477	8,485	8,478
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	3%	3%	<-1%	3%	3%	3%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%








Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

							
Species/Life Stage	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Rainbow trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	3%	3%	<1%	3%	3%	3%
juvenile	--	3%	3%	<1%	3%	3%	3%
Wet Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	4,230	4,139	4,139	4,269	4,139	4,139	4,194
spawning	0	0	0	0	0	0	0
fry	1,007	985	985	1,016	985	985	998
juvenile	2,440	2,387	2,387	2,463	2,387	2,387	2,419
Rainbow trout							
adult	4,047	3,960	3,960	4,084	3,960	3,960	4,013
spawning	0	0	0	0	0	0	0
fry	1,007	985	985	1,016	985	985	998
juvenile	3,494	3,419	3,419	3,527	3,419	3,419	3,465
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	-2%	-2%	<1%	-2%	-2%	<1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	-2%	-2%	<1%	-2%	-2%	<1%
juvenile	--	-2%	-2%	<1%	-2%	-2%	<1%
Rainbow trout							
adult	--	-2%	-2%	<1%	-2%	-2%	<1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	-2%	-2%	<1%	-2%	-2%	<1%
juvenile	--	-2%	-2%	<1%	-2%	-2%	<1%








Arkansas Valley Conduit EIS

Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 12. Direct Effects Summary of the Percent Change in Median Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 6

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	25,414	25,089	25,132	25,411	25,119	25,245	25,257
spawning	0	0	0	0	0	0	0
fry	1,811	1,818	1,821	1,826	1,824	1,821	1,819
juvenile	11,343	11,336	11,344	11,344	11,339	11,339	11,338
Rainbow trout							
adult	24,131	23,764	23,873	24,131	23,806	23,966	23,947
spawning	0	0	0	0	0	0	0
fry	2,159	2,148	2,143	2,165	2,125	2,159	2,124
juvenile	13,576	13,516	13,582	13,585	13,540	13,554	13,573
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	-1%	-1%	<-1%	-1%	<-1%	<-1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<-1%	<1%	<1%	<-1%	<-1%	<-1%
Rainbow trout							
adult	--	-2%	-1%	<-1%	-1%	<-1%	<-1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	<-1%	<-1%	<1%	-2%	<1%	-2%
juvenile	--	<-1%	<1%	<1%	<-1%	<-1%	<-1%
Dry Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	22,838	22,852	22,840	22,853	22,840	22,853	22,840
spawning	0	0	0	0	0	0	0
fry	1,717	1,719	1,719	1,717	1,719	1,719	1,719
juvenile	10,493	10,490	10,490	10,476	10,490	10,507	10,490
Rainbow trout							
adult	22,387	22,447	22,447	22,347	22,447	22,493	22,439
spawning	0	0	0	0	0	0	0
fry	1,887	1,888	1,893	1,887	1,887	1,891	1,890
juvenile	12,429	12,419	12,420	12,428	12,420	12,431	12,424
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	<1%	<1%	<-1%	<1%	<1%	<1%
juvenile	--	<-1%	<-1%	<-1%	<-1%	<1%	<-1%

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

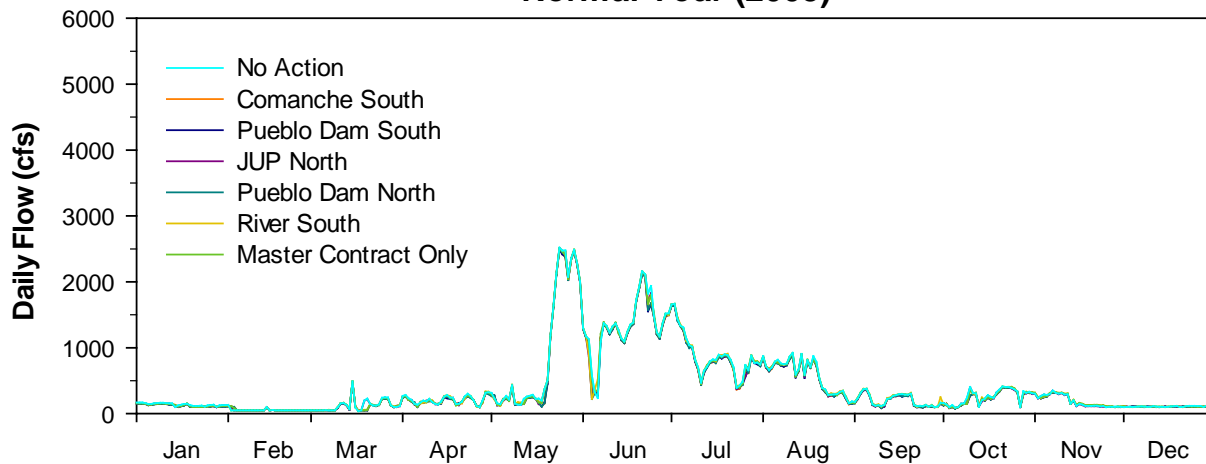
							
Species/Life Stage	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Rainbow trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%
Wet Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	24,534	24,438	24,438	24,523	24,438	24,438	24,430
spawning	0	0	0	0	0	0	0
fry	2,277	2,213	2,214	2,312	2,213	2,211	2,195
juvenile	9,284	9,279	9,279	9,284	9,279	9,279	9,280
Rainbow trout							
adult	25,068	25,061	25,061	25,144	25,060	25,060	25,059
spawning	0	0	0	0	0	0	0
fry	2,517	2,509	2,509	2,514	2,509	2,509	2,510
juvenile	11,943	11,938	11,938	11,943	11,938	11,938	11,939
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	-3%	-3%	2%	-3%	-3%	-4%
juvenile	--	<1%	<1%	0%	<1%	<1%	<1%
Rainbow trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	0%	<1%	<1%	<1%

Arkansas Valley Conduit EIS

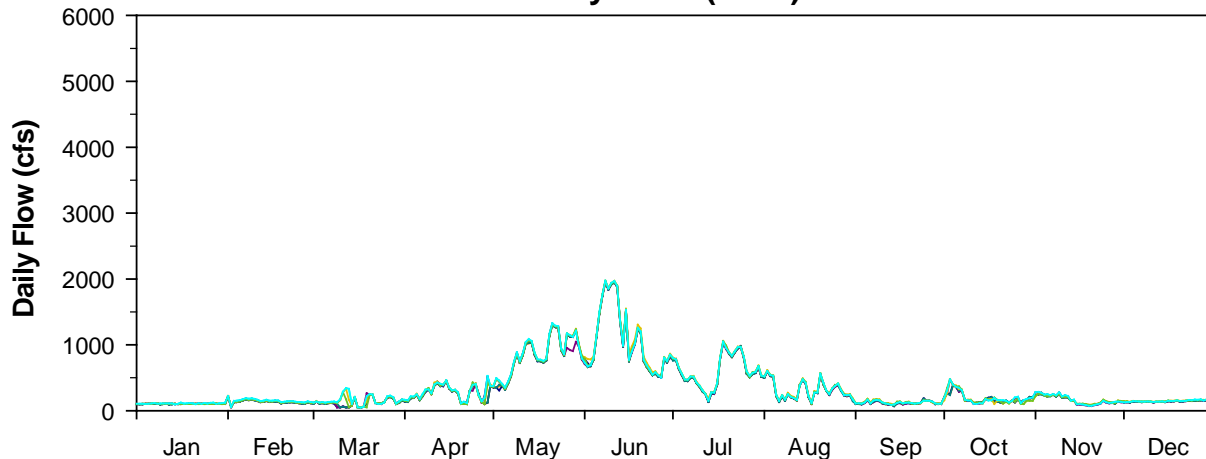
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Lower Arkansas River, Segment 1 – Pueblo Reservoir to Wildhorse Creek

Normal Year (2005)



Dry Year (2004)



Wet Year (1997)

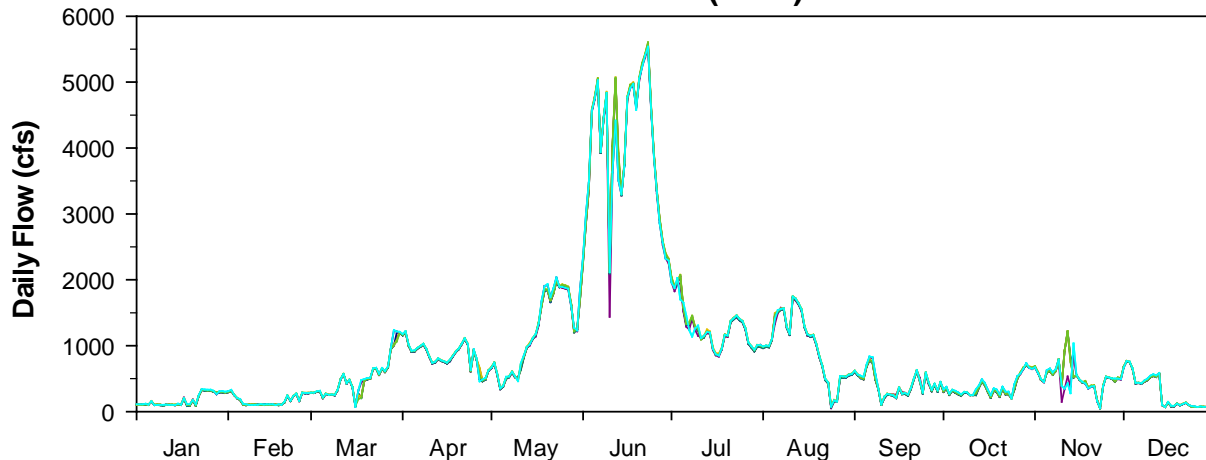


Figure 45. Direct Effects Daily Hydrology for All Alternatives for Segment 1 of the Lower Arkansas River at the Above Pueblo Gage

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

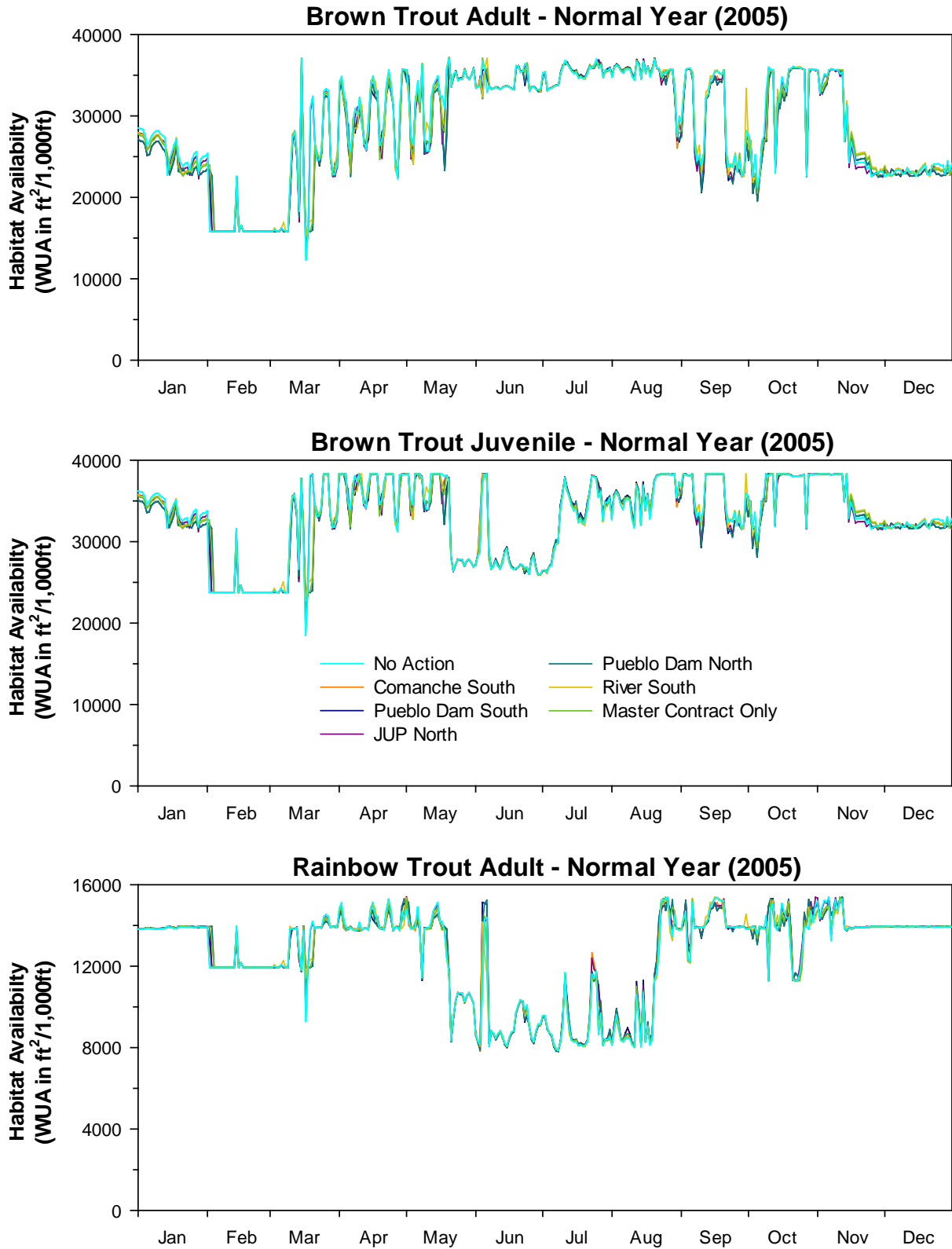


Figure 46. Direct Effects Brown Trout Adult, Brown Trout Juvenile, and Rainbow Trout Adult Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 1 of the Lower Arkansas River

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

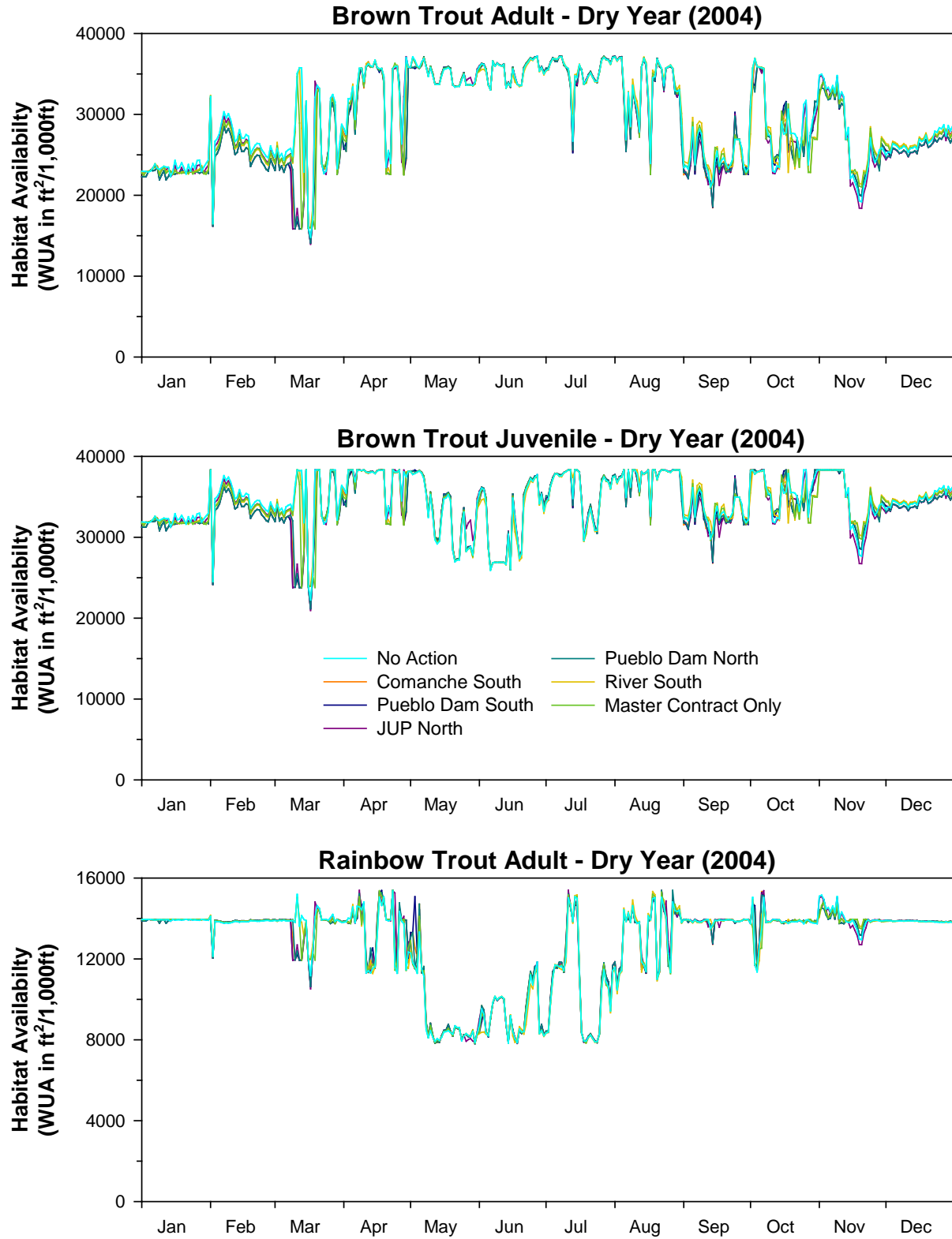


Figure 47. Direct Effects Brown Trout Adult, Brown Trout Juvenile, and Rainbow Trout Adult Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 1 of the Lower Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

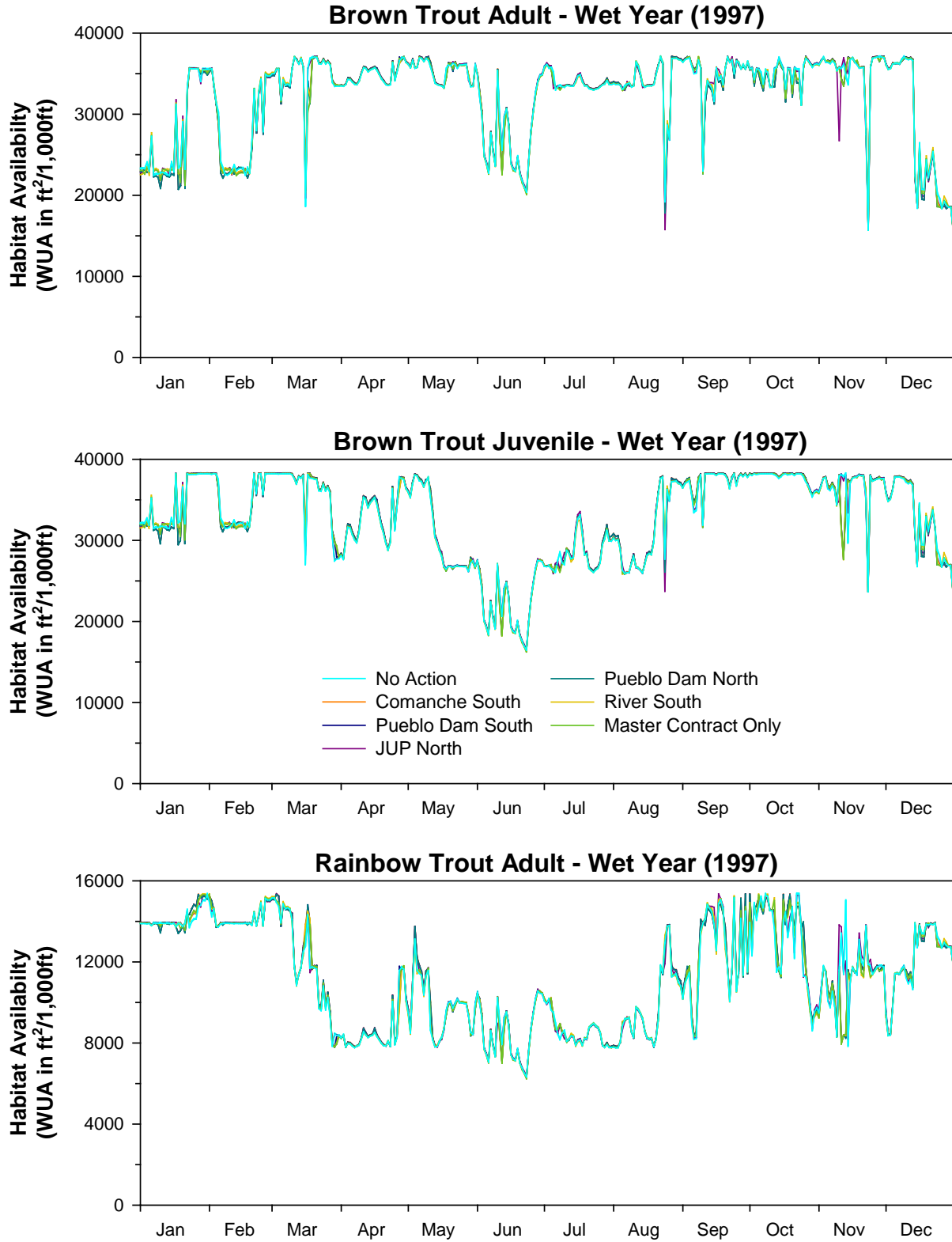









Figure 48. Direct Effects Brown Trout Adult, Brown Trout Juvenile, and Rainbow Trout Adult Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 1 of the Lower Arkansas River

Arkansas Valley Conduit EIS








Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 13. Direct Effects Summary of the Percent Change in Minimum Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Lower Arkansas River Segment 1

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	12,334	14,203	14,221	15,832	14,048	15,156	12,653
juvenile	18,517	21,324	21,351	23,769	21,092	22,755	18,997
Rainbow trout							
adult	7,852	7,840	7,809	7,813	7,818	7,902	7,853
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	15%	15%	28%	14%	23%	3%
juvenile	--	15%	15%	28%	14%	23%	3%
Rainbow trout							
adult	--	<-1%	<-1%	<-1%	<-1%	<1%	<1%
Dry Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	14,816	14,096	14,096	13,943	14,098	15,972	15,832
juvenile	22,245	21,164	21,164	20,934	21,166	23,932	23,769
Rainbow trout							
adult	7,833	7,828	7,806	7,817	7,808	7,839	7,826
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	-5%	-5%	-6%	-5%	8%	7%
juvenile	--	-5%	-5%	-6%	-5%	8%	7%
Rainbow trout							
adult	--	<-1%	<-1%	<-1%	<-1%	<1%	<-1%
Wet Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	15,832	15,832	15,832	15,832	15,832	15,832	15,832
juvenile	16,578	16,445	16,440	16,563	16,442	16,355	16,341
Rainbow trout							
adult	6,370	6,319	6,317	6,365	6,318	6,284	6,279
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	0%	0%	0%	0%	0%	0%
juvenile	--	<-1%	<-1%	<-1%	<-1%	-1%	-1%
Rainbow trout							
adult	--	<-1%	<-1%	<-1%	<-1%	-1%	-1%

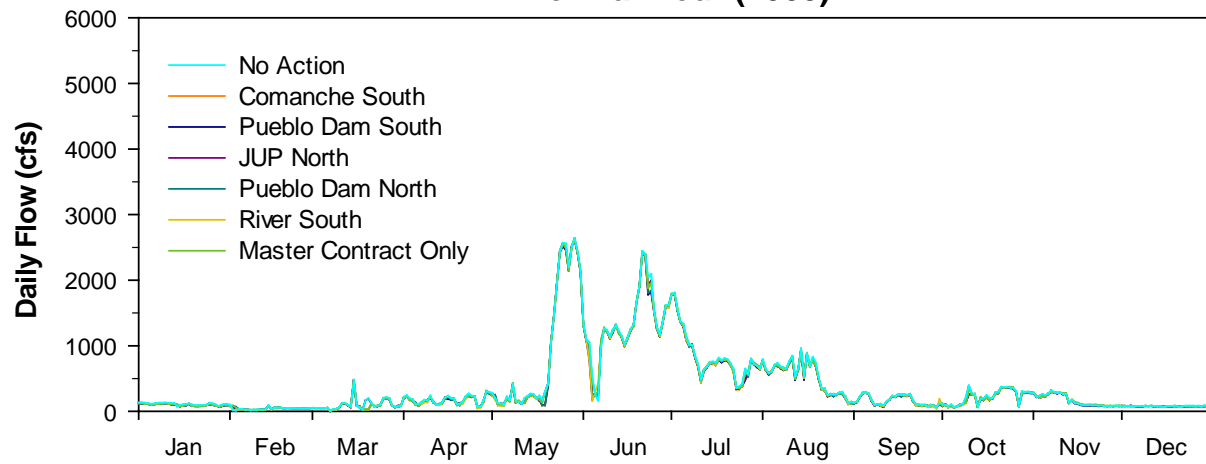
Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 14. Direct Effects Summary of the Percent Change in Median Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Lower Arkansas River Segment 1

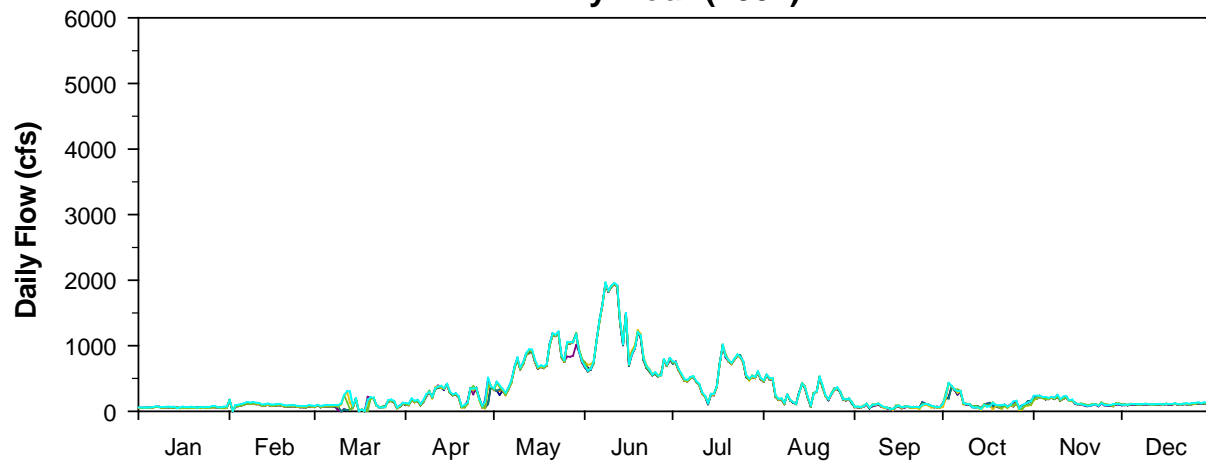
Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	31,238	28,475	28,721	30,031	28,779	29,746	29,798
juvenile	33,768	33,227	33,264	33,278	33,214	33,818	33,667
Rainbow trout							
adult	13,844	13,855	13,855	13,848	13,854	13,844	13,848
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	-9%	-8%	-4%	-8%	-5%	-5%
juvenile	--	-2%	-1%	-1%	-2%	<1%	<-1%
Rainbow trout							
adult	--	<1%	<1%	<1%	<1%	<-1%	<1%
Dry Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	28,868	27,400	27,385	28,085	27,394	28,460	28,047
juvenile	34,834	34,079	34,011	34,506	34,048	34,539	34,558
Rainbow trout							
adult	13,847	13,860	13,861	13,850	13,861	13,852	13,849
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	-5%	-5%	-3%	-5%	-1%	-3%
juvenile	--	-2%	-2%	<-1%	-2%	<-1%	<-1%
Rainbow trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
Wet Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	34,449	34,246	34,224	34,454	34,224	34,432	34,386
juvenile	34,629	34,708	34,585	34,632	34,592	34,554	34,599
Rainbow trout							
adult	11,386	11,422	11,429	11,400	11,423	11,335	11,367
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<-1%	<-1%	<1%	<-1%	<-1%	<-1%
juvenile	--	<1%	<-1%	<1%	<-1%	<-1%	<-1%
Rainbow trout							
adult	--	<1%	<1%	<1%	<1%	<-1%	<-1%

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

**Lower Arkansas River, Segment 2 – Wildhorse Creek to Fountain Creek
Normal Year (2005)**



Dry Year (2004)



Wet Year (1997)

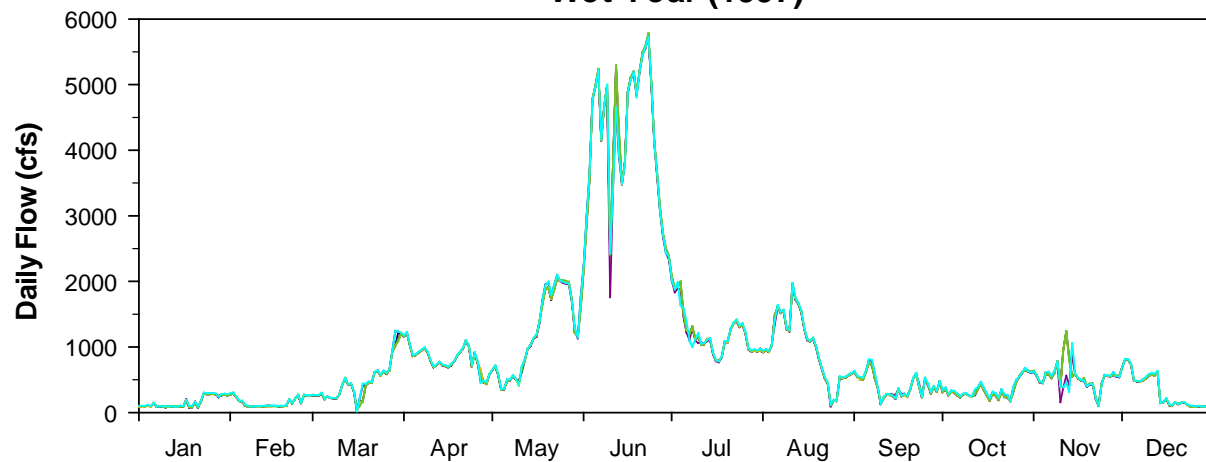
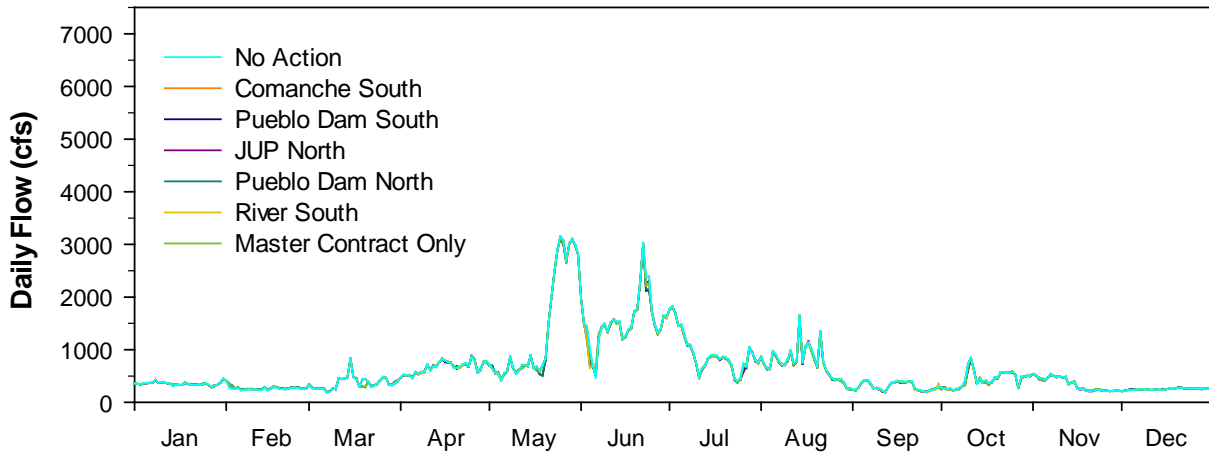


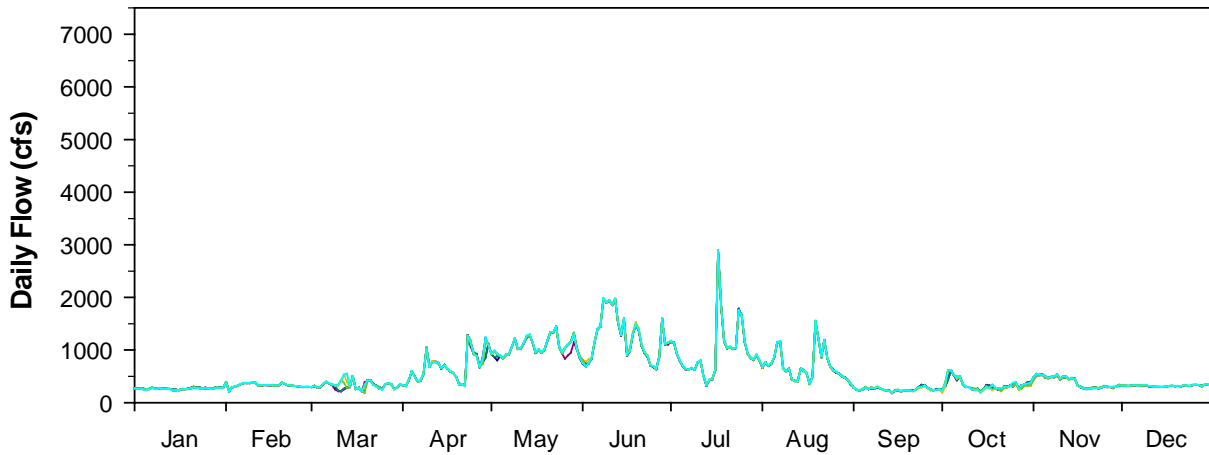
Figure 49. Direct Effects Daily Hydrology for All Alternatives for Segment 2 of the Lower Arkansas River at the Moffat Street Gage

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Lower Arkansas River, Segment 3 – Fountain Creek to John Martin Reservoir
Normal Year (2005)



Dry Year (2004)



Wet Year (1997)

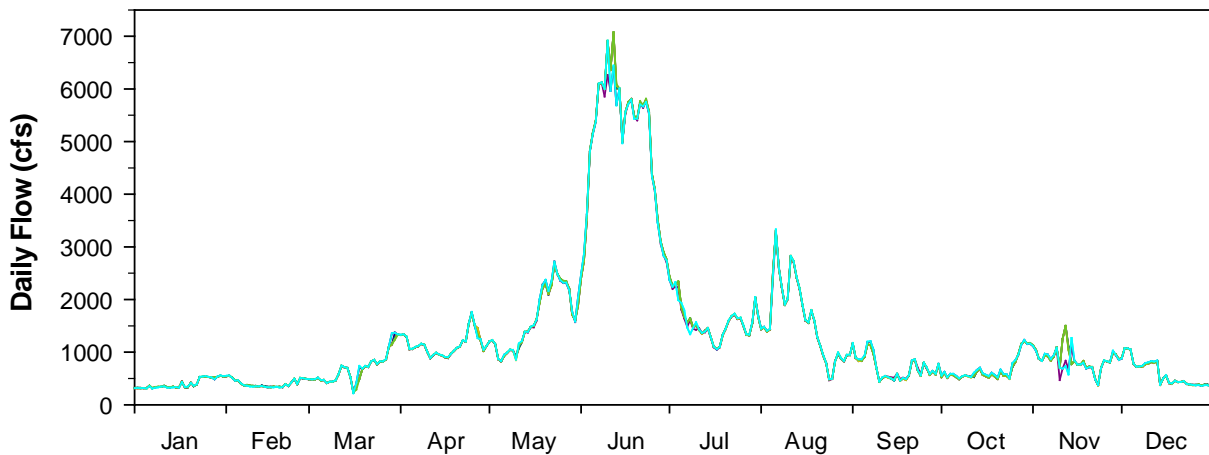


Figure 50. Direct Effects Daily Hydrology for All Alternatives for Segment 3 of the Lower Arkansas River at the Avondale Gage

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

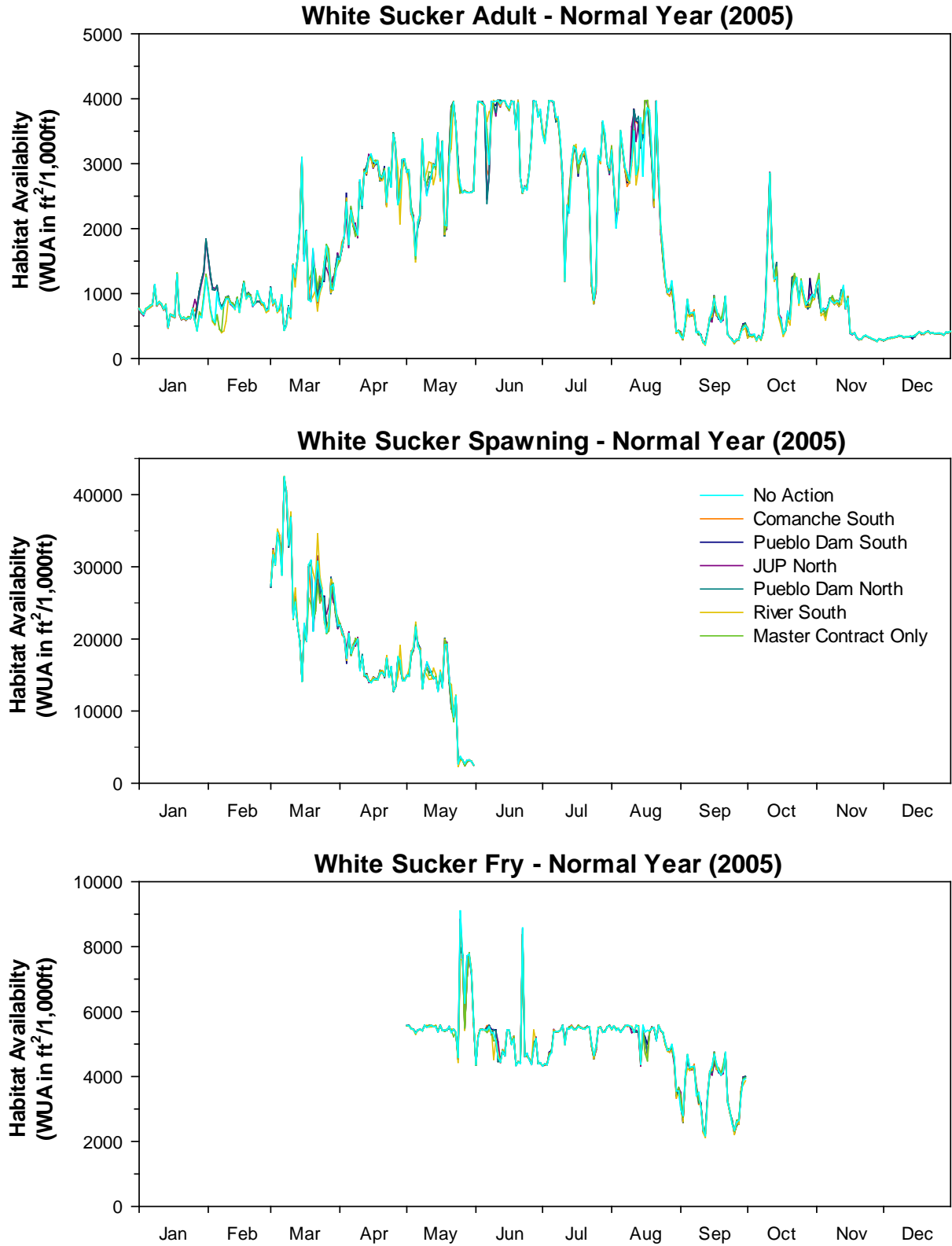


Figure 51. Direct Effects White Sucker Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 3 of the Lower Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

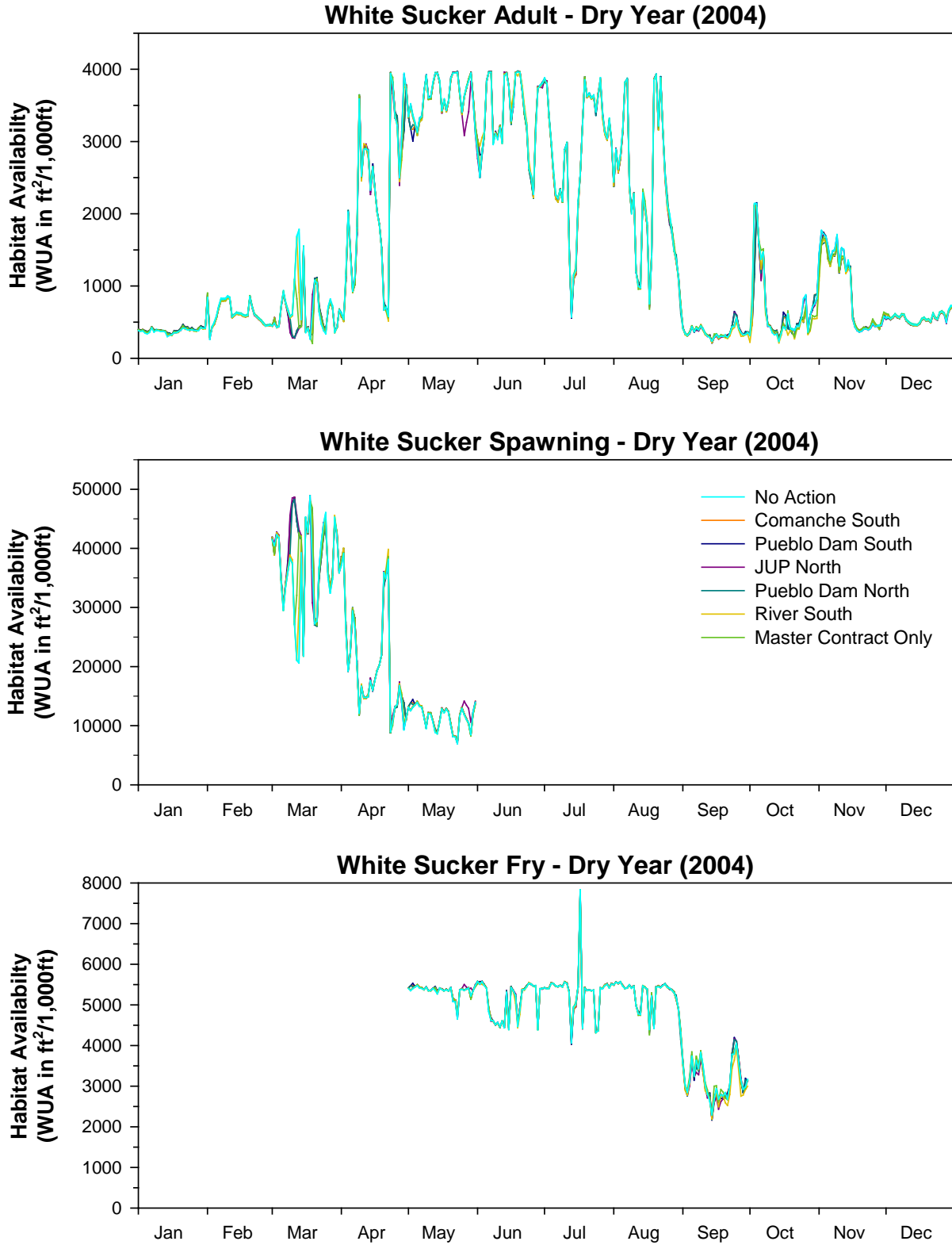


Figure 52. Direct Effects White Sucker Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 3 of the Lower Arkansas River

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

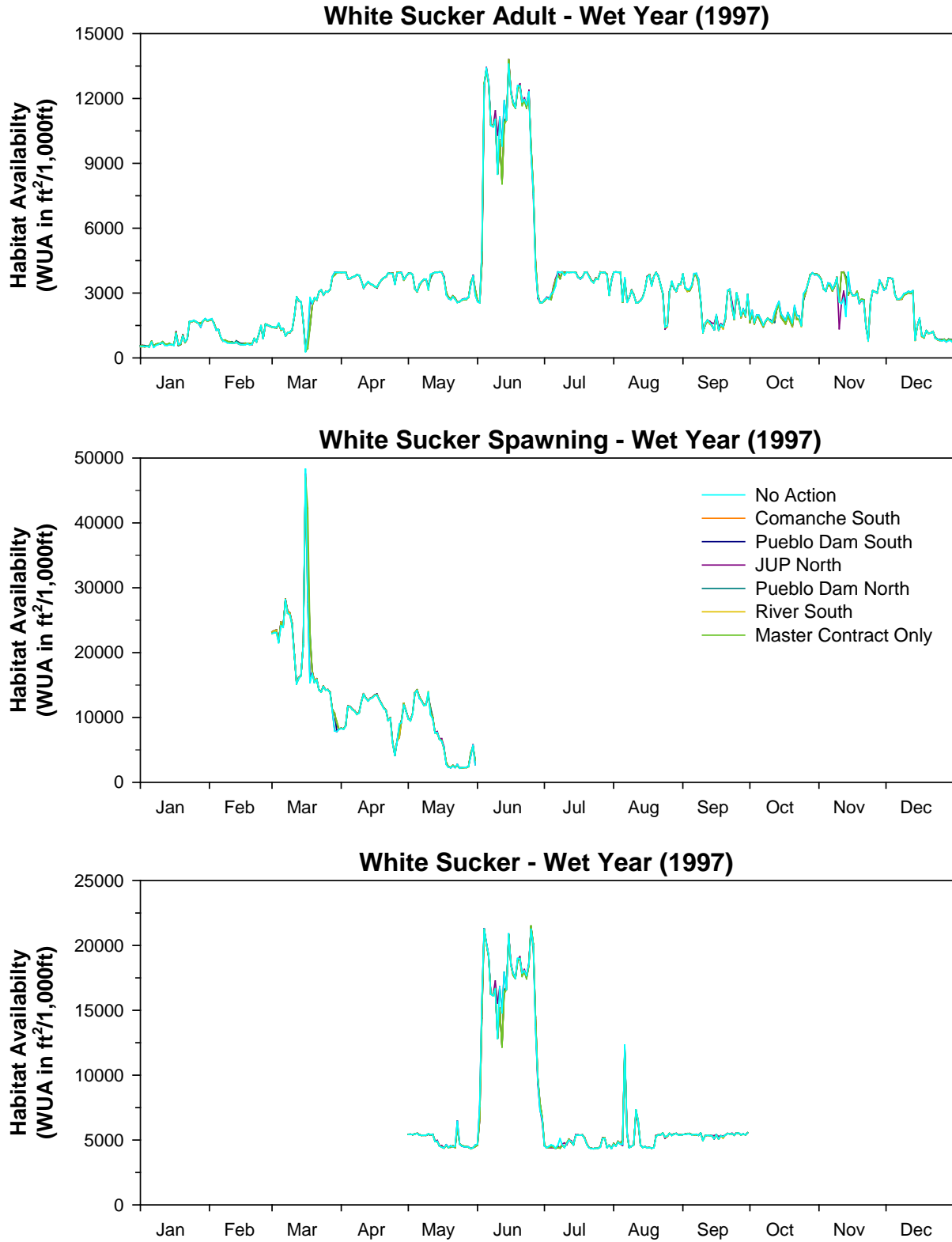


Figure 53. Direct Effects White Sucker Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 3 of the Lower Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

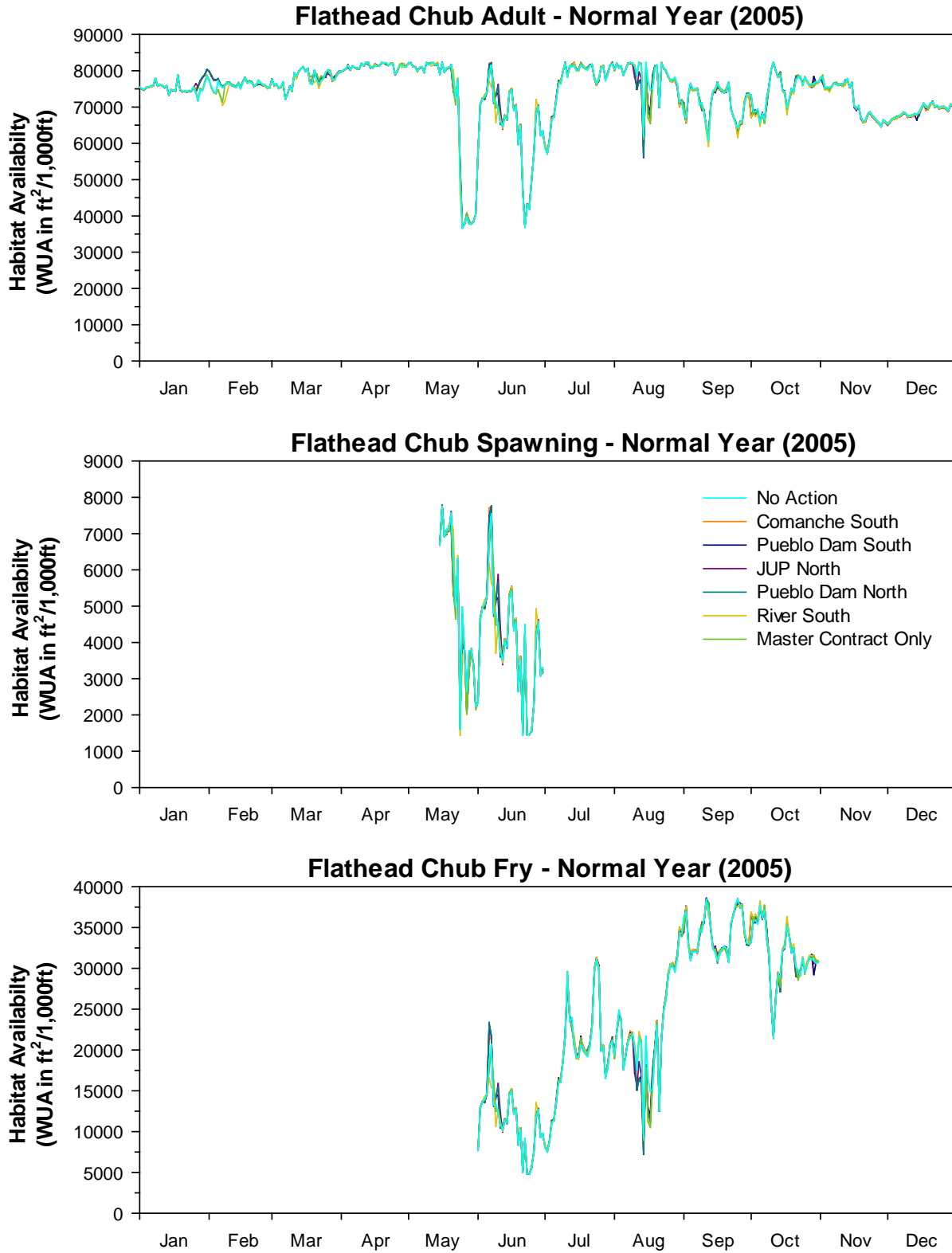


Figure 54. Direct Effects Flathead Chub Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 3 of the Lower Arkansas River

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

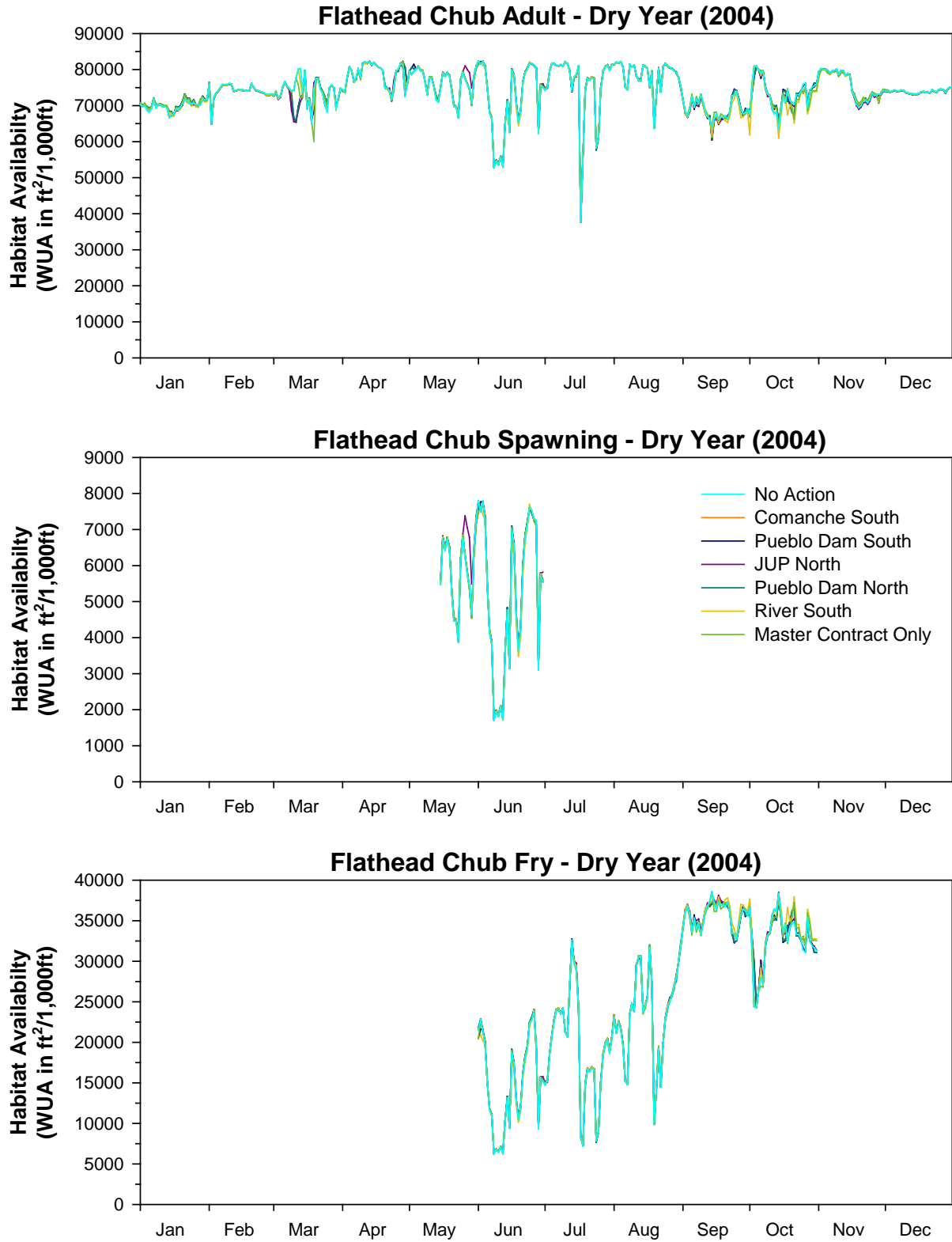


Figure 55. Direct Effects Flathead Chub Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 3 of the Lower Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

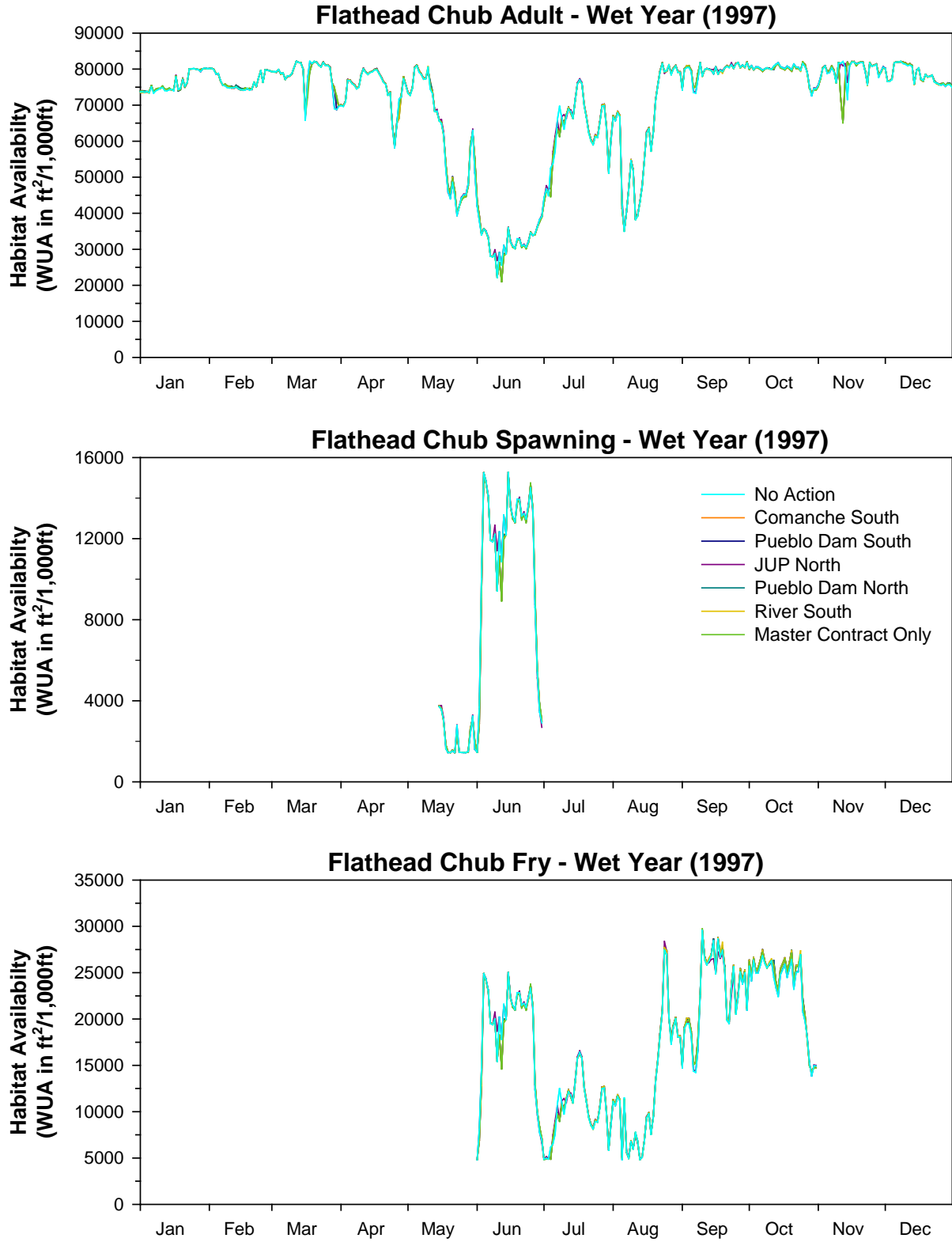


Figure 56. Direct Effects Flathead Chub Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 3 of the Lower Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

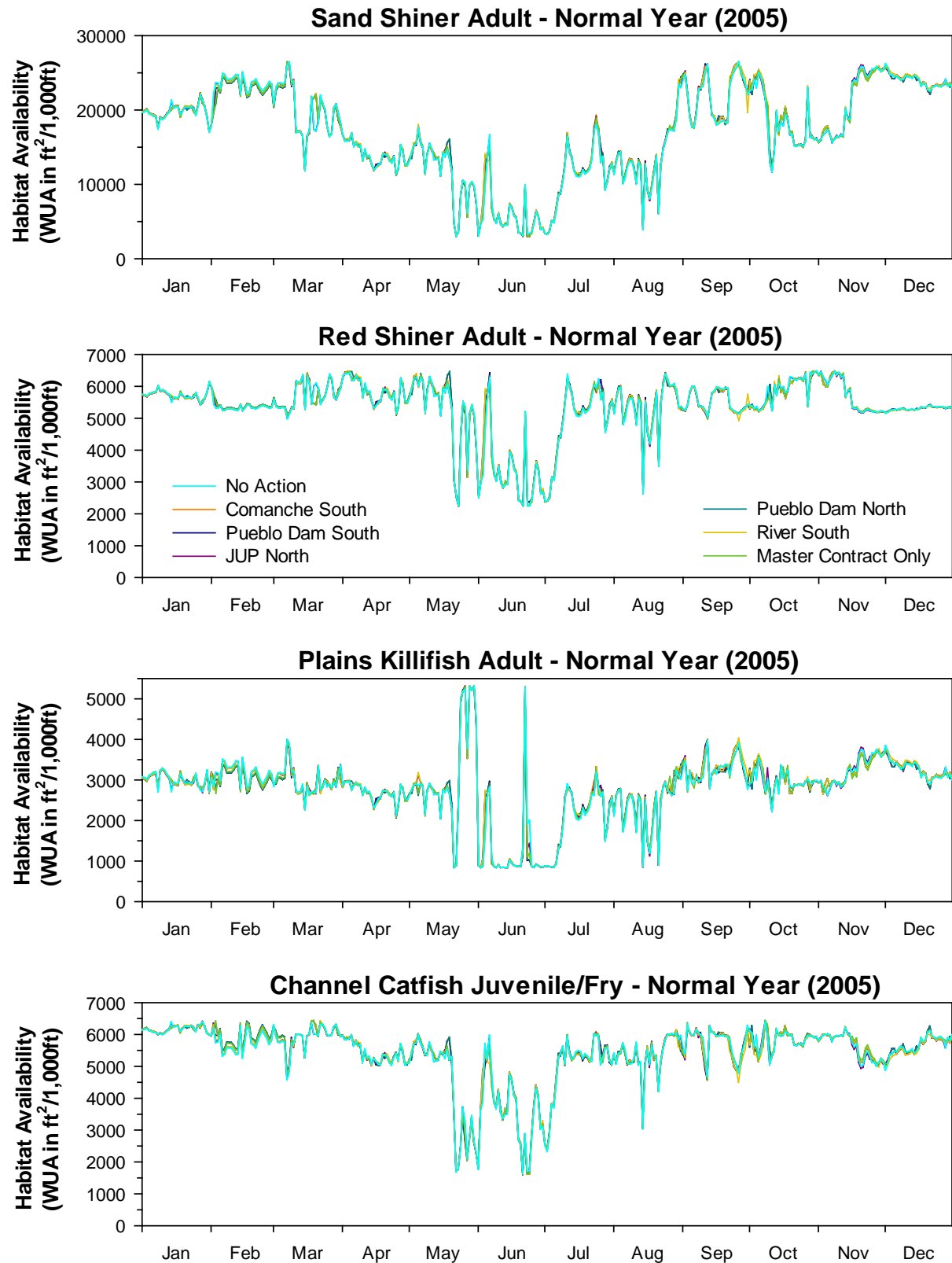


Figure 57. Direct Effects Sand Shiner (Adult), Red Shiner (Adult), Plains Killifish (Adult), and Channel Catfish (Juvenile/Fry) Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 3 of the Lower Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

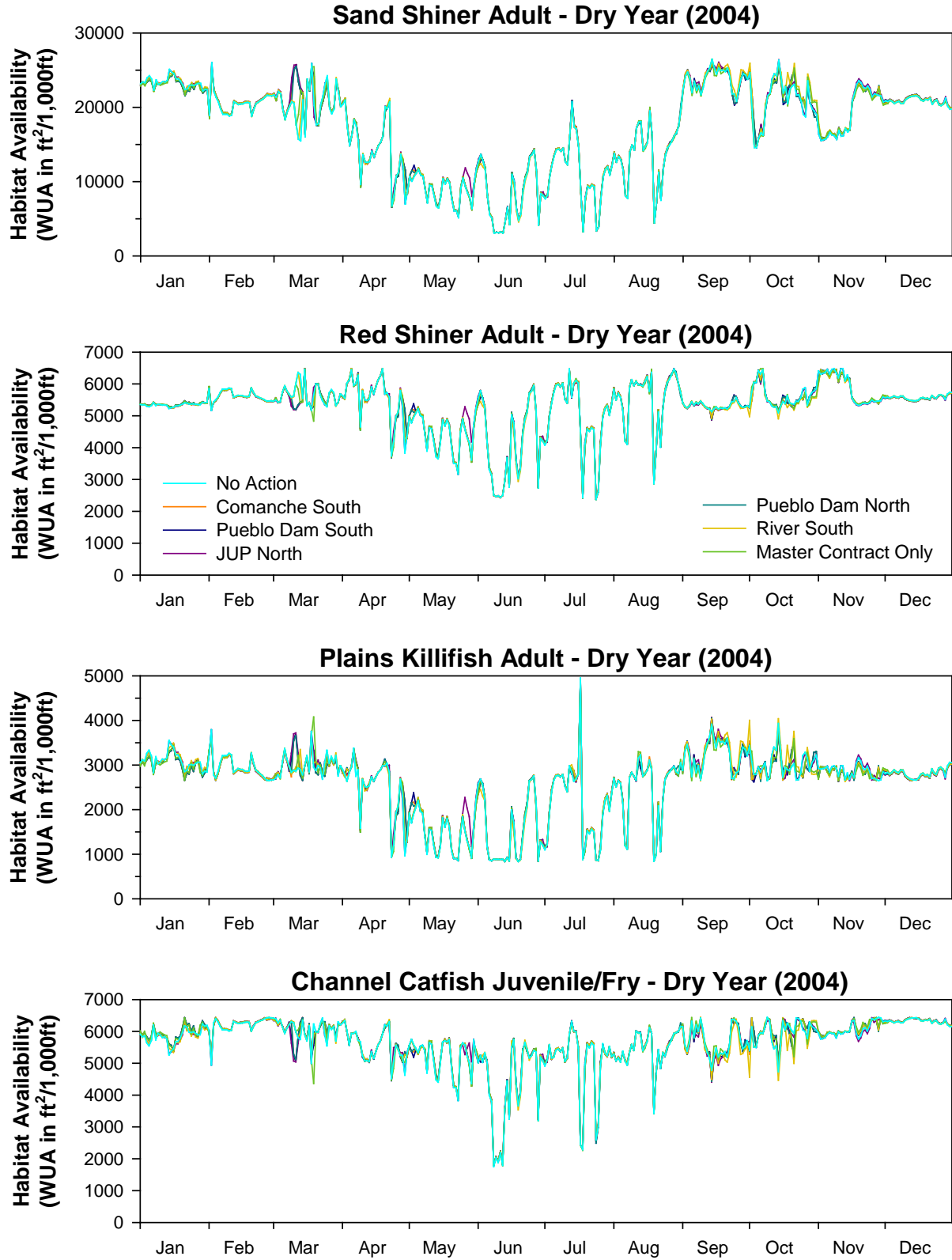


Figure 58. Direct Effects Sand Shiner (Adult), Red Shiner (Adult), Plains Killifish (Adult), and Channel Catfish (Juvenile/Fry) Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 3 of the Lower Arkansas River

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

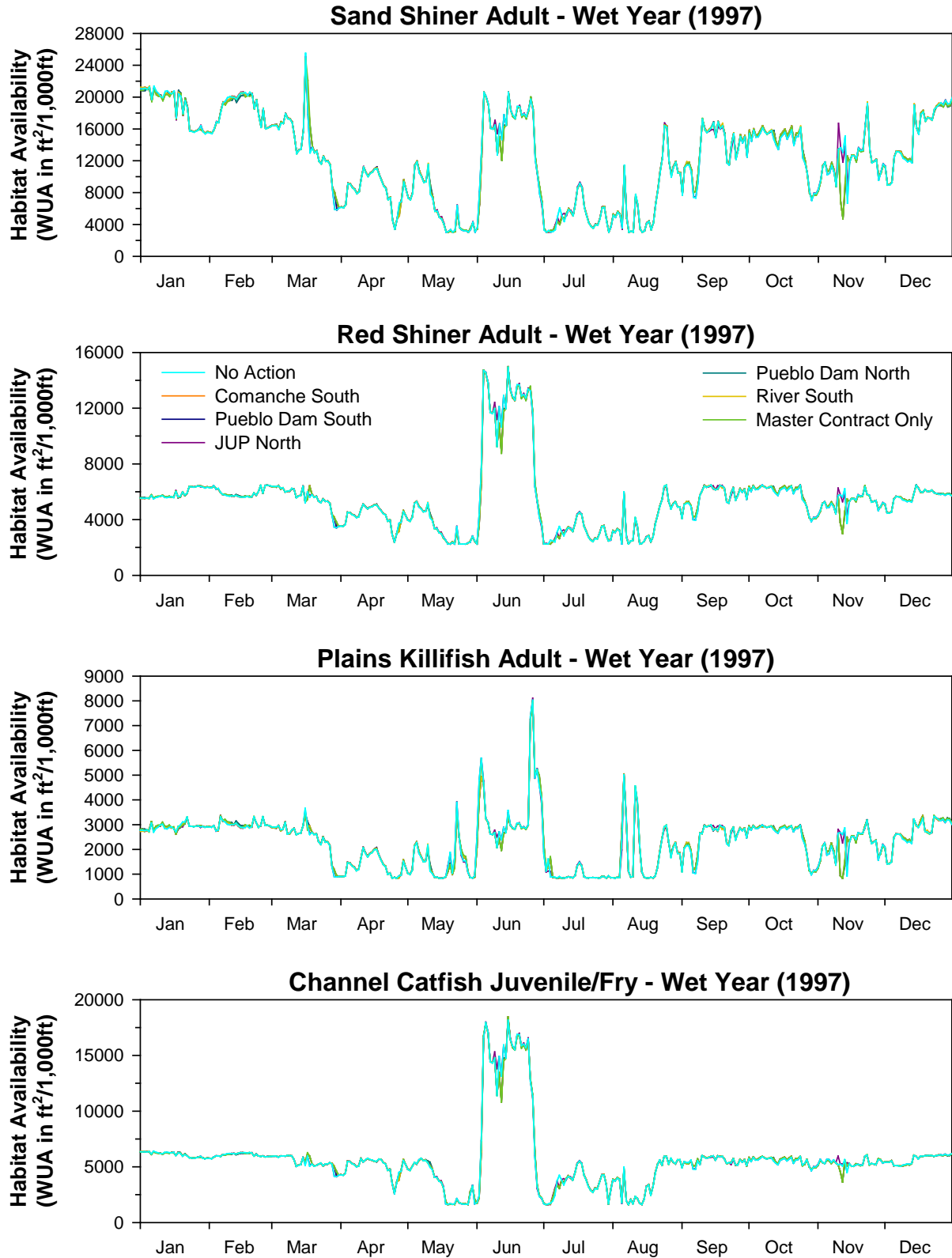









Figure 59. Direct Effects Sand Shiner (Adult), Red Shiner (Adult), Plains Killifish (Adult), and Channel Catfish (Juvenile/Fry) Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 3 of the Lower Arkansas River








Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 15. Direct Effects Summary of the Percent Change in Minimum Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for White Sucker, Flathead Chub, Sand Shiner (Adult), Red Shiner (Adult), Plains Killifish (Adult), and Channel Catfish (Juvenile/Fry), Lower Arkansas River Segment 3

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	234	235	235	237	240	227	233
spawning	2,196	2,204	2,204	2,198	2,205	2,203	2,197
fry	2,260	2,233	2,233	2,260	2,255	2,201	2,226
Flathead chub							
adult/juvenile	35,978	36,096	36,220	35,983	36,075	36,076	36,028
spawning	1,444	1,441	1,441	1,442	1,441	1,442	1,441
fry	4,858	4,949	4,949	4,912	4,946	4,927	4,919
Sand shiner	3,021	3,027	3,026	3,021	3,027	3,030	3,021
Red shiner	2,247	2,247	2,247	2,247	2,247	2,247	2,247
Plains killifish	834	834	834	834	834	833	833
Channel catfish	1,637	1,608	1,608	1,628	1,607	1,609	1,614
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	<1%	<1%	1%	3%	-3%	<-1%
spawning	--	<1%	<1%	<1%	<1%	<1%	<1%
fry	--	-1%	-1%	<1%	<-1%	-3%	-2%
Flathead chub							
adult/juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
fry	--	2%	2%	1%	2%	1%	1%
Sand shiner	--	<1%	<1%	<-1%	<1%	<1%	<-1%
Red shiner	--	<1%	<1%	<1%	<1%	<1%	<1%
Plains killifish	--	<1%	<1%	<-1%	<1%	<-1%	<-1%
Channel catfish	--	-2%	-2%	<-1%	-2%	-2%	-1%
Dry Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	248	219	221	220	222	225	216
spawning	6,975	7,184	7,179	6,988	7,187	7,185	7,158
fry	2,304	2,171	2,175	2,173	2,181	2,203	2,302
Flathead chub							
adult/juvenile	37,661	37,753	37,714	37,705	37,756	37,786	37,669
spawning	1,703	1,756	1,739	1,754	1,756	1,754	1,724
fry	6,201	6,324	6,284	6,319	6,324	6,319	6,250
Sand shiner	3,050	3,076	3,068	3,075	3,076	3,075	3,060
Red shiner	2,374	2,379	2,390	2,376	2,390	2,376	2,374
Plains killifish	834	835	835	833	835	835	836
Channel catfish	1,759	1,820	1,801	1,818	1,821	1,818	1,784








Arkansas Valley Conduit EIS

Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

							
Species/Life Stage	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	-12%	-11%	-11%	-11%	-9%	-13%
spawning	--	3%	3%	<1%	3%	3%	3%
fry	--	-6%	-6%	-6%	-5%	-4%	<-1%
Flathead chub							
adult/juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	3%	2%	3%	3%	3%	1%
fry	--	2%	1%	2%	2%	2%	<1%
Sand shiner	--	<1%	<1%	<1%	<1%	<1%	<1%
Red shiner	--	<1%	<1%	<1%	<1%	<1%	<-1%
Plains killifish	--	<1%	<1%	<-1%	<1%	<1%	<1%
Channel catfish	--	3%	2%	3%	3%	3%	1%
Wet Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	296	353	329	314	329	329	322
spawning	2,195	2,197	2,197	2,196	2,196	2,196	2,191
fry	4,328	4,335	4,334	4,341	4,334	4,334	4,327
Flathead chub							
adult/juvenile	22,252	21,154	21,154	25,886	21,154	21,154	21,073
spawning	1,442	1,442	1,442	1,443	1,442	1,442	1,442
fry	4,810	4,839	4,839	4,815	4,838	4,838	4,833
Sand shiner	3,021	3,021	3,021	3,021	3,021	3,021	3,021
Red shiner	2,247	2,247	2,247	2,247	2,247	2,247	2,247
Plains killifish	834	833	833	835	833	833	833
Channel catfish	1,608	1,610	1,610	1,609	1,610	1,610	1,608
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	19%	11%	6%	11%	11%	9%
spawning	--	<1%	<1%	<1%	<1%	<1%	<-1%
fry	--	<1%	<1%	<1%	<1%	<1%	<-1%
Flathead chub							
adult/juvenile	--	-5%	-5%	16%	-5%	-5%	-5%
spawning	--	<-1%	<1%	<1%	<-1%	<-1%	<-1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
Sand shiner	--	<-1%	<-1%	<-1%	<-1%	<-1%	<1%
Red shiner	--	<1%	<1%	<1%	<1%	<1%	<-1%
Plains killifish	--	<-1%	<-1%	<1%	<-1%	<-1%	<-1%
Channel catfish	--	<1%	<1%	<1%	<1%	<1%	<-1%








Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 16. Direct Effects Summary of the Percent Change in Median Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for White Sucker, Flathead Chub, Sand Shiner (Adult), Red Shiner (Adult), Plains Killifish (Adult), and Channel Catfish (Juvenile/Fry), Lower Arkansas River Segment 3

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	1,185	1,142	1,119	1,170	1,140	1,124	1,142
Spawning	19,377	19,770	19,804	19,272	19,952	19,728	19,647
fry	5,260	5,338	5,342	5,350	5,348	5,362	5,280
Flathead chub							
adult/juvenile	75,135	74,941	74,933	74,982	74,948	74,885	75,039
spawning	3,981	4,135	4,135	4,068	4,137	4,132	3,958
fry	23,010	24,086	24,087	23,585	23,859	23,370	23,170
Sand shiner	17,262	17,433	17,531	17,312	17,441	17,507	17,430
Red shiner	5,416	5,427	5,427	5,425	5,433	5,423	5,427
Plains killifish	2,897	2,899	2,897	2,888	2,900	2,906	2,890
Channel catfish	5,649	5,655	5,666	5,622	5,668	5,617	5,668
Change in Median Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	-4%	-6%	-1%	-4%	-5%	-4%
spawning	--	2%	2%	<-1%	3%	2%	1%
fry	--	1%	2%	2%	2%	2%	<1%
Flathead chub							
adult/juvenile	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
spawning	--	4%	4%	2%	4%	4%	<-1%
fry	--	5%	5%	2%	4%	2%	<1%
Sand shiner	--	<1%	2%	<1%	1%	1%	<1%
Red shiner	--	<1%	<1%	<1%	<1%	<1%	<1%
Plains killifish	--	<1%	<1%	<-1%	<1%	<1%	<-1%
Channel catfish	--	<1%	<1%	<-1%	<1%	<-1%	<1%
Dry Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	801	735	736	728	738	735	749
spawning	17,688	17,654	17,826	17,909	17,655	17,655	17,658
fry	5,366	5,367	5,368	5,375	5,367	5,367	5,367
Flathead chub							
adult/juvenile	74,306	74,173	74,174	74,163	74,177	74,194	74,315
spawning	5,696	5,789	5,793	5,991	5,789	5,704	5,700
fry	24,536	24,798	24,797	24,500	24,804	24,723	24,547
Sand shiner	19,269	19,723	19,716	19,776	19,706	19,729	19,630
Red shiner	5,452	5,444	5,442	5,427	5,445	5,435	5,451
Plains killifish	2,819	2,803	2,802	2,806	2,803	2,809	2,810
Channel catfish	5,815	5,889	5,885	5,811	5,891	5,830	5,877

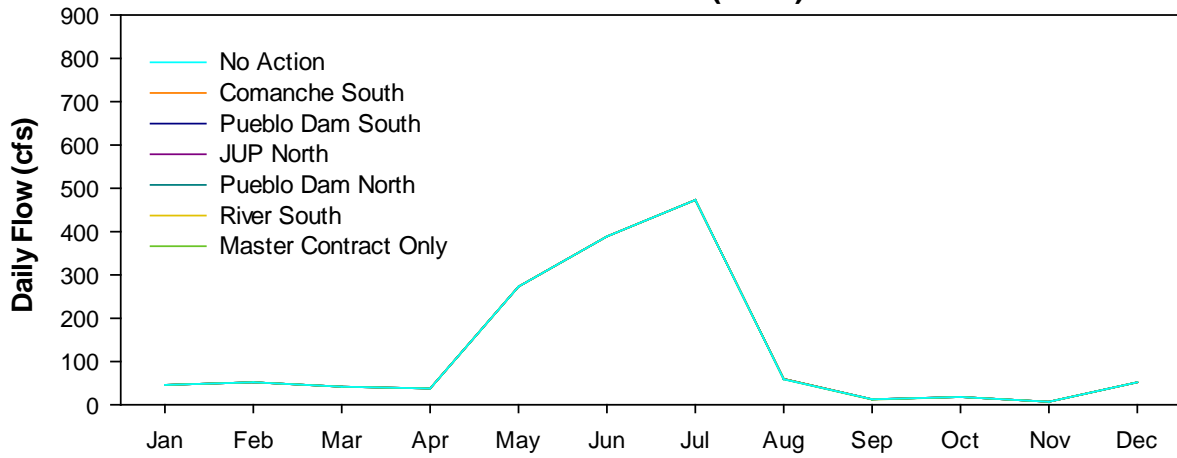
Arkansas Valley Conduit EIS

Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

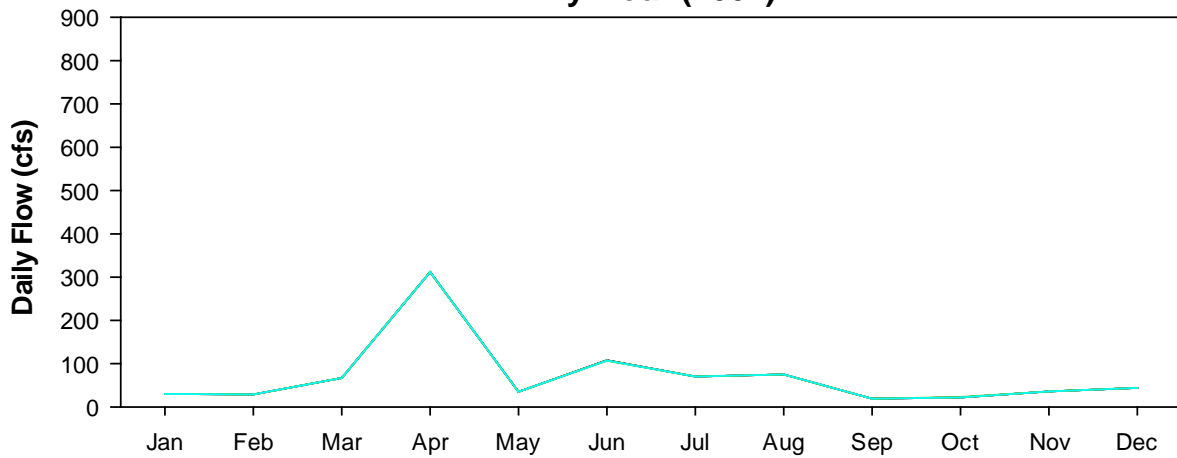
Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Change in Median Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	-8%	-8%	-9%	-8%	-8%	-7%
spawning	--	<-1%	<1%	1%	<-1%	<-1%	<-1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
Flathead chub							
adult/juvenile	--	<-1%	<-1%	<-1%	<-1%	<-1%	<1%
spawning	--	2%	2%	5%	2%	<1%	<1%
fry	--	1%	1%	<-1%	1%	<1%	<1%
Sand shiner	--	2%	2%	3%	2%	2%	2%
Red shiner	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
Plains killifish	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
Channel catfish	--	1%	1%	<-1%	1%	<1%	1%
Wet Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	2,907	2,909	2,912	2,906	2,909	2,910	2,924
spawning	11,663	11,732	11,731	11,747	11,728	11,730	11,646
fry	5,368	5,364	5,364	5,368	5,365	5,364	5,365
Flathead chub							
adult/juvenile	76,429	76,346	76,211	76,402	76,348	76,346	76,351
spawning	9,417	9,125	9,125	10,001	9,122	9,124	9,267
fry	19,114	19,134	19,130	19,154	19,125	19,127	18,981
Sand shiner	12,465	12,521	12,520	12,476	12,521	12,520	12,493
Red shiner	5,473	5,490	5,489	5,470	5,489	5,489	5,463
Plains killifish	2,599	2,615	2,615	2,606	2,615	2,611	2,598
Channel catfish	5,502	5,518	5,512	5,506	5,511	5,512	5,507
Change in Median Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	<1%	<1%	<-1%	<1%	<1%	<1%
spawning	--	<1%	<1%	<1%	<1%	<1%	<-1%
fry	--	<-1%	<-1%	<1%	<-1%	<-1%	<-1%
Flathead chub							
adult/juvenile	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
spawning	--	-3%	-3%	6%	-3%	-3%	-2%
fry	--	<1%	<1%	<1%	<1%	<1%	<-1%
Sand shiner	--	<1%	<1%	<1%	<1%	<1%	<1%
Red shiner	--	<1%	<1%	<-1%	<1%	<1%	<-1%
Plains killifish	--	<1%	<1%	<1%	<1%	<1%	<-1%
Channel catfish	--	<1%	<1%	<1%	<1%	<1%	<1%

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Lower Arkansas River, Segment 4 – John Martin Reservoir to Kansas State Line
Normal Year (2005)



Dry Year (2004)



Wet Year (1997)

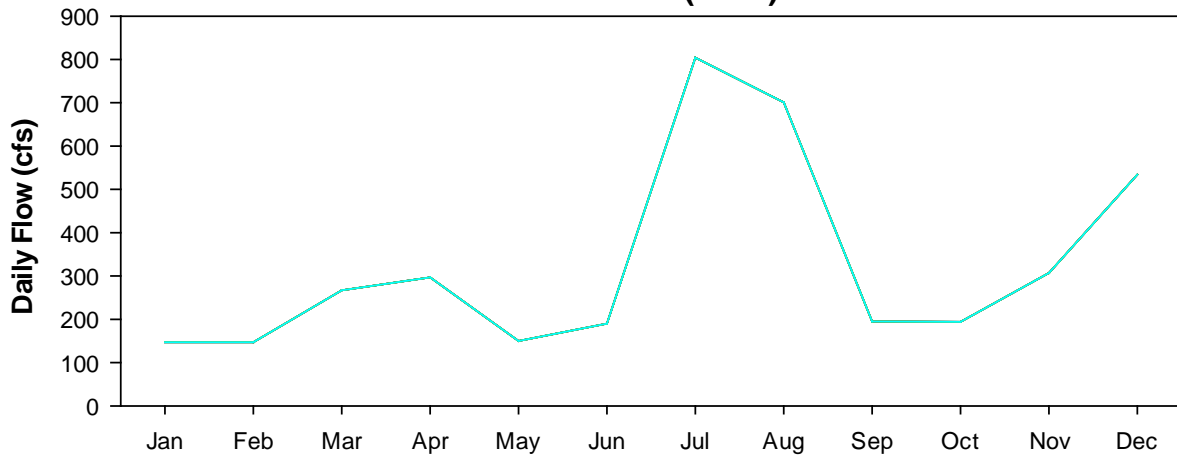
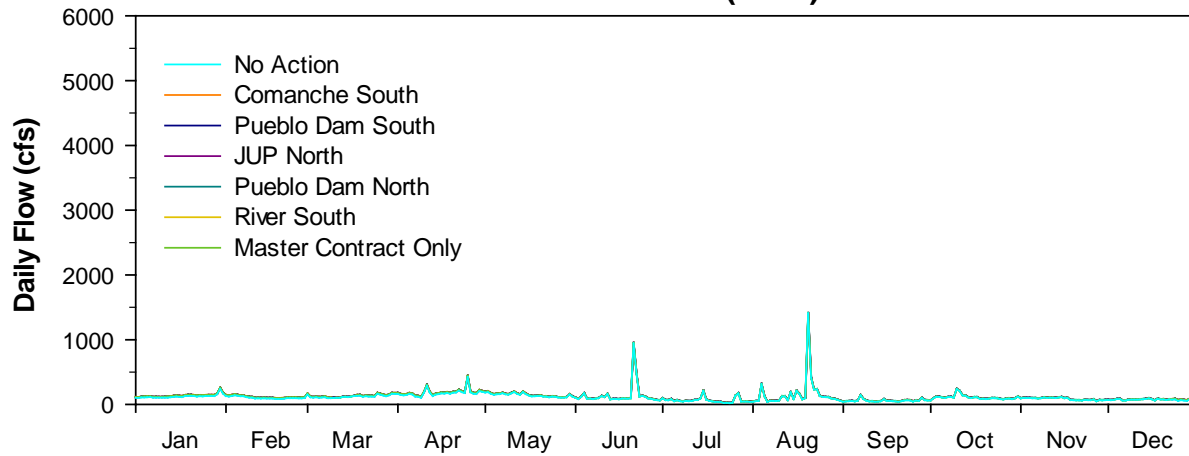


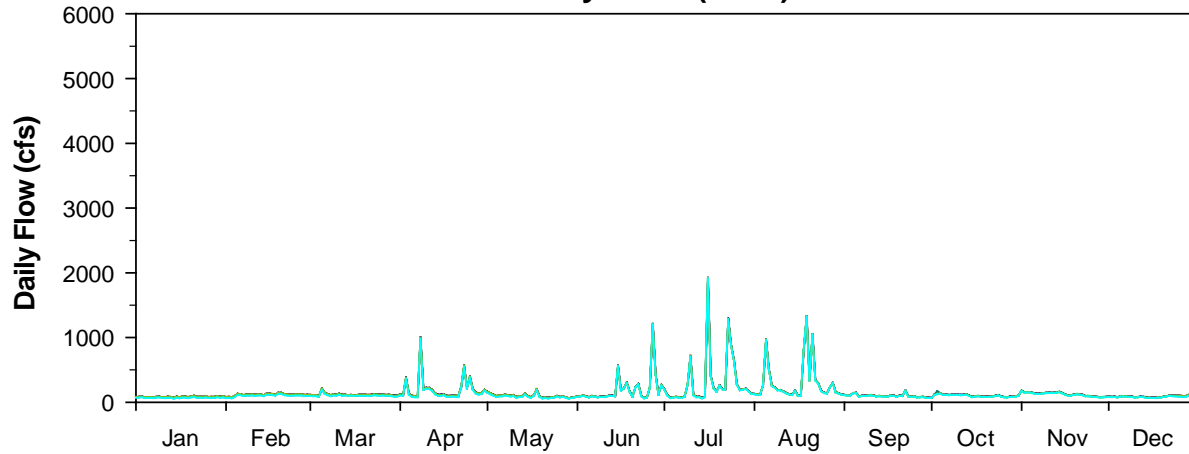
Figure 60. Direct Effects Mean Monthly Streamflow for All Alternatives for Segment 4 of the Lower Arkansas River at the Granada Gage

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

**Fountain Creek, Segment 3 – Security to County Line
Normal Year (2005)**



Dry Year (2004)



Wet Year (1997)

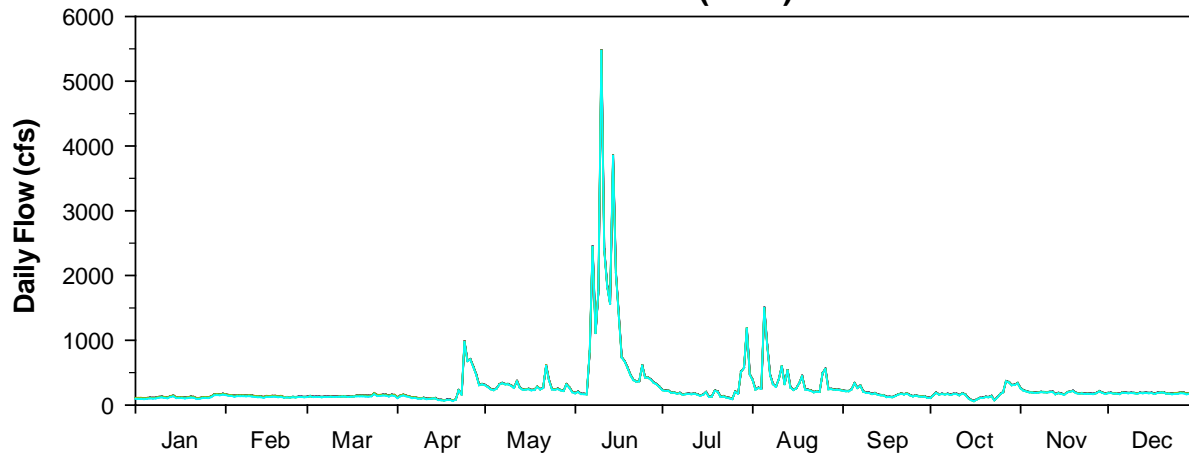


Figure 61. Direct Effects Daily Hydrology for All Alternatives for Segment 3 of Fountain Creek at the Near Fountain Gage

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

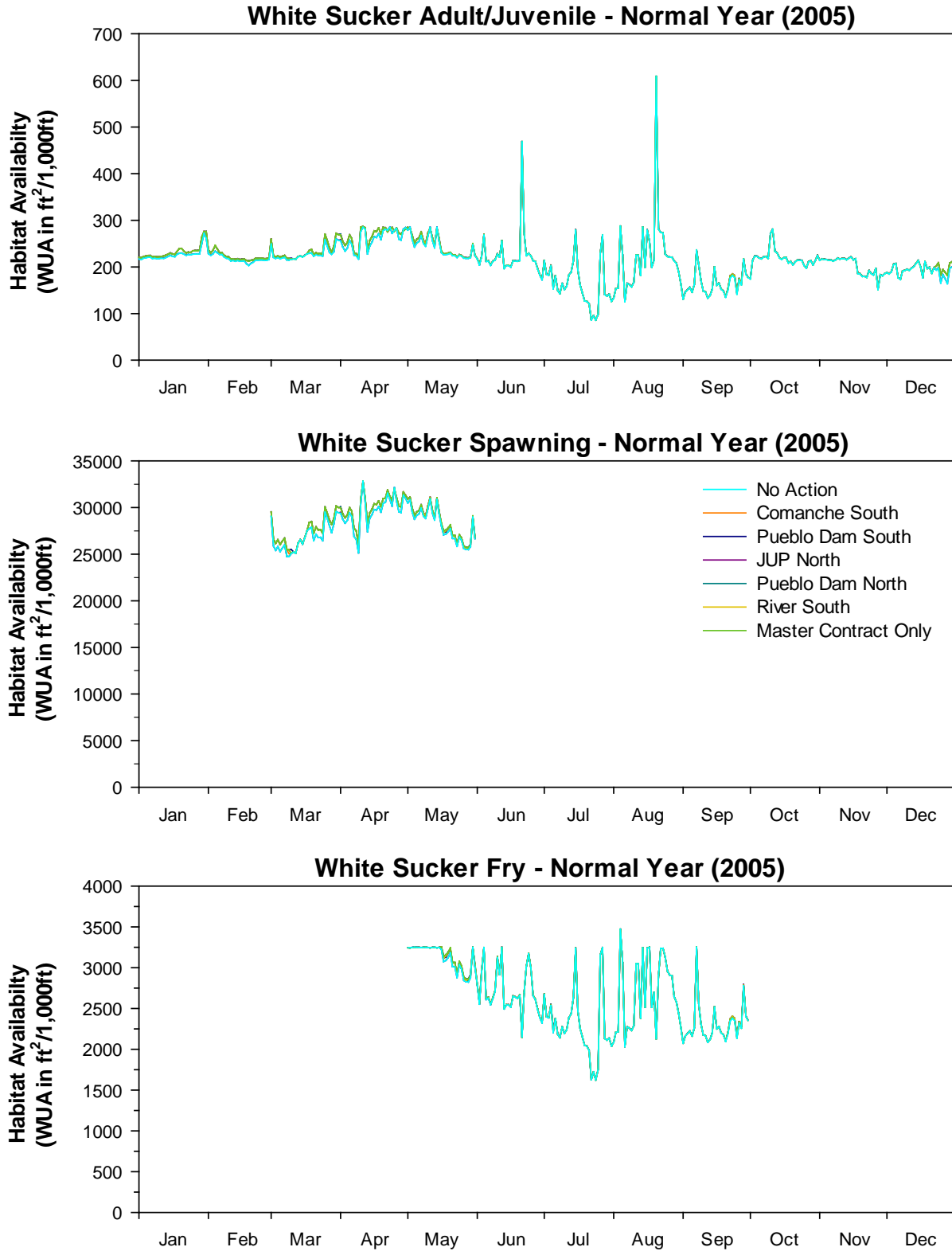


Figure 62. Direct Effects White Sucker Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 3 of Fountain Creek

Arkansas Valley Conduit EIS
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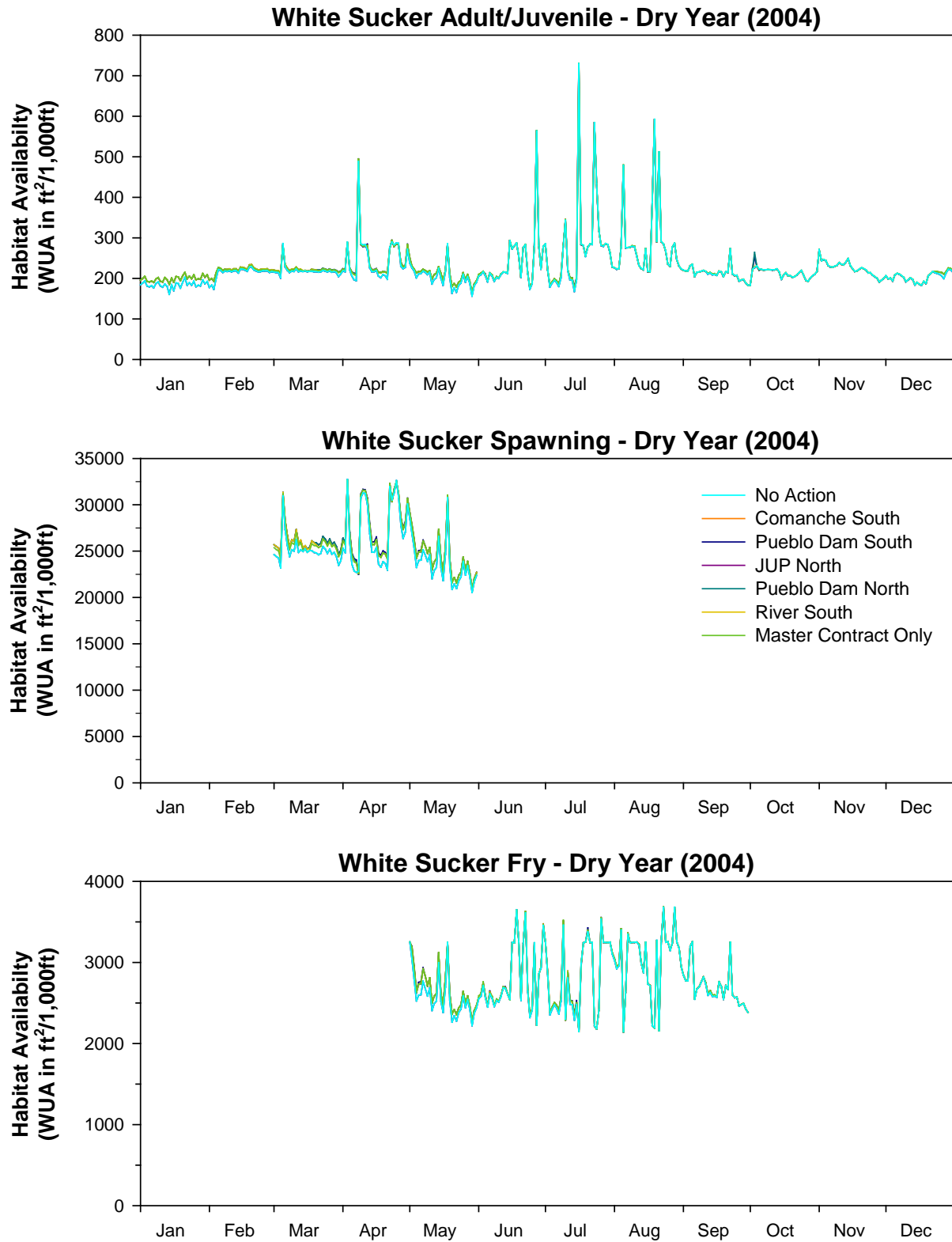


Figure 63. Direct Effects White Sucker Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 3 of Fountain Creek

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

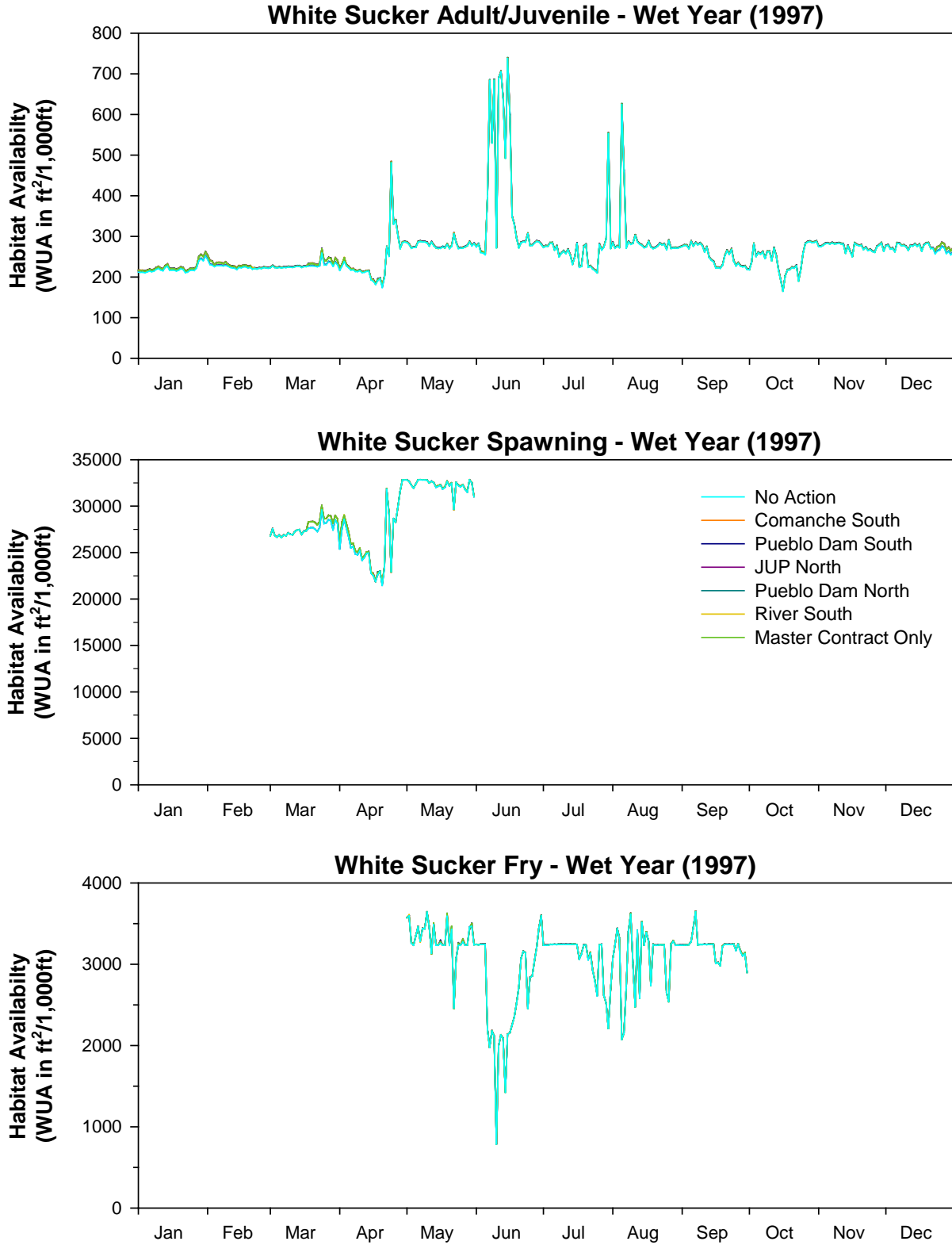


Figure 64. Direct Effects White Sucker Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 3 of Fountain Creek

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

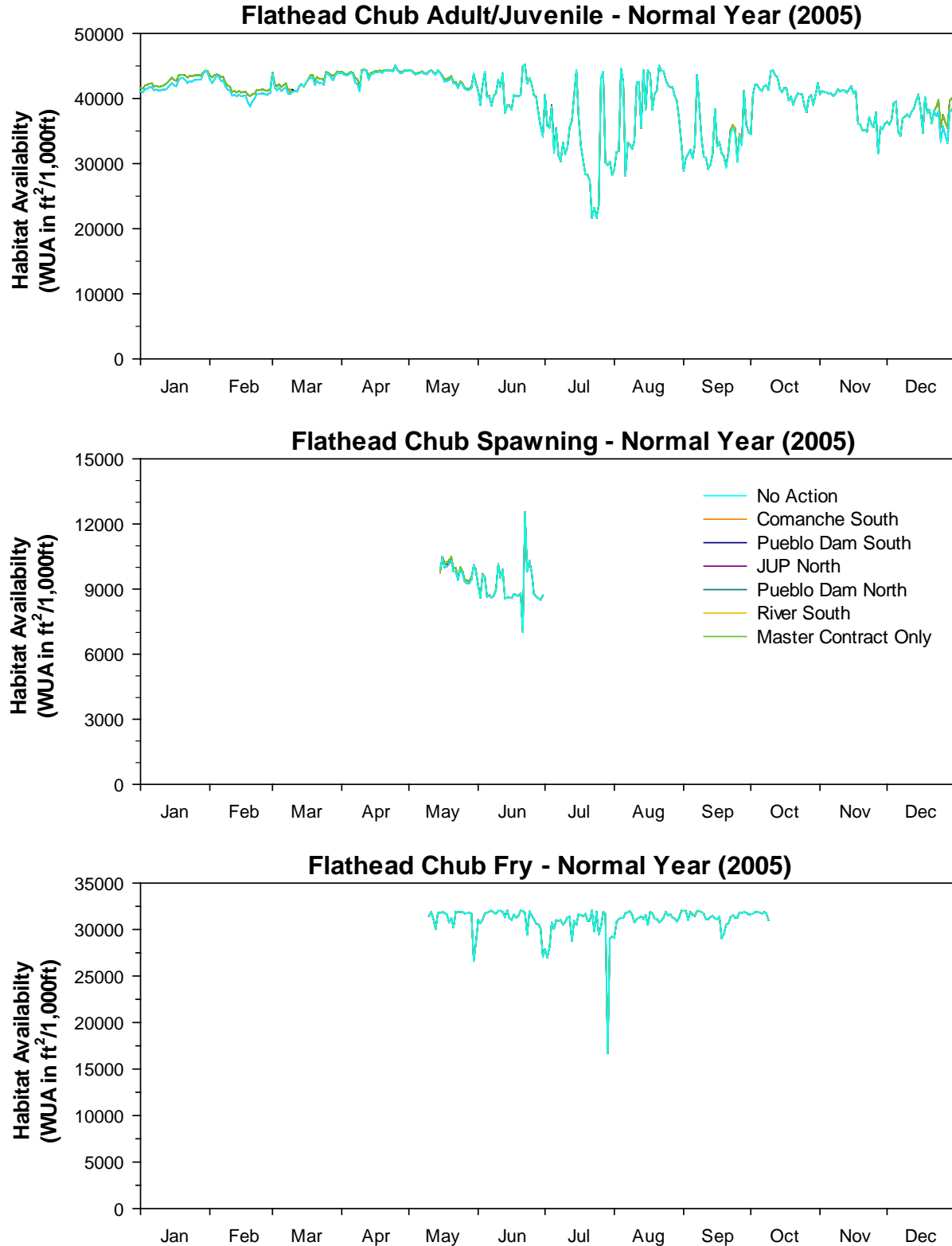


Figure 65. Direct Effects Flathead Chub Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 3 of Fountain Creek

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

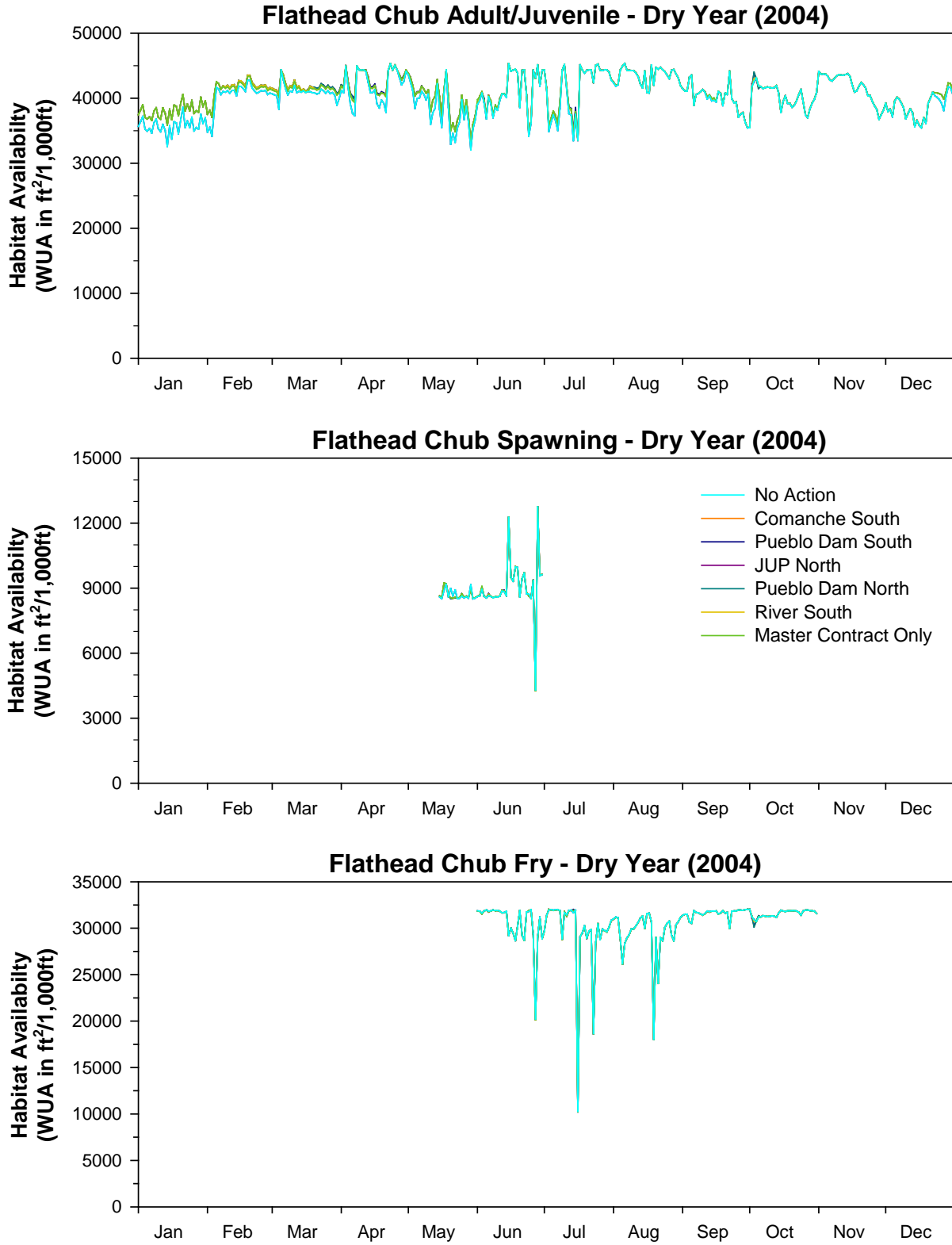


Figure 66. Direct Effects Flathead Chub Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 3 of Fountain Creek

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

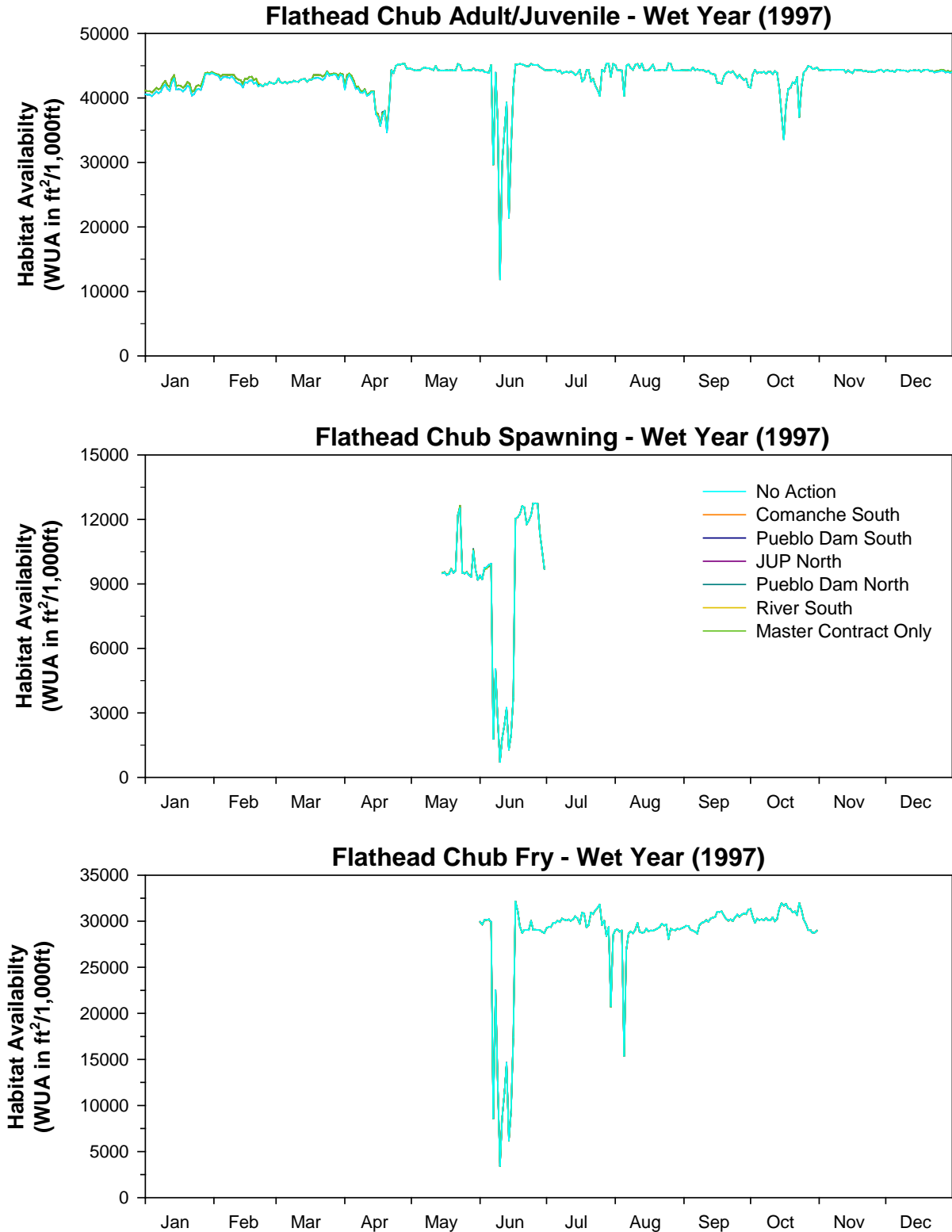


Figure 67. Direct Effects Flathead Chub Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 3 of Fountain Creek

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

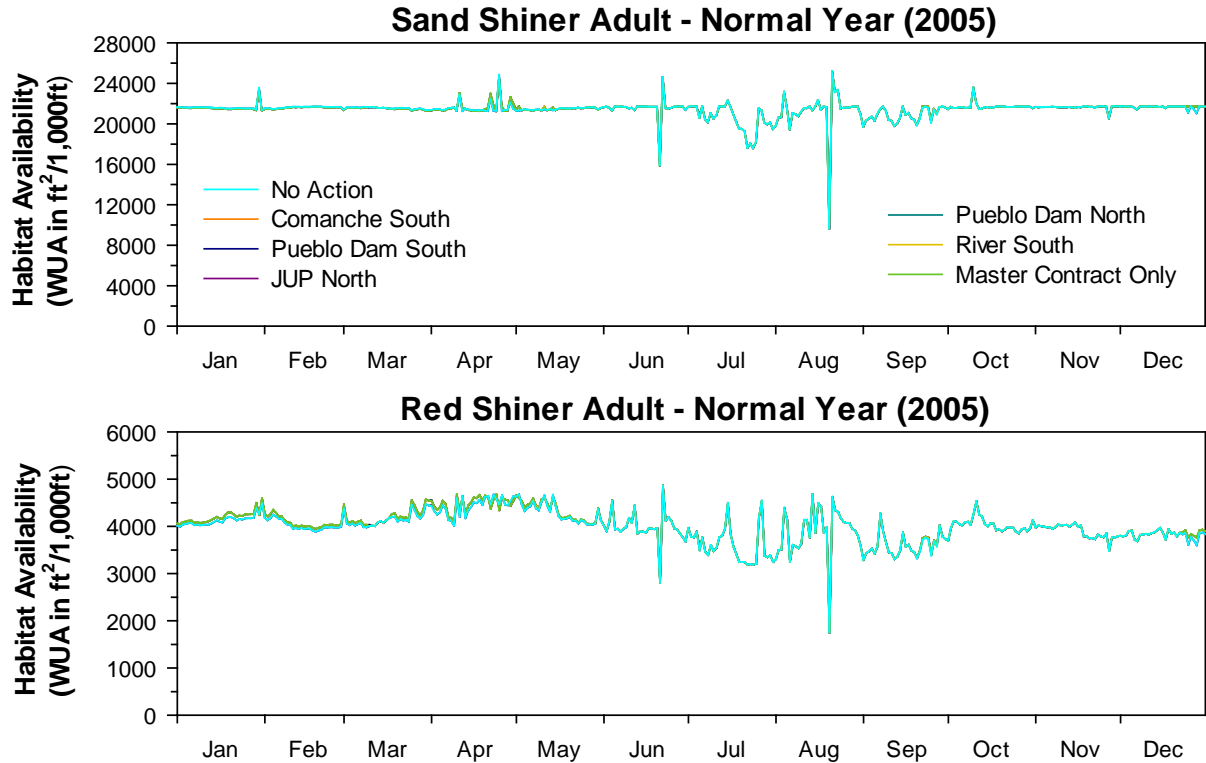


Figure 68. Direct Effects Sand Shiner (Adult) and Red Shiner (Adult) Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 3 of Fountain Creek

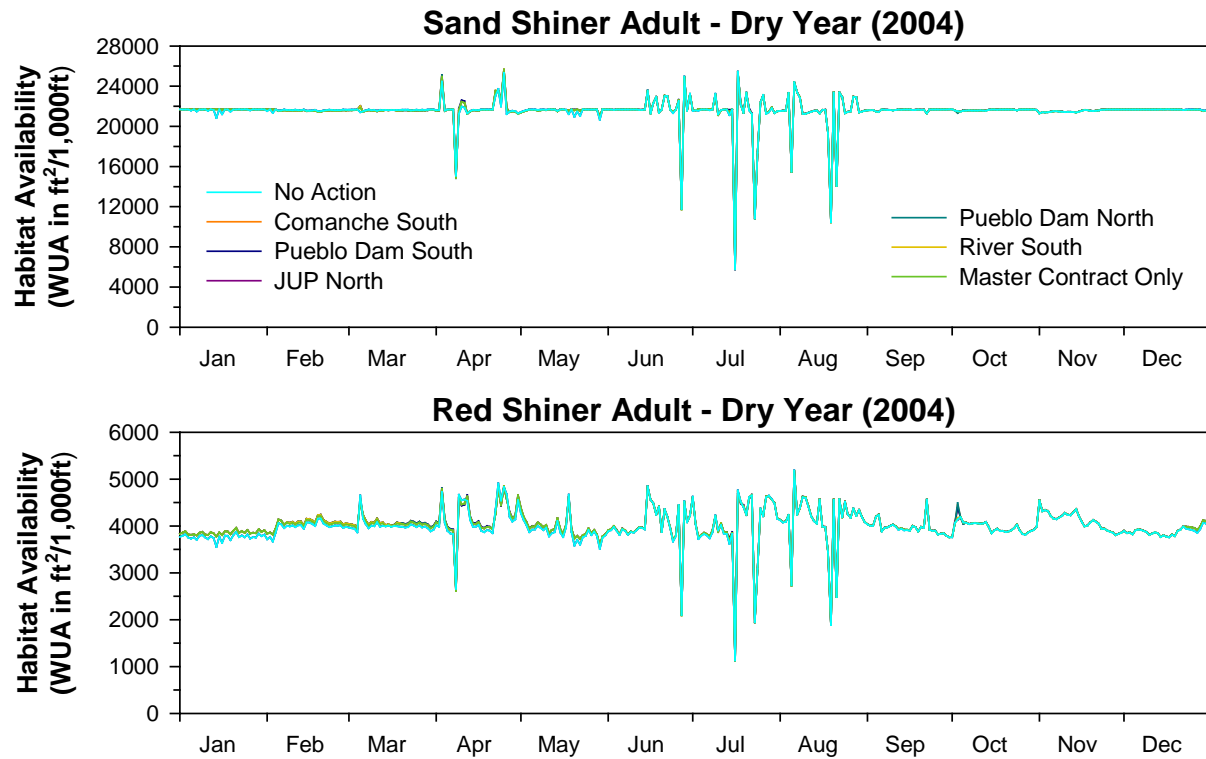


Figure 69. Direct Effects Sand Shiner (Adult) and Red Shiner (Adult) Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 3 of Fountain Creek

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

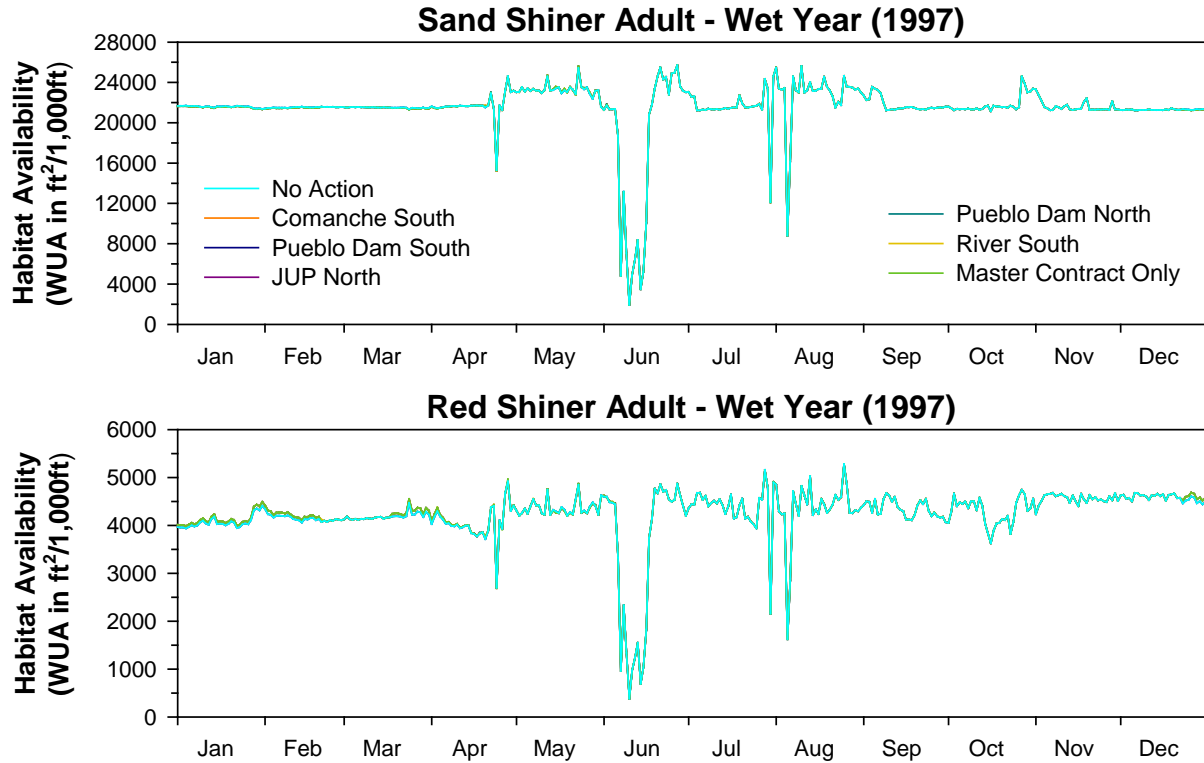
















Figure 70. Direct Effects Sand Shiner (Adult) and Red Shiner (Adult) Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 3 of Fountain Creek

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 17. Direct Effects Summary of the Percent Change in Minimum Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for White Sucker, Flathead Chub, Sand Shiner (Adult), and Red Shiner (Adult), Fountain Creek Segment 3








Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	86	87	87	86	86	86	86
spawning	24,756	25,068	25,140	24,759	24,770	25,090	25,090
fry	1,624	1,625	1,625	1,624	1,624	1,624	1,624
Flathead chub							
adult/juvenile	21,636	21,650	21,650	21,636	21,646	21,648	21,648
spawning	7,032	7,024	7,021	7,032	7,025	7,025	7,024
fry	16,726	16,726	16,726	16,726	16,726	16,726	16,726
Sand shiner	9,646	9,646	9,646	9,646	9,646	9,646	9,646
Red shiner	1,755	1,755	1,755	1,755	1,755	1,755	1,755
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	<1%	<1%	0%	<1%	<1%	<1%
spawning	--	1%	2%	<1%	<1%	1%	1%
fry	--	<1%	<1%	0%	<1%	<1%	<1%
Flathead chub							
adult/juvenile	--	<1%	<1%	0%	<1%	<1%	<1%
spawning	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
fry	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
Sand shiner	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
Red shiner	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
Dry Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	156	164	164	156	164	164	164
spawning	20,534	20,911	20,914	20,534	20,911	20,906	20,904
fry	2,143	2,142	2,142	2,143	2,142	2,142	2,142
Flathead chub							
adult/juvenile	32,025	33,077	33,085	32,025	33,077	33,063	33,058
spawning	4,295	4,273	4,283	4,295	4,274	4,273	4,274
fry	10,287	10,264	10,221	10,287	10,252	10,264	10,264
Sand shiner	5,807	5,793	5,767	5,807	5,786	5,793	5,793
Red shiner	1,136	1,134	1,130	1,136	1,133	1,134	1,134
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	5%	5%	0%	5%	5%	5%
spawning	--	2%	2%	0%	2%	2%	2%
fry	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)








Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Flathead chub							
adult/juvenile	--	3%	3%	0%	3%	3%	3%
spawning	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
fry	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
Sand shiner	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
Red shiner	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
Wet Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	168	168	168	168	168	168	168
spawning	21,484	21,767	21,628	21,484	21,628	21,877	21,628
fry	793	793	793	793	793	793	793
Flathead chub							
adult/juvenile	11,887	11,881	11,885	11,887	11,881	11,885	11,877
spawning	718	717	717	718	717	717	717
fry	3,444	3,442	3,443	3,444	3,442	3,443	3,441
Sand shiner	1,936	1,935	1,935	1,936	1,935	1,935	1,934
Red shiner	385	385	385	385	385	385	385
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	0%	0%	0%	0%	0%	0%
spawning	--	1%	<1%	0%	<1%	2%	<1%
fry	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
Flathead chub							
adult/juvenile	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
spawning	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
fry	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
Sand shiner	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
Red shiner	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%

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Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 18. Direct Effects Summary of the Percent Change in Median Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for White Sucker, Flathead Chub, Sand Shiner (Adult), and Red Shiner (Adult), Fountain Creek Segment 3

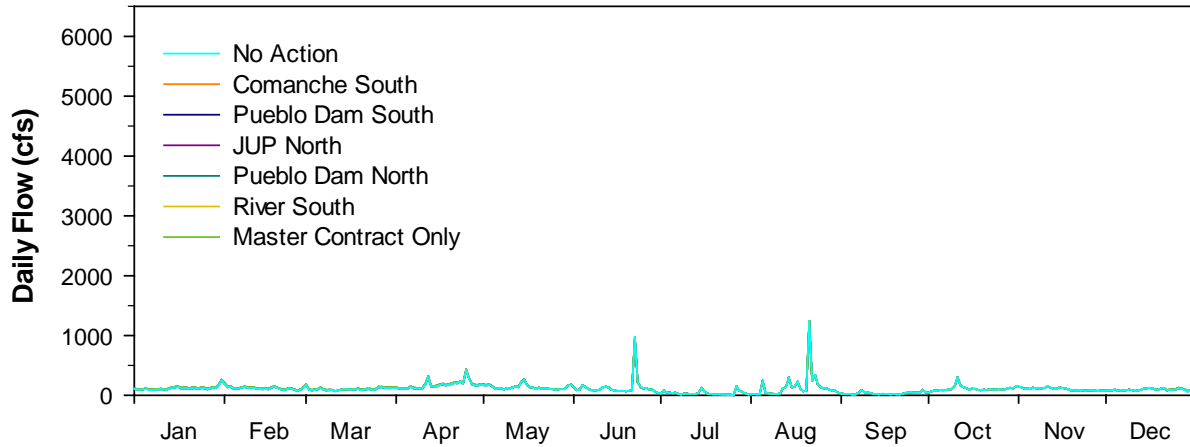
Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	217	218	219	217	218	219	219
Spawning	28,472	28,938	28,947	28,472	28,921	28,936	28,889
fry	2,552	2,554	2,555	2,552	2,554	2,554	2,554
Flathead chub							
adult/juvenile	41,049	41,211	41,295	41,051	41,209	41,237	41,237
spawning	9,326	9,362	9,443	9,326	9,397	9,440	9,442
fry	31,398	31,408	31,408	31,398	31,408	31,400	31,400
Sand shiner	21,582	21,579	21,579	21,585	21,579	21,579	21,579
Red shiner	4,001	4,020	4,023	4,001	4,020	4,020	4,020
Change in Median Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	2%	2%	0%	2%	2%	1%
fry	--	<1%	<1%	0%	<1%	<1%	<1%
Flathead chub							
adult/juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	<1%	1%	0%	<1%	1%	1%
fry	--	<1%	<1%	0%	<1%	<1%	<1%
Sand shiner	--	<-1%	<-1%	<1%	<-1%	<-1%	<-1%
Red shiner	--	<1%	<1%	<1%	<1%	<1%	<1%
Dry Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	215	218	218	215	218	218	217
spawning	24,774	25,688	25,688	24,774	25,688	25,525	25,458
fry	2,671	2,701	2,703	2,671	2,701	2,701	2,701
Flathead chub							
adult/juvenile	40,763	41,210	41,210	40,763	41,210	41,181	41,084
spawning	8,640	8,645	8,645	8,640	8,645	8,644	8,643
fry	31,405	31,362	31,358	31,405	31,362	31,362	31,362
Sand shiner	21,668	21,661	21,661	21,668	21,661	21,661	21,661
Red shiner	3,970	4,001	4,004	3,970	4,001	3,998	3,996
Change in Median Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	1%	1%	0%	1%	1%	<1%
spawning	--	4%	4%	0%	4%	3%	3%
fry	--	1%	1%	0%	1%	1%	1%

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

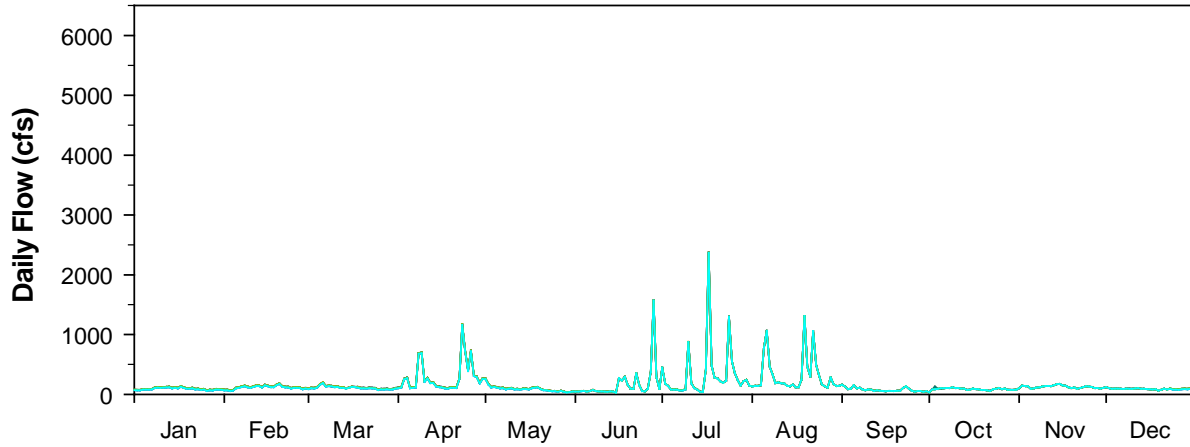
Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Flathead chub							
adult/juvenile	--	1%	1%	0%	1%	1%	<1%
spawning	--	<1%	<1%	0%	<1%	<1%	<1%
fry	--	<1%	<1%	0%	<1%	<1%	<1%
Sand shiner	--	<1%	<1%	0%	<1%	<1%	<1%
Red shiner	--	<1%	<1%	0%	<1%	<1%	<1%
Wet Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	266	269	269	266	269	269	269
spawning	28,141	28,501	28,501	28,141	28,499	28,501	28,501
fry	3,240	3,241	3,241	3,240	3,241	3,241	3,240
Flathead chub							
adult/juvenile	44,014	44,027	44,035	44,014	44,027	44,027	44,035
spawning	9,611	9,626	9,618	9,611	9,626	9,618	9,629
fry	29,737	29,733	29,733	29,737	29,733	29,733	29,733
Sand shiner	21,547	21,541	21,541	21,547	21,541	21,541	21,541
Red shiner	4,294	4,308	4,310	4,294	4,310	4,308	4,304
Change in Median Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	1%	1%	0%	1%	1%	1%
spawning	--	1%	1%	0%	1%	1%	1%
fry	--	<1%	<1%	0%	<1%	<1%	<1%
Flathead chub							
adult/juvenile	--	<1%	<1%	0%	<1%	<1%	<1%
spawning	--	<1%	<1%	0%	<1%	<1%	<1%
fry	--	<1%	<1%	0%	<1%	<1%	<1%
Sand shiner	--	<1%	<1%	0%	<1%	<1%	<1%
Red shiner	--	<1%	<1%	0%	<1%	<1%	<1%

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Fountain Creek, Segment 4 – County Line to Arkansas River
Normal Year (2005)



Dry Year (2004)



Wet Year (1997)

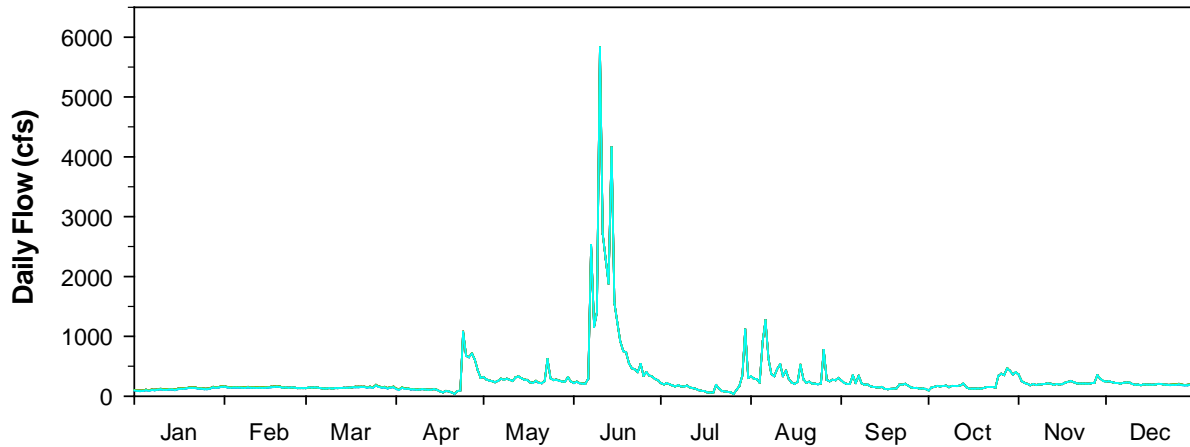


Figure 71. Direct Effects Daily Hydrology for All Alternatives for Segment 4 of Fountain Creek at the Pueblo Gage

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

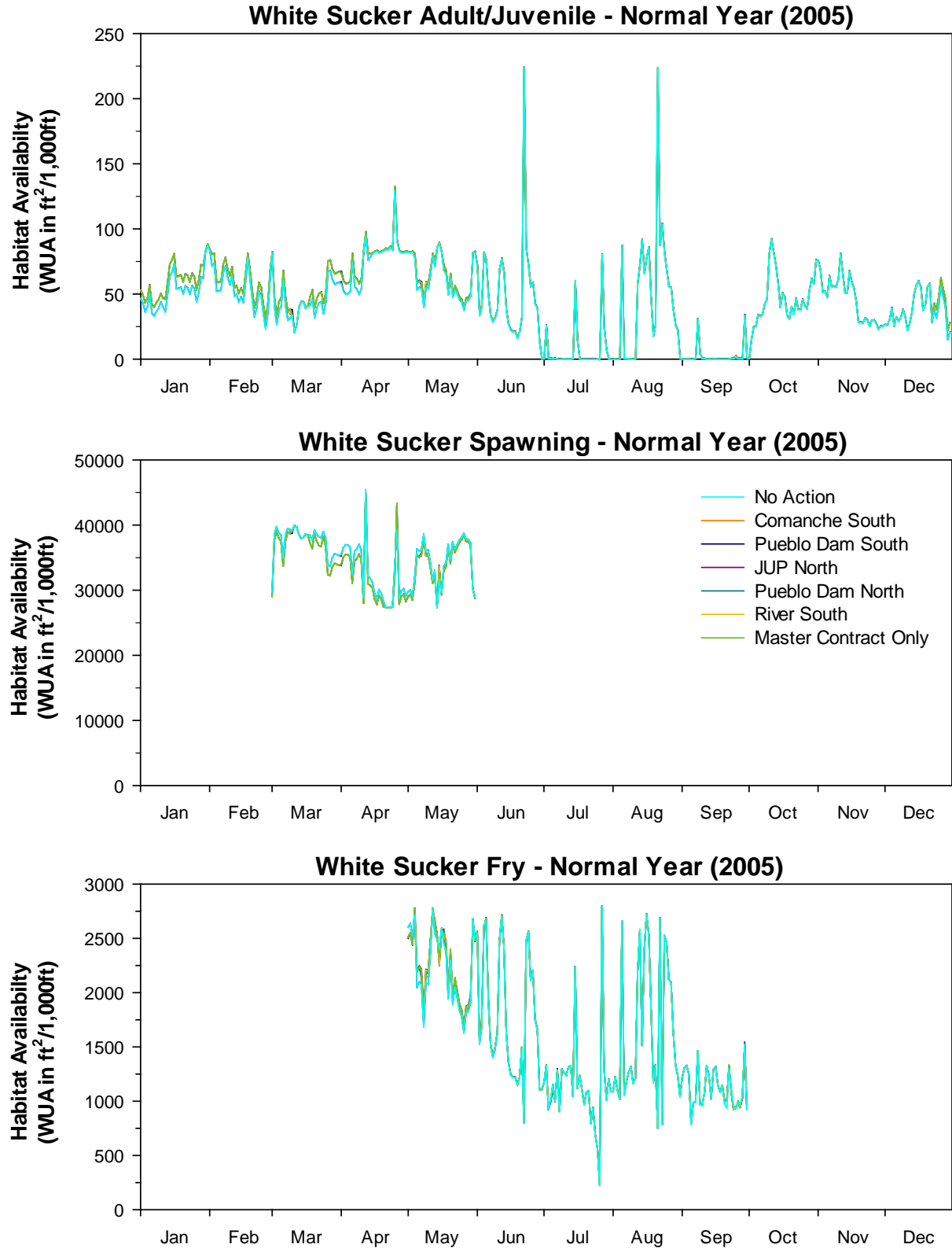


Figure 72. Direct Effects White Sucker Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 4 of Fountain Creek

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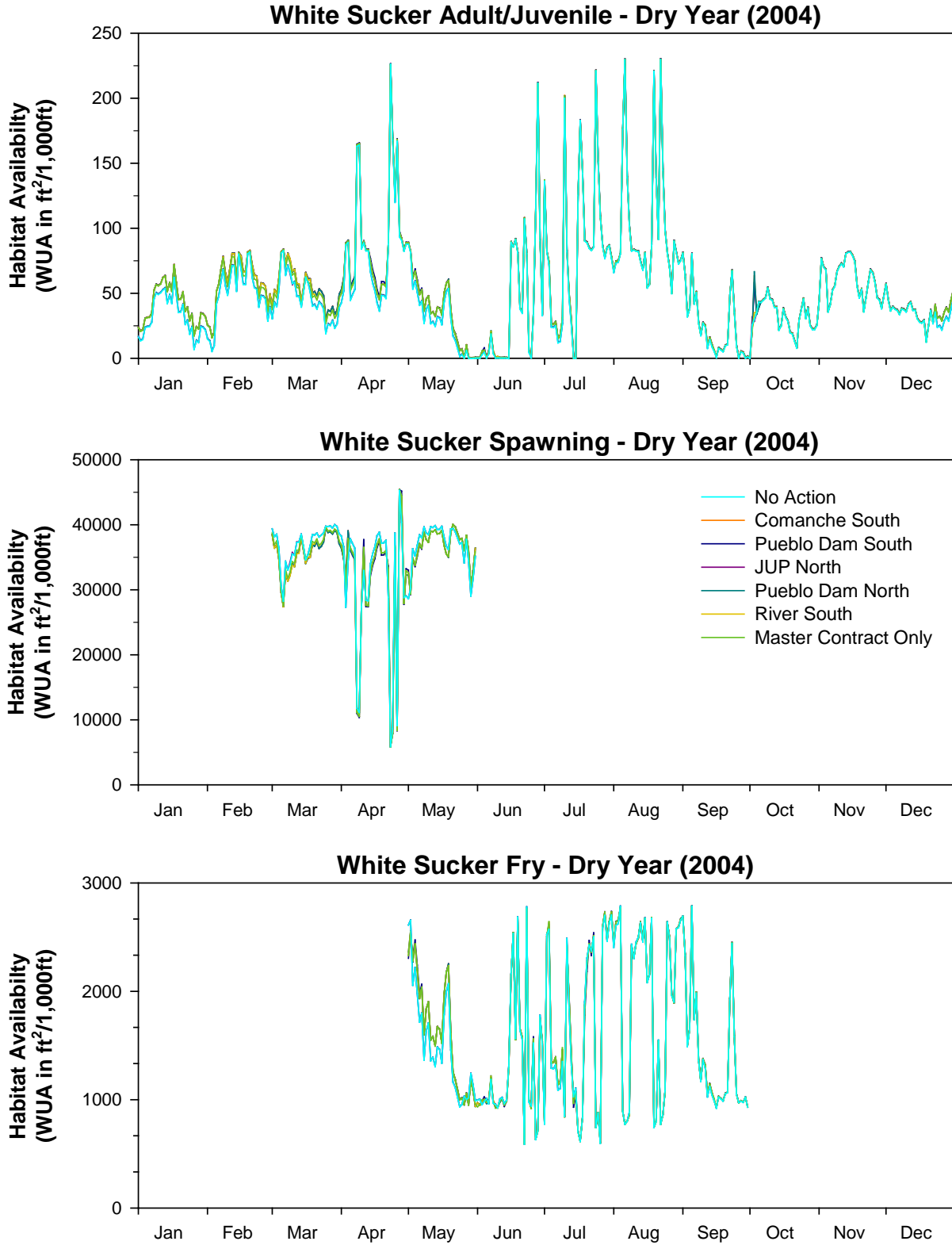


Figure 73. Direct Effects White Sucker Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 4 of Fountain Creek

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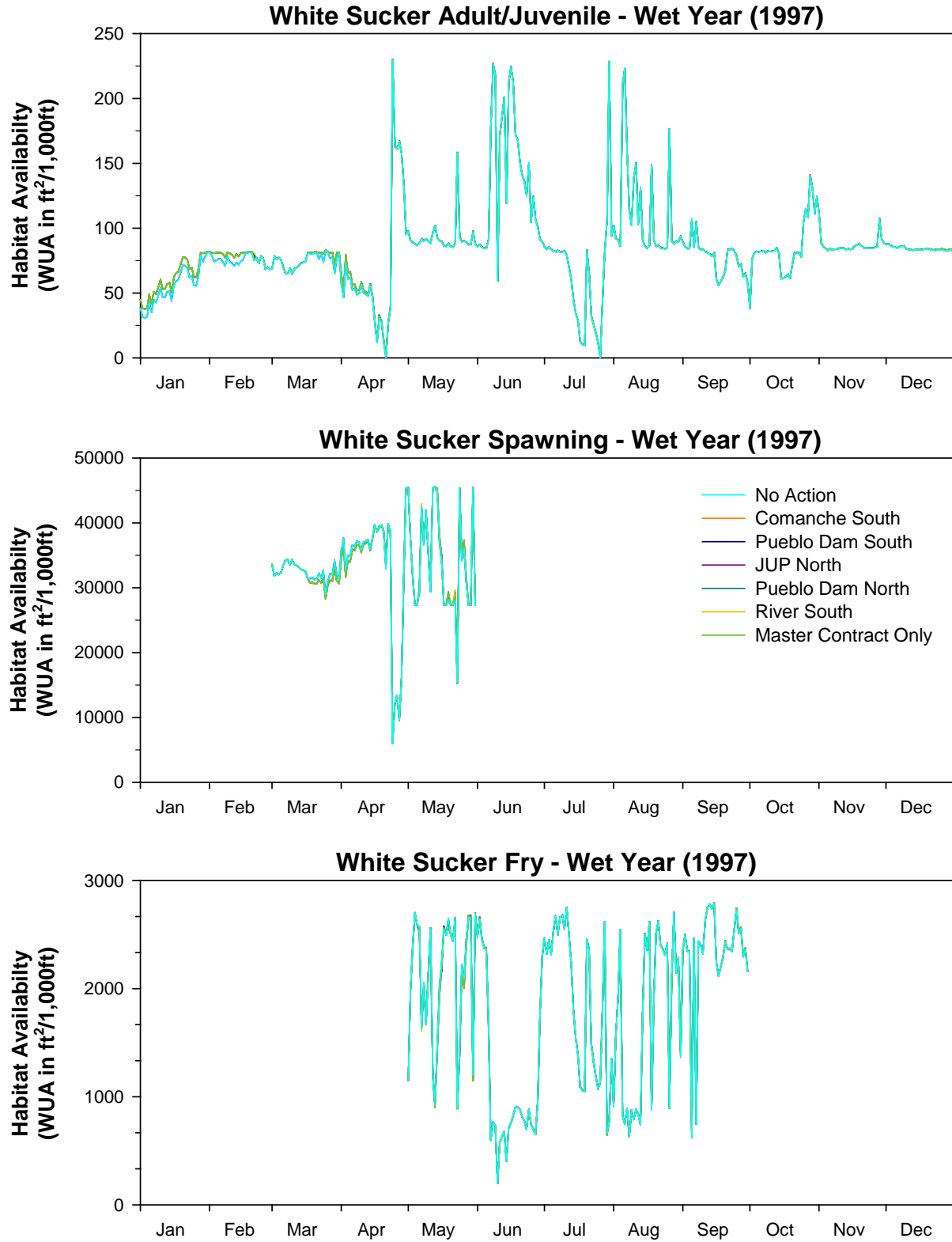


Figure 74. Direct Effects White Sucker Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 4 of Fountain Creek

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

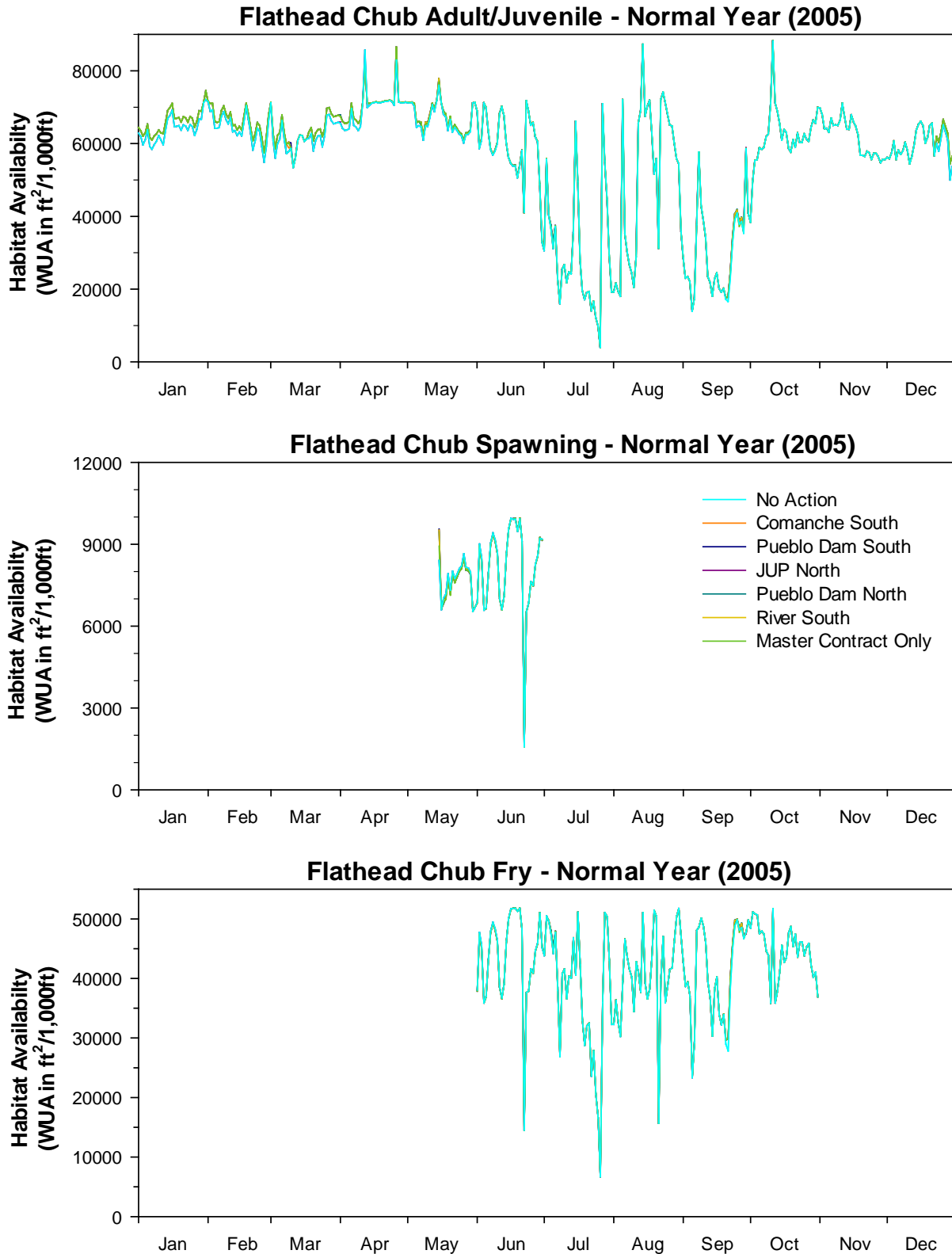


Figure 75. Direct Effects Flathead Chub Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 4 of Fountain Creek

Arkansas Valley Conduit EIS
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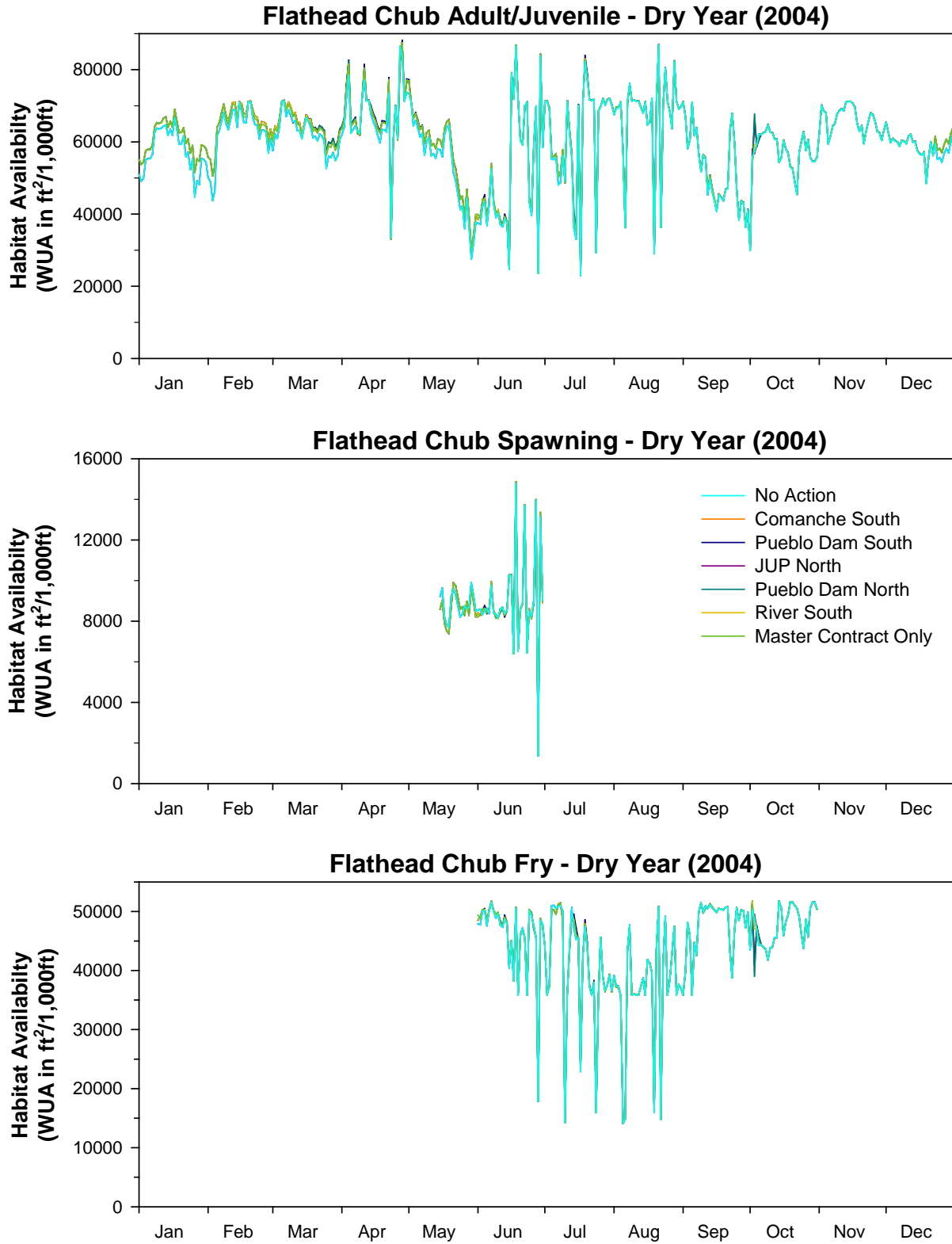


Figure 76. Direct Effects Flathead Chub Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 4 of Fountain Creek

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

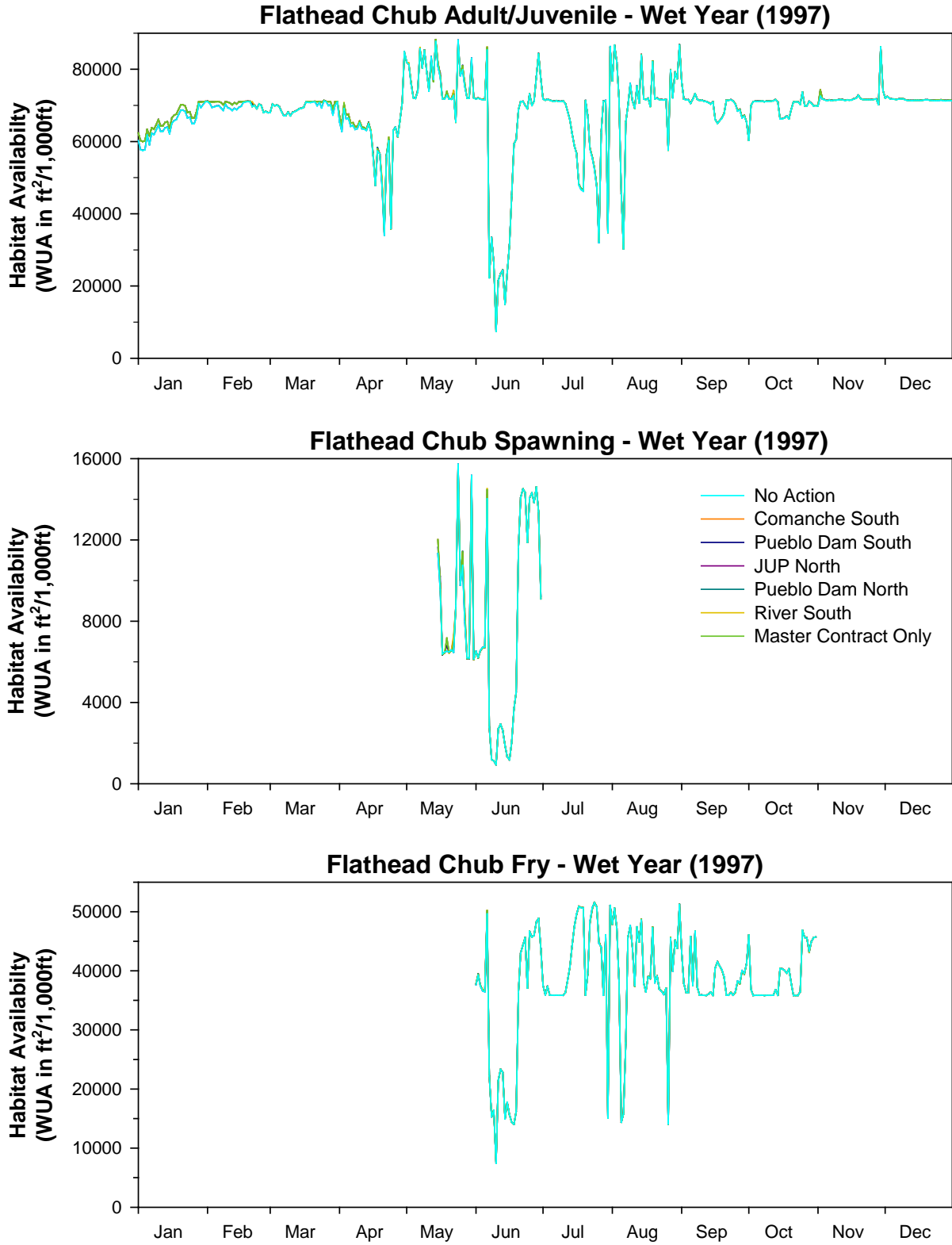


Figure 77. Direct Effects Flathead Chub Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 4 of Fountain Creek

Arkansas Valley Conduit EIS
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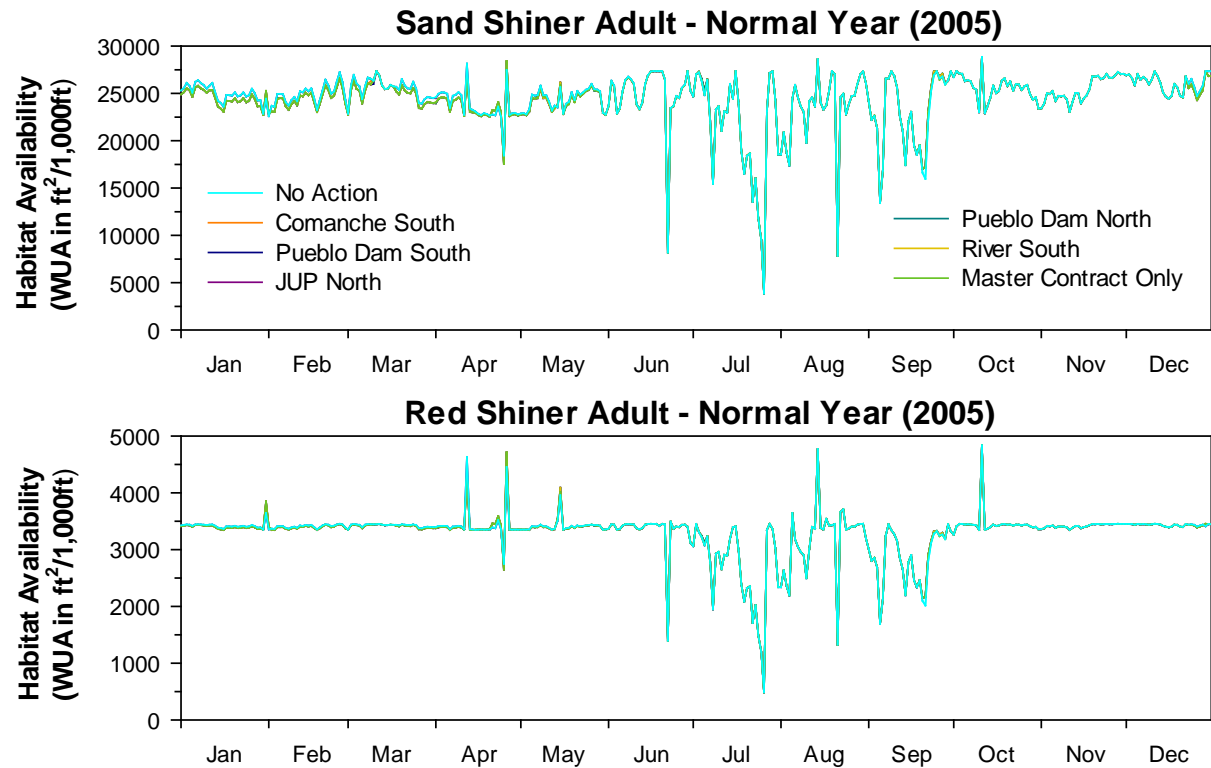


Figure 78. Direct Effects Sand Shiner (Adult) and Red Shiner (Adult) Habitat Availability (WUA [$\text{ft}^2/1,000\text{ft}$]) for Seven Alternatives during a Normal Year for Segment 4 of Fountain Creek

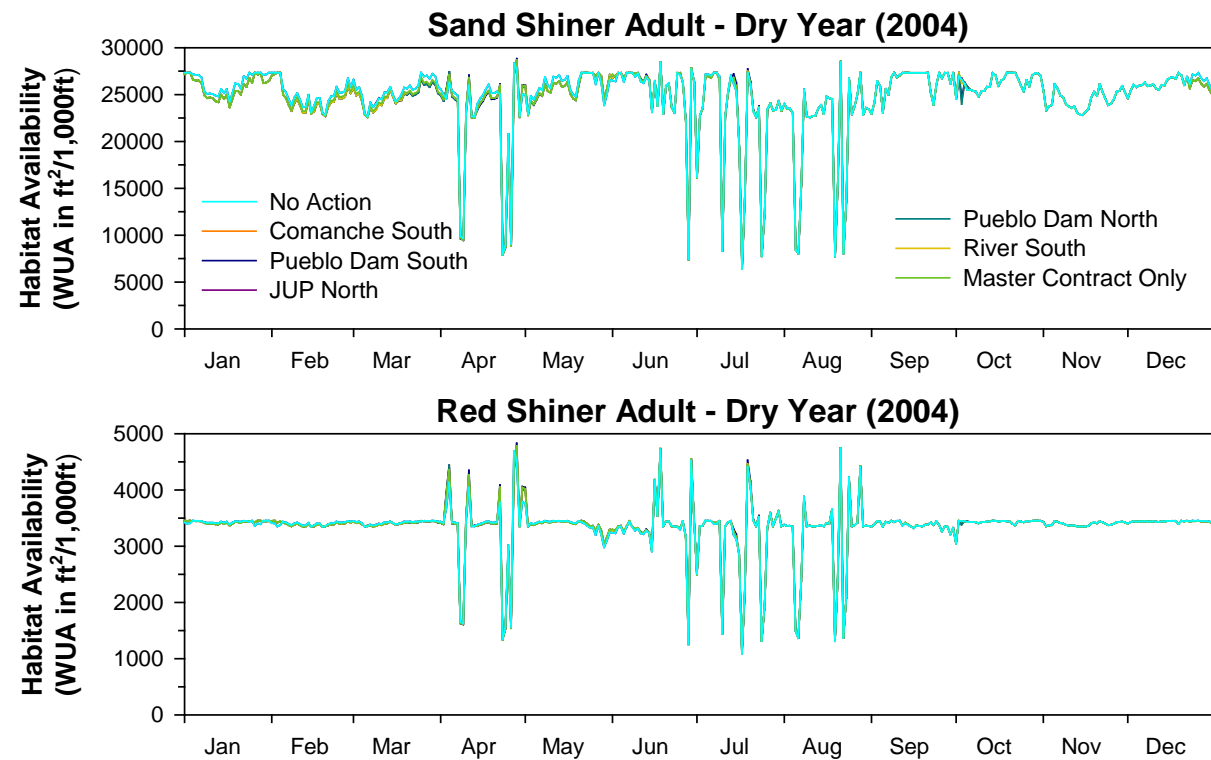


Figure 79. Direct Effects Sand Shiner (Adult) and Red Shiner (Adult) Habitat Availability (WUA [$\text{ft}^2/1,000\text{ft}$]) for Seven Alternatives during a Dry Year for Segment 4 of Fountain Creek

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

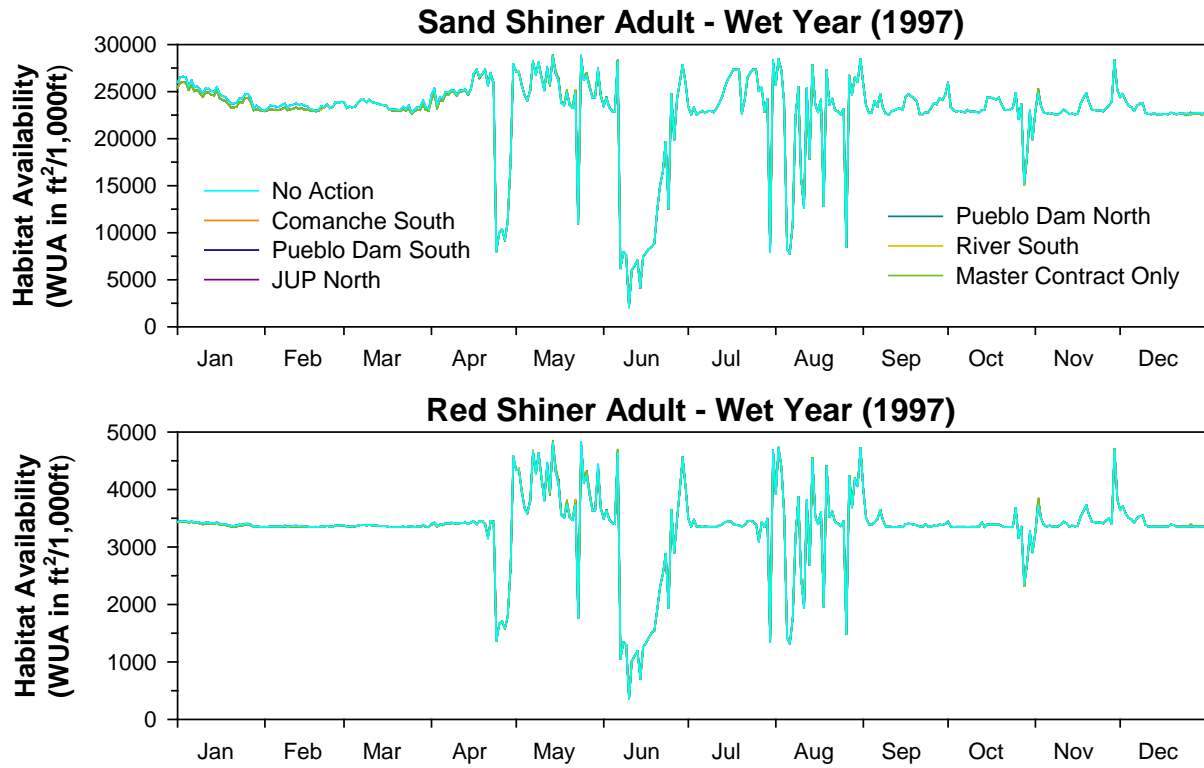









Figure 80. Direct Effects Sand Shiner (Adult) and Red Shiner (Adult) Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 4 of Fountain Creek








Arkansas Valley Conduit EIS

Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 19. Direct Effects Summary of the Percent Change in Minimum Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for White Sucker, Flathead Chub, Sand Shiner (Adult), and Red Shiner (Adult), Fountain Creek Segment 4

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	0	0	0	0	0	0	0
spawning	27,379	27,362	27,362	27,379	27,362	27,362	27,362
fry	226	227	227	226	227	227	227
Flathead chub							
adult/juvenile	3,989	4,013	4,013	3,989	4,004	4,008	4,008
spawning	1,576	1,574	1,573	1,576	1,574	1,574	1,574
fry	6,697	6,737	6,737	6,697	6,721	6,729	6,729
Sand shiner	3,846	3,869	3,869	3,846	3,859	3,864	3,864
Red shiner	485	488	488	485	487	488	488
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	<1%	<1%	0%	<1%	<1%	<1%
spawning	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
fry	--	<1%	<1%	0%	<1%	<1%	<1%
Flathead chub							
adult/juvenile	--	<1%	<1%	0%	<1%	<1%	<1%
spawning	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
fry	--	<1%	<1%	0%	<1%	<1%	<1%
Sand shiner	--	<1%	<1%	0%	<1%	<1%	<1%
Red shiner	--	<1%	<1%	0%	<1%	<1%	<1%
Dry Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	0	1	1	0	1	1	1
spawning	5,899	5,889	5,887	5,899	5,889	5,889	5,889
fry	592	595	595	592	595	595	595
Flathead chub							
adult/juvenile	23,076	23,068	23,049	23,076	23,068	23,068	23,068
spawning	1,365	1,369	1,369	1,365	1,374	1,369	1,369
fry	14,105	14,109	14,109	14,105	14,109	14,109	14,109
Sand shiner	6,418	6,416	6,410	6,418	6,416	6,415	6,415
Red shiner	1,087	1,087	1,086	1,087	1,087	1,087	1,087
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	3%	3%	0%	3%	7%	3%
spawning	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
fry	--	<1%	<1%	0%	<1%	<1%	<1%








Arkansas Valley Conduit EIS
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Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Flathead chub							
adult/juvenile	--	<1%	<1%	0%	<1%	<1%	<1%
spawning	--	<1%	<1%	0%	<1%	<1%	<1%
fry	--	<1%	<1%	0%	<1%	<1%	<1%
Sand shiner	--	<1%	<1%	0%	<1%	<1%	<1%
Red shiner	--	<1%	<1%	0%	<1%	<1%	<1%
Wet Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	1	1	1	1	1	1	1
spawning	5,978	5,976	5,976	5,978	5,977	5,976	5,977
fry	201	201	201	201	201	201	201
Flathead chub							
adult/juvenile	7,513	7,509	7,511	7,513	7,509	7,511	7,506
spawning	937	936	937	937	936	937	936
fry	7,471	7,466	7,469	7,471	7,466	7,469	7,463
Sand shiner	2,089	2,088	2,089	2,089	2,088	2,089	2,087
Red shiner	354	354	354	354	354	354	354
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	2%	2%	0%	2%	2%	2%
spawning	--	<1%	<1%	0%	<1%	<1%	<1%
fry	--	<1%	<1%	0%	<1%	<1%	<1%
Flathead chub							
adult/juvenile	--	<1%	<1%	0%	<1%	<1%	<1%
spawning	--	<1%	<1%	0%	<1%	<1%	<1%
fry	--	<1%	<1%	0%	<1%	<1%	<1%
Sand shiner	--	<1%	<1%	0%	<1%	<1%	<1%
Red shiner	--	<1%	<1%	0%	<1%	<1%	<1%








Arkansas Valley Conduit EIS

Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 20. Direct Effects Summary of the Percent Change in Median Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for White Sucker, Flathead Chub, Sand Shiner (Adult), and Red Shiner (Adult), Fountain Creek Segment 4

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	44	47	48	44	47	48	48
Spawning	36,147	34,978	34,954	36,147	34,982	34,986	34,985
fry	1,326	1,328	1,328	1,326	1,328	1,328	1,328
Flathead chub							
adult/juvenile	62,174	62,935	62,967	62,174	62,933	62,965	62,964
spawning	8,113	8,020	8,005	8,113	8,006	8,006	8,000
fry	42,805	42,817	42,817	42,805	42,813	42,815	42,815
Sand shiner	24,963	24,730	24,730	24,963	24,730	24,730	24,731
Red shiner	3,408	3,399	3,399	3,408	3,399	3,399	3,399
Change in Median Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	7%	8%	<1%	7%	8%	8%
spawning	--	-3%	-3%	0%	-3%	-3%	-3%
fry	--	<1%	<1%	0%	<1%	<1%	<1%
Flathead chub							
adult/juvenile	--	1%	1%	0%	1%	1%	1%
spawning	--	-1%	-1%	0%	-1%	-1%	-1%
fry	--	<1%	<1%	0%	<1%	<1%	<1%
Sand shiner	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
Red shiner	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
Dry Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	44	50	50	44	50	50	48
spawning	37,202	36,134	36,133	37,202	36,131	36,280	36,303
fry	1,356	1,458	1,459	1,356	1,458	1,459	1,482
Flathead chub							
adult/juvenile	61,708	62,845	62,945	61,708	62,844	62,670	62,668
spawning	8,609	8,591	8,597	8,609	8,591	8,589	8,596
fry	45,981	45,854	45,853	45,981	45,854	45,899	45,901
Sand shiner	25,575	25,337	25,313	25,575	25,337	25,367	25,368
Red shiner	3,416	3,408	3,407	3,416	3,408	3,410	3,412
Change in Median Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	13%	14%	0%	13%	13%	10%
spawning	--	-3%	-3%	0%	-3%	-2%	-2%
fry	--	8%	8%	<-1%	8%	8%	9%

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Flathead chub							
adult/juvenile	--	2%	2%	0%	2%	2%	2%
spawning	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
fry	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
Sand shiner	--	<-1%	-1%	0%	<-1%	<-1%	<-1%
Red shiner	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
Wet Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	83	83	83	83	83	83	83
spawning	33,261	33,261	33,261	33,261	33,261	33,261	33,261
fry	2,206	2,172	2,168	2,206	2,162	2,191	2,191
Flathead chub							
adult/juvenile	71,043	71,088	71,088	71,043	71,088	71,088	71,088
spawning	6,564	6,691	6,691	6,564	6,691	6,672	6,691
fry	37,845	37,824	37,845	37,845	37,824	37,845	37,845
Sand shiner	23,519	23,363	23,353	23,519	23,371	23,353	23,380
Red shiner	3,380	3,375	3,375	3,380	3,375	3,375	3,375
Change in Median Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	<1%	<1%	0%	<1%	<1%	<1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	-2%	-2%	0%	-2%	<-1%	<-1%
Flathead chub							
adult/juvenile	--	<1%	<1%	0%	<1%	<1%	<1%
spawning	--	2%	2%	0%	2%	2%	2%
fry	--	<-1%	0%	0%	<-1%	0%	0%
Sand shiner	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
Red shiner	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%

Cumulative Effects

Upper Arkansas River, Upstream of Pueblo Reservoir

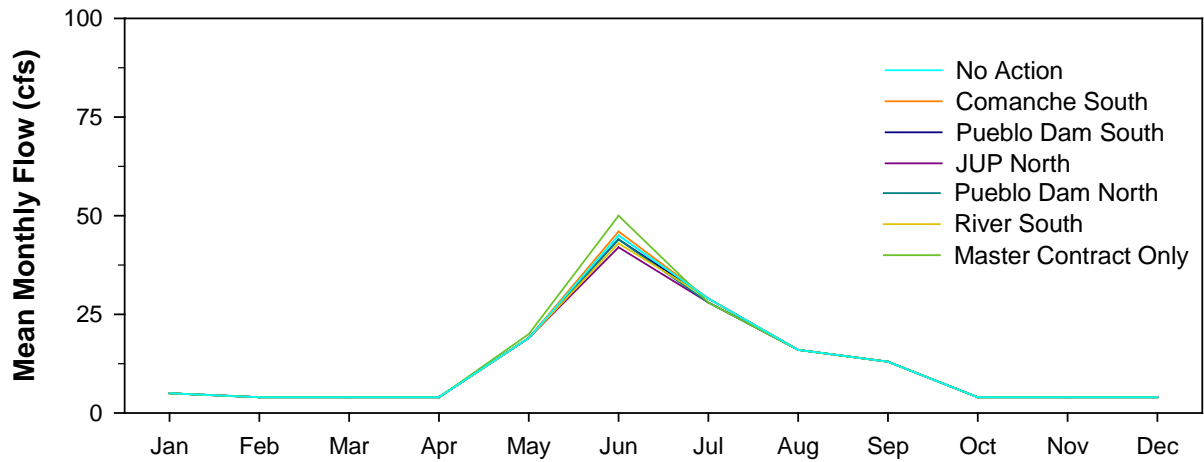


Figure 81. Cumulative Effects Mean Monthly Streamflow for All Alternatives in Lake Fork Creek

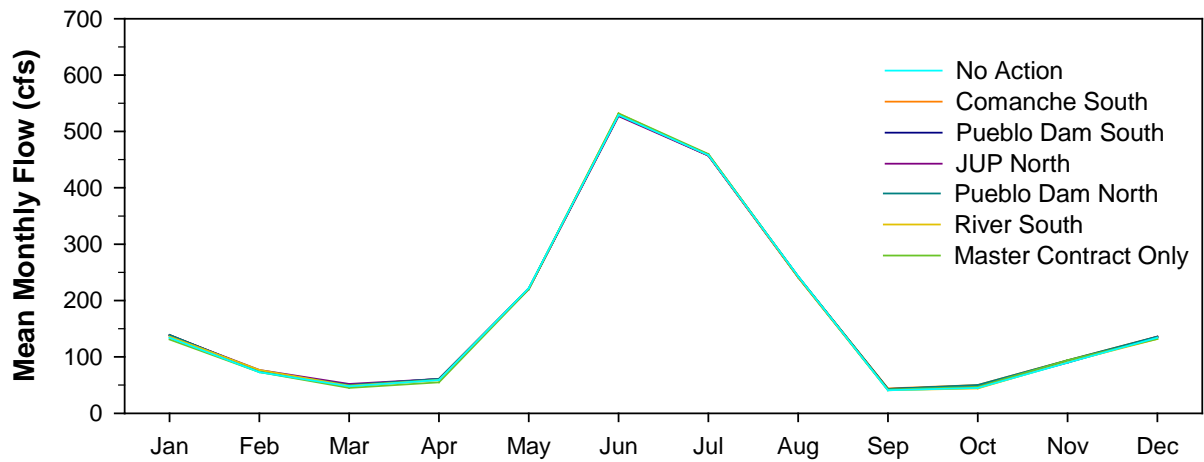


Figure 82. Cumulative Effects Mean Monthly Streamflow for All Alternatives in Lake Creek

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

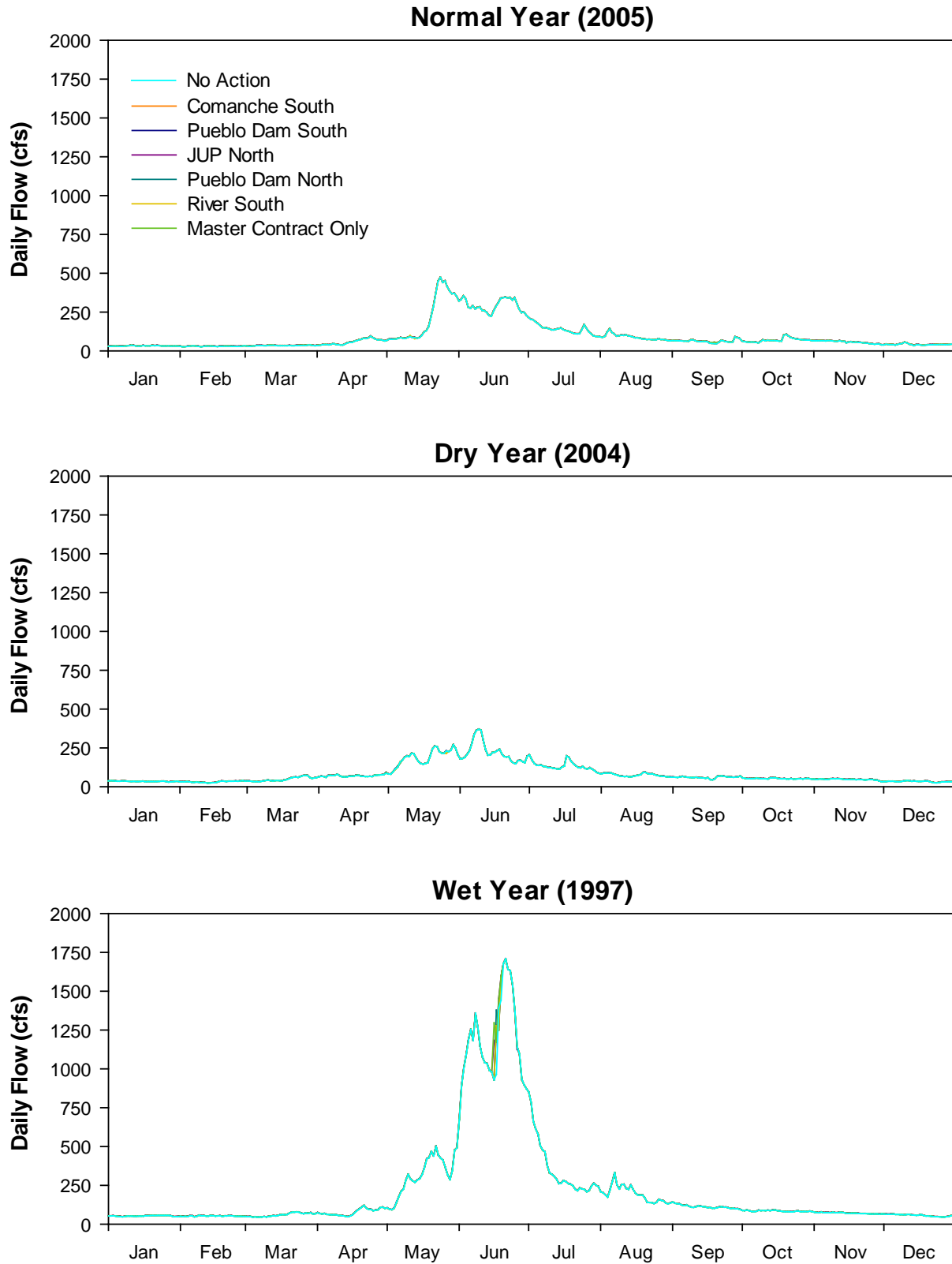


Figure 83. Cumulative Effects Daily Hydrology for All Alternatives for Segment 1 of the Upper Arkansas River at the Malta Gage

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

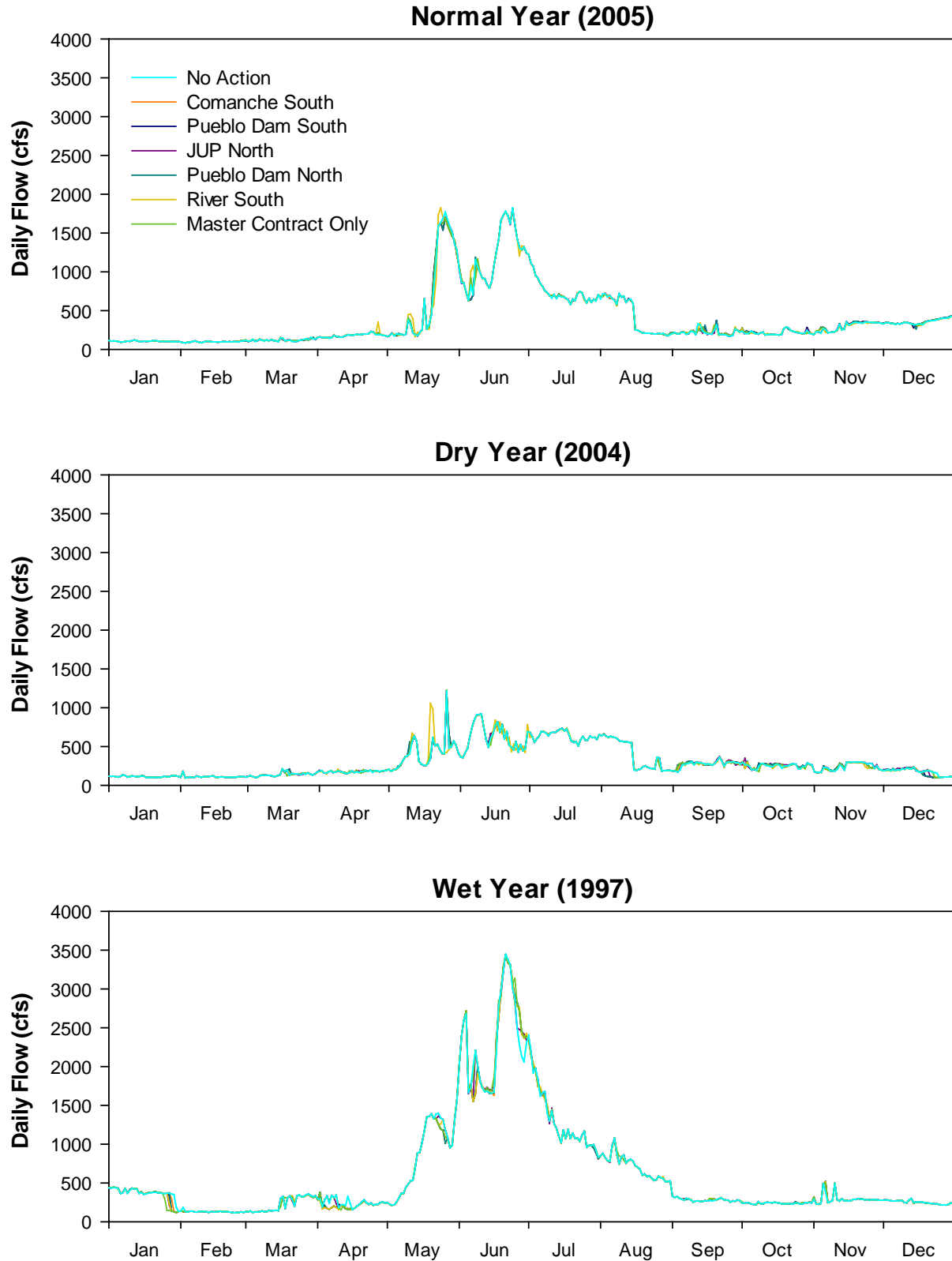


Figure 84. Cumulative Effects Daily Hydrology for All Alternatives for Segment 2 of the Upper Arkansas River at the Buena Vista Gage

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

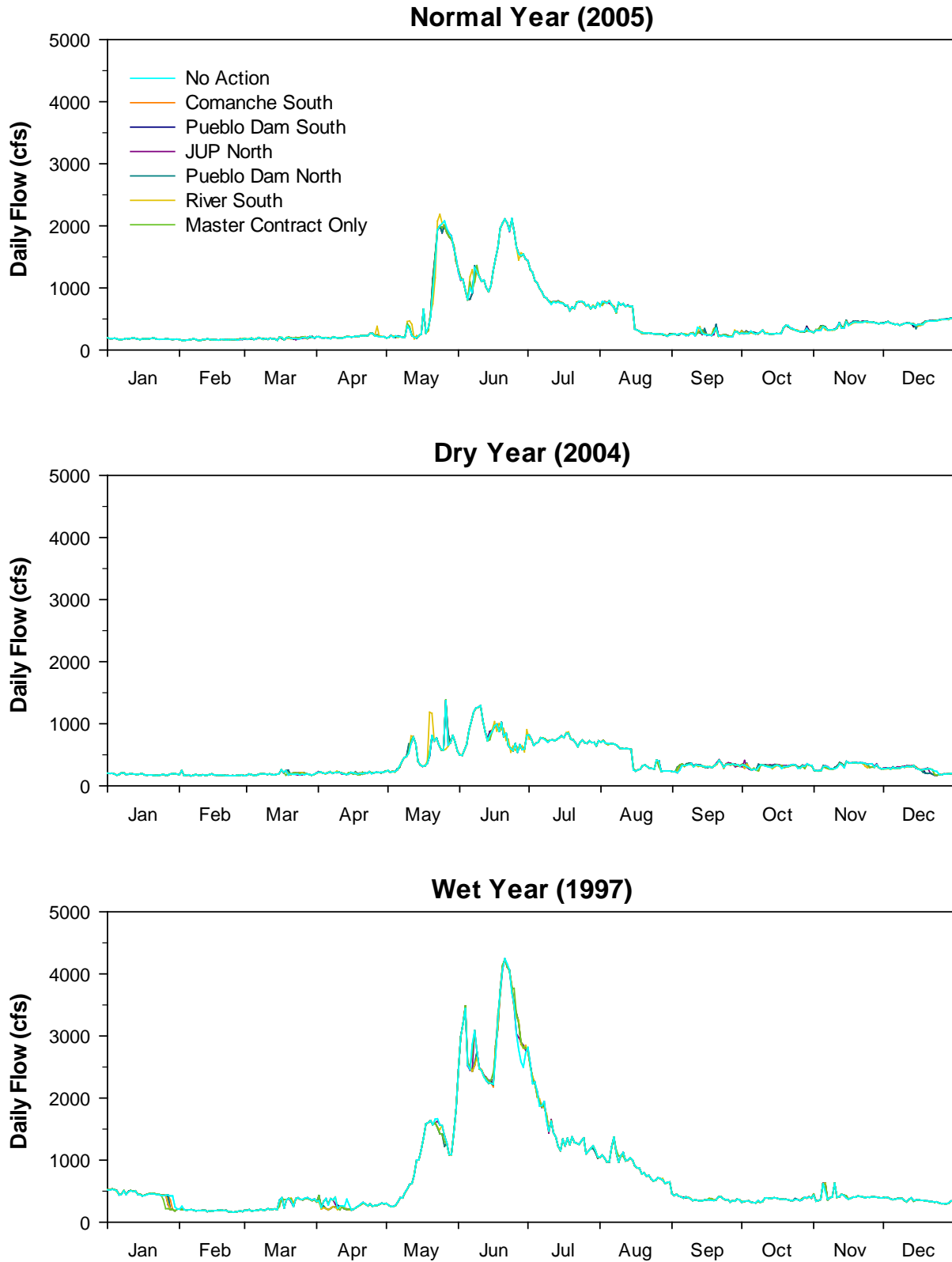


Figure 85. Cumulative Effects Daily Hydrology for All Alternatives for Segment 3 of the Upper Arkansas River at the Nathrop Gage

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

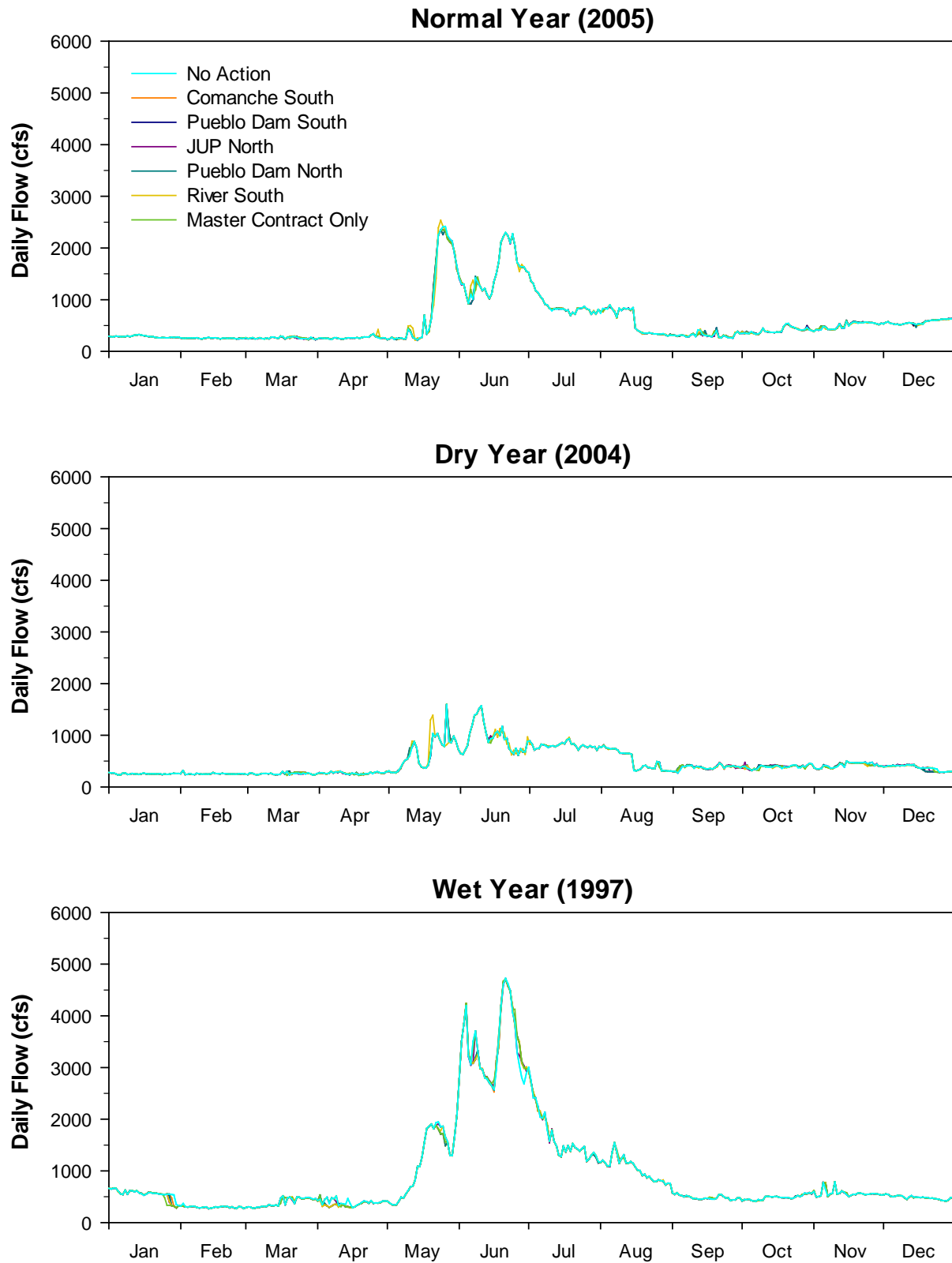


Figure 86. Cumulative Effects Daily Hydrology for All Alternatives for Segment 4 and Segment 5 of the Upper Arkansas River at the Wellsville Gage

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

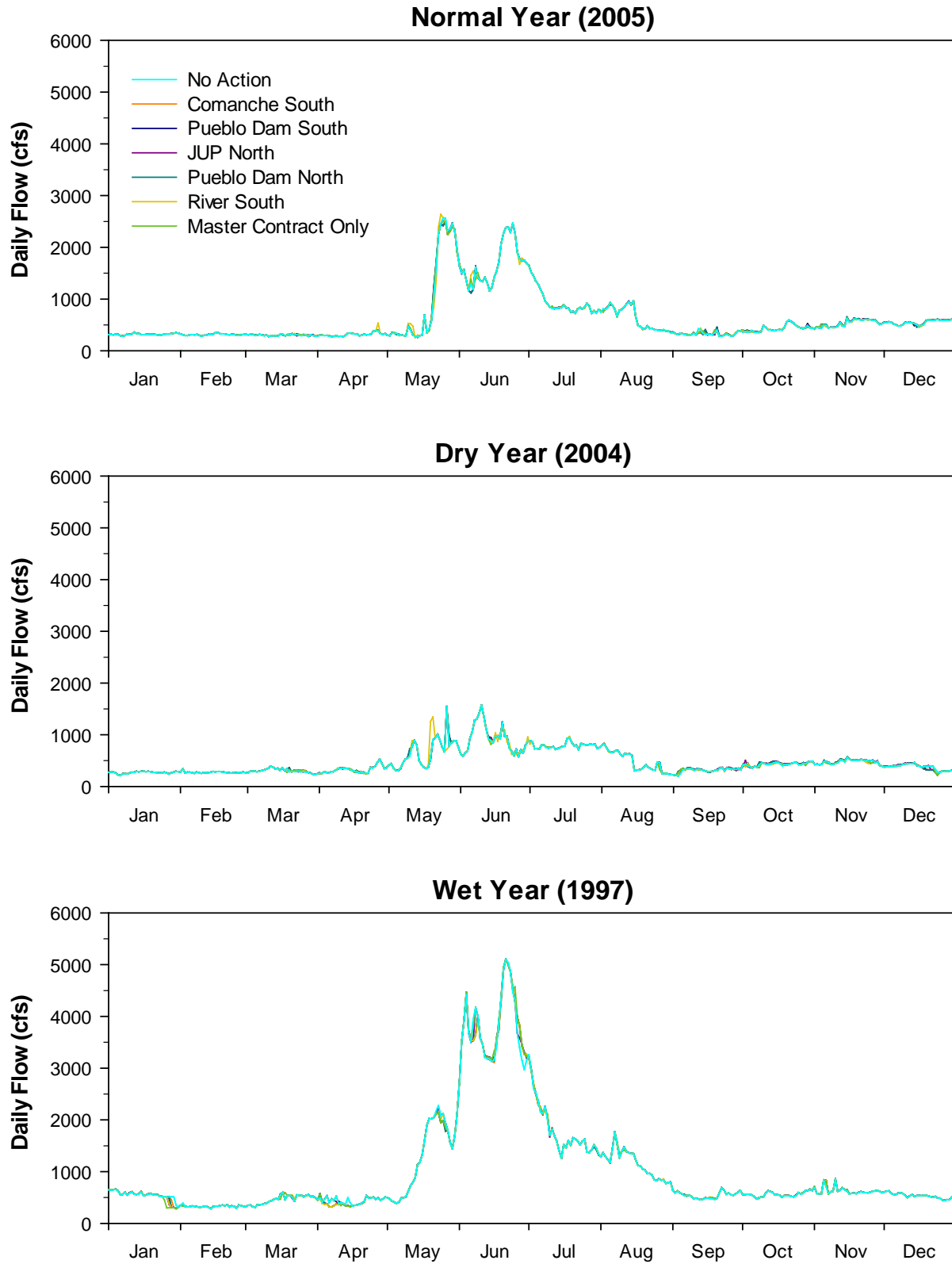


Figure 87. Cumulative Effects Daily Hydrology for All Alternatives for Segment 6 of the Upper Arkansas River at the Parkdale Gage

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

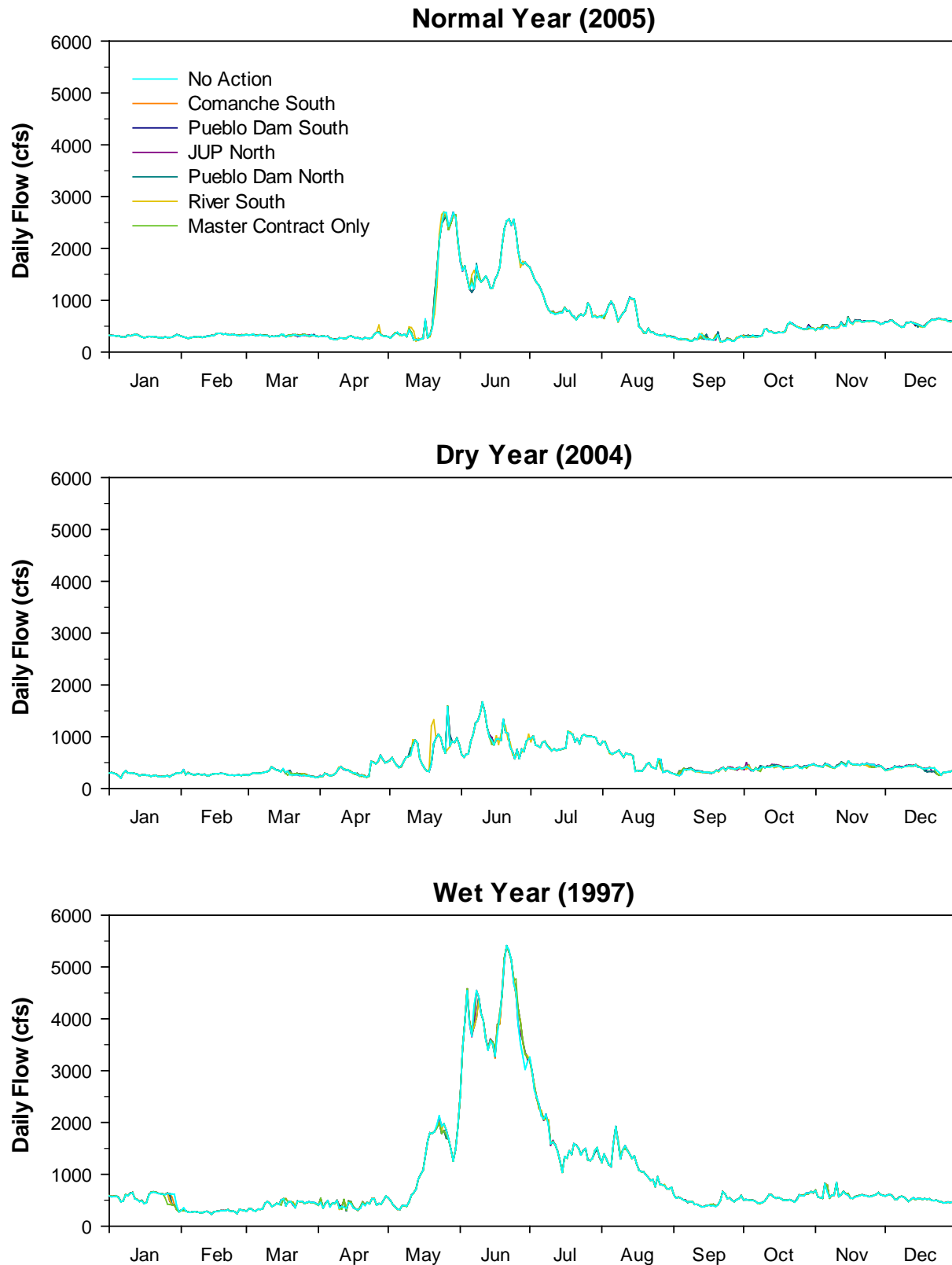


Figure 88. Cumulative Effects Daily Hydrology for All Alternatives for Segment 7 of the Upper Arkansas River at the Portland Gage

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

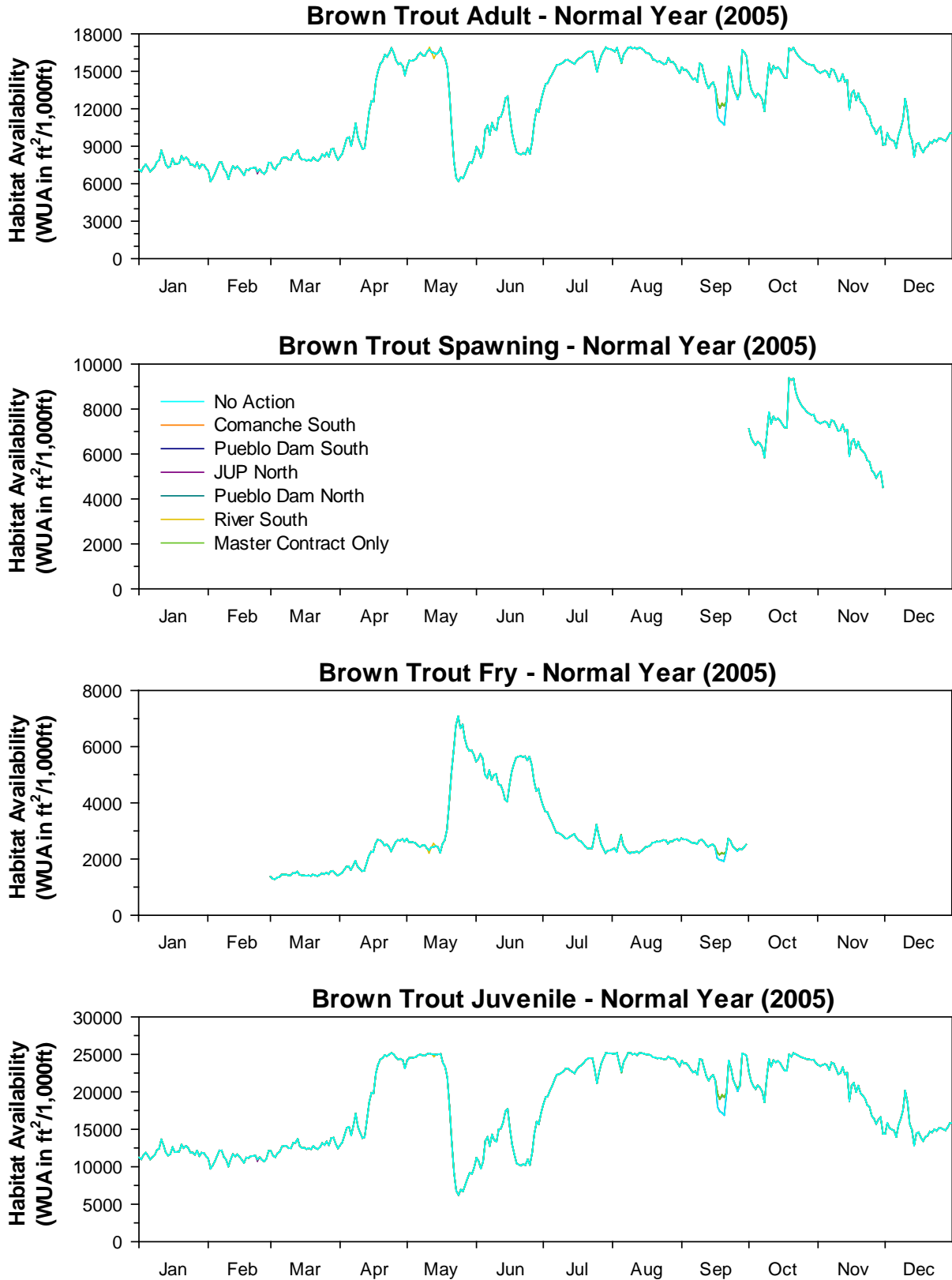


Figure 89. Cumulative Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [$\text{ft}^2/1,000\text{ft}$]) for Seven Alternatives during a Normal Year for Segment 1 of the Upper Arkansas River

Arkansas Valley Conduit EIS
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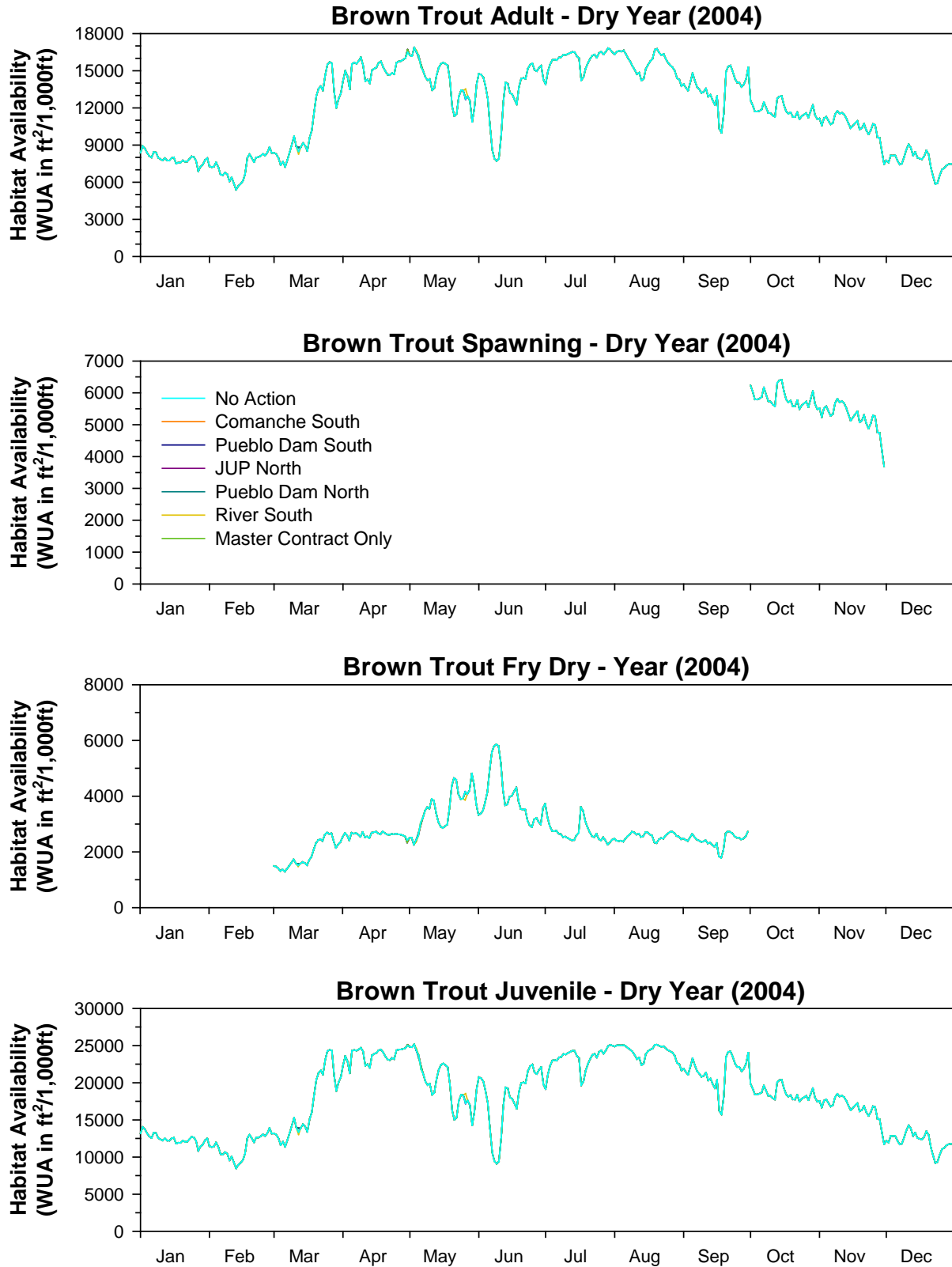


Figure 90. Cumulative Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 1 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

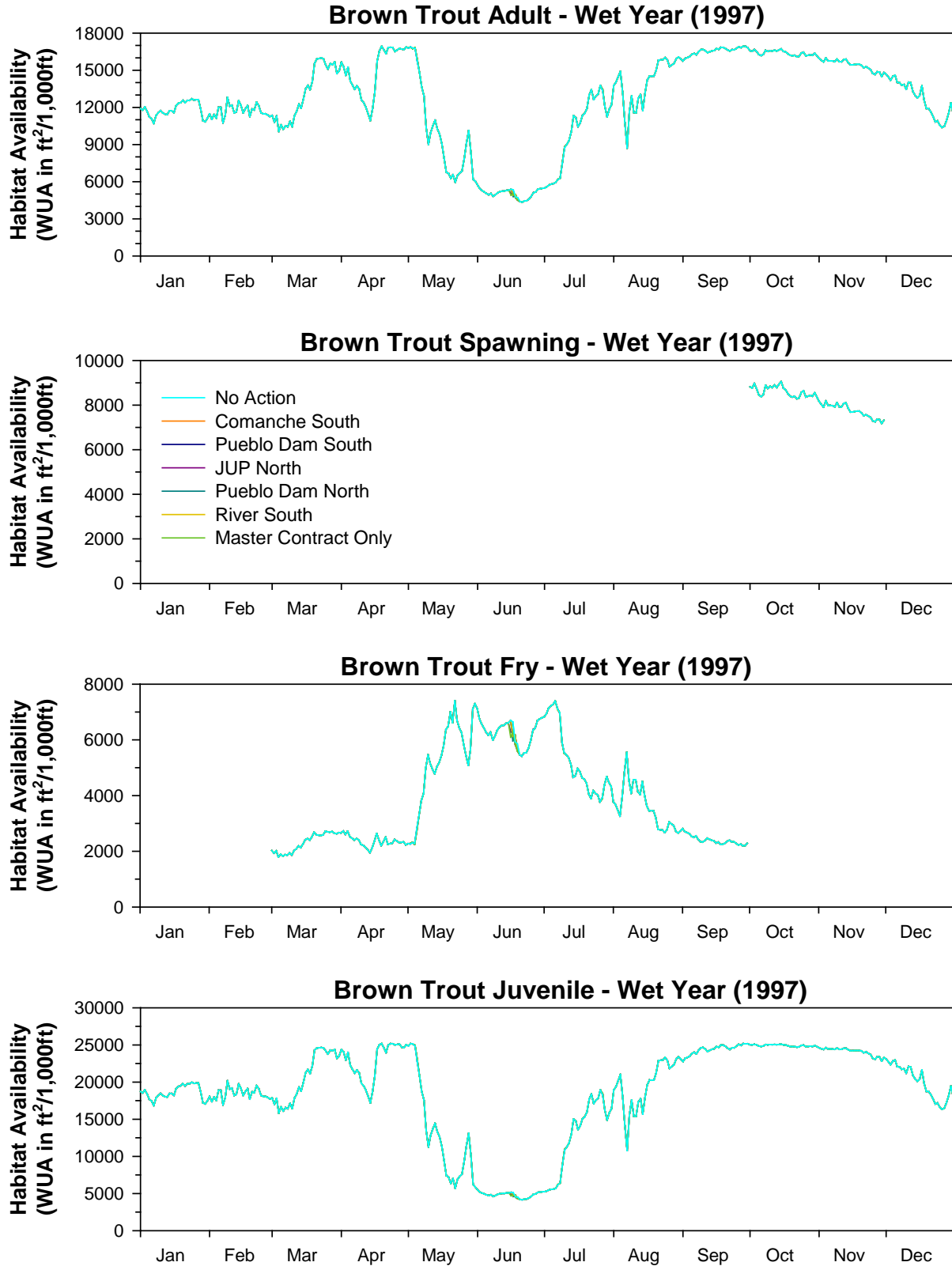


Figure 91. Cumulative Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 1 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

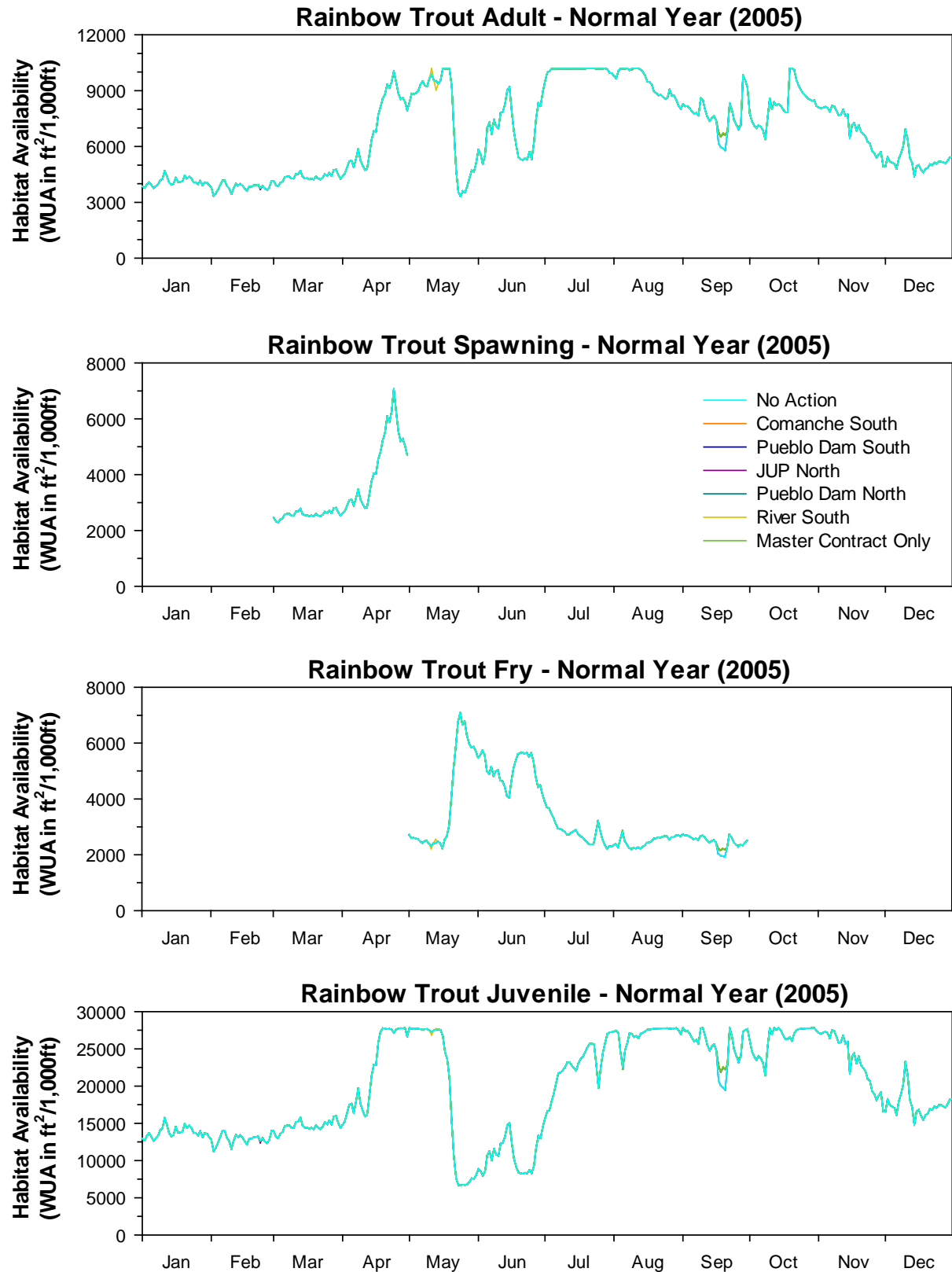


Figure 92. Cumulative Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 1 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

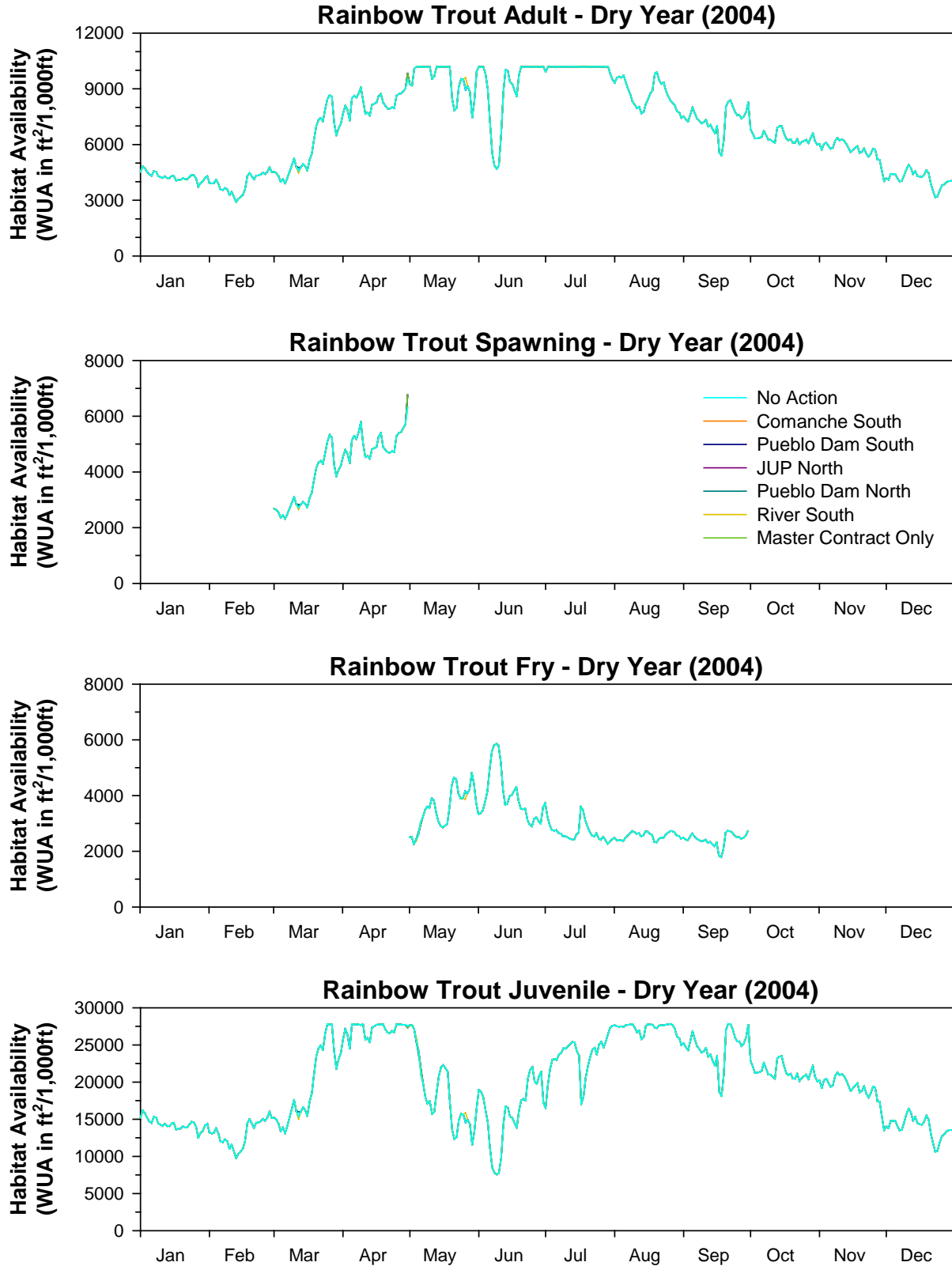


Figure 93. Cumulative Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 1 of the Upper Arkansas River

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

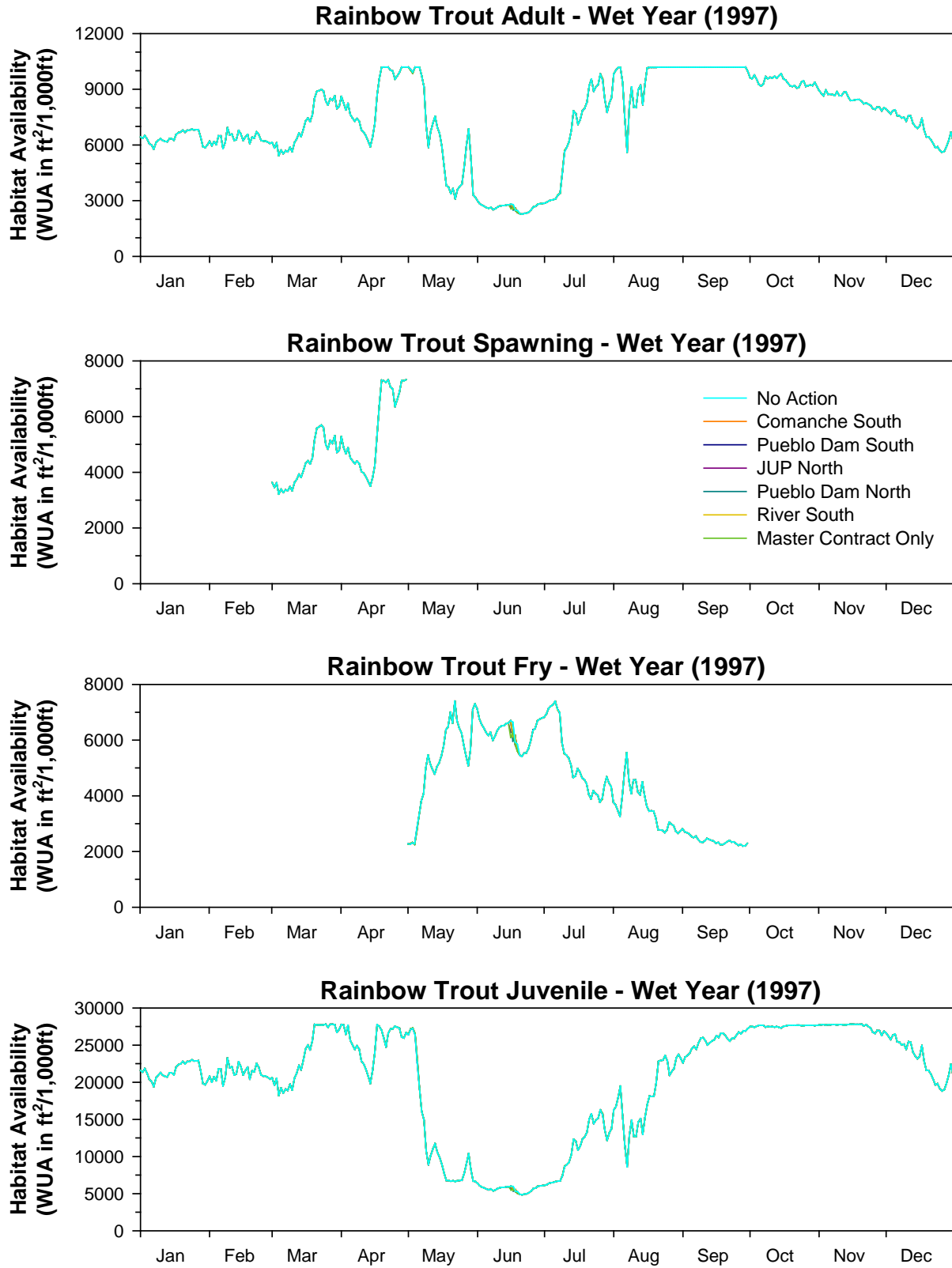


Figure 94. Cumulative Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 1 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

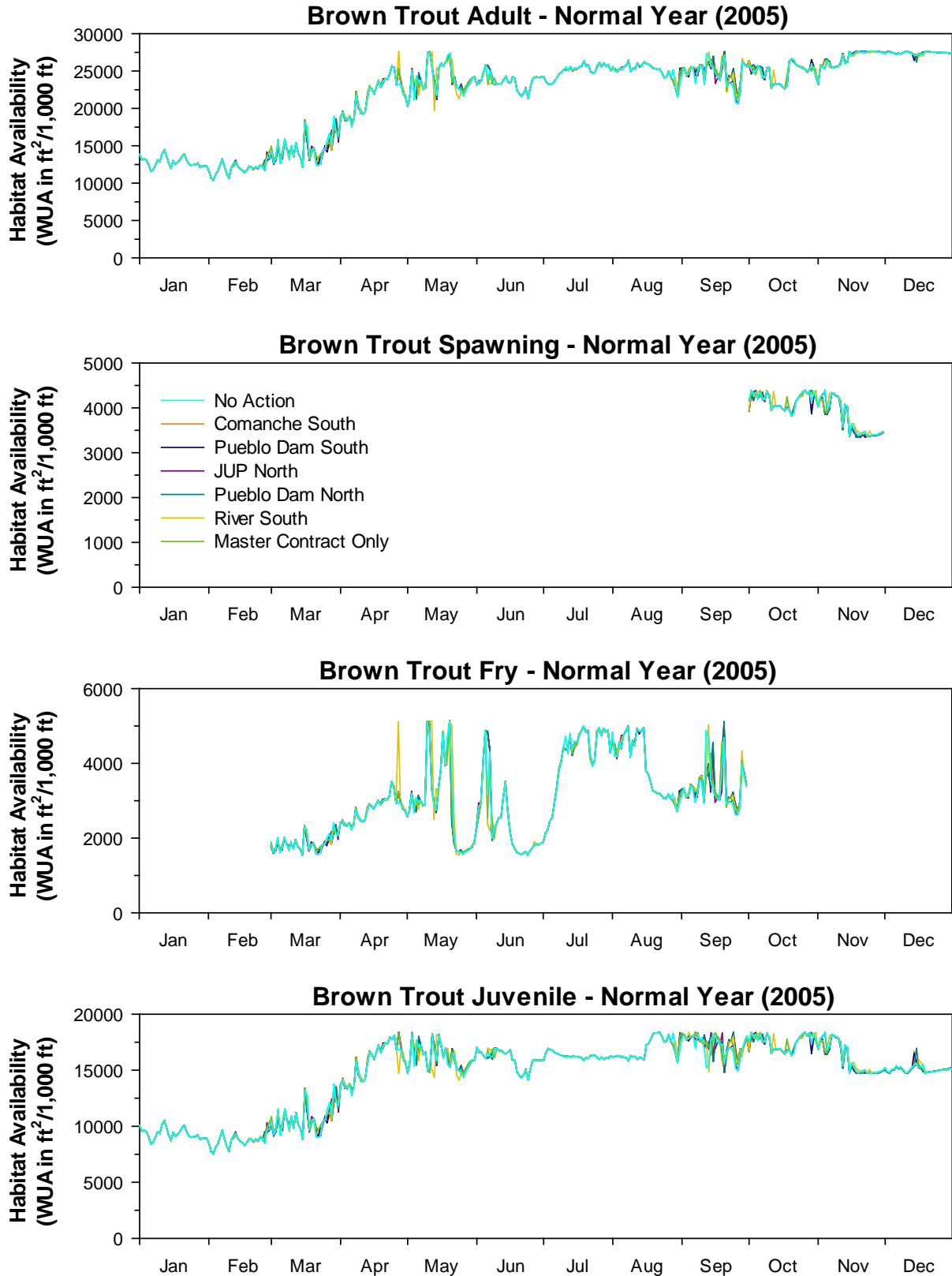


Figure 95. Cumulative Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 2 of the Upper Arkansas River

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

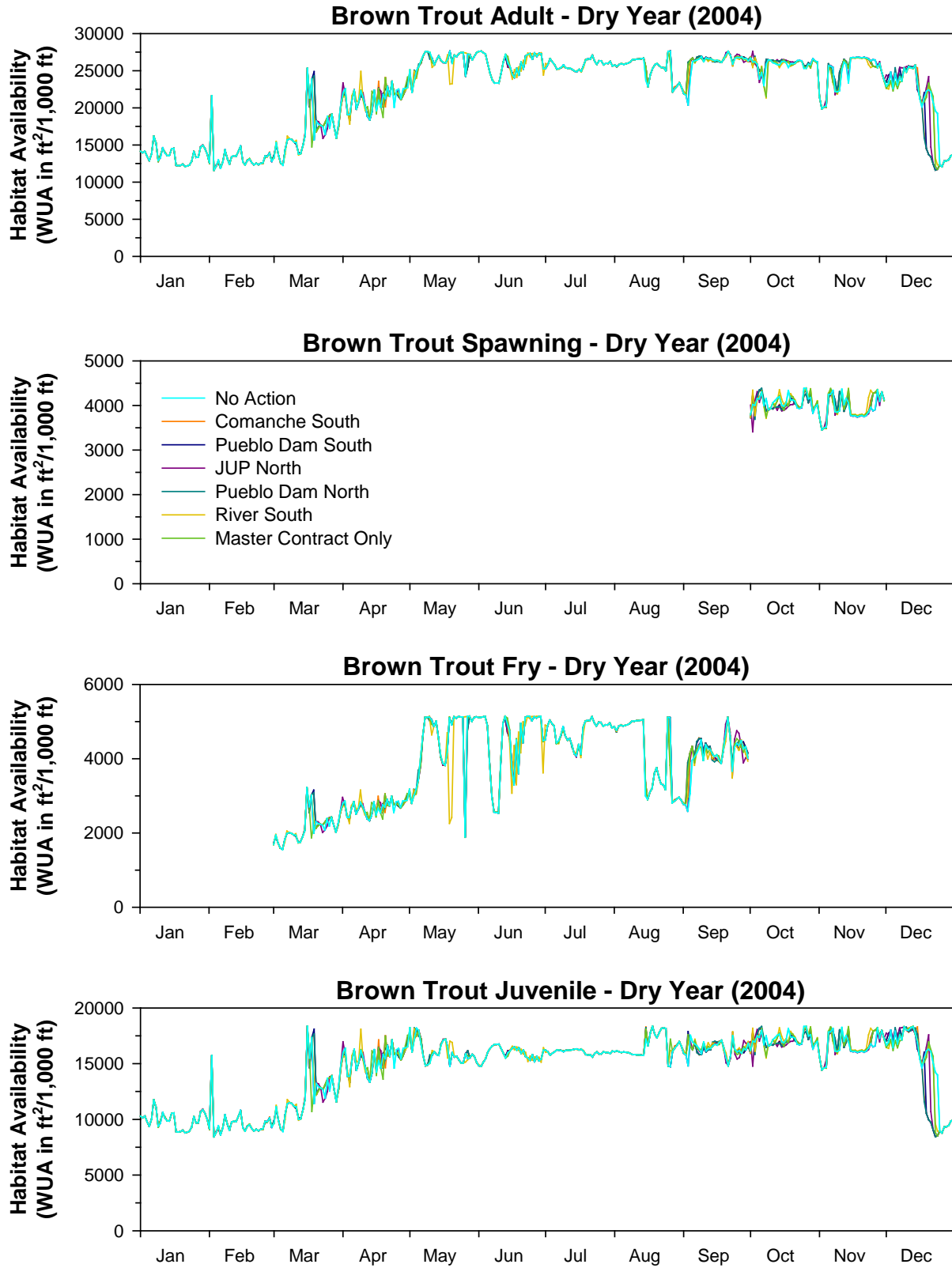


Figure 96. Cumulative Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 2 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

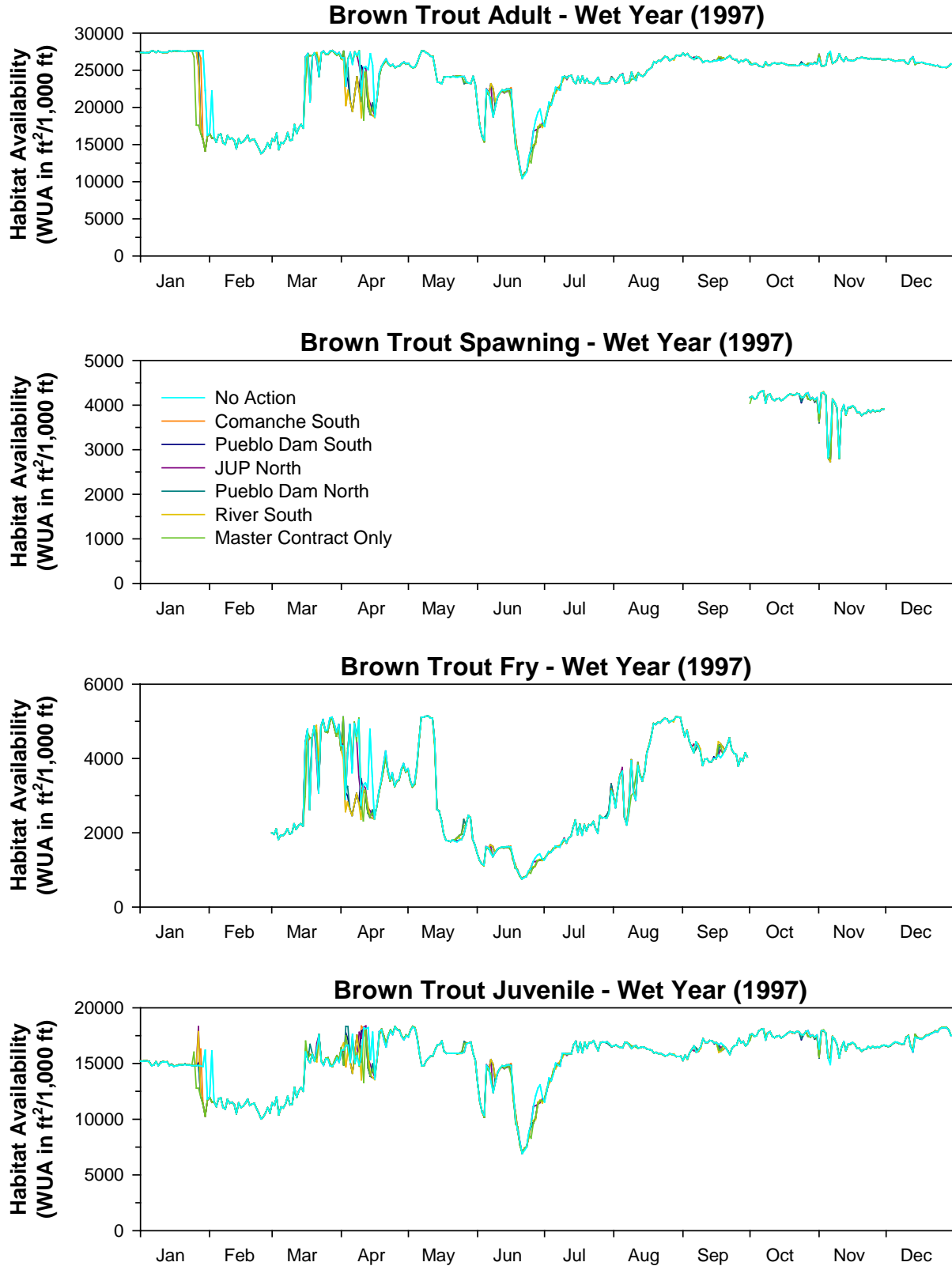


Figure 97. Cumulative Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 2 of the Upper Arkansas River

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

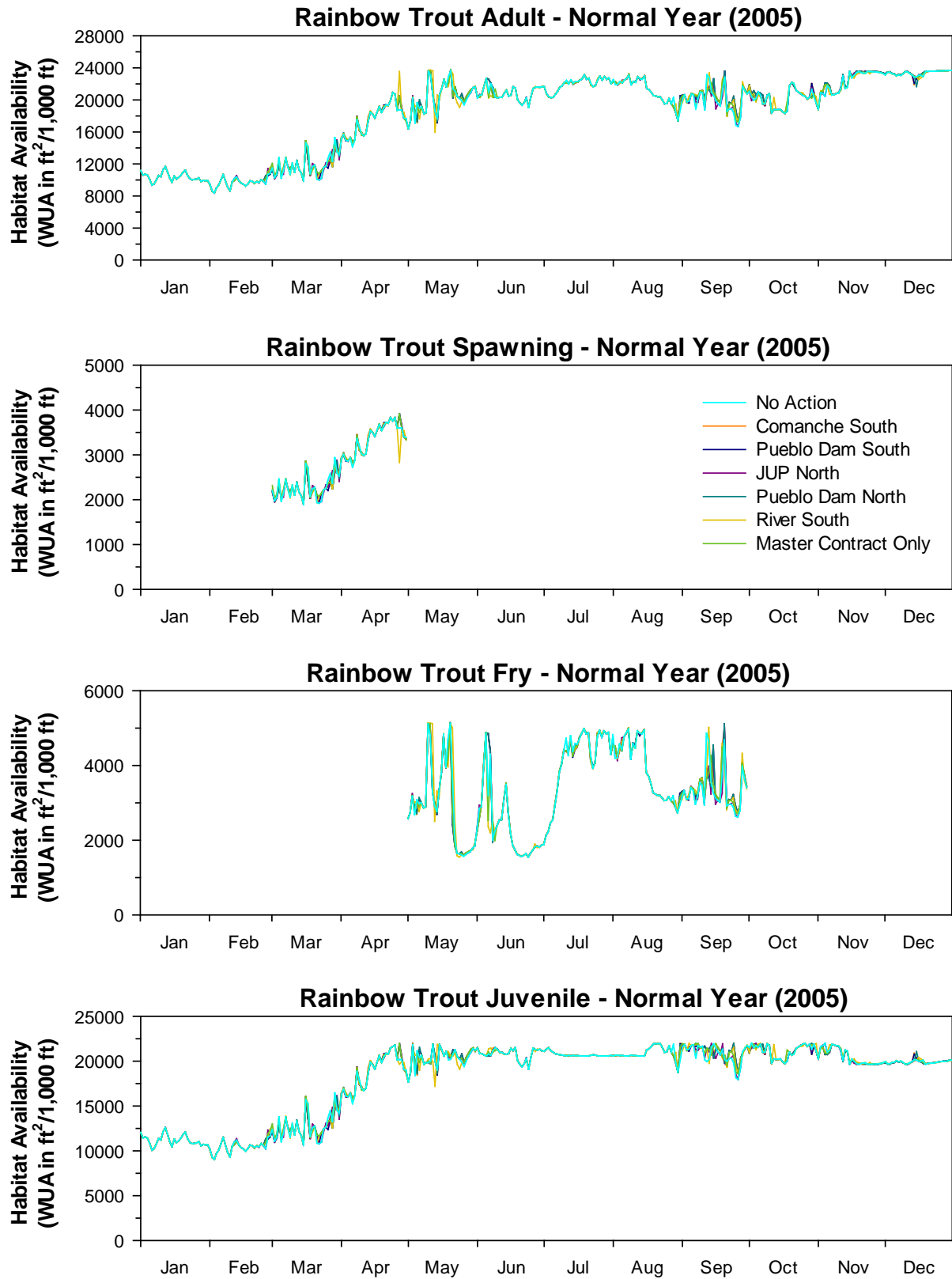


Figure 98. Cumulative Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 2 of the Upper Arkansas River

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

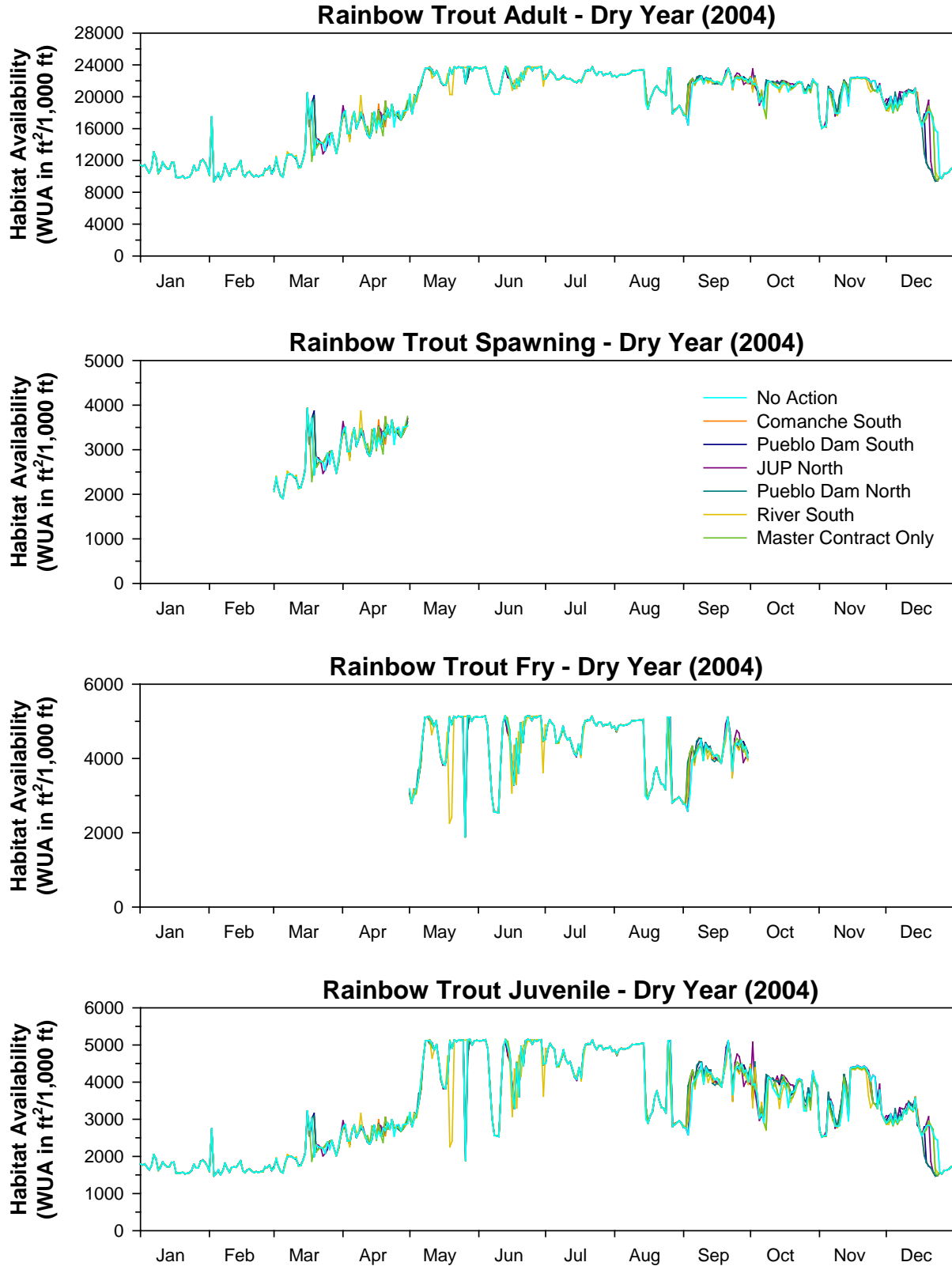


Figure 99. Cumulative Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 2 of the Upper Arkansas River

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

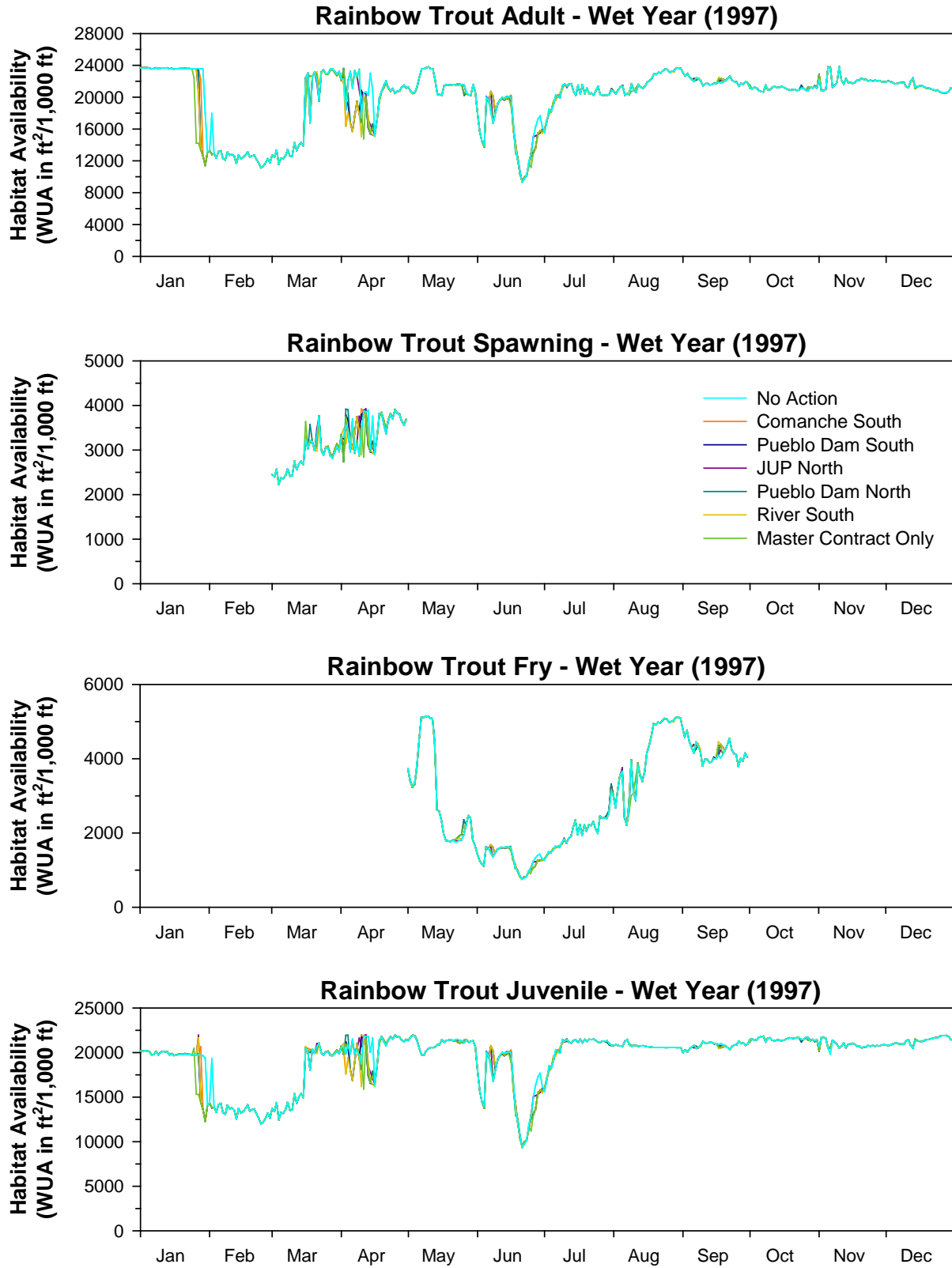


Figure 100. Cumulative Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 2 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

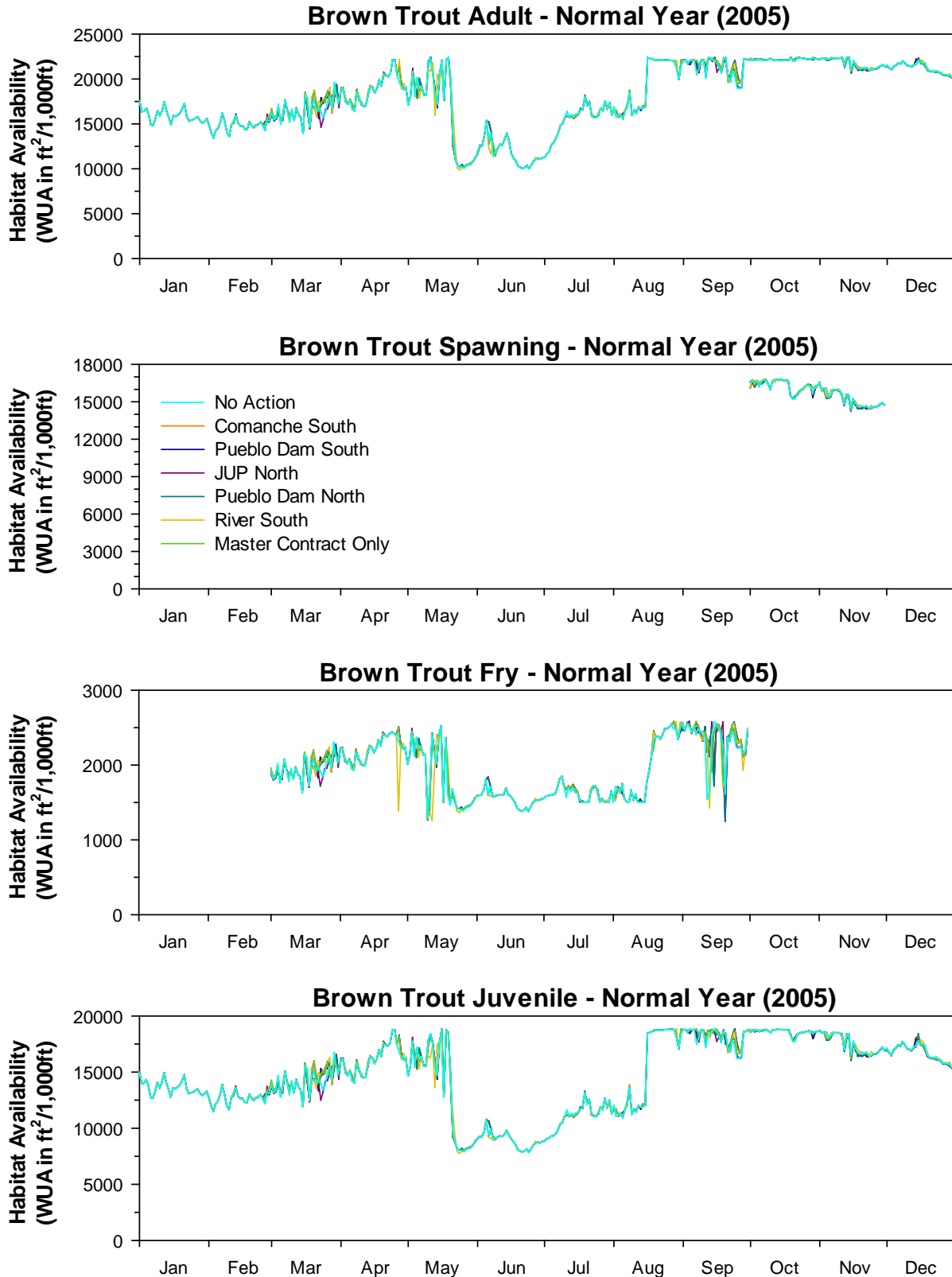


Figure 101. Cumulative Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 3 of the Upper Arkansas River

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

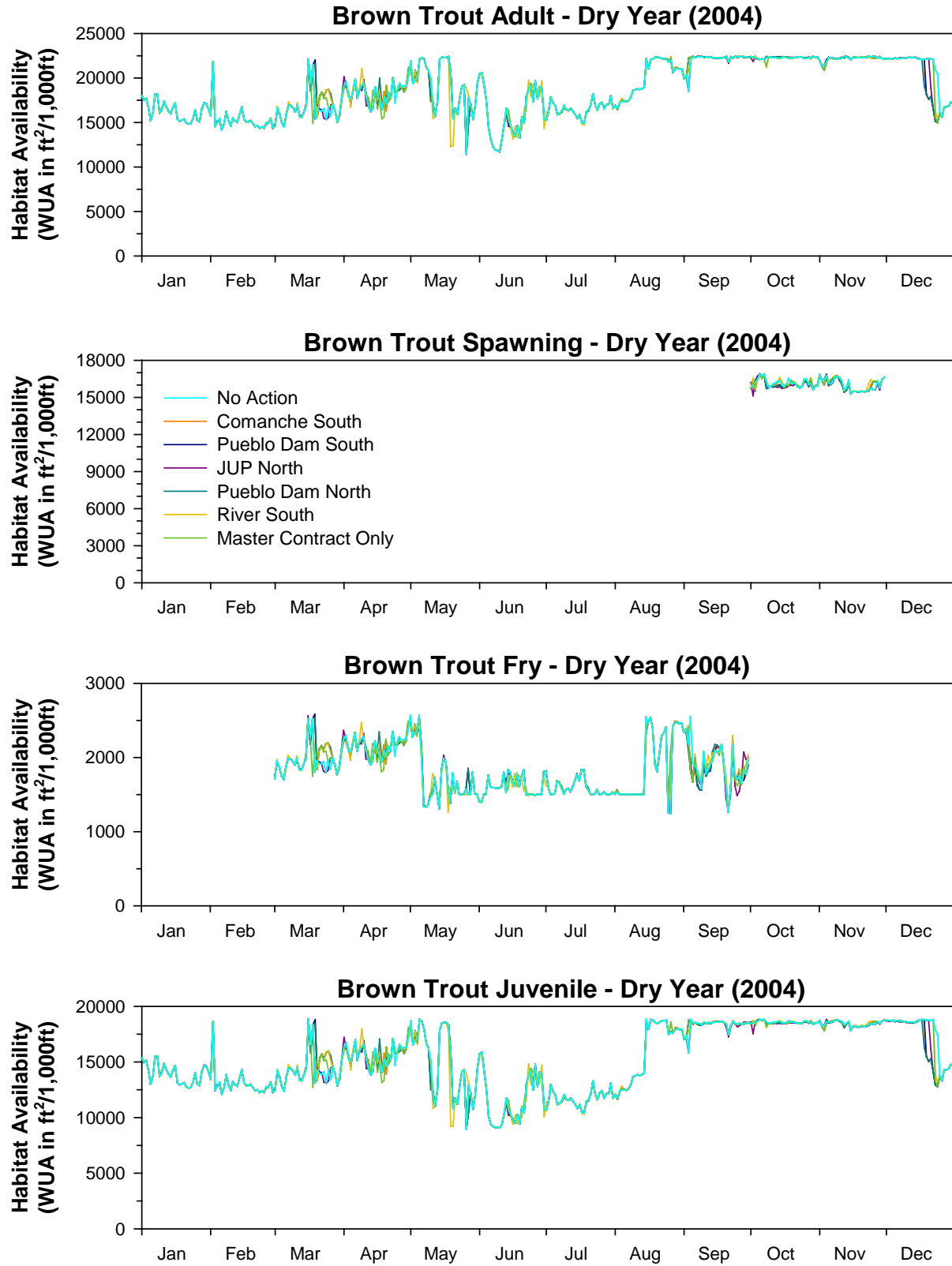


Figure 102. Cumulative Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 3 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

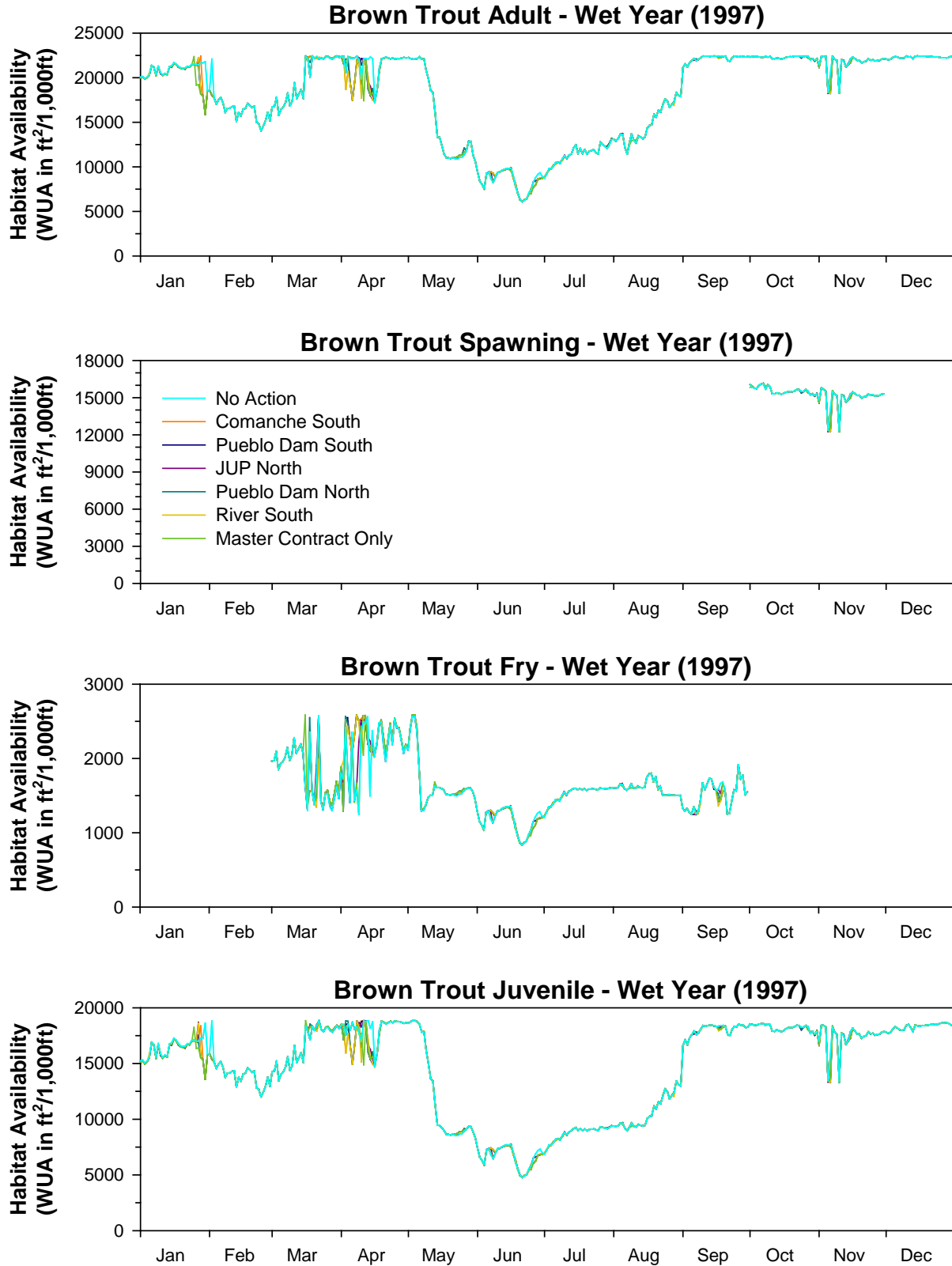


Figure 103. Cumulative Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 3 of the Upper Arkansas River

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

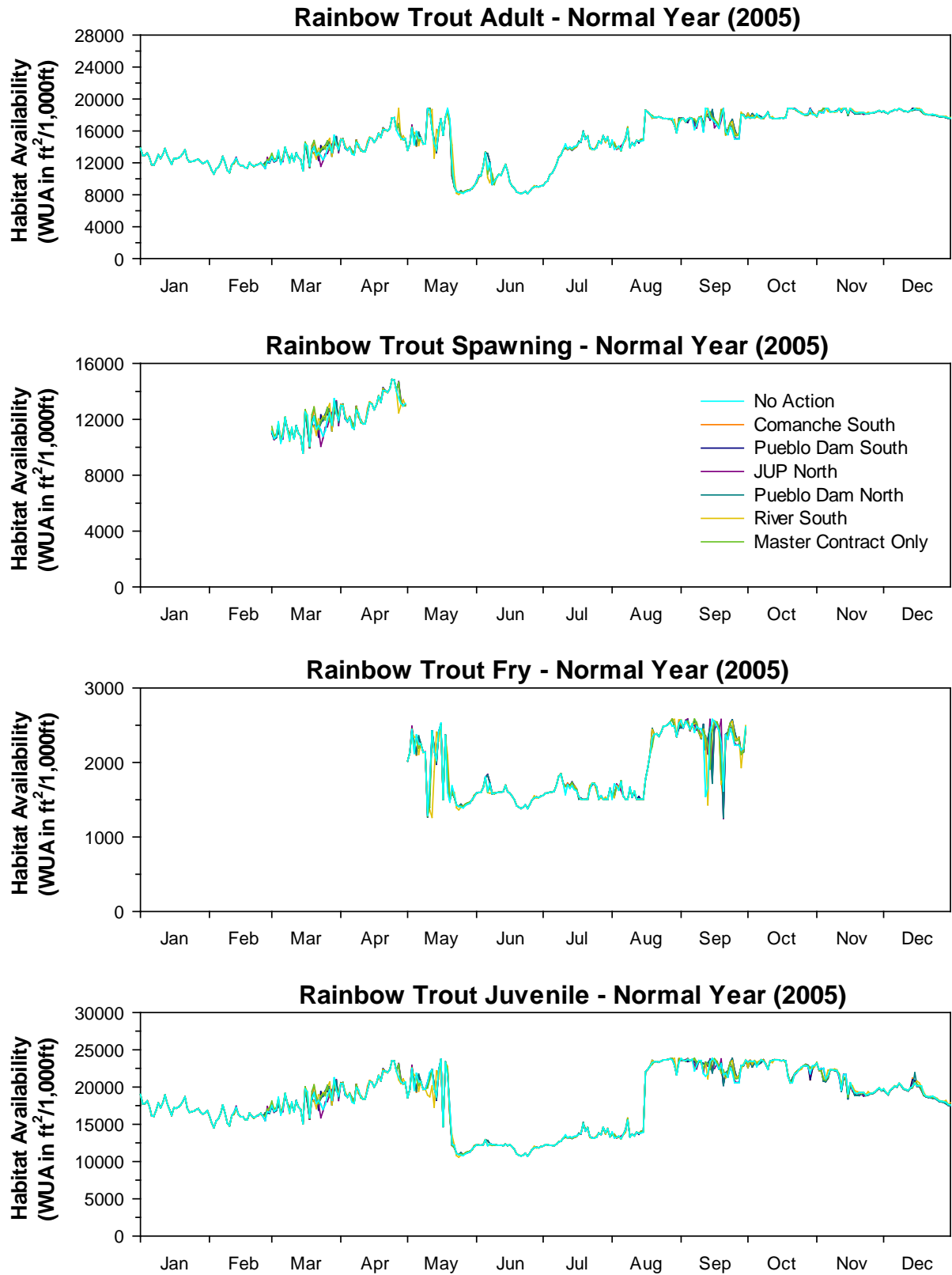


Figure 104. Cumulative Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 3 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

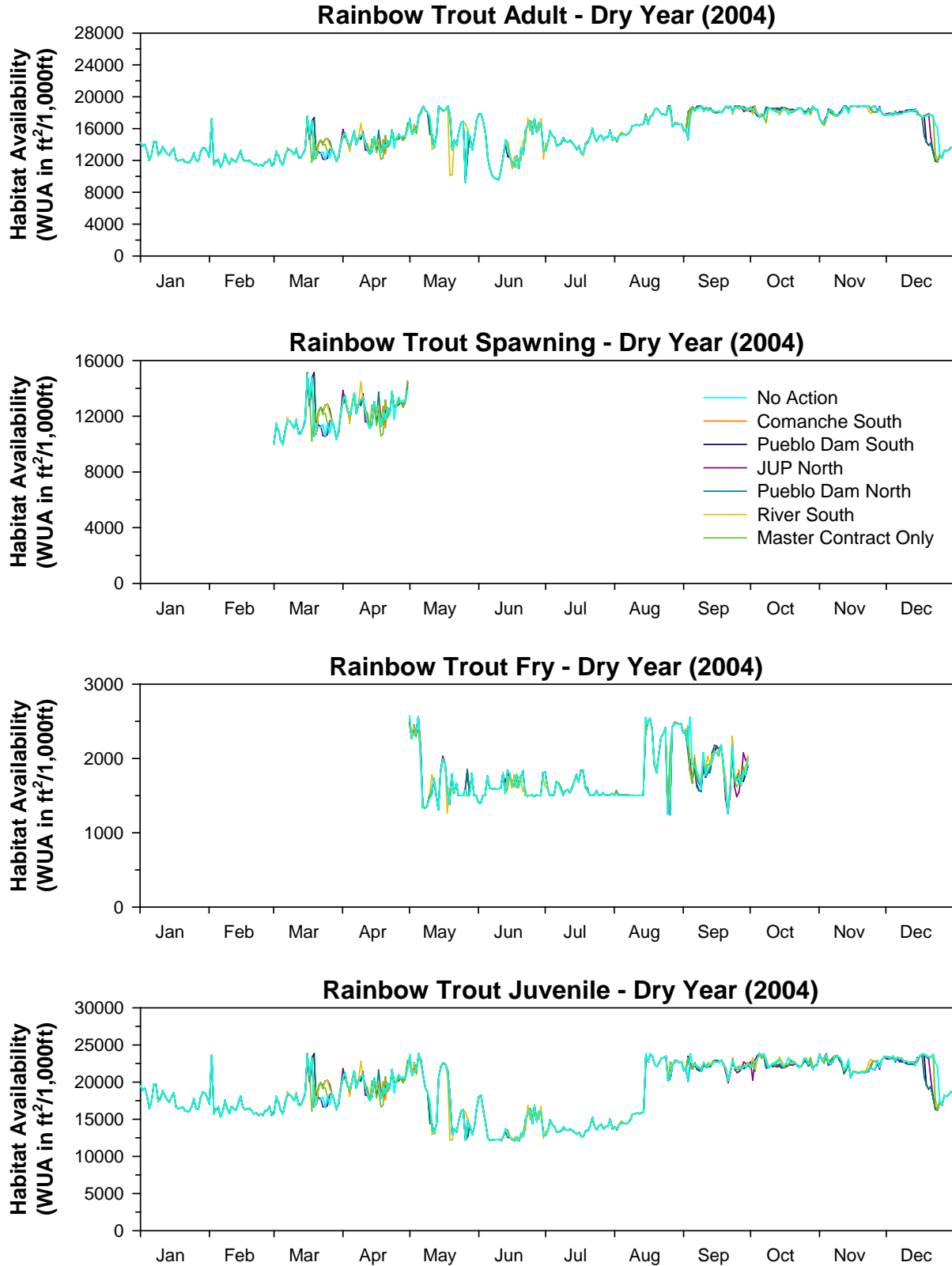


Figure 105. Cumulative Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 3 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

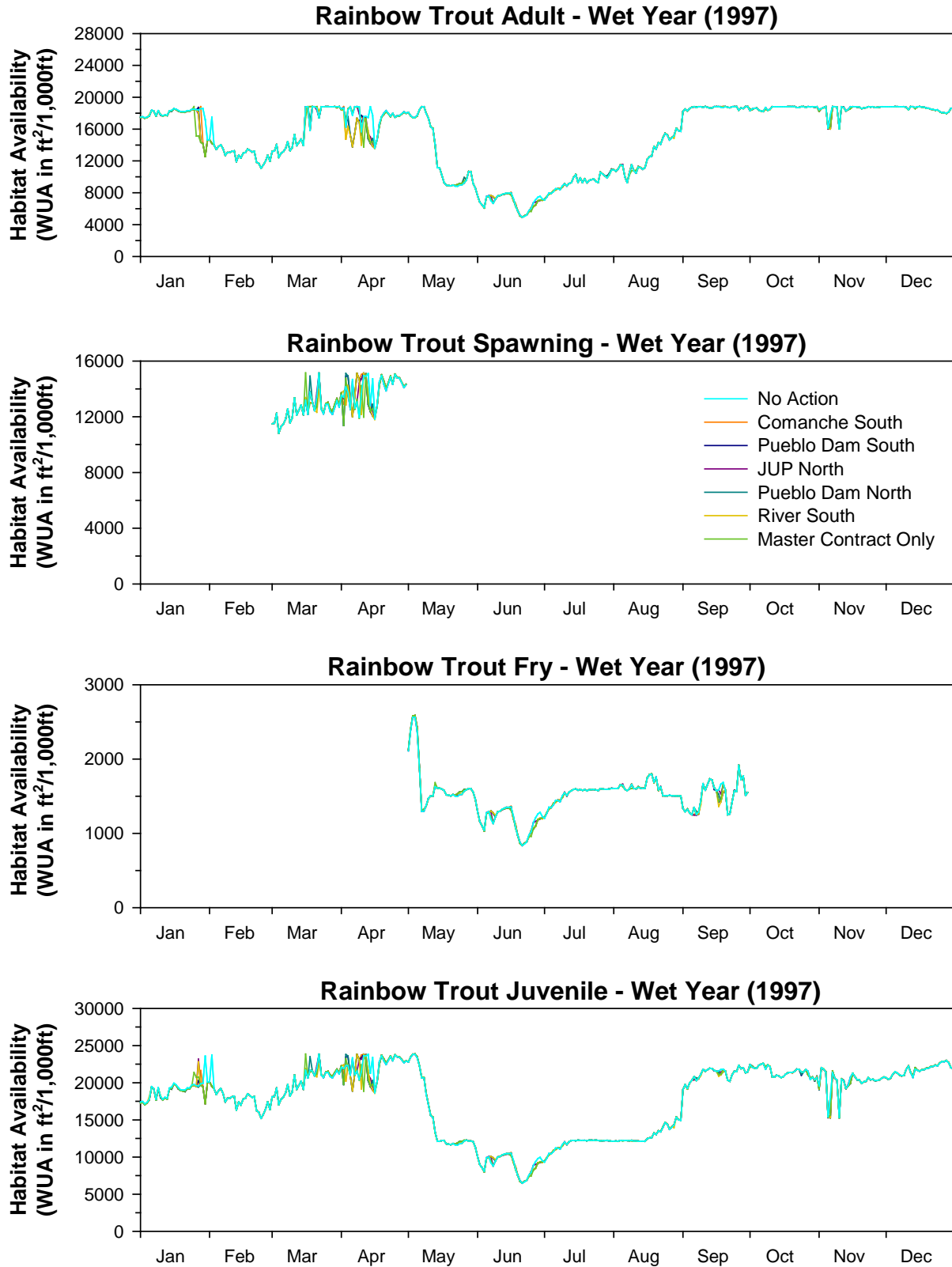


Figure 106. Cumulative Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 3 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

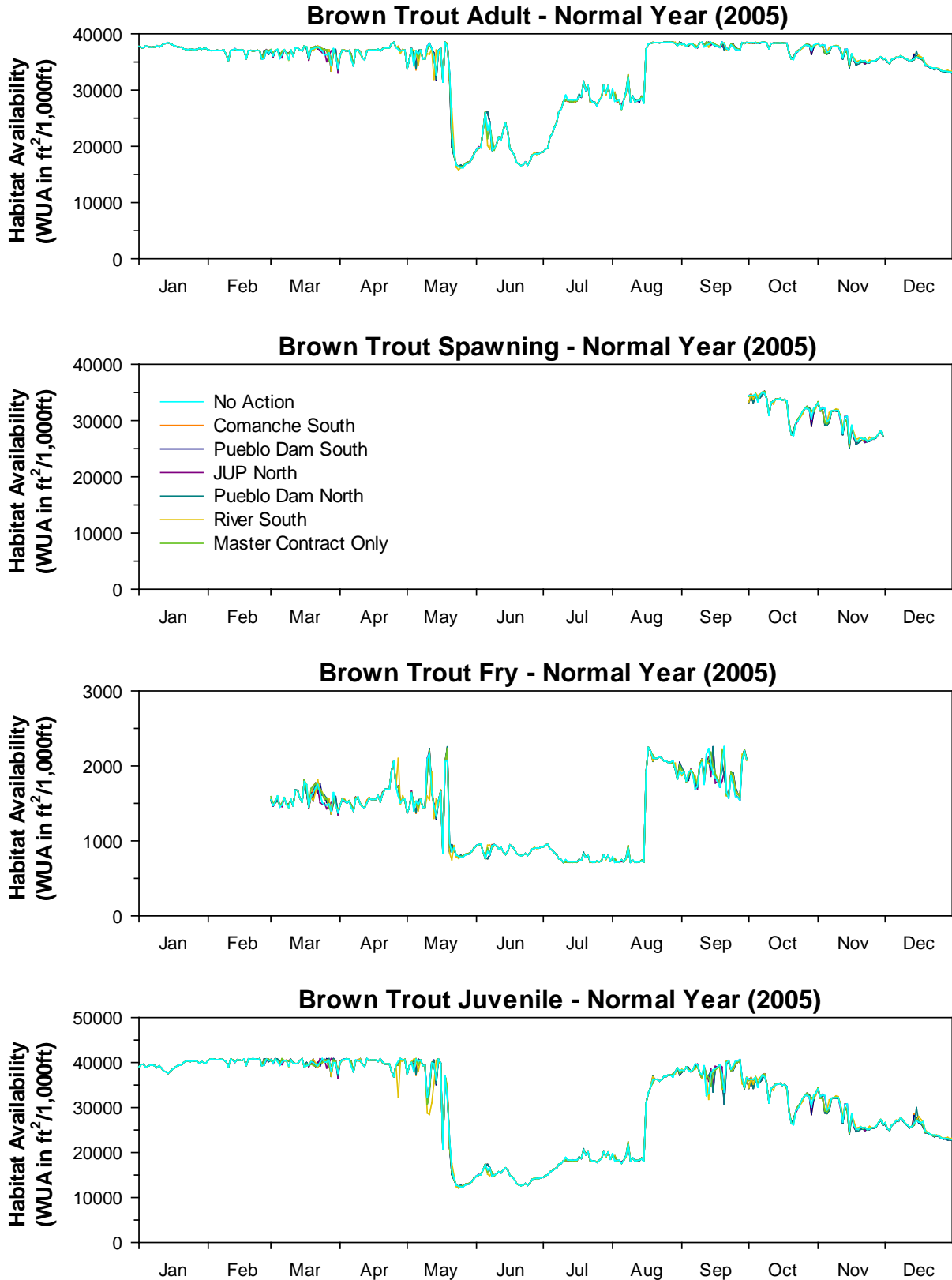


Figure 107. Cumulative Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 4 of the Upper Arkansas River

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

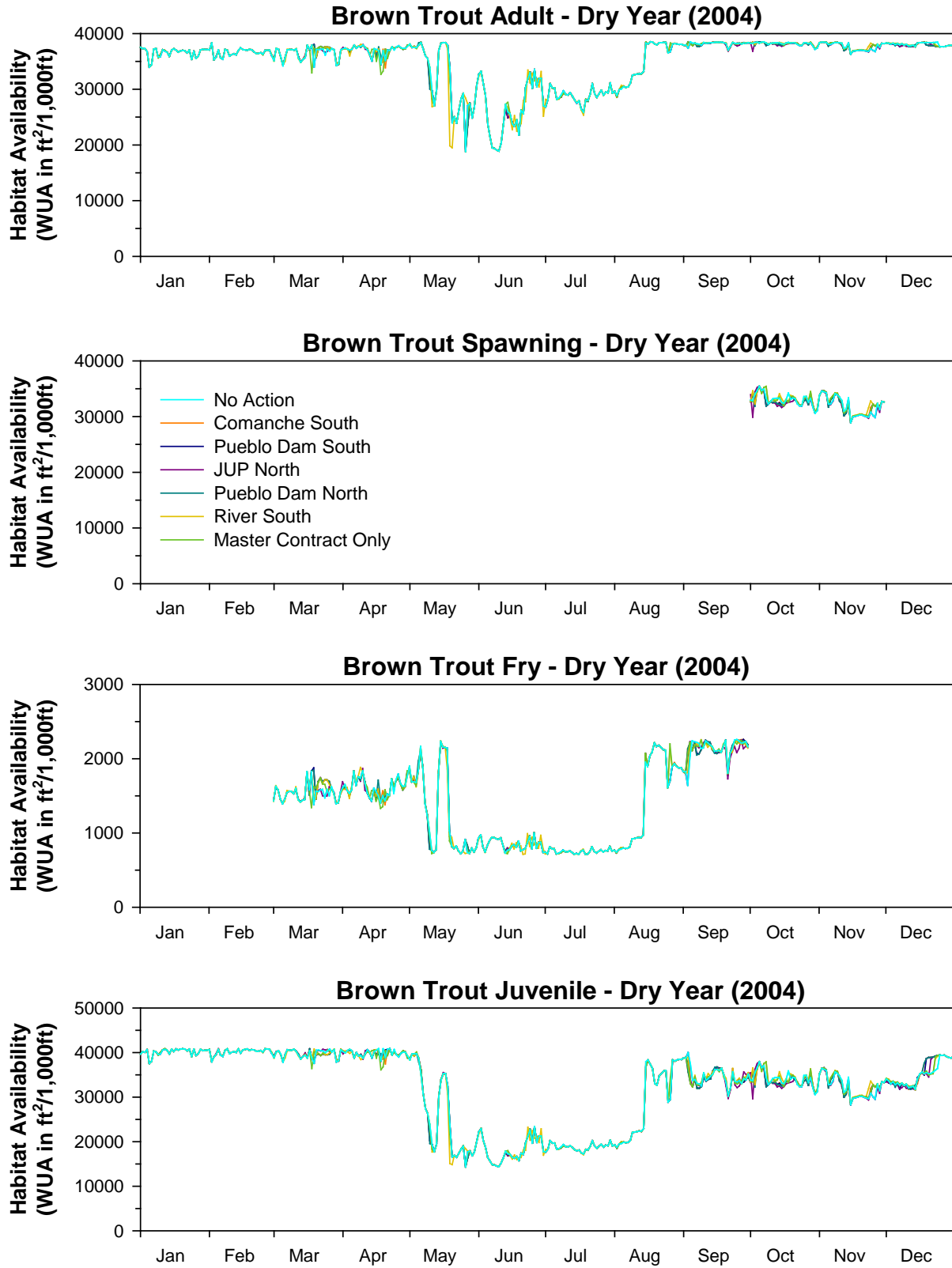


Figure 108. Cumulative Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 4 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

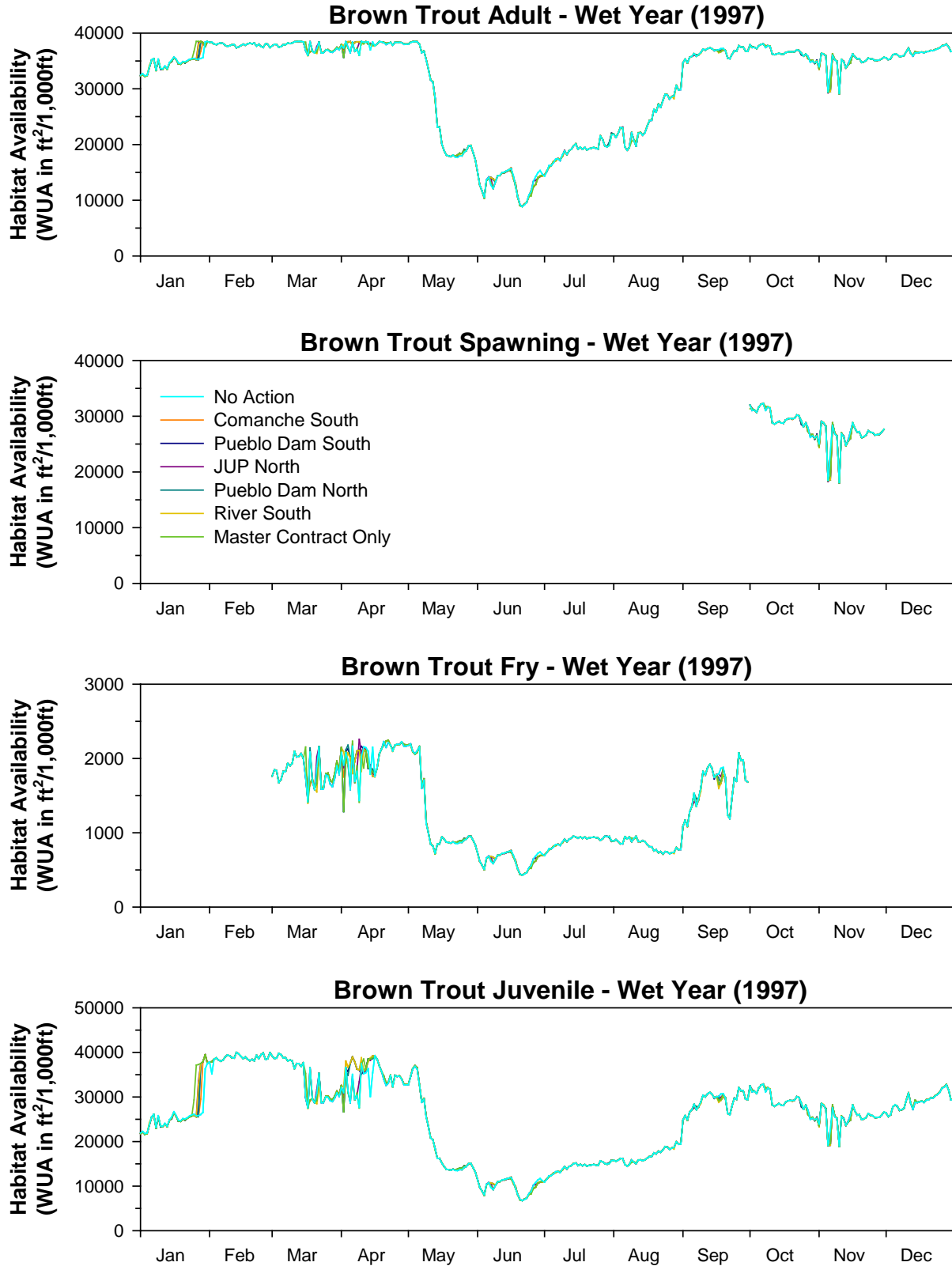


Figure 109. Cumulative Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 4 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

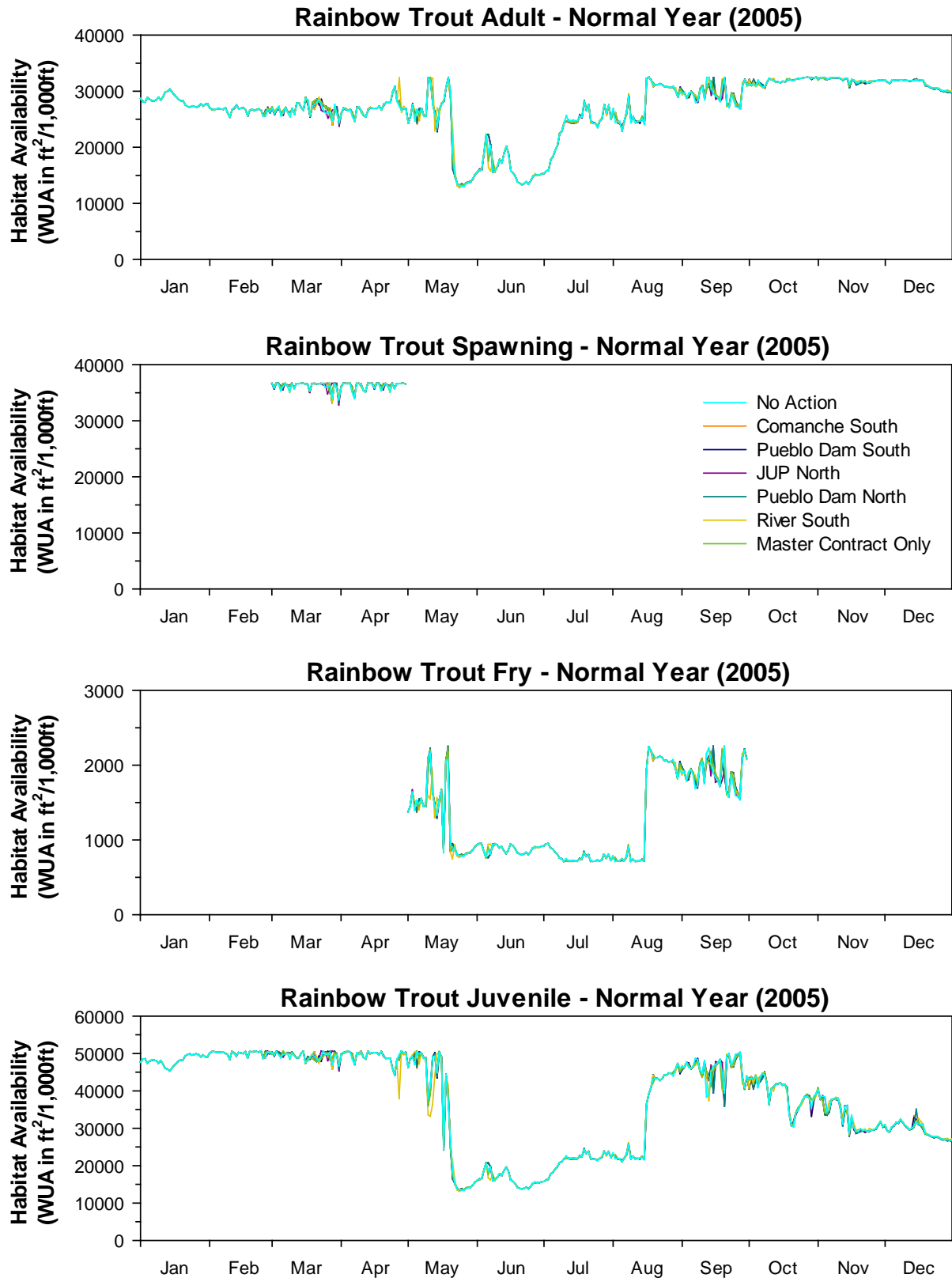


Figure 110. Cumulative Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 4 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

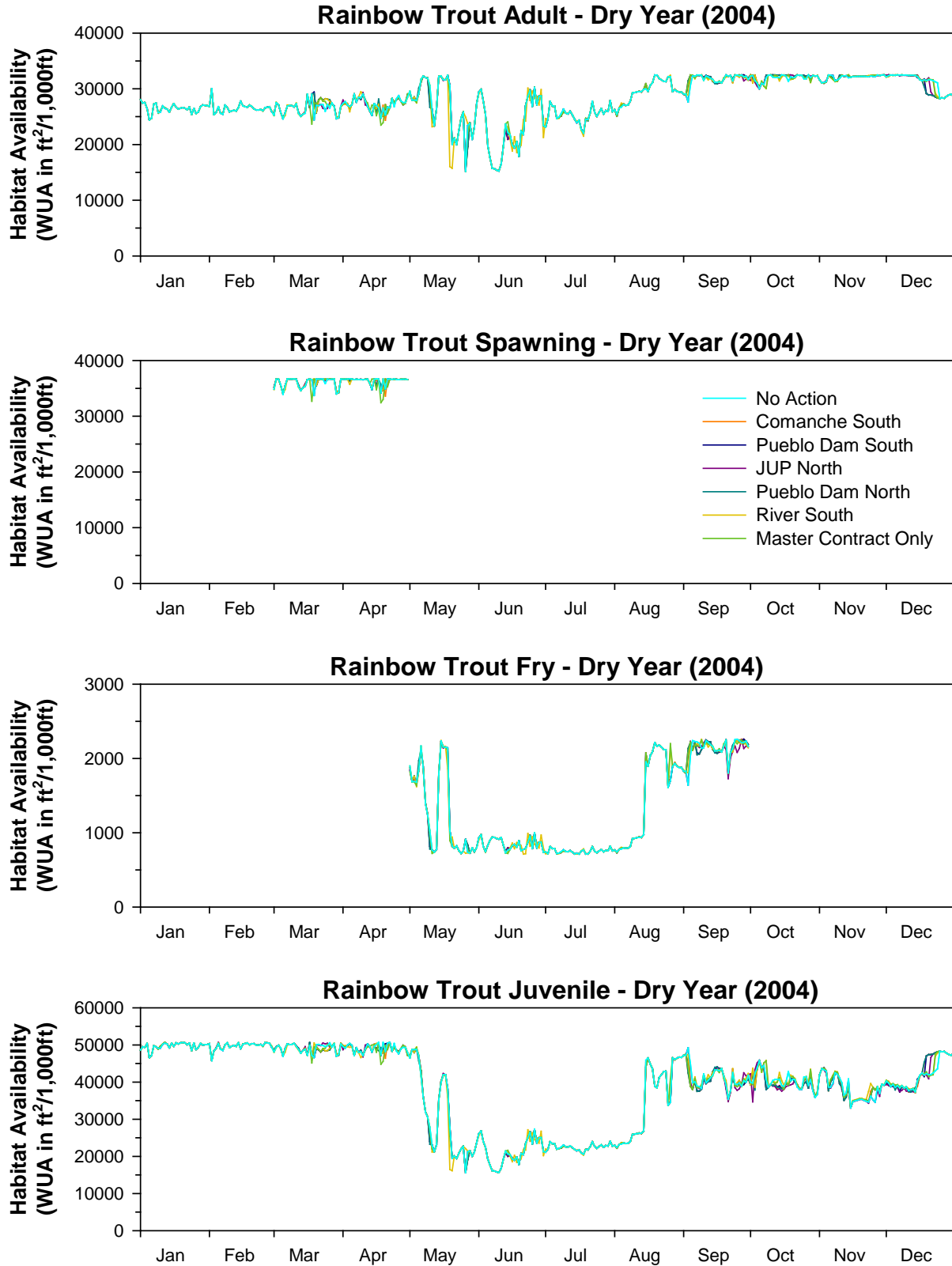


Figure 111. Cumulative Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 4 of the Upper Arkansas River

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

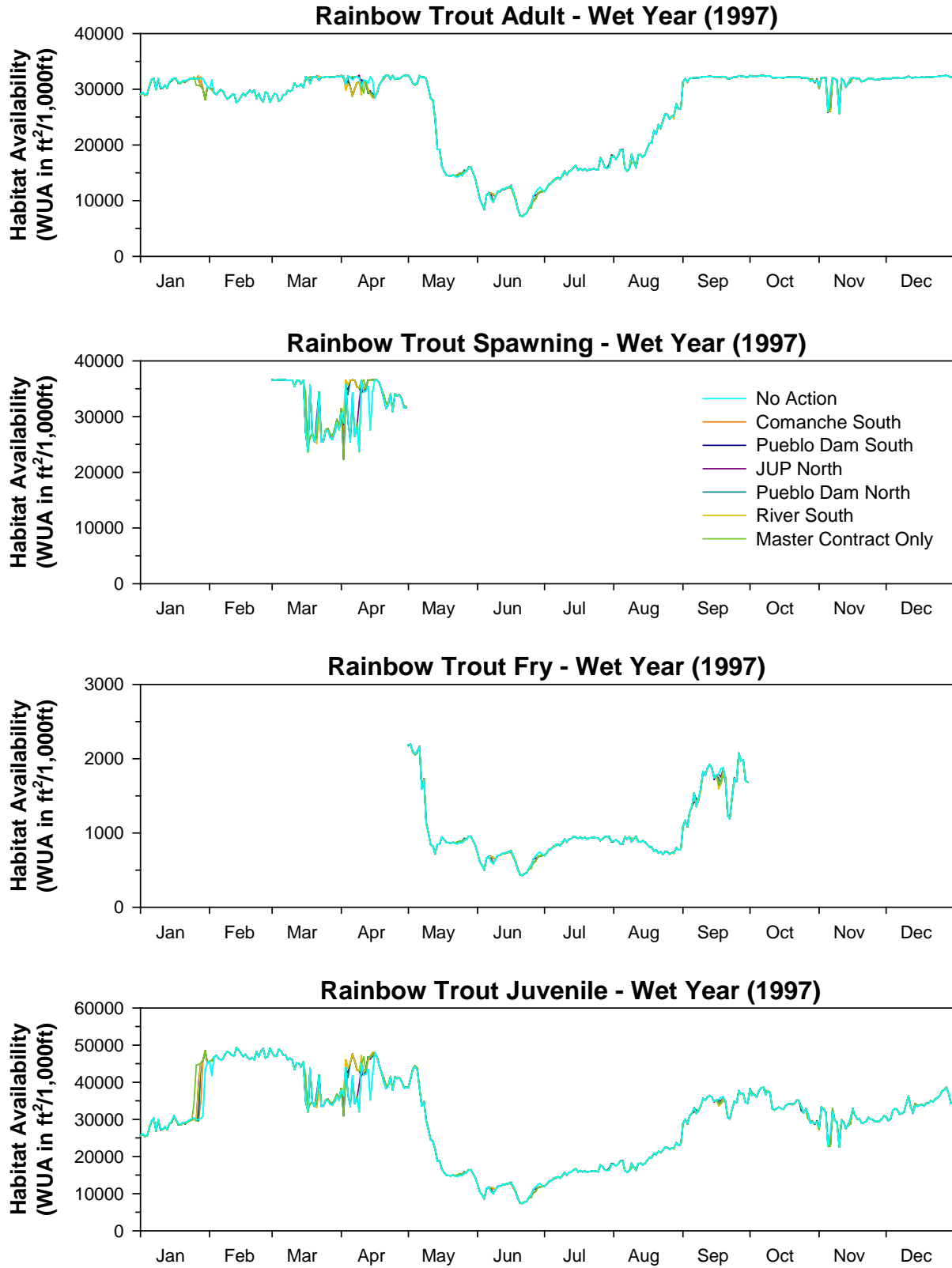


Figure 112. Cumulative Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 4 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

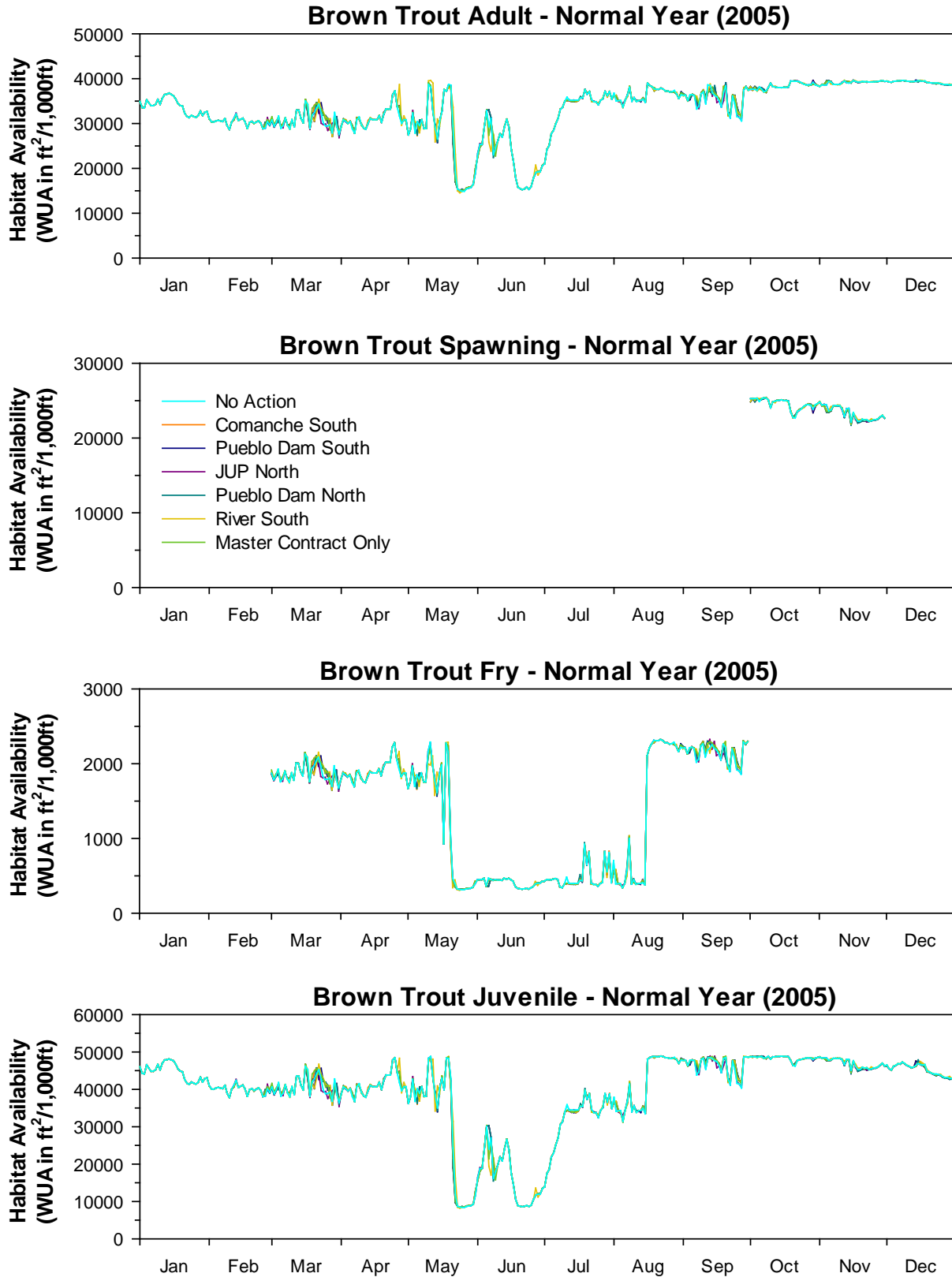


Figure 113. Cumulative Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 5 of the Upper Arkansas River

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

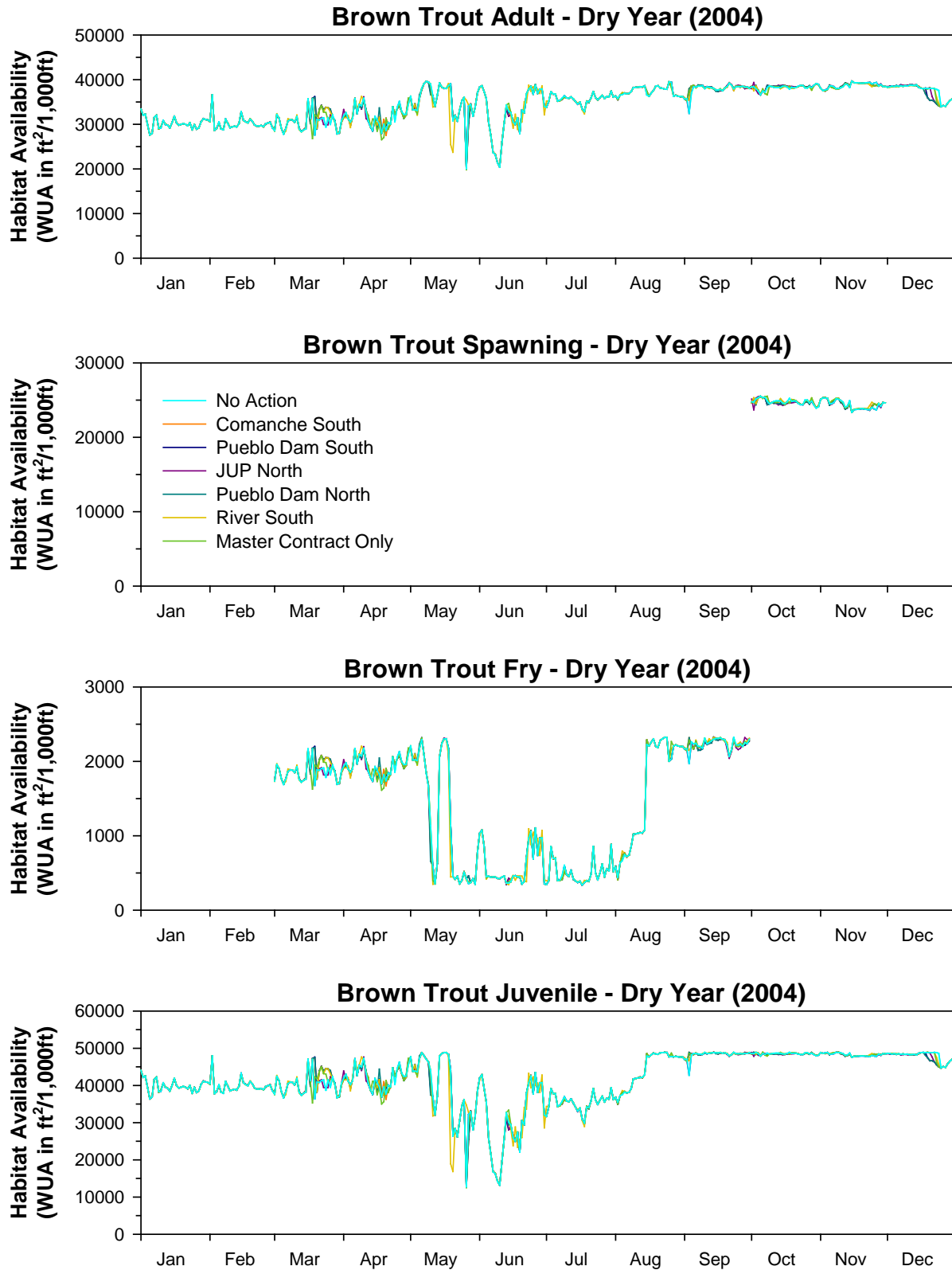


Figure 114. Cumulative Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 5 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
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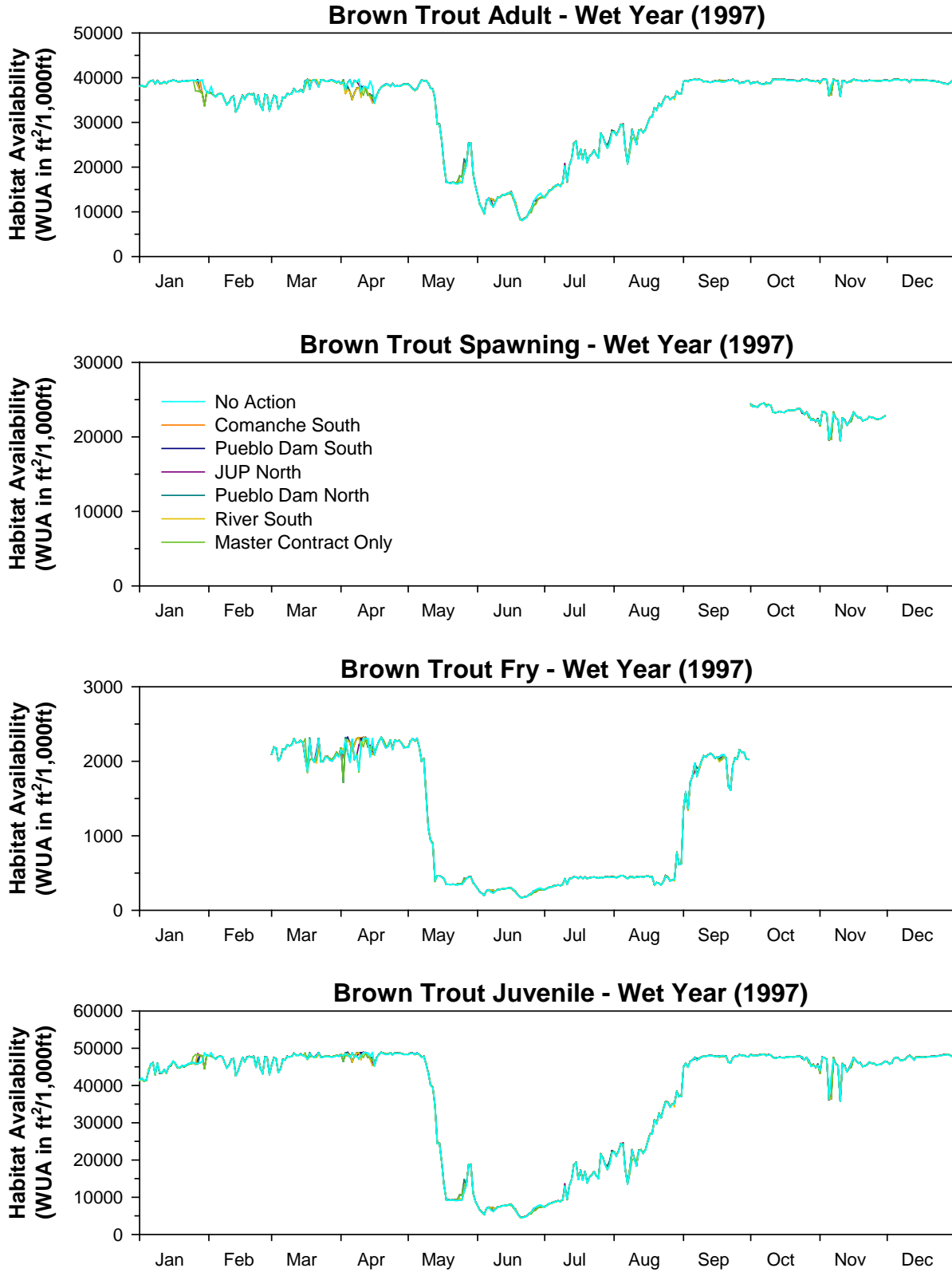


Figure 115. Cumulative Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 5 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
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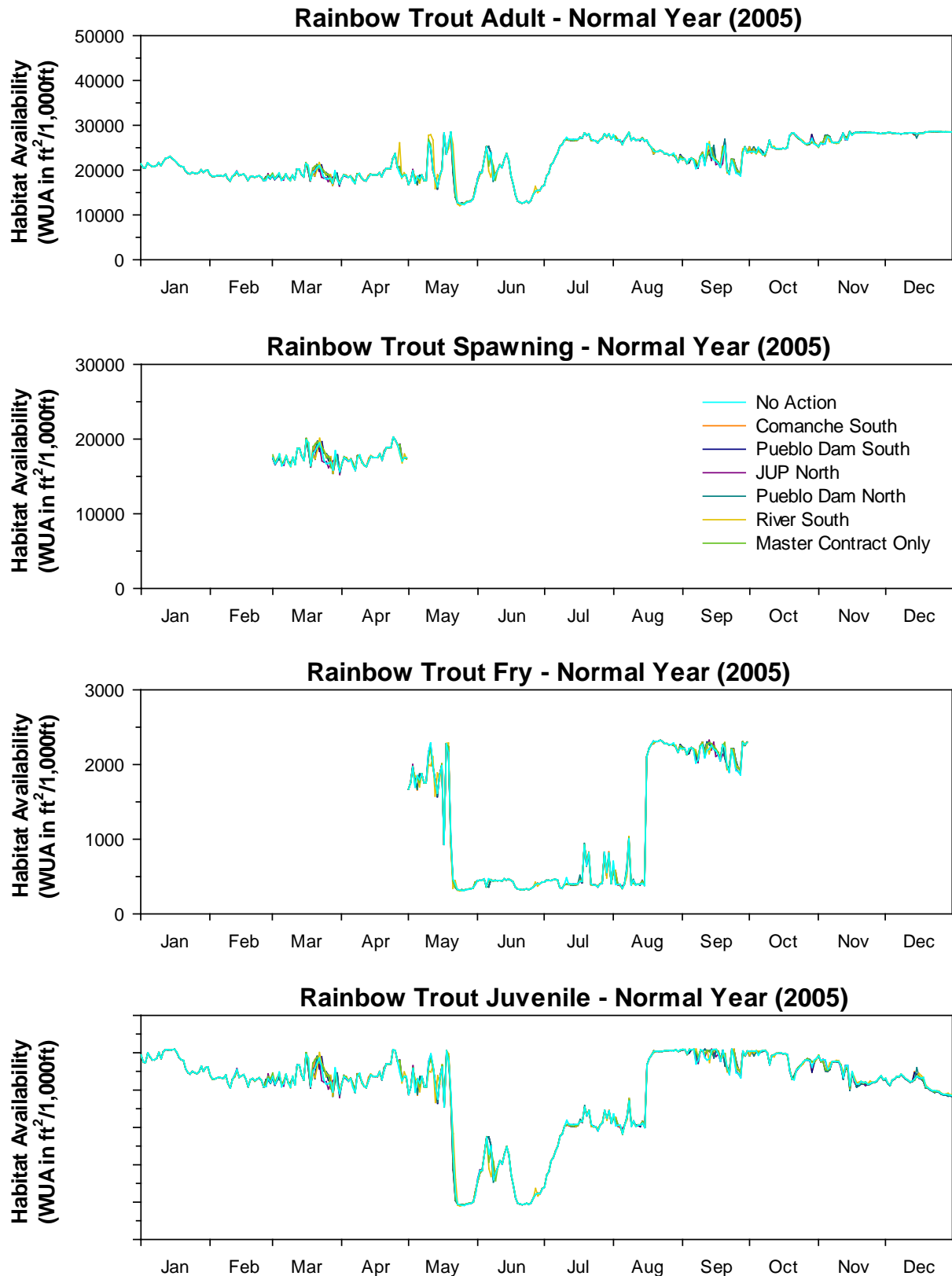


Figure 116. Cumulative Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 5 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
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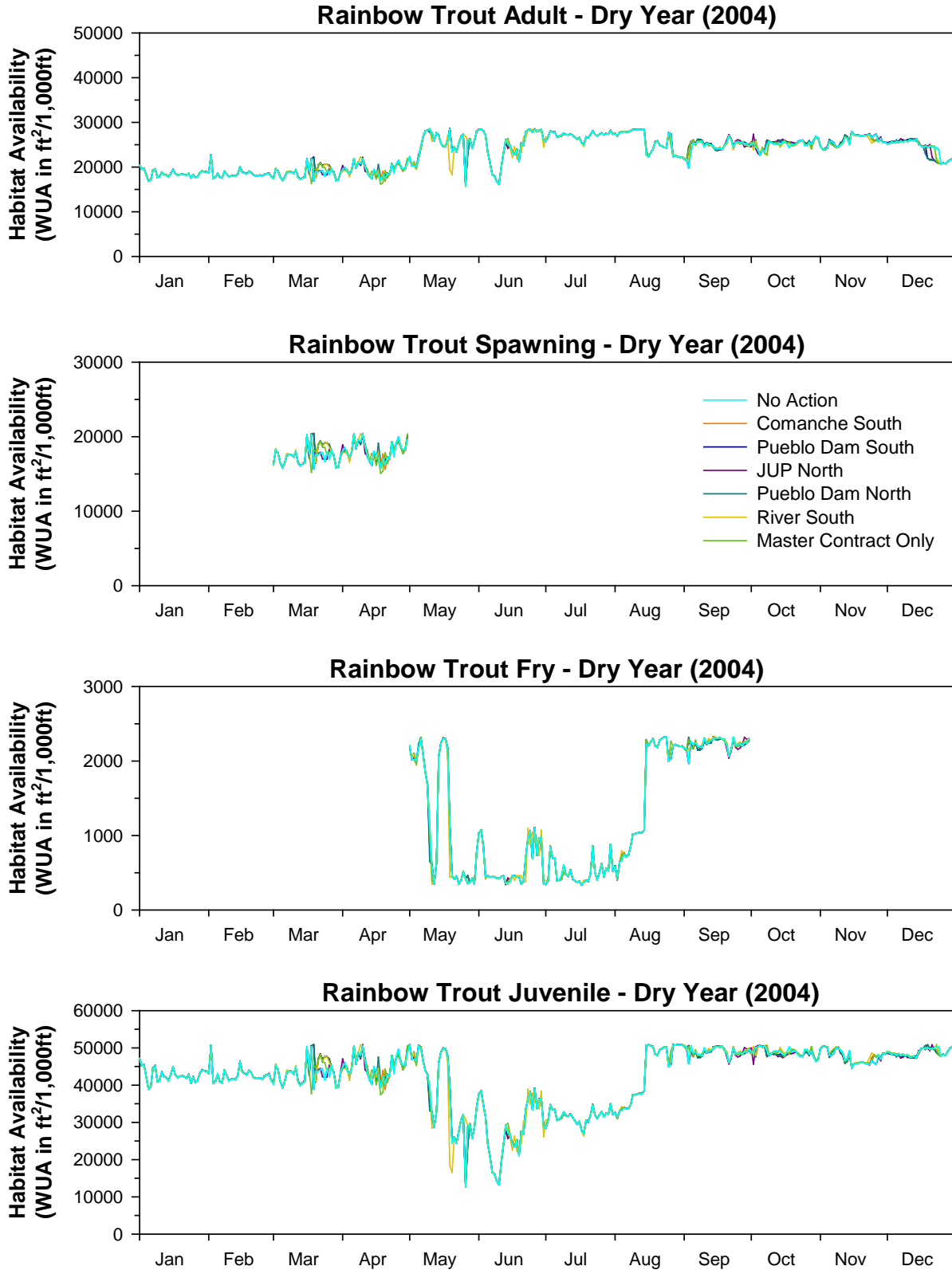


Figure 117. Cumulative Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 5 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
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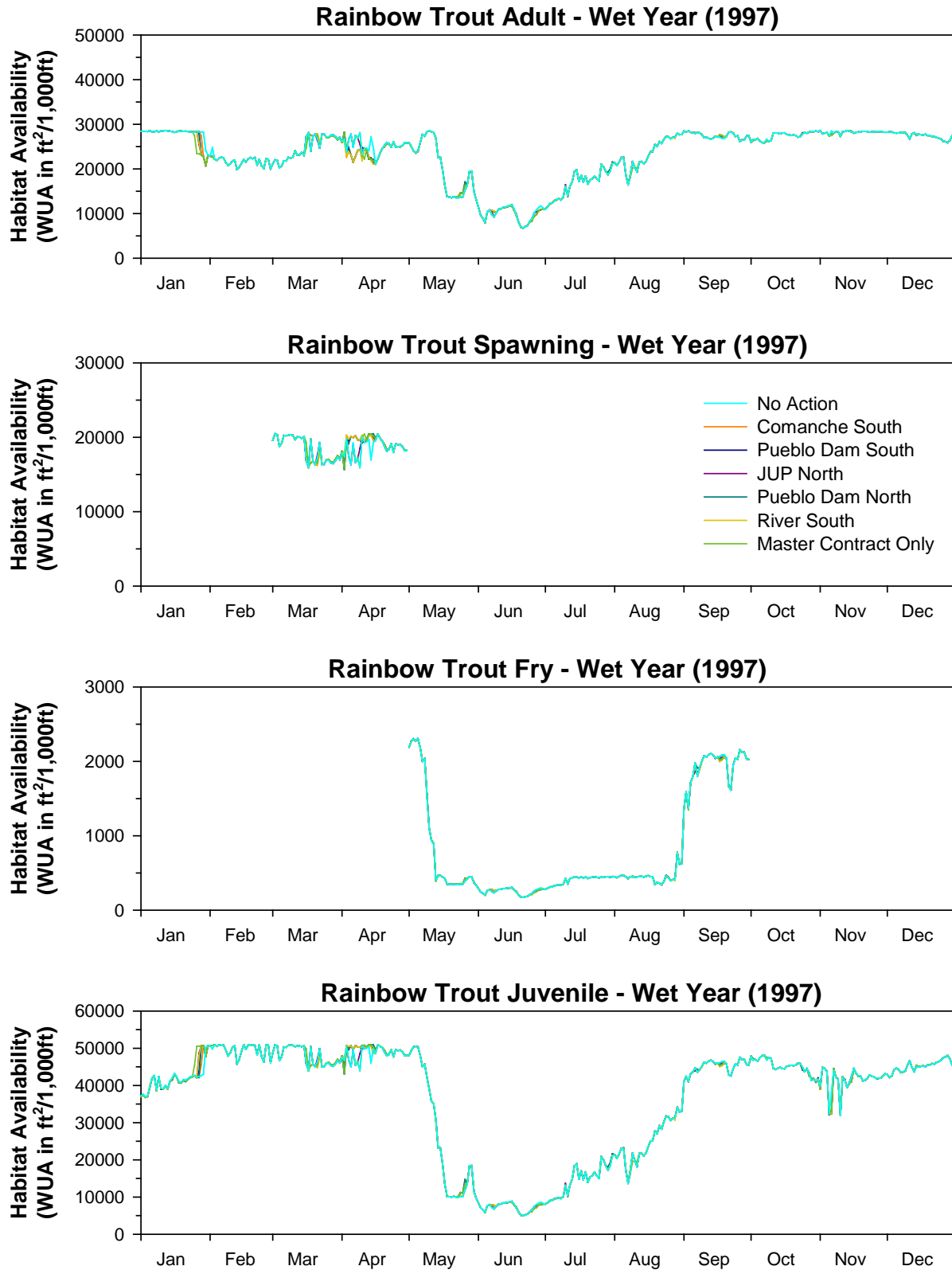


Figure 118. Cumulative Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 5 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
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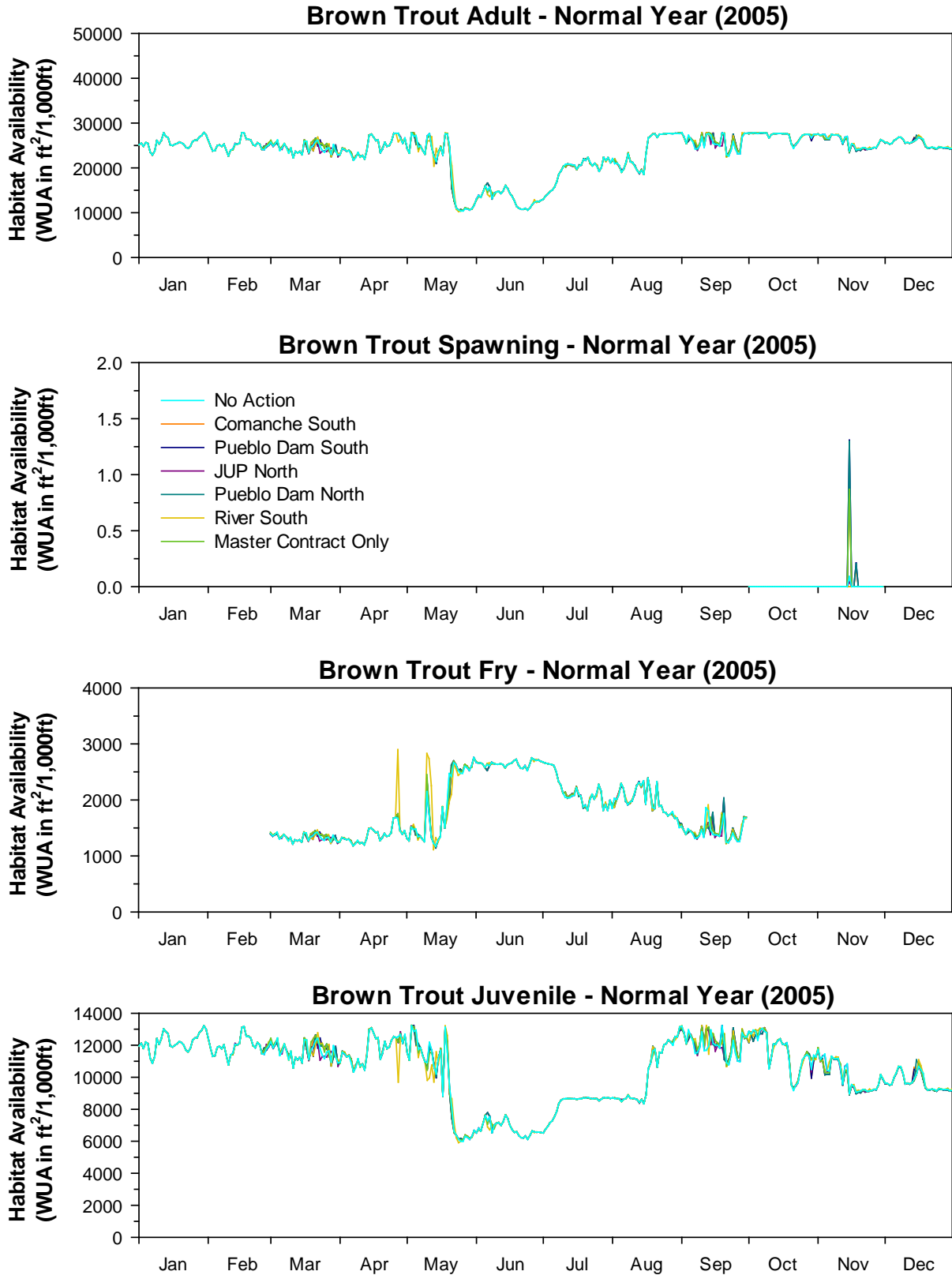


Figure 119. Cumulative Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 6 of the Upper Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

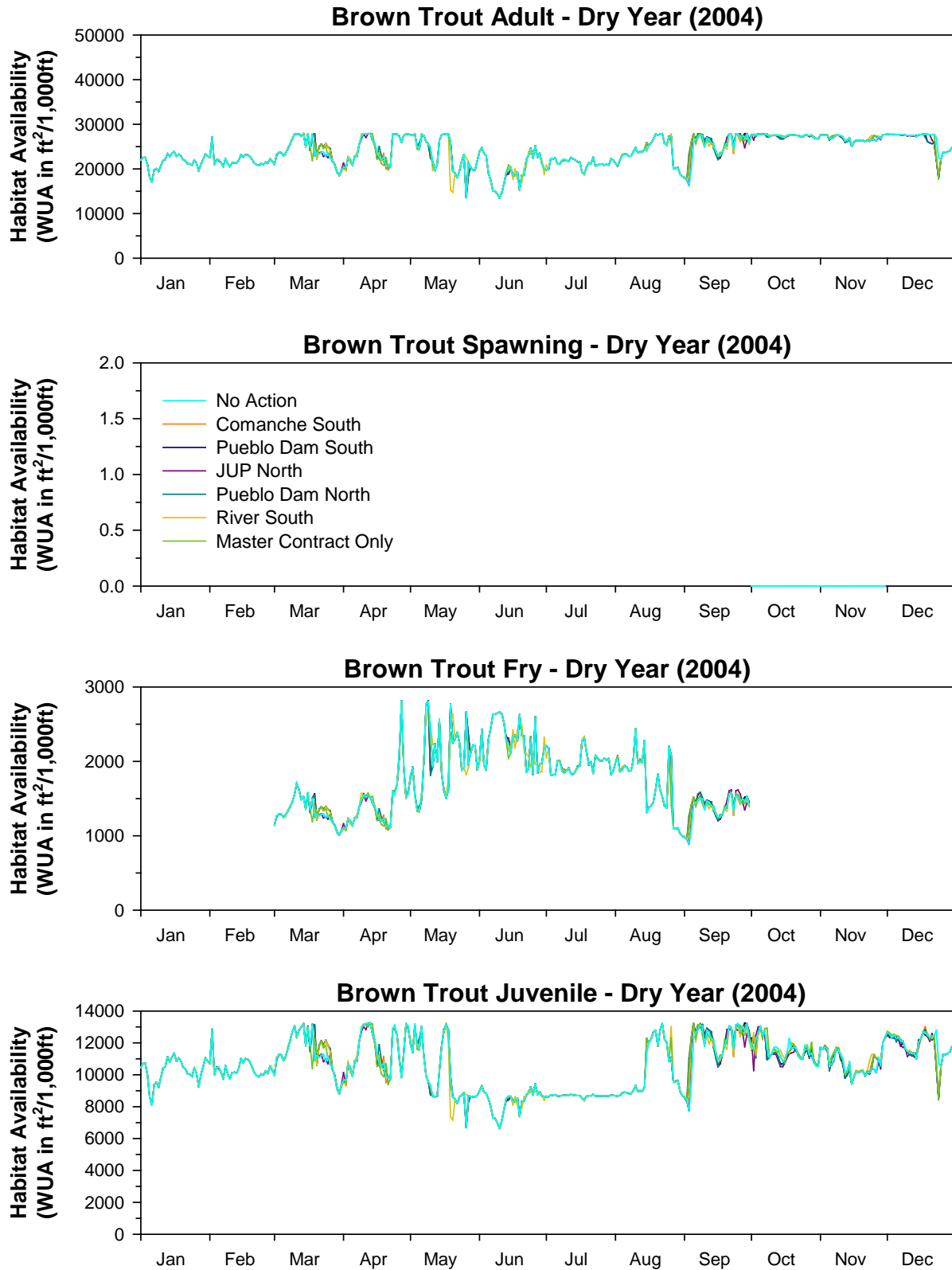


Figure 120. Cumulative Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 6 of the Upper Arkansas River

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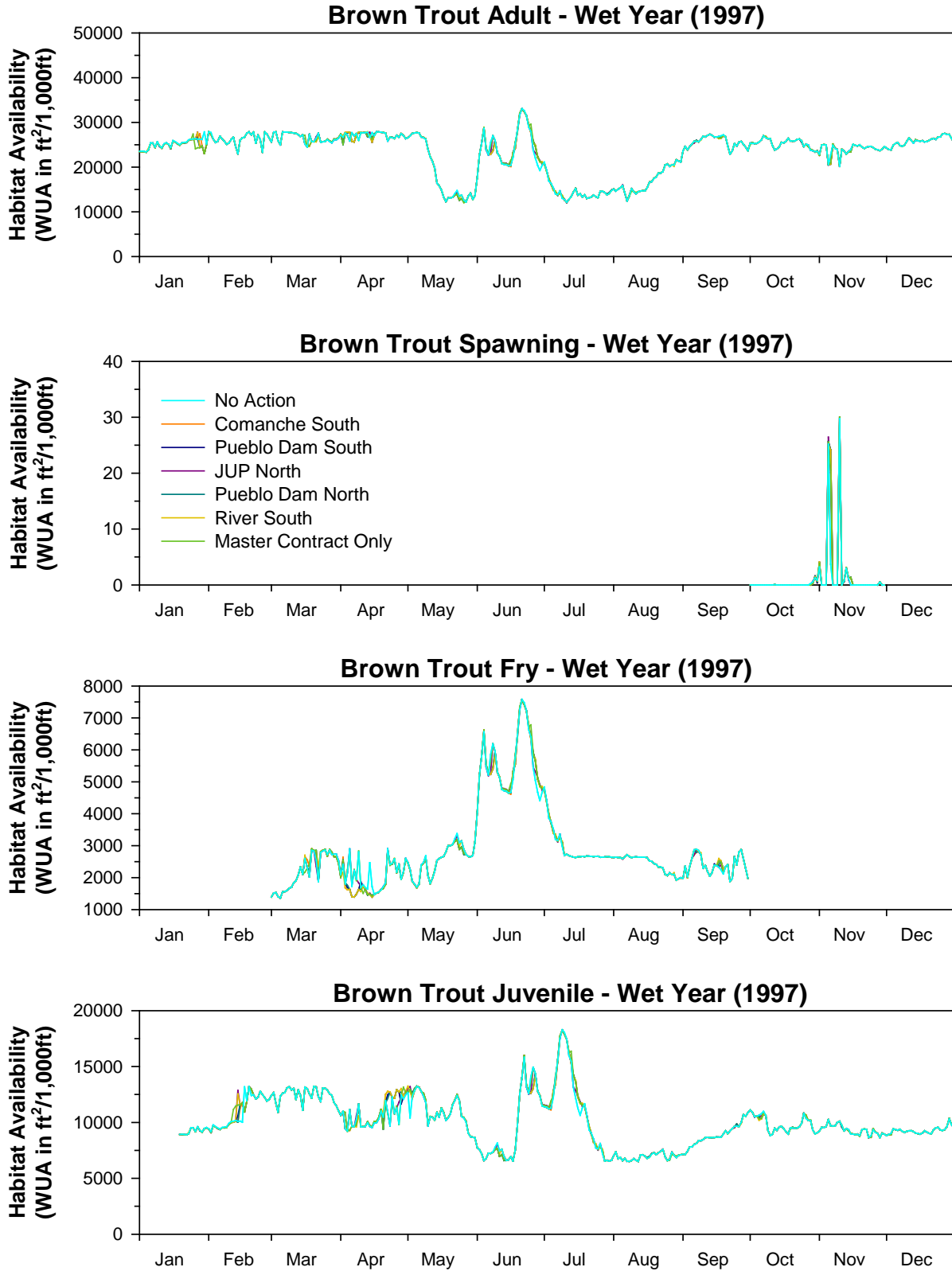


Figure 121. Cumulative Effects Brown Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 6 of the Upper Arkansas River

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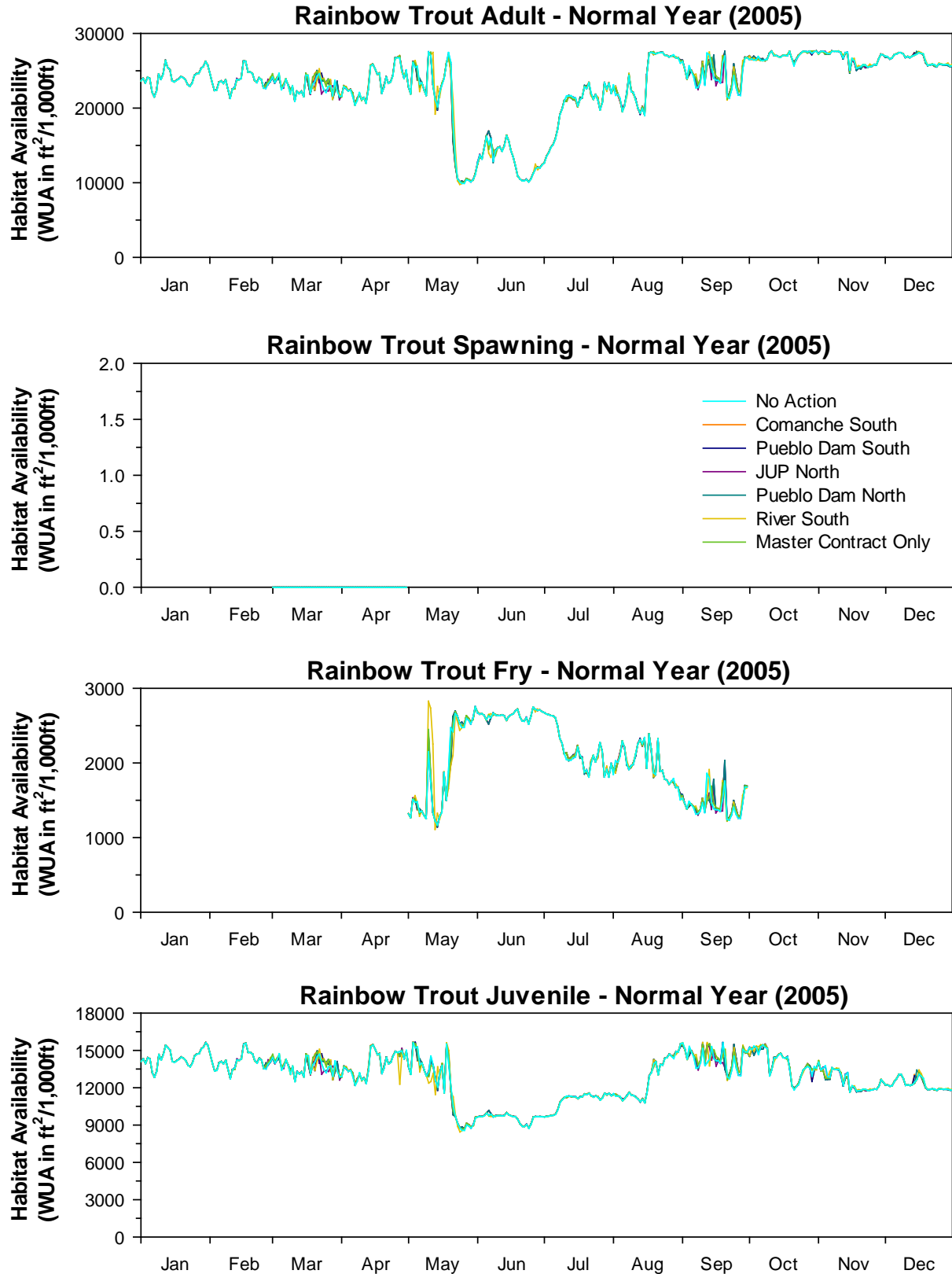


Figure 122. Cumulative Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 6 of the Upper Arkansas River

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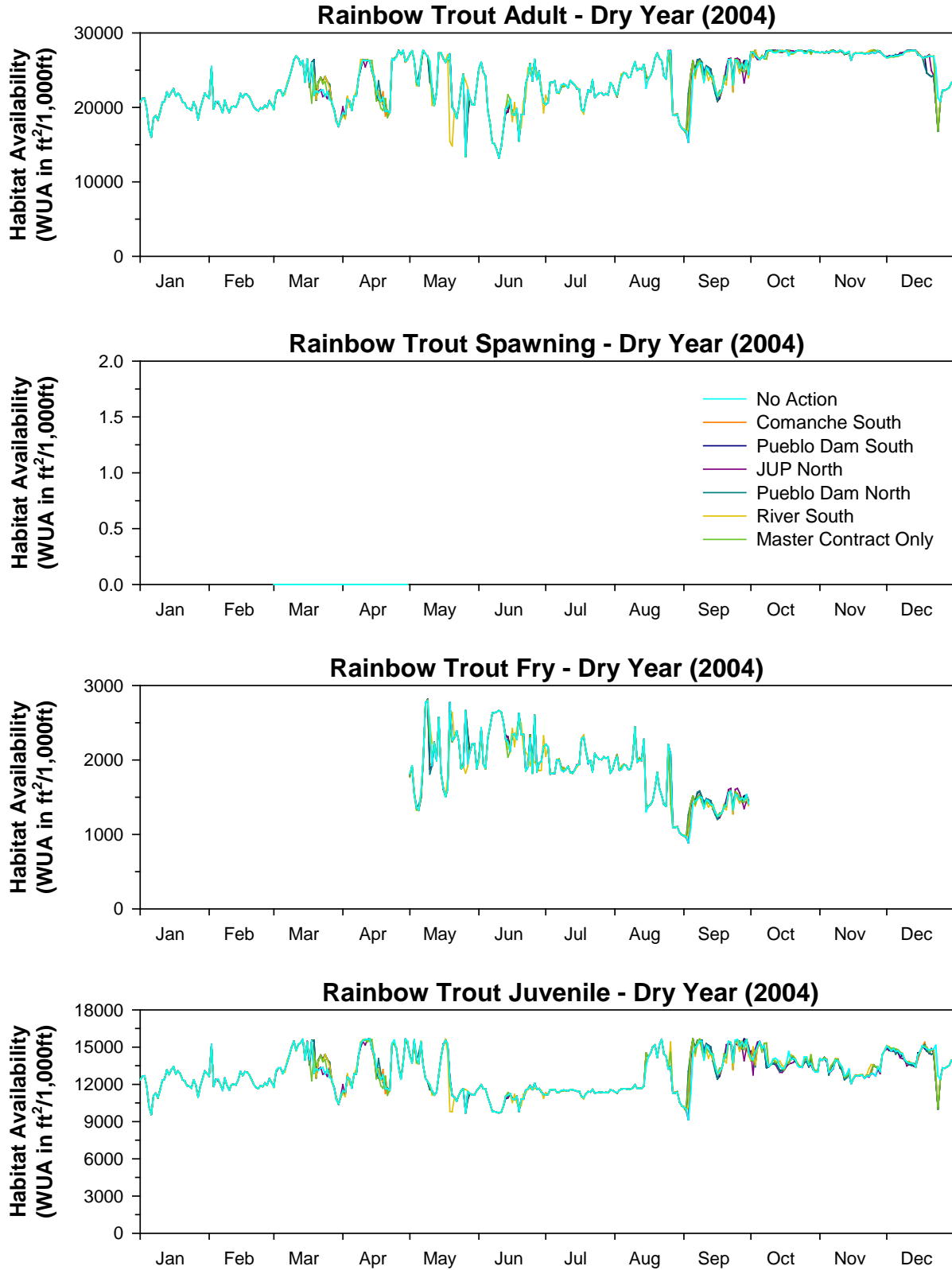


Figure 123. Cumulative Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft] for Seven Alternatives during a Dry Year for Segment 6 of the Upper Arkansas River

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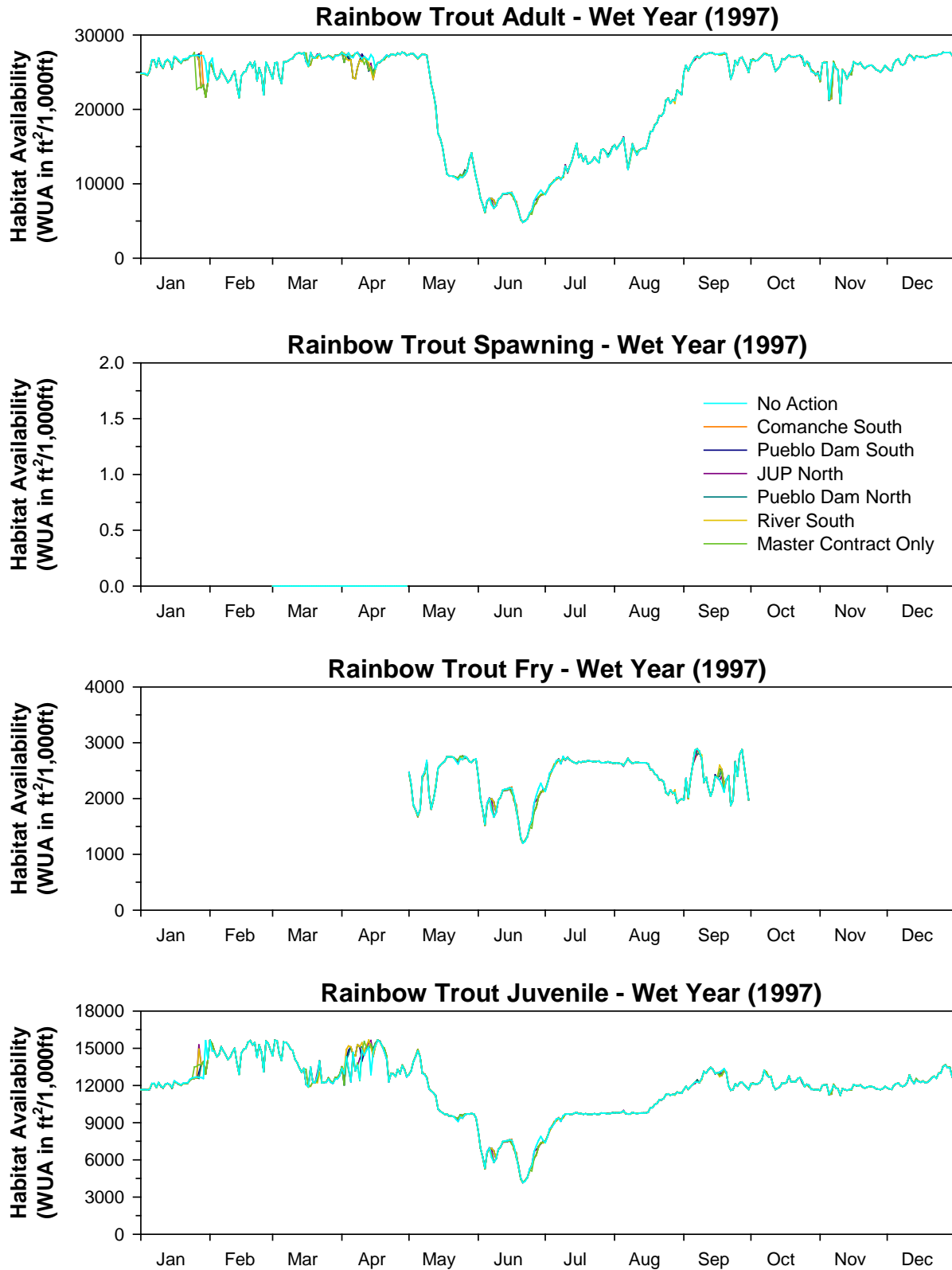
















Figure 124. Cumulative Effects Rainbow Trout Adult, Spawning, Fry, and Juvenile Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 6 of the Upper Arkansas River

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Table 21. Cumulative Effects Summary of the Percent Change in Minimum Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 1








Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	6,188	6,188	6,188	6,188	6,188	6,188	6,188
spawning	4,518	4,518	4,518	4,518	4,518	4,518	4,518
fry	1,278	1,278	1,278	1,278	1,278	1,278	1,278
juvenile	6,223	6,223	6,223	6,223	6,223	6,223	6,223
Rainbow trout							
adult	3,323	3,323	3,323	3,323	3,323	3,323	3,323
spawning	2,291	2,291	2,291	2,291	2,291	2,291	2,291
fry	1,915	2,156	2,156	1,915	2,156	2,156	2,156
juvenile	6,678	6,678	6,678	6,678	6,678	6,678	6,678
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	0%	0%	0%	0%	0%	0%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	0%	0%	0%	0%	0%	0%
juvenile	--	0%	0%	0%	0%	0%	0%
Rainbow trout							
adult	--	0%	0%	0%	0%	0%	0%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	13%	13%	0%	13%	13%	13%
juvenile	--	0%	0%	0%	0%	0%	0%
Dry Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	5,380	5,380	5,380	5,380	5,380	5,380	5,380
spawning	3,687	3,687	3,687	3,687	3,687	3,687	3,687
fry	1,290	1,290	1,290	1,290	1,290	1,290	1,290
juvenile	8,469	8,469	8,469	8,469	8,469	8,469	8,469
Rainbow trout							
adult	2,908	2,908	2,908	2,908	2,908	2,908	2,908
spawning	2,313	2,313	2,313	2,313	2,313	2,313	2,313
fry	1,784	1,784	1,784	1,784	1,784	1,784	1,784
juvenile	7,574	7,574	7,574	7,574	7,574	7,574	7,574
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	0%	<1%	0%	0%	0%	0%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	0%	0%	0%	0%	0%	0%
juvenile	--	0%	0%	0%	0%	0%	0%

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Species/Life Stage	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Rainbow trout							
adult	--	0%	0%	0%	0%	0%	0%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	0%	0%	0%	0%	0%	0%
juvenile	--	0%	0%	0%	0%	0%	0%
Wet Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	4,350	4,352	4,352	4,350	4,352	4,352	4,352
spawning	7,174	7,174	7,174	7,174	7,174	7,174	7,174
fry	1,795	1,795	1,795	1,795	1,795	1,795	1,795
juvenile	4,163	4,165	4,165	4,163	4,165	4,165	4,165
Rainbow trout							
adult	2,271	2,271	2,271	2,271	2,271	2,271	2,271
spawning	3,217	3,217	3,217	3,217	3,217	3,217	3,217
fry	2,201	2,201	2,201	2,201	2,201	2,201	2,201
juvenile	4,851	4,852	4,852	4,850	4,852	4,852	4,852
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<-1%	<1%	<1%	<1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	0%	0%	0%	0%	0%	0%
juvenile	--	<1%	<1%	<-1%	<1%	<1%	<1%
Rainbow trout							
adult	--	<1%	<1%	<-1%	<1%	<1%	<1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	0%	0%	0%	0%	0%	0%
juvenile	--	<1%	<1%	<-1%	<1%	<1%	<1%

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Table 22. Cumulative Effects Summary of the Percent Change in Median Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 1








Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	11,822	12,072	12,072	11,822	12,072	12,071	12,071
spawning	7,177	7,177	7,177	7,177	7,177	7,177	7,177
fry	2,541	2,541	2,541	2,541	2,541	2,544	2,541
juvenile	17,836	18,293	18,293	17,836	18,293	18,293	18,293
Rainbow trout							
adult	6,913	6,923	6,923	6,913	6,923	6,923	6,923
spawning	2,786	2,786	2,786	2,786	2,786	2,786	2,786
fry	2,660	2,660	2,660	2,660	2,660	2,660	2,660
juvenile	19,346	19,346	19,346	19,346	19,346	19,346	19,346
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	2%	2%	0%	2%	2%	2%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	0%	0%	0%	0%	<1%	0%
juvenile	--	3%	3%	0%	3%	3%	3%
Rainbow trout							
adult	--	<1%	<1%	0%	<1%	<1%	<1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	0%	0%	0%	0%	0%	0%
juvenile	--	0%	0%	0%	0%	0%	0%
Dry Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	12,365	12,365	12,365	12,365	12,365	12,365	12,365
spawning	5,581	5,581	5,581	5,581	5,581	5,581	5,581
fry	2,627	2,627	2,627	2,627	2,628	2,627	2,627
juvenile	18,431	18,431	18,431	18,431	18,431	18,432	18,431
Rainbow trout							
adult	6,988	6,988	6,988	6,988	6,988	6,988	6,988
spawning	4,534	4,534	4,534	4,534	4,534	4,534	4,534
fry	2,682	2,682	2,682	2,682	2,685	2,682	2,682
juvenile	20,181	20,181	20,181	20,181	20,181	20,181	20,181
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	0%	0%	0%	0%	0%	0%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	0%	0%	0%	<1%	0%	0%
juvenile	--	0%	0%	0%	0%	<1%	0%

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Species/Life Stage	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Rainbow trout							
adult	--	0%	0%	0%	0%	0%	0%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	0%	0%	0%	<1%	0%	0%
juvenile	--	0%	0%	0%	0%	0%	0%
Wet Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	12,925	12,925	12,925	12,925	12,925	12,925	12,925
spawning	8,283	8,283	8,283	8,283	8,283	8,283	8,283
fry	3,130	3,130	3,130	3,130	3,130	3,130	3,130
juvenile	19,749	19,749	19,749	19,749	19,749	19,749	19,749
Rainbow trout							
adult	7,575	7,575	7,575	7,575	7,575	7,575	7,575
spawning	4,522	4,522	4,522	4,522	4,522	4,522	4,522
fry	4,563	4,563	4,563	4,563	4,563	4,563	4,563
juvenile	22,040	22,040	22,040	22,040	22,040	22,040	22,040
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	0%	0%	0%	0%	0%	0%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	0%	0%	0%	0%	0%	0%
juvenile	--	0%	0%	0%	0%	0%	0%
Rainbow trout							
adult	--	0%	0%	0%	0%	0%	0%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	0%	0%	0%	0%	0%	0%
juvenile	--	0%	0%	0%	0%	0%	0%

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Table 23. Cumulative Effects Summary of the Percent Change in Minimum Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 2








Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	10,374	10,374	10,374	10,374	10,374	10,374	10,374
spawning	3,373	3,352	3,348	3,355	3,348	3,379	3,371
fry	1,542	1,546	1,546	1,546	1,546	1,542	1,546
juvenile	7,539	7,539	7,539	7,539	7,539	7,539	7,539
Rainbow trout							
adult	8,382	8,382	8,382	8,382	8,382	8,382	8,382
spawning	1,894	1,894	1,894	1,894	1,894	1,894	1,894
fry	1,542	1,549	1,549	1,546	1,549	1,542	1,548
juvenile	9,020	9,020	9,020	9,020	9,020	9,020	9,020
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	0%	0%	0%	0%	0%	0%
spawning	--	<1%	<1%	<1%	<1%	<1%	<1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	0%	0%	0%	0%	0%	0%
Rainbow trout							
adult	--	0%	0%	0%	0%	0%	0%
spawning	--	<1%	<1%	0%	<1%	<1%	<1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	0%	0%	0%	0%	0%	0%
Dry Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	11,593	11,593	11,593	11,593	11,593	11,593	11,593
spawning	3,451	3,451	3,451	3,407	3,451	3,451	3,451
fry	1,552	1,562	1,562	1,562	1,562	1,565	1,560
juvenile	8,425	8,425	8,425	8,425	8,425	8,425	8,425
Rainbow trout							
adult	9,367	9,367	9,367	9,367	9,367	9,367	9,367
spawning	1,901	1,913	1,913	1,913	1,913	1,918	1,911
fry	1,891	1,891	1,891	1,917	1,891	2,257	1,882
juvenile	10,080	10,080	10,080	10,080	10,080	10,080	10,080
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	0%	0%	0%	0%	0%	0%
spawning	--	<1%	0%	-1%	<1%	0%	0%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	0%	0%	0%	0%	0%	0%

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Species/Life Stage	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Rainbow trout							
adult	--	0%	0%	0%	0%	0%	0%
spawning	--	<1%	<1%	<1%	<1%	<1%	<1%
fry	--	<1%	<1%	1%	<1%	19%	<1%
juvenile	--	0%	0%	0%	0%	0%	0%
Wet Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	10,440	10,491	10,488	10,461	10,491	10,490	10,544
spawning	2,814	2,731	2,730	2,806	2,730	2,732	2,795
fry	755	759	758	756	759	759	762
juvenile	6,914	6,947	6,946	6,927	6,948	6,947	6,983
Rainbow trout							
adult	9,328	9,373	9,371	9,347	9,374	9,372	9,421
spawning	2,224	2,224	2,224	2,224	2,224	2,224	2,224
fry	755	759	758	756	759	759	762
juvenile	9,342	9,387	9,384	9,360	9,387	9,386	9,435
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	-3%	-3%	<1%	-3%	-3%	<1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%
Rainbow trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	0%	0%	0%	0%	0%	<1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%

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Table 24. Cumulative Effects Summary of the Percent Change in Median Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 2








Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	24,099	24,186	24,200	24,099	24,200	24,156	24,132
spawning	4,048	4,013	4,013	4,042	4,035	4,042	4,040
fry	2,940	2,974	2,964	2,960	2,965	2,983	2,953
juvenile	15,882	15,897	15,894	15,895	15,894	15,882	15,894
Rainbow trout							
adult	20,317	20,392	20,405	20,351	20,392	20,336	20,339
spawning	2,809	2,859	2,844	2,843	2,856	2,825	2,839
fry	3,188	3,212	3,217	3,199	3,203	3,199	3,199
juvenile	20,107	20,186	20,186	20,115	20,158	20,209	20,186
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<-1%	<1%	<1%	<1%
spawning	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
fry	--	1%	<1%	<1%	<1%	1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<-1%	<1%
Rainbow trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	2%	1%	1%	2%	<1%	1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%
Dry Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	24,827	24,937	24,984	24,939	25,082	24,914	24,890
spawning	4,006	4,003	3,995	3,950	3,976	4,053	3,994
fry	4,078	4,129	4,129	4,033	4,114	4,048	4,099
juvenile	15,926	15,900	15,922	15,912	15,888	15,911	15,920
Rainbow trout							
adult	20,476	20,668	20,656	20,677	20,601	20,465	20,532
spawning	2,972	3,023	3,023	2,973	3,023	3,050	2,968
fry	4,591	4,576	4,578	4,612	4,593	4,541	4,576
juvenile	20,411	20,504	20,507	20,496	20,501	20,431	20,457
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<1%	1%	<1%	<1%
spawning	--	<-1%	<-1%	-1%	<-1%	1%	<-1%
fry	--	1%	1%	-1%	<1%	<-1%	<1%
juvenile	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%

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Species/Life Stage	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Rainbow trout							
adult	--	<1%	<1%	<1%	<1%	<-1%	<1%
spawning	--	2%	2%	<1%	2%	3%	<-1%
fry	--	<-1%	<-1%	<1%	<1%	-1%	<-1%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%
Wet Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	25,698	25,630	25,612	25,645	25,612	25,628	25,641
spawning	4,127	4,118	4,103	4,117	4,103	4,118	4,118
fry	3,118	2,827	2,863	3,037	2,864	2,791	3,033
juvenile	16,142	16,102	16,053	16,105	16,093	16,027	16,031
Rainbow trout							
adult	21,263	21,201	21,194	21,245	21,180	21,180	21,219
spawning	3,073	3,138	3,110	3,140	3,123	3,080	3,069
fry	2,462	2,465	2,471	2,462	2,475	2,465	2,465
juvenile	20,696	20,649	20,662	20,689	20,683	20,662	20,642
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
spawning	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
fry	--	-9%	-8%	-3%	-8%	-10%	-3%
juvenile	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
Rainbow trout							
adult	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
spawning	--	2%	1%	2%	2%	<1%	<-1%
fry	--	<1%	<1%	<-1%	<1%	<1%	<1%
juvenile	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%

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Table 25. Cumulative Effects Summary of the Percent Change in Minimum Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 3








Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	10,023	10,044	10,044	10,038	10,044	9,897	10,044
spawning	14,487	14,346	14,251	14,453	14,253	14,506	14,361
fry	1,291	1,270	1,259	1,247	1,259	1,263	1,281
juvenile	7,863	7,880	7,880	7,875	7,880	7,764	7,880
Rainbow trout							
adult	8,131	8,148	8,148	8,143	8,148	8,028	8,148
spawning	9,584	9,584	9,584	9,584	9,584	9,584	9,584
fry	1,291	1,270	1,259	1,247	1,259	1,263	1,281
juvenile	10,707	10,729	10,729	10,723	10,729	10,572	10,729
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<1%	<1%	-1%	<1%
spawning	--	<-1%	-2%	<-1%	-2%	<1%	<-1%
fry	--	-2%	-3%	-3%	-3%	-2%	<-1%
juvenile	--	<1%	<1%	<1%	<1%	-1%	<1%
Rainbow trout							
adult	--	<1%	<1%	<1%	<1%	-1%	<1%
spawning	--	<1%	<1%	0%	<1%	<1%	<1%
fry	--	-2%	-3%	-3%	-3%	-2%	<-1%
juvenile	--	<1%	<1%	<1%	<1%	-1%	<1%
Dry Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	11,416	11,416	11,416	11,457	11,416	11,717	11,395
spawning	15,276	15,290	15,289	15,126	15,287	15,307	15,291
fry	1,243	1,243	1,243	1,246	1,243	1,261	1,261
juvenile	8,957	8,956	8,957	8,989	8,956	9,075	8,939
Rainbow trout							
adult	9,261	9,261	9,261	9,294	9,261	9,543	9,243
spawning	9,937	9,977	9,977	9,977	9,977	9,982	9,969
fry	1,243	1,243	1,243	1,246	1,243	1,261	1,261
juvenile	12,122	12,121	12,121	12,122	12,121	12,114	12,121
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<-1%	<-1%	<1%	<-1%	3%	<-1%
spawning	--	<1%	<1%	<-1%	<1%	<1%	<1%
fry	--	<1%	<1%	<1%	<1%	1%	1%
juvenile	--	<-1%	<-1%	<1%	<-1%	1%	<-1%

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Species/Life Stage	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Rainbow trout							
adult	--	<-1%	<-1%	<1%	<-1%	3%	<-1%
spawning	--	<1%	<1%	<1%	<1%	<1%	<1%
fry	--	<1%	<1%	<1%	<1%	1%	1%
juvenile	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
Wet Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	6,067	6,081	6,080	6,073	6,081	6,081	6,096
spawning	12,287	12,261	12,261	12,261	12,259	12,267	12,265
fry	835	837	837	836	837	837	839
juvenile	4,760	4,771	4,770	4,764	4,771	4,771	4,782
Rainbow trout							
adult	4,922	4,933	4,932	4,926	4,933	4,933	4,945
spawning	10,831	10,831	10,831	10,831	10,831	10,831	10,831
fry	835	837	837	836	837	837	839
juvenile	6,481	6,496	6,495	6,487	6,496	6,496	6,512
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%
Rainbow trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	0%	0%	0%	0%	0%	<1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%

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Table 26. Cumulative Effects Summary of the Percent Change in Median Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 3








Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	18,052	17,892	17,982	17,707	18,001	17,953	18,051
spawning	15,971	15,922	15,916	15,956	15,935	15,939	15,958
fry	1,891	1,922	1,910	1,913	1,909	1,886	1,928
juvenile	15,100	15,177	15,123	15,084	15,127	15,206	15,149
Rainbow trout							
adult	14,717	14,783	14,723	14,701	14,752	14,786	14,765
spawning	12,067	12,177	12,087	12,032	12,126	12,184	12,148
fry	1,658	1,681	1,682	1,680	1,673	1,664	1,669
juvenile	18,679	18,647	18,598	18,620	18,597	18,698	18,675
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<-1%	<-1%	-2%	<-1%	<-1%	<-1%
spawning	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
fry	--	2%	<1%	1%	<1%	<-1%	2%
juvenile	--	<1%	<1%	<-1%	<1%	<1%	<1%
Rainbow trout							
adult	--	<1%	<1%	<-1%	<1%	<1%	<1%
spawning	--	<1%	<1%	<-1%	<1%	<1%	<1%
fry	--	1%	1%	1%	<1%	<1%	<1%
juvenile	--	<-1%	<-1%	<-1%	<-1%	<1%	<-1%
Dry Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	18,446	18,424	18,358	18,196	18,339	18,570	18,409
spawning	16,086	16,005	15,991	15,913	15,951	16,185	16,064
fry	1,800	1,785	1,787	1,786	1,791	1,780	1,793
juvenile	14,936	15,143	15,154	14,768	15,089	15,118	15,008
Rainbow trout							
adult	15,296	15,136	15,137	15,245	15,134	15,283	15,252
spawning	11,702	12,293	12,293	11,704	12,197	12,166	12,148
fry	1,604	1,605	1,605	1,603	1,607	1,605	1,606
juvenile	18,590	18,728	18,728	18,547	18,728	18,860	18,743
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<-1%	<-1%	-1%	<-1%	<1%	<-1%
spawning	--	<-1%	<-1%	-1%	<-1%	<1%	<-1%
fry	--	<-1%	<-1%	<-1%	<-1%	-1%	<-1%
juvenile	--	1%	1%	-1%	1%	1%	<1%

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Species/Life Stage	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Rainbow trout							
adult	--	-1%	-1%	<-1%	-1%	<-1%	<-1%
spawning	--	5%	5%	<1%	4%	4%	4%
fry	--	<1%	<1%	<-1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<-1%	<1%	1%	<1%
Wet Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	21,226	20,730	20,486	20,987	20,468	20,431	20,718
spawning	15,318	15,331	15,331	15,318	15,329	15,326	15,318
fry	1,580	1,578	1,580	1,581	1,581	1,581	1,576
juvenile	16,782	16,492	16,512	16,585	16,464	16,469	16,442
Rainbow trout							
adult	17,667	17,459	17,427	17,533	17,434	17,423	17,470
spawning	13,053	12,910	12,936	13,062	12,936	12,936	12,884
fry	1,524	1,533	1,533	1,524	1,533	1,524	1,533
juvenile	19,596	19,401	19,273	19,474	19,399	19,273	19,403
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	-2%	-3%	-1%	-4%	-4%	-2%
spawning	--	<1%	<1%	0%	<1%	<1%	0%
fry	--	<-1%	<1%	<1%	<1%	<1%	<-1%
juvenile	--	-2%	-2%	-1%	-2%	-2%	-2%
Rainbow trout							
adult	--	-1%	-1%	<-1%	-1%	-1%	-1%
spawning	--	-1%	<-1%	<1%	<-1%	<-1%	-1%
fry	--	<1%	<1%	<-1%	<1%	<1%	<1%
juvenile	--	<-1%	-2%	<-1%	-1%	-2%	<-1%

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Table 27. Cumulative Effects Summary of the Percent Change in Minimum Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 4








Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	16,184	16,407	16,406	16,396	16,408	15,807	16,409
spawning	26,030	25,378	25,084	26,031	25,091	26,415	25,425
fry	712	711	711	712	711	712	712
juvenile	12,325	12,494	12,493	12,486	12,495	12,037	12,496
Rainbow trout							
adult	13,063	13,242	13,242	13,234	13,243	12,758	13,244
spawning	33,730	34,037	33,146	32,808	33,118	30,892	33,939
fry	712	711	711	712	711	712	712
juvenile	13,411	13,596	13,595	13,587	13,597	13,098	13,598
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	1%	1%	1%	1%	-2%	1%
spawning	--	-3%	-4%	<1%	-4%	1%	-2%
fry	--	<-1%	<-1%	<1%	<-1%	<1%	<1%
juvenile	--	1%	1%	1%	1%	-2%	1%
Rainbow trout							
adult	--	1%	1%	1%	1%	-2%	1%
spawning	--	<1%	-2%	-3%	-2%	-8%	<1%
fry	--	<-1%	<-1%	<1%	<-1%	<1%	<1%
juvenile	--	1%	1%	1%	1%	-2%	1%
Dry Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	18,819	18,819	18,819	18,888	18,818	18,899	18,782
spawning	28,903	28,937	28,930	28,882	28,920	29,022	28,944
fry	712	712	713	711	712	711	712
juvenile	14,331	14,331	14,331	14,384	14,331	14,392	14,303
Rainbow trout							
adult	15,189	15,189	15,189	15,245	15,189	15,254	15,160
spawning	33,718	33,608	34,031	33,726	34,031	34,064	32,423
fry	712	712	713	711	712	711	712
juvenile	15,595	15,594	15,595	15,652	15,594	15,661	15,564
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<-1%	<-1%	<1%	<-1%	<1%	<-1%
spawning	--	<1%	<1%	<-1%	<1%	<1%	<1%
fry	--	<-1%	<1%	<-1%	<-1%	<-1%	<-1%
juvenile	--	<-1%	<-1%	<1%	<-1%	<1%	<-1%

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Species/Life Stage	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Rainbow trout							
adult	--	<-1%	<-1%	<1%	<-1%	<1%	<-1%
spawning	--	<-1%	<1%	<1%	<1%	1%	-4%
fry	--	<-1%	<1%	<-1%	<-1%	<-1%	<-1%
juvenile	--	<-1%	<-1%	<1%	<-1%	<1%	<-1%
Wet Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	8,845	8,868	8,867	8,854	8,868	8,868	8,893
spawning	18,099	18,046	18,043	18,100	18,037	18,065	18,045
fry	428	429	429	428	429	429	430
juvenile	6,735	6,753	6,752	6,743	6,753	6,753	6,772
Rainbow trout							
adult	7,139	7,158	7,157	7,146	7,158	7,157	7,178
spawning	23,752	25,621	22,394	23,752	22,394	23,569	22,394
fry	428	429	429	428	429	429	430
juvenile	7,329	7,349	7,348	7,337	7,349	7,348	7,369
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	<-1%	<-1%	<1%	<-1%	<-1%	<-1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%
Rainbow trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	8%	-6%	0%	-6%	<-1%	-6%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%

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Table 28. Cumulative Effects Summary of the Percent Change in Median Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 4








Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	36,981	36,994	36,993	36,978	36,999	37,013	36,994
spawning	31,612	30,952	30,952	31,341	31,335	31,426	31,564
fry	1,471	1,482	1,484	1,473	1,485	1,476	1,474
juvenile	35,346	35,212	35,213	35,360	35,207	35,166	35,383
Rainbow trout							
adult	27,587	27,665	27,608	27,588	27,633	27,611	27,598
spawning	36,624	36,624	36,643	36,628	36,644	36,638	36,624
fry	915	916	916	915	920	924	912
juvenile	42,076	41,889	41,908	42,096	41,882	41,824	42,128
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<-1%	<1%	<1%	<1%
spawning	--	-2%	-2%	<-1%	<-1%	<-1%	<-1%
fry	--	<1%	<1%	<1%	1%	<1%	<1%
juvenile	--	<-1%	<-1%	<1%	<-1%	<-1%	<1%
Rainbow trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	<-1%	<1%	<1%	<1%	<1%	<-1%
fry	--	<1%	<1%	<-1%	<1%	<1%	<-1%
juvenile	--	<-1%	<-1%	<1%	<-1%	<-1%	<1%
Dry Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	37,111	37,129	37,129	37,098	37,129	37,167	37,155
spawning	32,708	32,413	32,343	32,274	32,268	32,713	32,653
fry	1,458	1,458	1,456	1,459	1,456	1,458	1,454
juvenile	34,865	34,520	34,549	34,587	34,538	35,098	34,842
Rainbow trout							
adult	27,784	28,011	27,980	27,773	28,011	27,906	27,775
spawning	36,639	36,613	36,609	36,614	36,609	36,612	36,631
fry	921	914	913	913	914	922	914
juvenile	41,402	40,918	40,958	41,012	40,943	41,729	41,369
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<-1%	<1%	<1%	<1%
spawning	--	<-1%	-1%	-1%	-1%	<1%	<-1%
fry	--	<-1%	<-1%	<1%	<-1%	<1%	<-1%
juvenile	--	<-1%	<-1%	<-1%	<-1%	<1%	<-1%

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Species/Life Stage	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Rainbow trout							
adult	--	<1%	<1%	<-1%	<1%	<1%	<-1%
spawning	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
fry	--	<-1%	<-1%	<-1%	<-1%	<1%	<-1%
juvenile	--	-1%	-1%	<-1%	-1%	<1%	<-1%
Wet Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	35,785	35,835	35,832	35,846	35,774	35,839	35,841
spawning	28,082	28,114	28,114	28,082	28,114	28,071	28,114
fry	948	948	949	947	949	948	947
juvenile	26,989	27,117	27,110	27,145	26,959	27,129	27,133
Rainbow trout							
adult	31,129	30,785	30,782	30,888	30,666	30,676	30,736
spawning	33,814	35,030	34,846	33,814	34,745	35,147	33,905
fry	884	887	887	883	887	885	891
juvenile	31,412	31,571	31,562	31,605	31,376	31,586	31,590
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<1%	<-1%	<1%	<1%
spawning	--	<1%	<1%	0%	<1%	<-1%	<1%
fry	--	<-1%	<1%	<-1%	<1%	<-1%	<-1%
juvenile	--	<1%	<1%	<1%	<-1%	<1%	<1%
Rainbow trout							
adult	--	-1%	-1%	<-1%	-1%	-1%	-1%
spawning	--	4%	3%	0%	3%	4%	<1%
fry	--	<1%	<1%	<-1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<-1%	<1%	<1%

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Table 29. Cumulative Effects Summary of the Percent Change in Minimum Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 5








Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	14,916	15,121	15,120	15,112	15,122	14,568	15,123
spawning	22,128	21,846	21,719	22,128	21,722	22,294	21,867
fry	314	318	318	318	318	307	318
juvenile	8,396	8,512	8,511	8,506	8,512	8,200	8,513
Rainbow trout							
adult	12,324	12,494	12,493	12,486	12,495	12,037	12,495
spawning	15,684	15,827	15,413	15,256	15,400	15,410	15,782
fry	314	318	318	318	318	307	318
juvenile	9,089	9,214	9,213	9,208	9,214	8,877	9,215
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	1%	1%	1%	1%	-2%	1%
spawning	--	-1%	-2%	<1%	-2%	<1%	-1%
fry	--	1%	1%	1%	1%	-2%	1%
juvenile	--	1%	1%	1%	1%	-2%	1%
Rainbow trout							
adult	--	1%	1%	1%	1%	-2%	1%
spawning	--	<1%	-2%	-3%	-2%	-2%	<1%
fry	--	1%	1%	1%	1%	-2%	1%
juvenile	--	1%	1%	1%	1%	-2%	1%
Dry Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	20,016	20,015	20,016	20,387	20,013	20,448	19,817
spawning	23,348	23,360	23,358	23,341	23,354	23,389	23,362
fry	337	336	336	335	339	343	339
juvenile	12,751	12,749	12,750	13,165	12,748	13,233	12,528
Rainbow trout							
adult	15,912	15,912	15,912	16,156	15,911	16,196	15,782
spawning	15,679	15,628	15,825	15,683	15,825	15,840	15,077
fry	337	336	336	335	339	343	339
juvenile	12,906	12,904	12,905	13,276	12,903	13,337	12,707
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<-1%	<-1%	2%	<-1%	2%	<-1%
spawning	--	<1%	<1%	<-1%	<1%	<1%	<1%
fry	--	<-1%	<-1%	<-1%	<1%	2%	<1%
juvenile	--	<-1%	<-1%	3%	<-1%	4%	-2%

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)








							
Species/Life Stage	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Rainbow trout							
adult	--	<-1%	<-1%	2%	<-1%	2%	<-1%
spawning	--	<-1%	<1%	<1%	<1%	1%	-4%
fry	--	<-1%	<-1%	<-1%	<1%	2%	<1%
juvenile	--	<-1%	<-1%	3%	<-1%	3%	-2%
Wet Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	8,152	8,173	8,172	8,160	8,173	8,173	8,196
spawning	19,534	19,520	19,519	19,534	19,518	19,525	19,520
fry	172	172	172	172	172	172	172
juvenile	4,588	4,601	4,600	4,593	4,601	4,600	4,613
Rainbow trout							
adult	6,735	6,753	6,752	6,743	6,753	6,753	6,772
spawning	15,917	16,360	15,679	15,917	15,679	15,884	15,679
fry	172	172	172	172	172	172	172
juvenile	4,967	4,980	4,979	4,972	4,980	4,980	4,994
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	<-1%	<-1%	<1%	<-1%	<-1%	<-1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%
Rainbow trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	3%	-1%	0%	-1%	<-1%	-1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 30. Cumulative Effects Summary of the Percent Change in Median Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 5








							
Species/Life Stage	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Normal Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	34,606	34,811	34,781	34,667	34,891	34,912	34,860
spawning	24,278	24,051	24,051	24,185	24,183	24,214	24,261
fry	1,783	1,797	1,799	1,787	1,801	1,789	1,788
juvenile	42,343	42,451	42,454	42,216	42,466	42,108	42,503
Rainbow trout							
adult	22,242	22,347	22,363	22,122	22,363	22,345	22,249
spawning	17,528	17,528	17,447	17,422	17,532	17,580	17,529
fry	468	468	468	467	516	468	468
juvenile	43,127	43,232	43,145	43,121	43,232	43,388	43,246
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
fry	--	<1%	<1%	<1%	1%	<1%	<1%
juvenile	--	<1%	<1%	<-1%	<1%	<-1%	<1%
Rainbow trout							
adult	--	<1%	<1%	<-1%	<1%	<1%	<1%
spawning	--	0%	<-1%	<-1%	<1%	<1%	<1%
fry	--	<-1%	<-1%	<-1%	10%	<-1%	<-1%
juvenile	--	<1%	<1%	<-1%	<1%	<1%	<1%
Dry Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	35,956	35,817	35,833	35,842	35,909	35,847	35,862
spawning	24,656	24,553	24,529	24,505	24,503	24,658	24,635
fry	1,778	1,772	1,767	1,777	1,767	1,770	1,766
juvenile	42,156	42,401	42,362	42,028	42,520	42,288	42,288
Rainbow trout							
adult	24,588	24,429	24,414	24,465	24,426	24,469	24,505
spawning	17,603	17,799	17,902	17,615	17,909	17,862	17,784
fry	882	883	860	878	860	881	882
juvenile	44,264	44,738	44,676	44,247	44,814	44,855	44,655

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Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
spawning	--	<-1%	<-1%	<-1%	<-1%	<1%	<-1%
fry	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
juvenile	--	<1%	<1%	<-1%	<1%	<1%	<1%
Rainbow trout							
adult	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
spawning	--	1%	2%	<1%	2%	1%	1%
fry	--	<1%	-3%	<-1%	-3%	<-1%	<-1%
juvenile	--	1%	<1%	<-1%	1%	1%	<1%
Wet Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	38,184	38,028	37,955	38,137	37,986	37,925	38,092
spawning	23,007	23,020	23,020	23,007	23,020	23,002	23,020
fry	466	467	467	465	467	466	467
juvenile	46,112	46,082	46,074	46,094	46,068	46,094	46,113
Rainbow trout							
adult	26,168	25,881	25,822	25,970	25,822	25,860	25,928
spawning	19,002	19,287	19,287	19,009	19,287	19,446	19,050
fry	442	443	443	442	443	443	443
juvenile	43,476	43,595	43,588	43,621	43,449	43,606	43,609
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
spawning	--	<1%	<1%	0%	<1%	<-1%	<1%
fry	--	<1%	<1%	<-1%	<1%	<-1%	<1%
juvenile	--	<-1%	<-1%	<-1%	<-1%	<-1%	<1%
Rainbow trout							
adult	--	-1%	-1%	<-1%	-1%	-1%	<-1%
spawning	--	2%	2%	<1%	2%	2%	<1%
fry	--	<1%	<1%	0%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<-1%	<1%	<1%








Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 31. Cumulative Effects Summary of the Percent Change in Minimum Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 6

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	10,406	10,549	10,549	10,530	10,550	10,246	10,540
spawning	0	0	0	0	0	0	0
fry	1,168	1,147	1,141	1,164	1,149	1,111	1,171
juvenile	6,002	6,085	6,085	6,074	6,086	5,910	6,080
Rainbow trout							
adult	9,955	10,093	10,092	10,074	10,094	9,802	10,084
spawning	0	0	0	0	0	0	0
fry	1,168	1,147	1,141	1,164	1,149	1,111	1,171
juvenile	8,596	8,715	8,714	8,699	8,716	8,464	8,707
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	1%	1%	1%	1%	-2%	1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	-2%	-2%	<-1%	-2%	-5%	<1%
juvenile	--	1%	1%	1%	1%	-2%	1%
Rainbow trout							
adult	--	1%	1%	1%	1%	-2%	1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	-2%	-2%	<-1%	-2%	-5%	<1%
juvenile	--	1%	1%	1%	1%	-2%	1%
Dry Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	13,440	13,462	13,453	13,440	13,463	13,459	13,463
spawning	0	0	0	0	0	0	0
fry	886	953	953	886	953	953	953
juvenile	6,636	6,646	6,642	6,636	6,646	6,644	6,646
Rainbow trout							
adult	13,219	13,246	13,235	13,219	13,247	13,242	13,247
spawning	0	0	0	0	0	0	0
fry	886	953	953	886	953	953	953
juvenile	9,149	9,571	9,571	9,152	9,571	9,572	9,571
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	0%	<1%	<1%	<1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	8%	8%	<1%	8%	8%	8%
juvenile	--	<1%	<1%	0%	<1%	<1%	<1%








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Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)








							
Species/Life Stage	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Rainbow trout							
adult	--	<1%	<1%	0%	<1%	<1%	<1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	8%	8%	<1%	8%	8%	8%
juvenile	--	5%	5%	<1%	5%	5%	5%
Wet Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	5,037	5,052	5,051	5,043	5,052	5,051	5,068
spawning	0	0	0	0	0	0	0
fry	1,199	1,202	1,202	1,200	1,202	1,202	1,206
juvenile	2,905	2,914	2,914	2,909	2,914	2,914	2,923
Rainbow trout							
adult	4,819	4,833	4,832	4,824	4,833	4,833	4,848
spawning	0	0	0	0	0	0	0
fry	1,199	1,202	1,202	1,200	1,202	1,202	1,206
juvenile	4,161	4,173	4,173	4,166	4,173	4,173	4,186
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%
Rainbow trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
juvenile	--	<1%	<1%	<1%	<1%	<1%	<1%

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 32. Cumulative Effects Summary of the Percent Change in Median Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Upper Arkansas River Segment 6

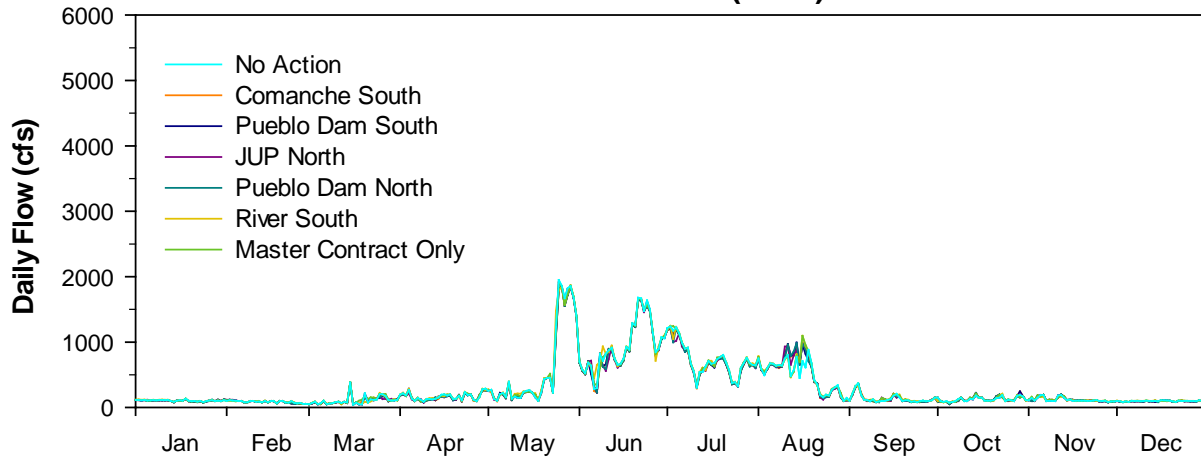
Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	24,805	24,865	24,893	24,807	24,938	24,942	24,938
spawning	0	0	0	0	0	0	0
fry	1,733	1,726	1,727	1,704	1,727	1,729	1,704
juvenile	11,149	11,139	11,137	11,149	11,134	11,105	11,165
Rainbow trout							
adult	23,901	23,880	23,875	23,841	23,939	24,020	24,019
spawning	0	0	0	0	0	0	0
fry	2,029	2,006	2,018	2,032	2,028	2,041	2,019
juvenile	13,300	13,315	13,308	13,310	13,331	13,292	13,328
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<1%	<1%	<1%	<1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	<-1%	<-1%	-2%	<-1%	<-1%	-2%
juvenile	--	<-1%	<-1%	0%	<-1%	<-1%	<1%
Rainbow trout							
adult	--	<-1%	<-1%	<-1%	<1%	<1%	<1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	-1%	<-1%	<1%	<-1%	<1%	<-1%
juvenile	--	<1%	<1%	<1%	<1%	<-1%	<1%
Dry Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	23,700	23,730	23,801	23,665	23,806	23,709	23,730
spawning	0	0	0	0	0	0	0
fry	1,659	1,658	1,658	1,651	1,658	1,657	1,625
juvenile	10,679	10,703	10,686	10,564	10,685	10,775	10,685
Rainbow trout							
adult	23,391	23,557	23,557	23,335	23,569	23,474	23,441
spawning	0	0	0	0	0	0	0
fry	1,902	1,904	1,900	1,903	1,900	1,901	1,899
juvenile	12,771	12,771	12,750	12,743	12,772	12,847	12,774
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<1%	<1%	<-1%	<1%	<1%	<1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	<-1%	<-1%	<-1%	<-1%	<-1%	-2%
juvenile	--	<1%	<1%	-1%	<1%	<1%	<1%

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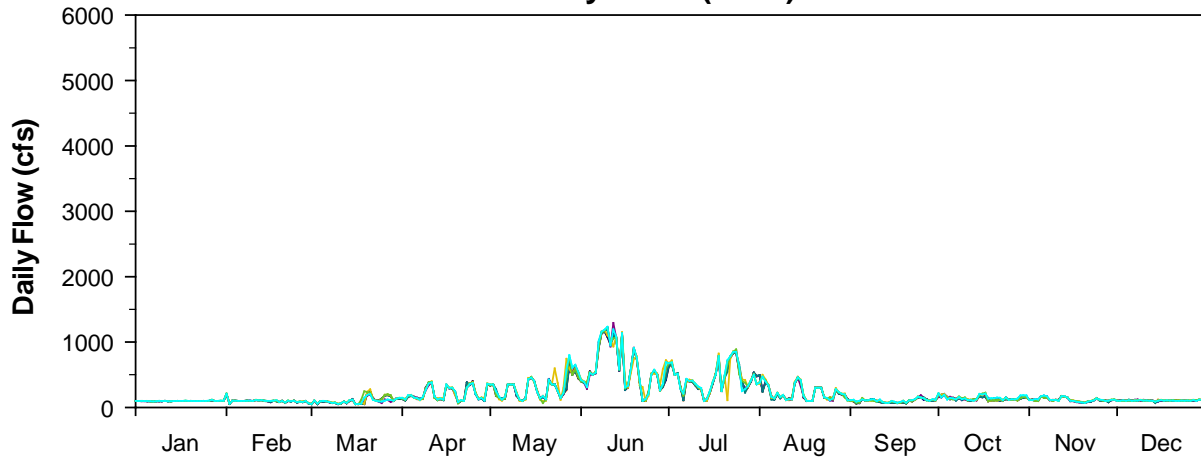
							
Species/Life Stage	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Rainbow trout							
adult	--	<1%	<1%	<-1%	<1%	<1%	<1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	<1%	<-1%	<1%	<-1%	<-1%	<-1%
juvenile	--	<-1%	<-1%	<-1%	<1%	<1%	<1%
Wet Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	24,976	24,961	24,920	24,926	24,920	24,912	24,867
spawning	0	0	0	0	0	0	0
fry	2,386	2,377	2,372	2,366	2,372	2,365	2,379
juvenile	9,435	9,422	9,421	9,424	9,419	9,435	9,406
Rainbow trout							
adult	25,804	25,620	25,579	25,705	25,600	25,599	25,600
spawning	0	0	0	0	0	0	0
fry	2,457	2,455	2,455	2,442	2,447	2,455	2,455
juvenile	12,074	12,063	12,062	12,065	12,061	12,075	12,049
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
juvenile	--	<-1%	<-1%	<-1%	<-1%	<1%	<-1%
Rainbow trout							
adult	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
spawning	--	0%	0%	0%	0%	0%	0%
fry	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
juvenile	--	<-1%	<-1%	<-1%	<-1%	<1%	<-1%

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Lower Arkansas River, Segment 1 – Pueblo Reservoir to Wildhorse Creek
Normal Year (2005)



Dry Year (2004)



Wet Year (1997)

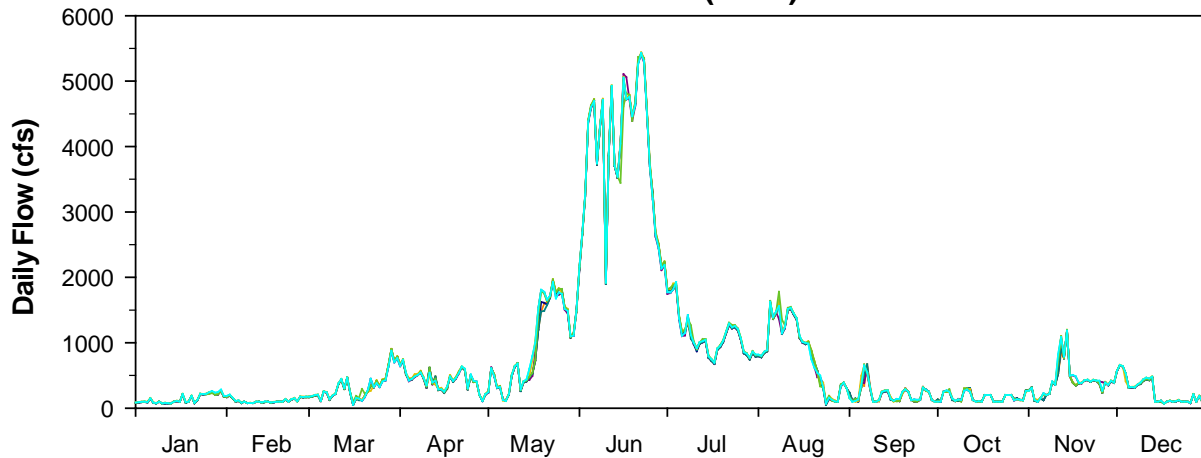


Figure 125. Cumulative Effects Daily Hydrology for All Alternatives for Segment 1 of the Lower Arkansas River at the Above Pueblo Gage

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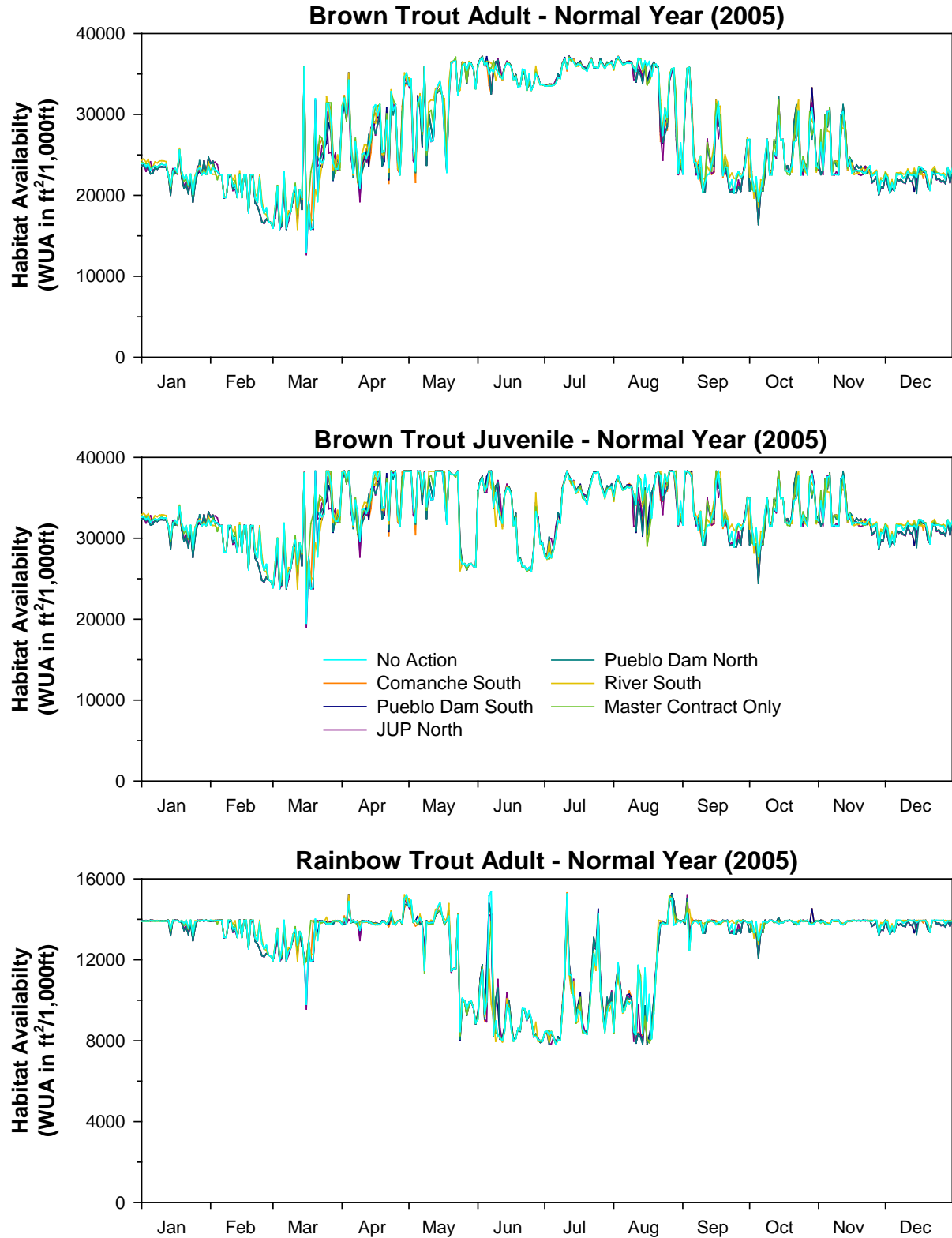


Figure 126. Cumulative Effects Brown Trout Adult, Brown Trout Juvenile, and Rainbow Trout Adult Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 1 of the Lower Arkansas River

**Arkansas Valley Conduit EIS
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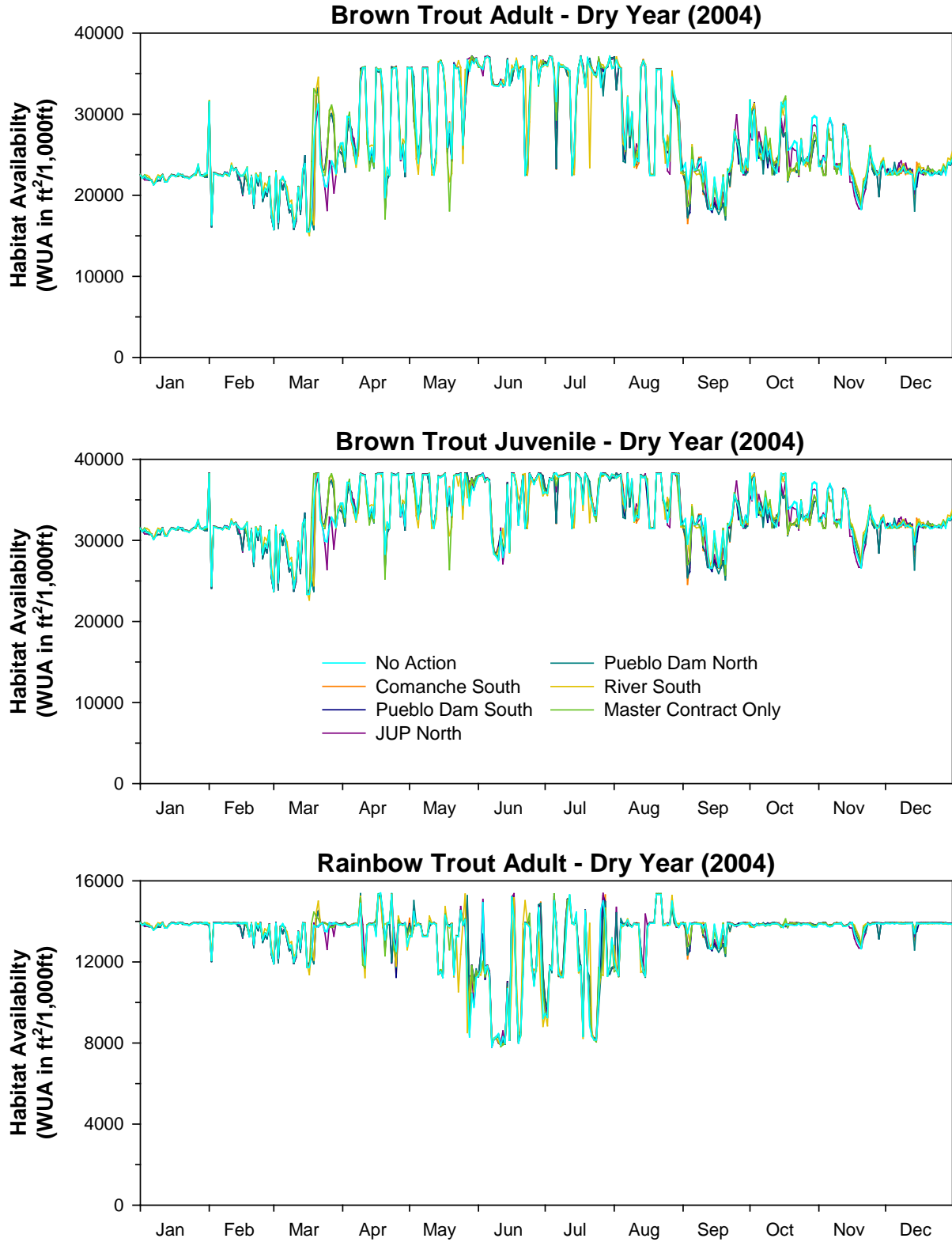


Figure 127. Cumulative Effects Brown Trout Adult, Brown Trout Juvenile, and Rainbow Trout Adult Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 1 of the Lower Arkansas River.

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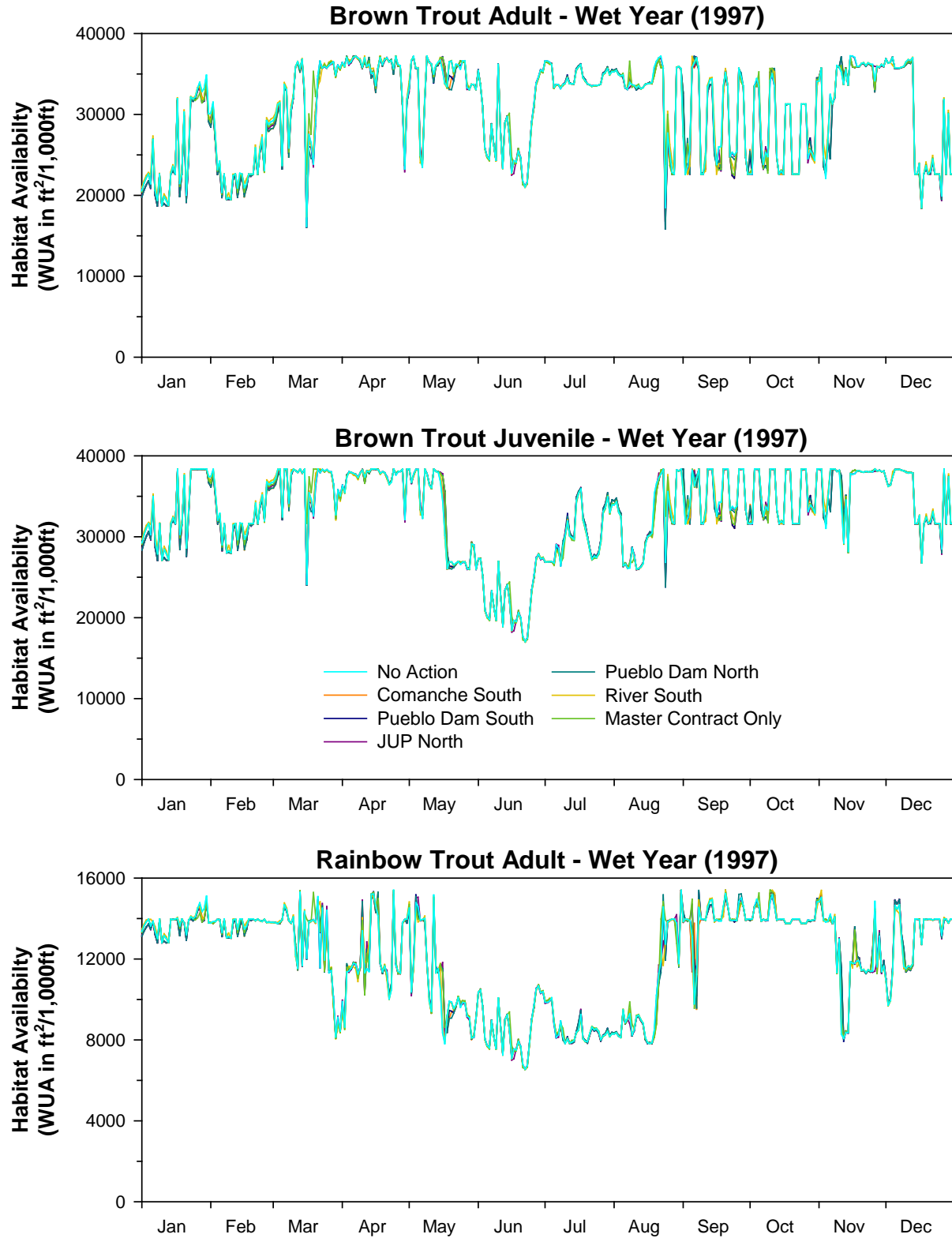









Figure 128. Cumulative Effects Brown Trout Adult, Brown Trout Juvenile, and Rainbow Trout Adult Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 1 of the Lower Arkansas River

Arkansas Valley Conduit EIS
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Table 33. Cumulative Effects Summary of the Percent Change in Minimum Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Lower Arkansas River Segment 1

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	13,012	15,832	15,832	12,693	15,832	15,832	15,839
juvenile	19,536	23,769	23,769	19,057	23,769	23,769	23,777
Rainbow trout							
adult	7,829	7,844	7,821	7,807	7,811	7,820	7,830
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	22%	22%	-2%	22%	22%	22%
juvenile	--	22%	22%	-2%	22%	22%	22%
Rainbow trout							
adult	--	<1%	<-1%	<-1%	<-1%	<-1%	<1%
Dry Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	15,627	15,832	15,832	15,600	15,832	15,132	15,624
juvenile	23,463	23,769	23,769	23,422	23,769	22,719	23,458
Rainbow trout							
adult	7,844	7,920	7,915	7,811	7,920	7,904	7,853
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	1%	1%	<-1%	1%	-3%	<-1%
juvenile	--	1%	1%	<-1%	1%	-3%	<-1%
Rainbow trout							
adult	--	<1%	<1%	<-1%	<1%	<1%	<1%
Wet Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	16,093	16,040	15,832	16,040	15,832	17,318	18,400
juvenile	16,980	16,989	17,009	17,071	17,004	16,944	17,136
Rainbow trout							
adult	6,525	6,528	6,536	6,560	6,534	6,511	6,585
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<-1%	-2%	<-1%	-2%	8%	14%
juvenile	--	<1%	<1%	<1%	<1%	<-1%	<1%
Rainbow trout							
adult	--	<1%	<1%	<1%	<1%	<-1%	<1%

Arkansas Valley Conduit EIS

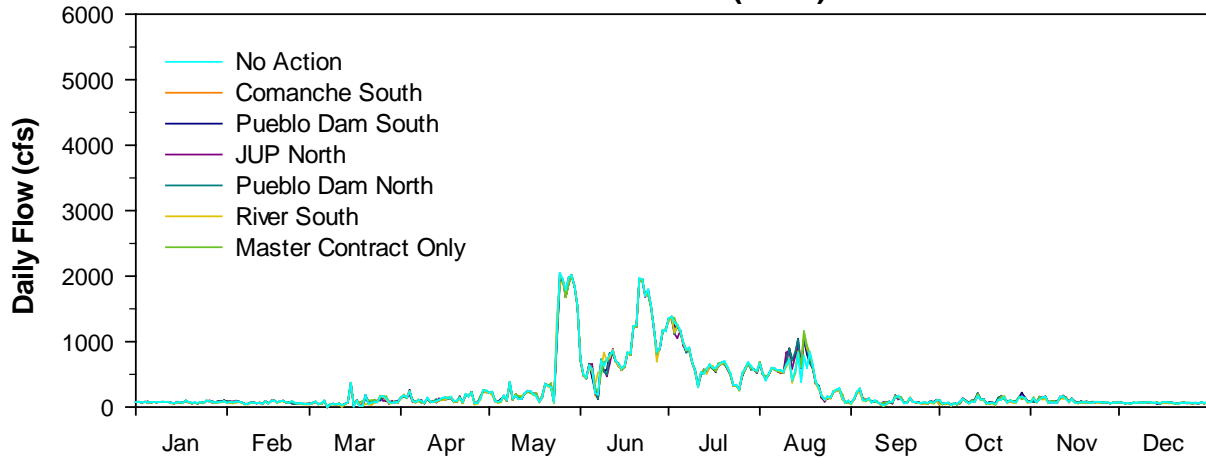
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 34. Cumulative Effects Summary of the Percent Change in Median Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for Brown and Rainbow Trout, Lower Arkansas River Segment 1

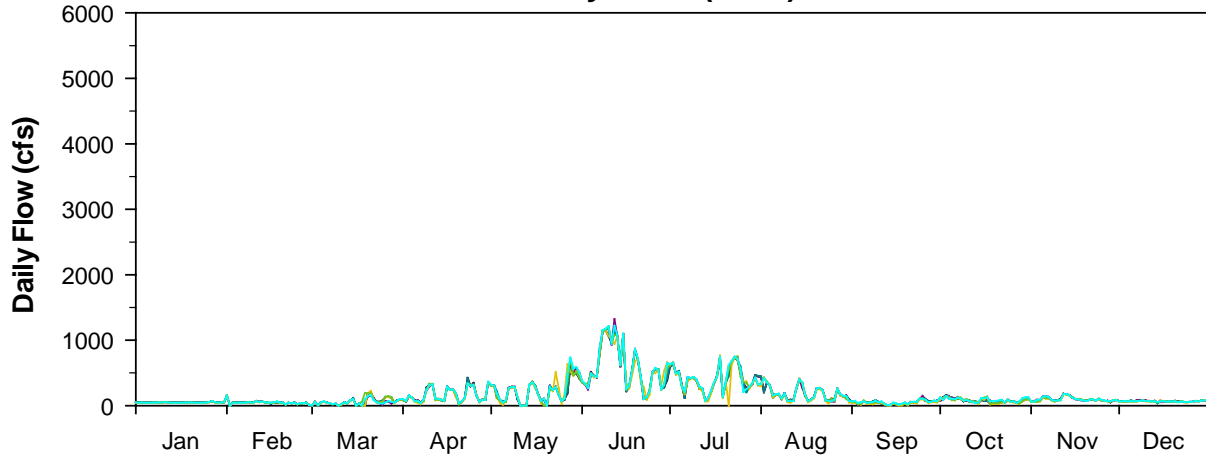
Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	24,520	24,310	24,231	24,456	24,283	24,490	24,784
juvenile	32,305	32,315	32,315	32,293	32,317	32,295	32,388
Rainbow trout							
adult	13,842	13,758	13,773	13,773	13,771	13,848	13,831
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<-1%	-1%	<-1%	<-1%	<-1%	1%
juvenile	--	<1%	<1%	<-1%	<1%	<-1%	<1%
Rainbow trout							
adult	--	<-1%	<-1%	<-1%	<-1%	<1%	<-1%
Dry Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	24,329	24,060	23,996	24,046	24,110	24,039	24,162
juvenile	32,764	32,548	32,565	32,606	32,620	32,658	32,631
Rainbow trout							
adult	13,882	13,874	13,877	13,867	13,872	13,890	13,886
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	-1%	-1%	-1%	<-1%	-1%	<-1%
juvenile	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
Rainbow trout							
adult	--	<-1%	<-1%	<-1%	<-1%	<1%	<1%
Wet Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
Brown trout							
adult	33,361	33,243	33,233	33,181	33,229	33,288	33,316
juvenile	33,684	33,390	33,403	33,595	33,379	33,523	33,716
Rainbow trout							
adult	13,091	13,108	13,108	12,988	13,108	13,230	13,218
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Brown trout							
adult	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
juvenile	--	<-1%	<-1%	<-1%	<-1%	<-1%	<1%
Rainbow trout							
adult	--	<1%	<1%	<-1%	<1%	1%	<1%

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

**Lower Arkansas River, Segment 2 – Wildhorse Creek to Fountain Creek
Normal Year (2005)**



Dry Year (2004)



Wet Year (1997)

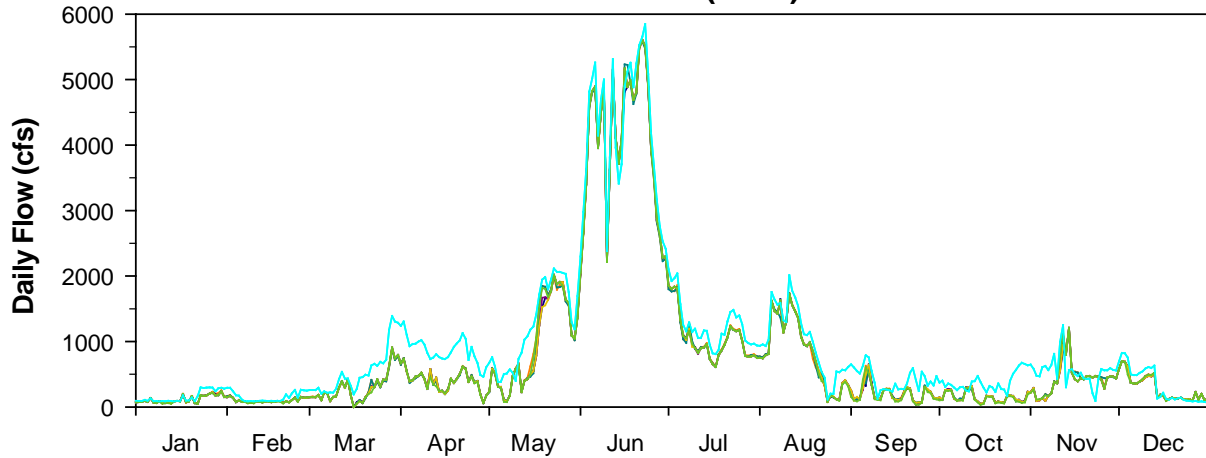
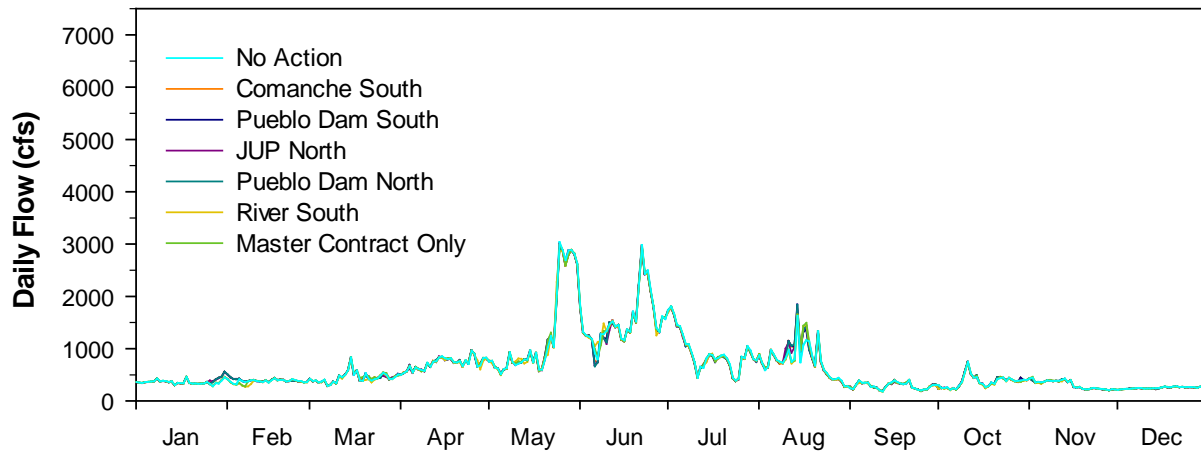


Figure 129. Cumulative Effects Daily Hydrology for All Alternatives for Segment 2 of the Lower Arkansas River at the Moffat Street Gage

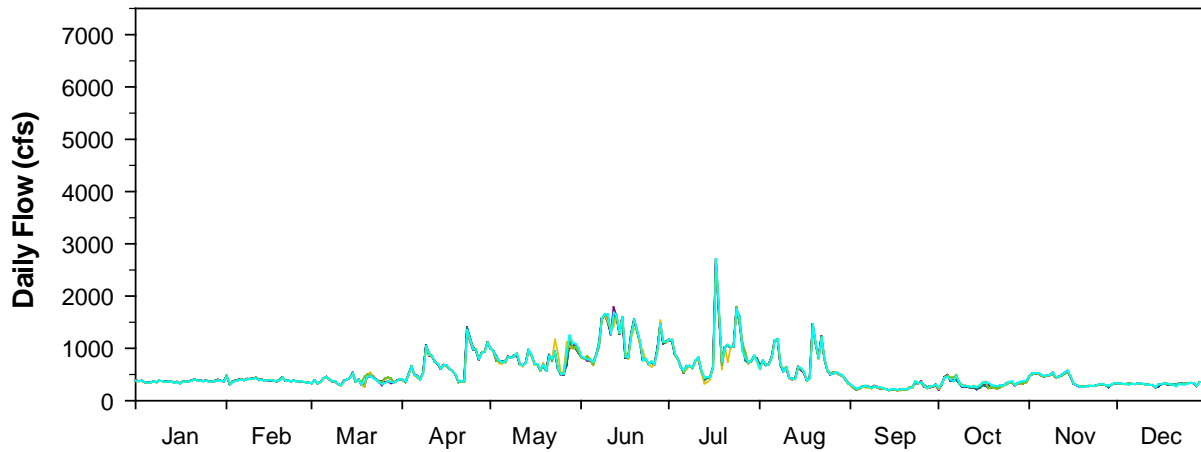
Arkansas Valley Conduit EIS

Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Lower Arkansas River, Segment 3 –Fountain Creek to John Martin Reservoir
Normal Year (2005)



Dry Year (2004)



Wet Year (1997)

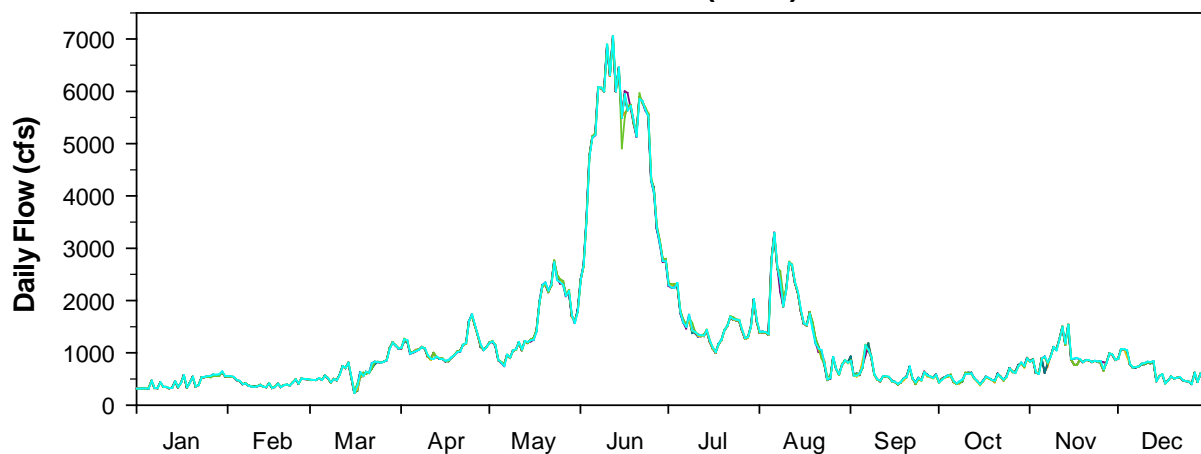


Figure 130. Cumulative Effects Daily Hydrology for All Alternatives for Segment 3 of the Lower Arkansas River at the Avondale Gage

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

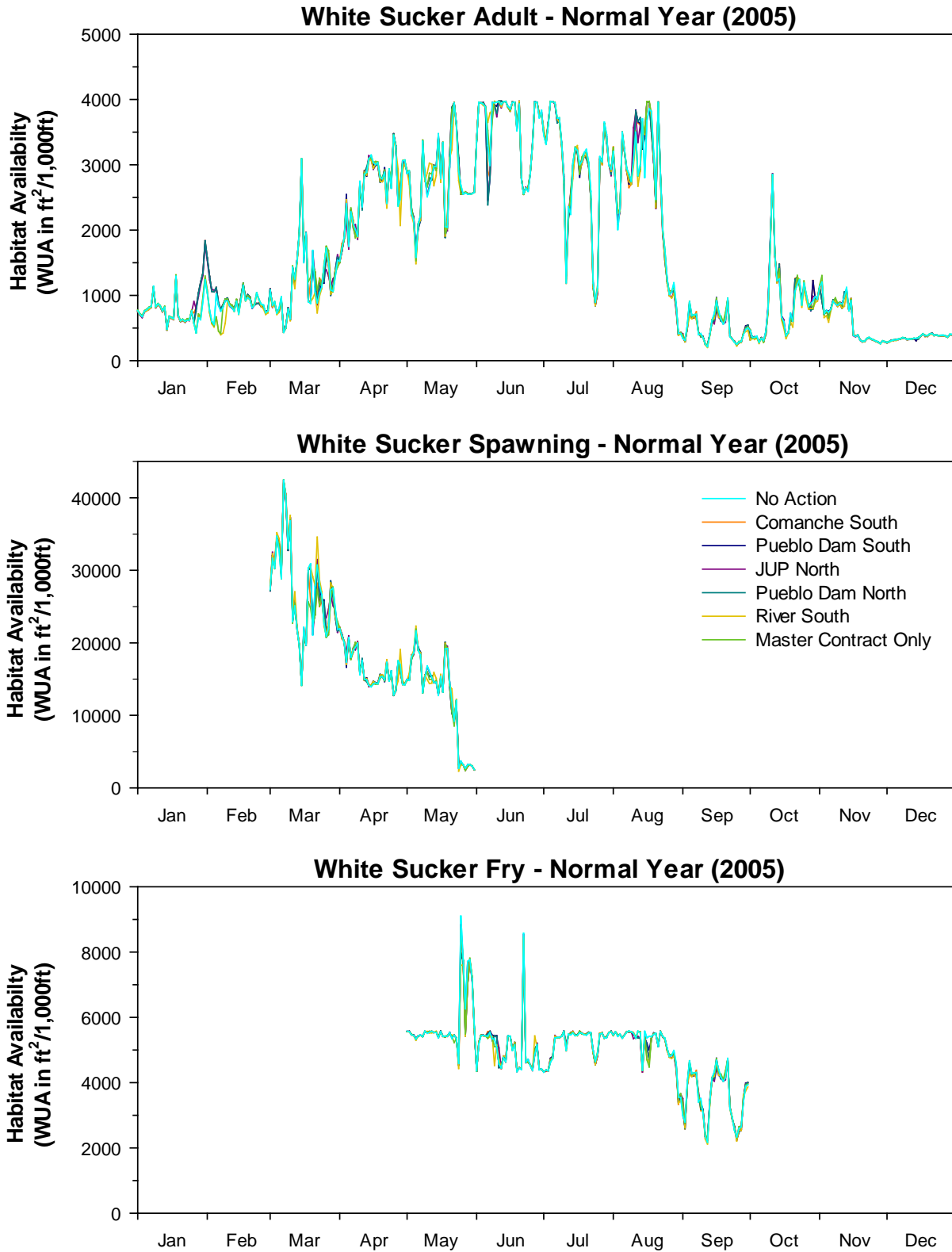


Figure 131. Cumulative Effects White Sucker Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 3 of the Lower Arkansas River

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

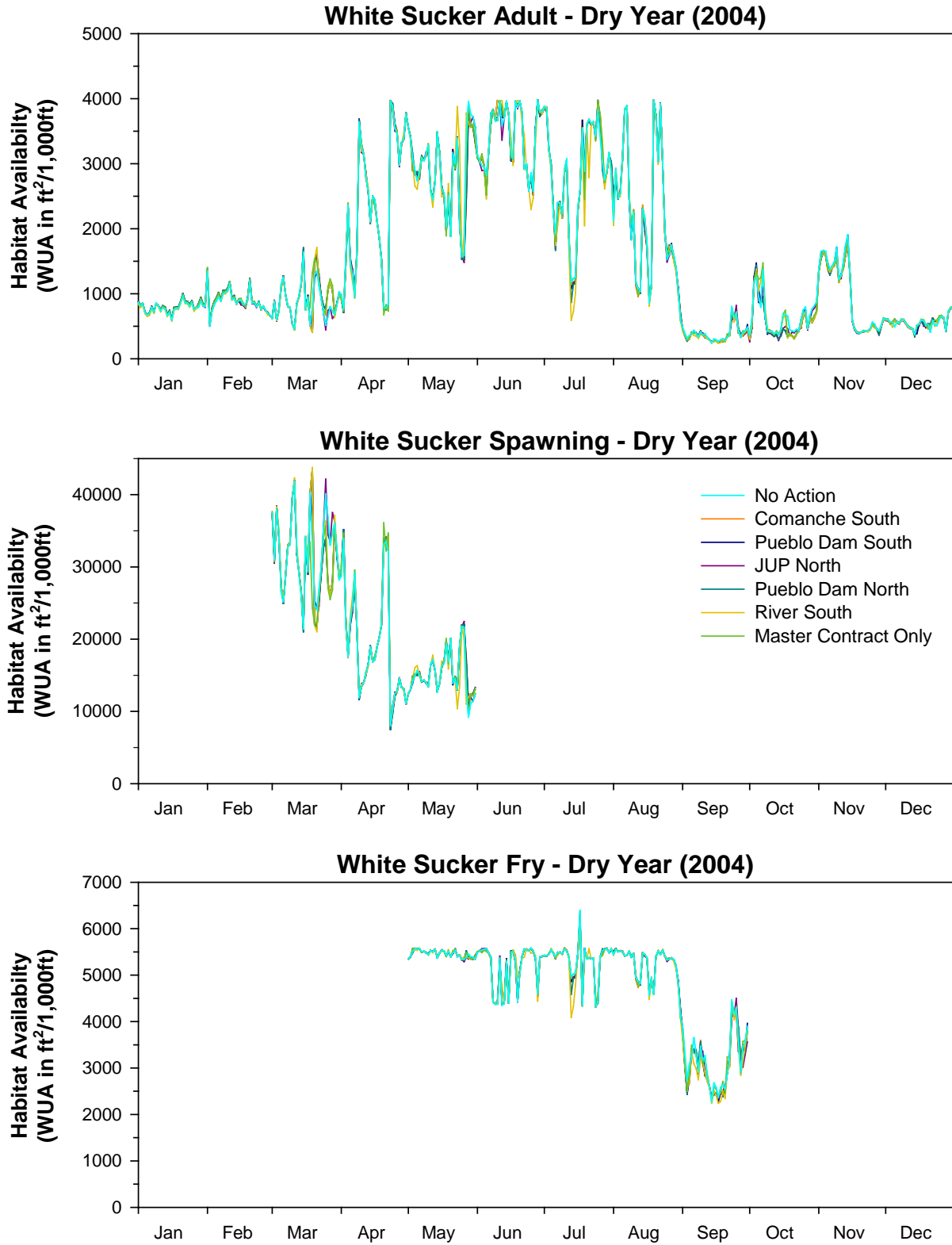


Figure 132. Cumulative Effects White Sucker Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 3 of the Lower Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

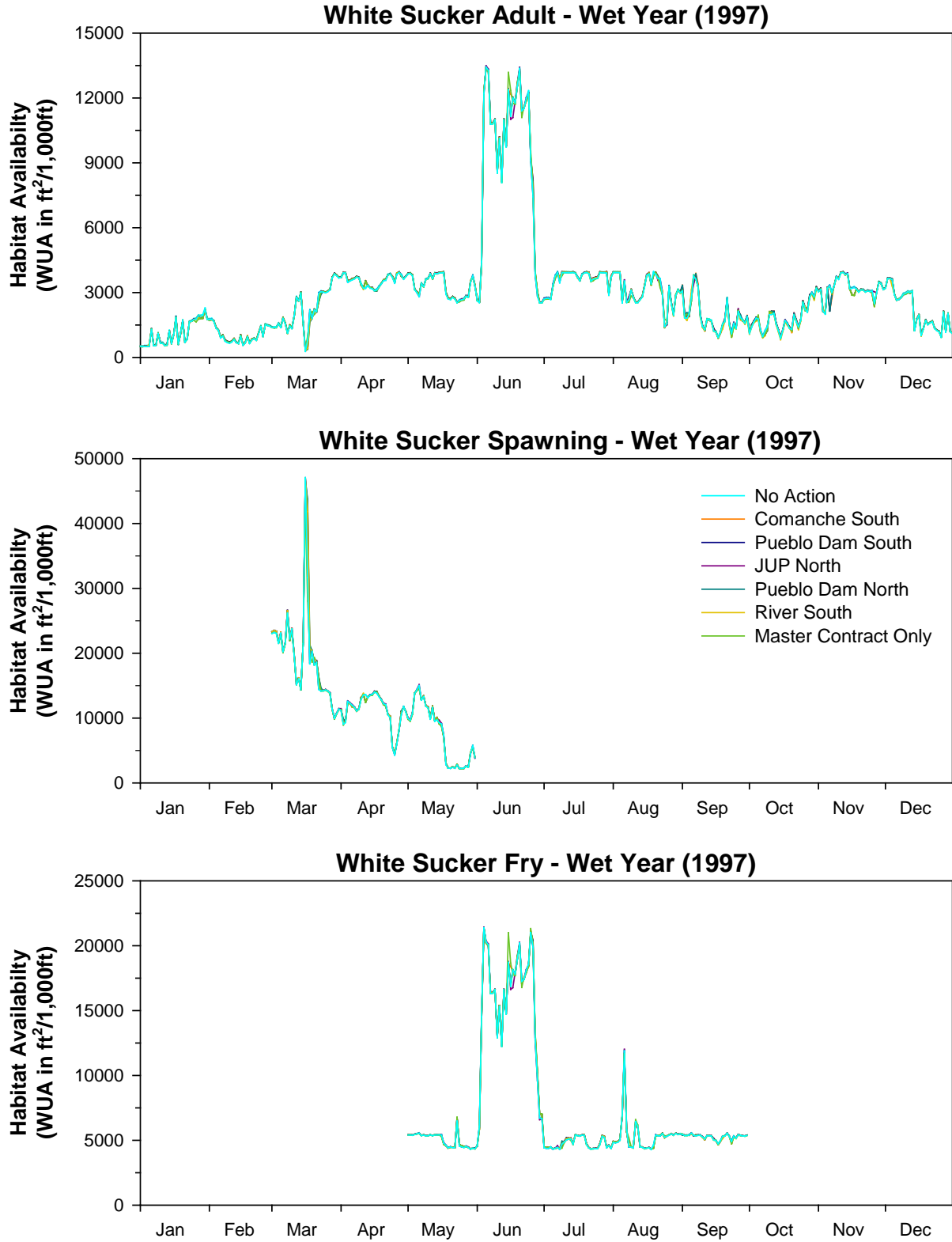


Figure 133. Cumulative Effects White Sucker Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 3 of the Lower Arkansas River

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

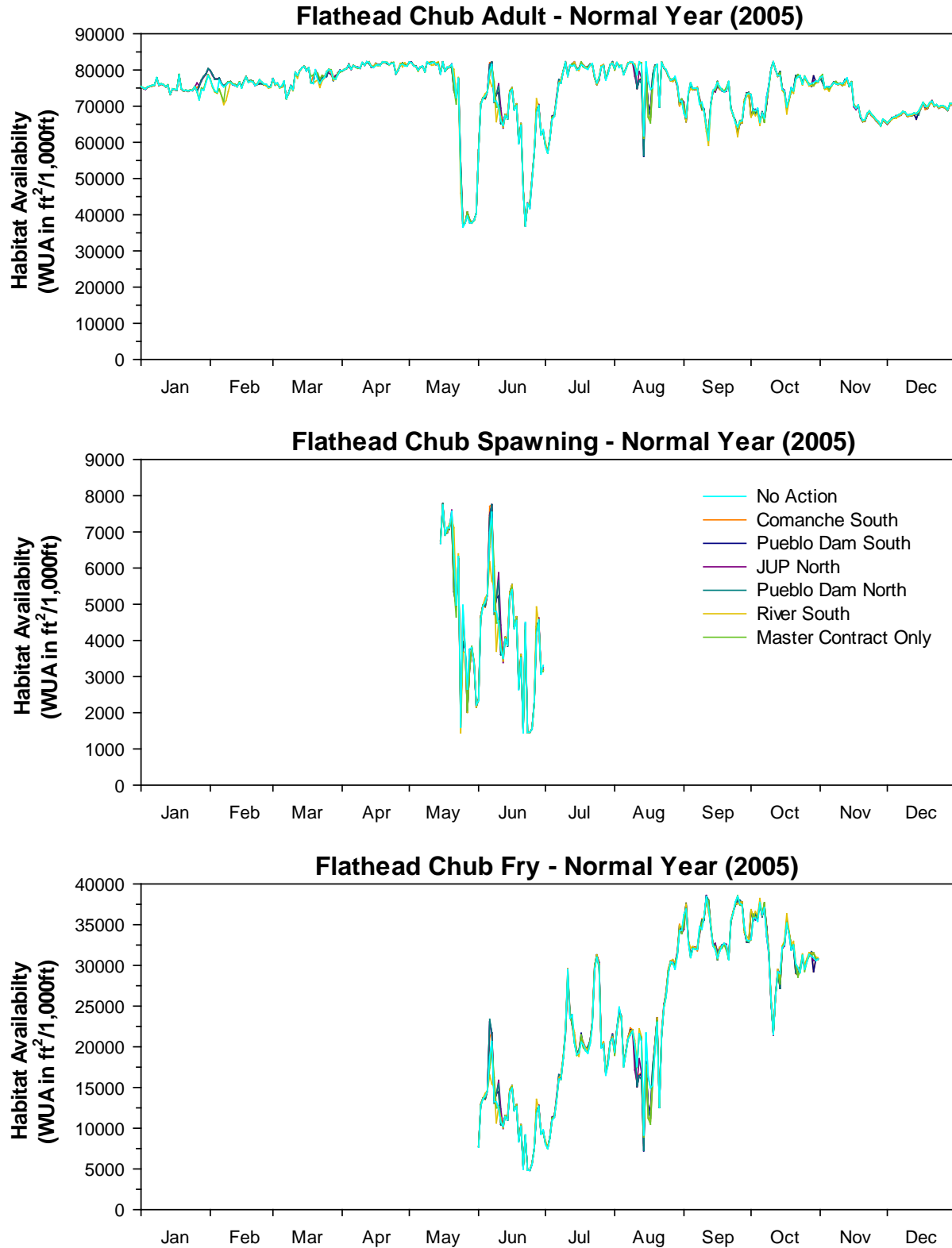


Figure 134. Cumulative Effects Flathead Chub Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 3 of the Lower Arkansas River

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

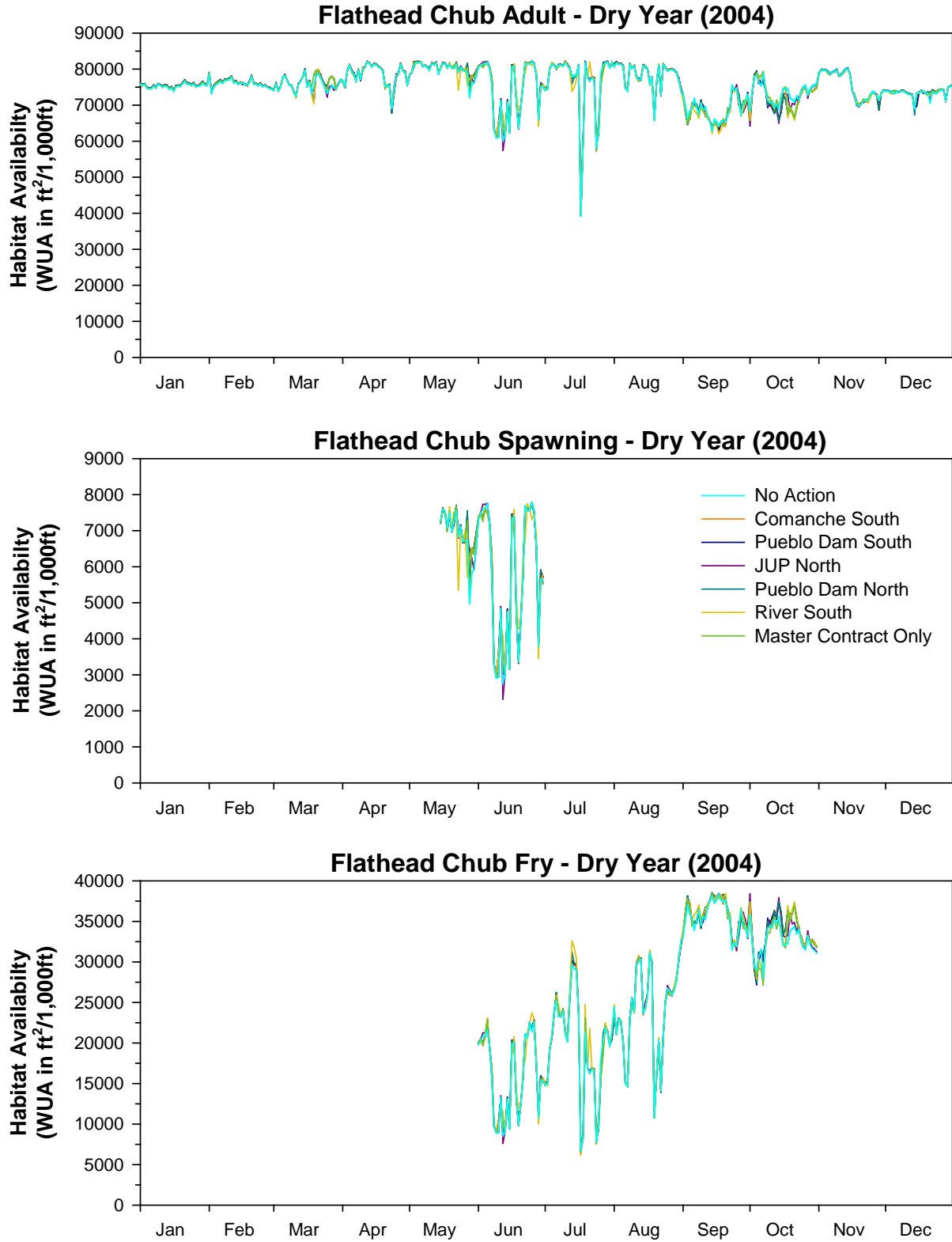


Figure 135. Cumulative Effects Flathead Chub Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 3 of the Lower Arkansas River

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

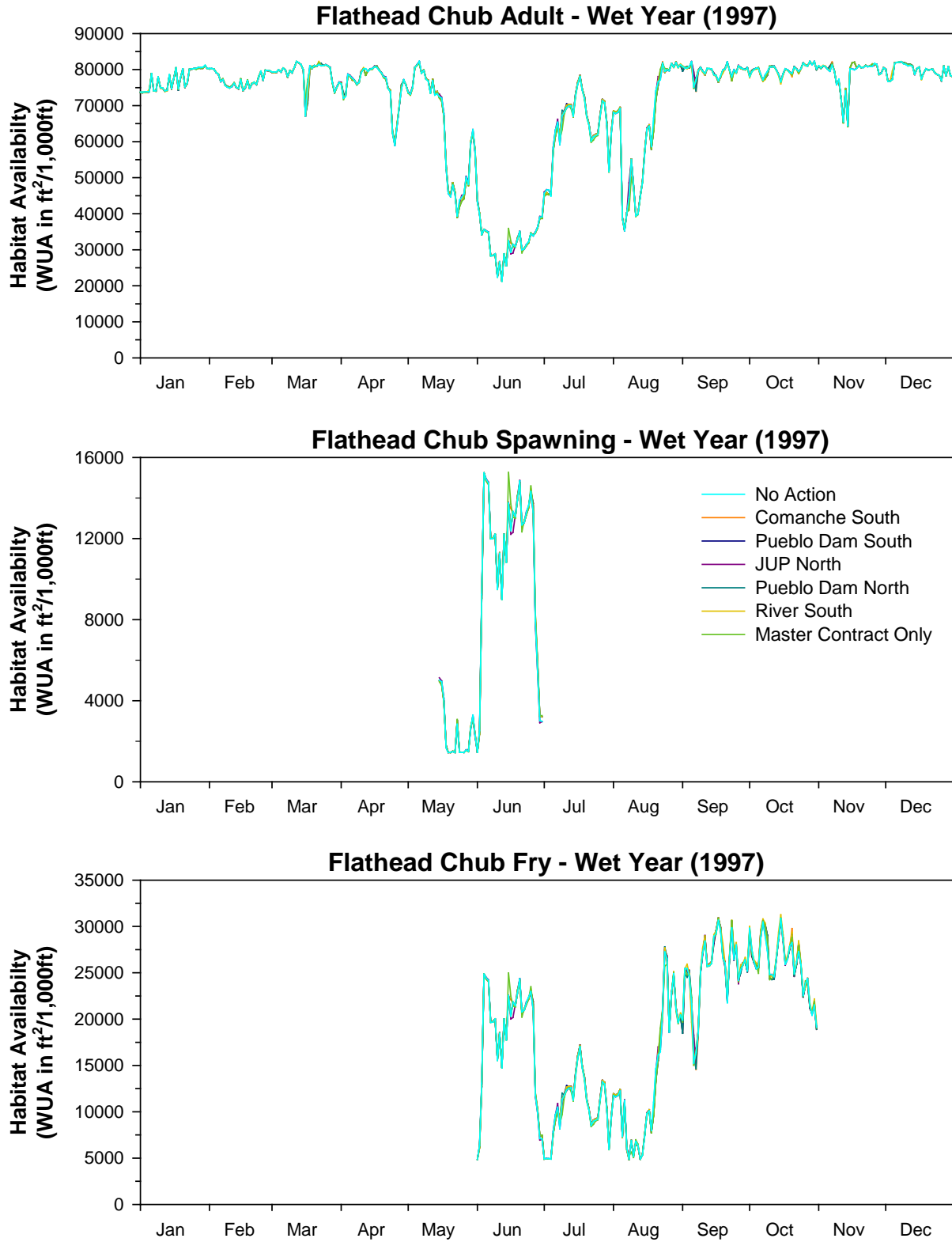


Figure 136. Cumulative Effects Flathead Chub Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 3 of the Lower Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

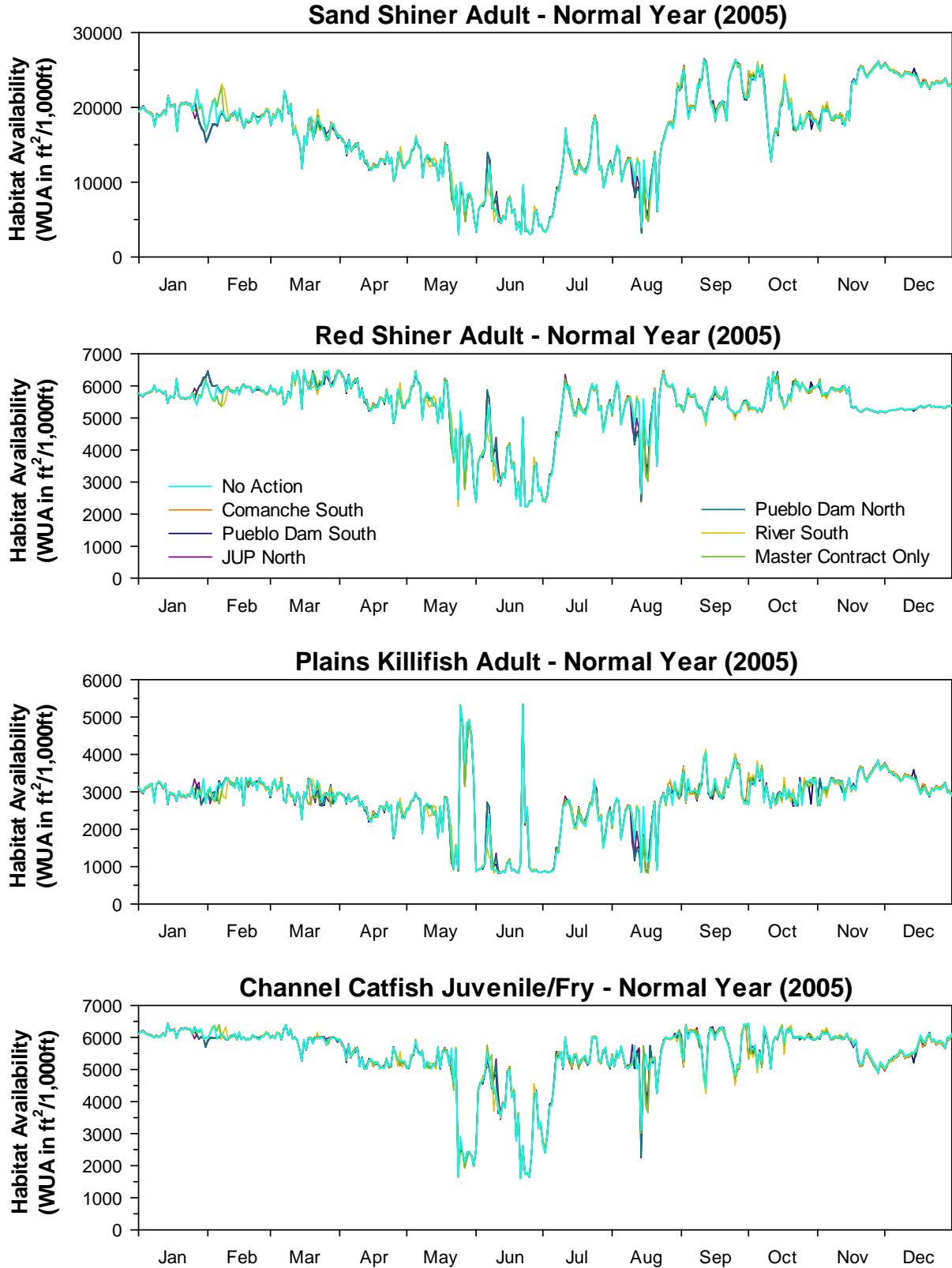


Figure 137. Cumulative Effects Sand Shiner (Adult), Red Shiner (Adult), Plains Killifish (Adult), and Channel Catfish (Juvenile/Fry) Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 3 of the Lower Arkansas River

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

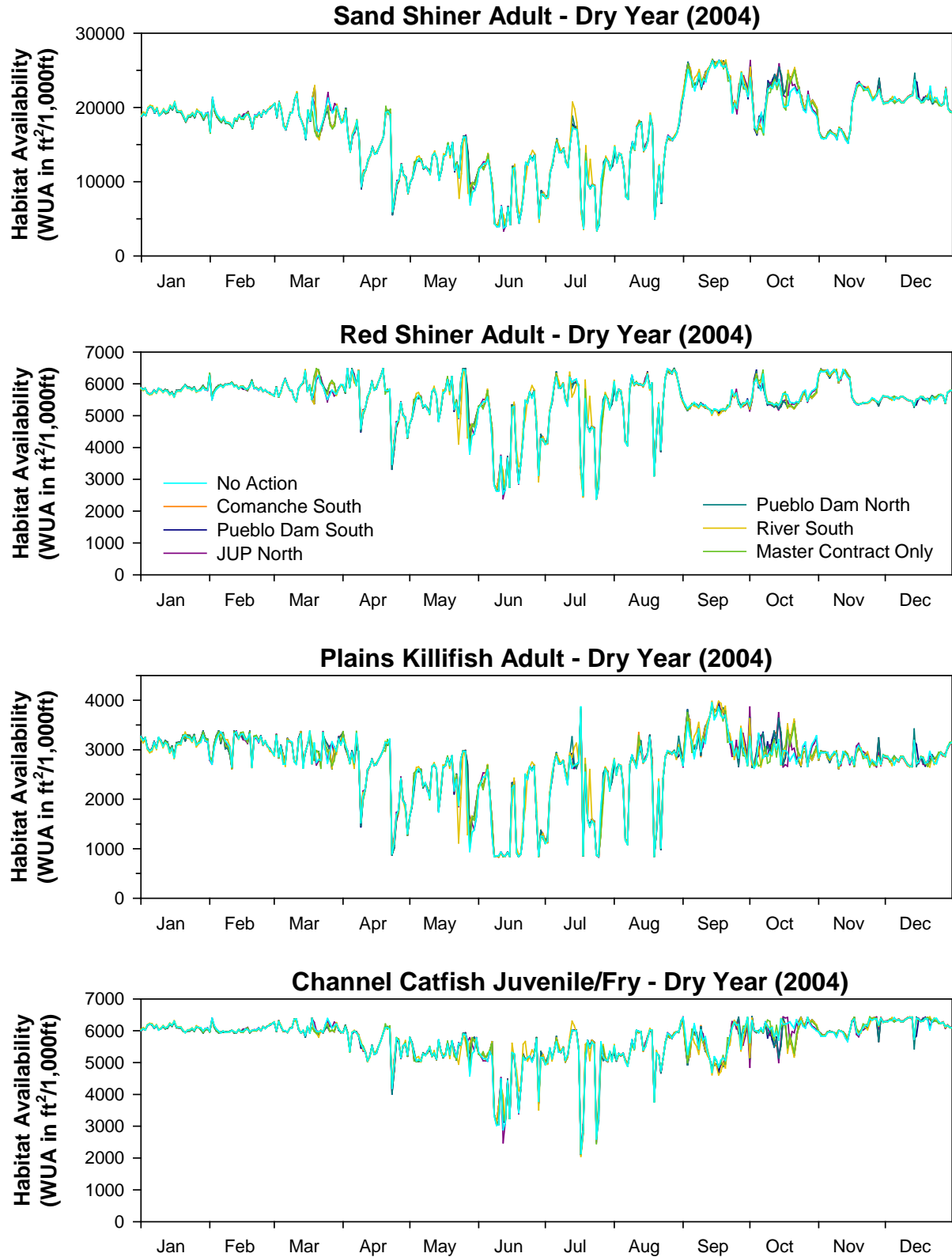


Figure 138. Cumulative Effects Sand Shiner (Adult), Red Shiner (Adult), Plains Killifish (Adult), and Channel Catfish (Juvenile/Fry) Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 3 of the Lower Arkansas River

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

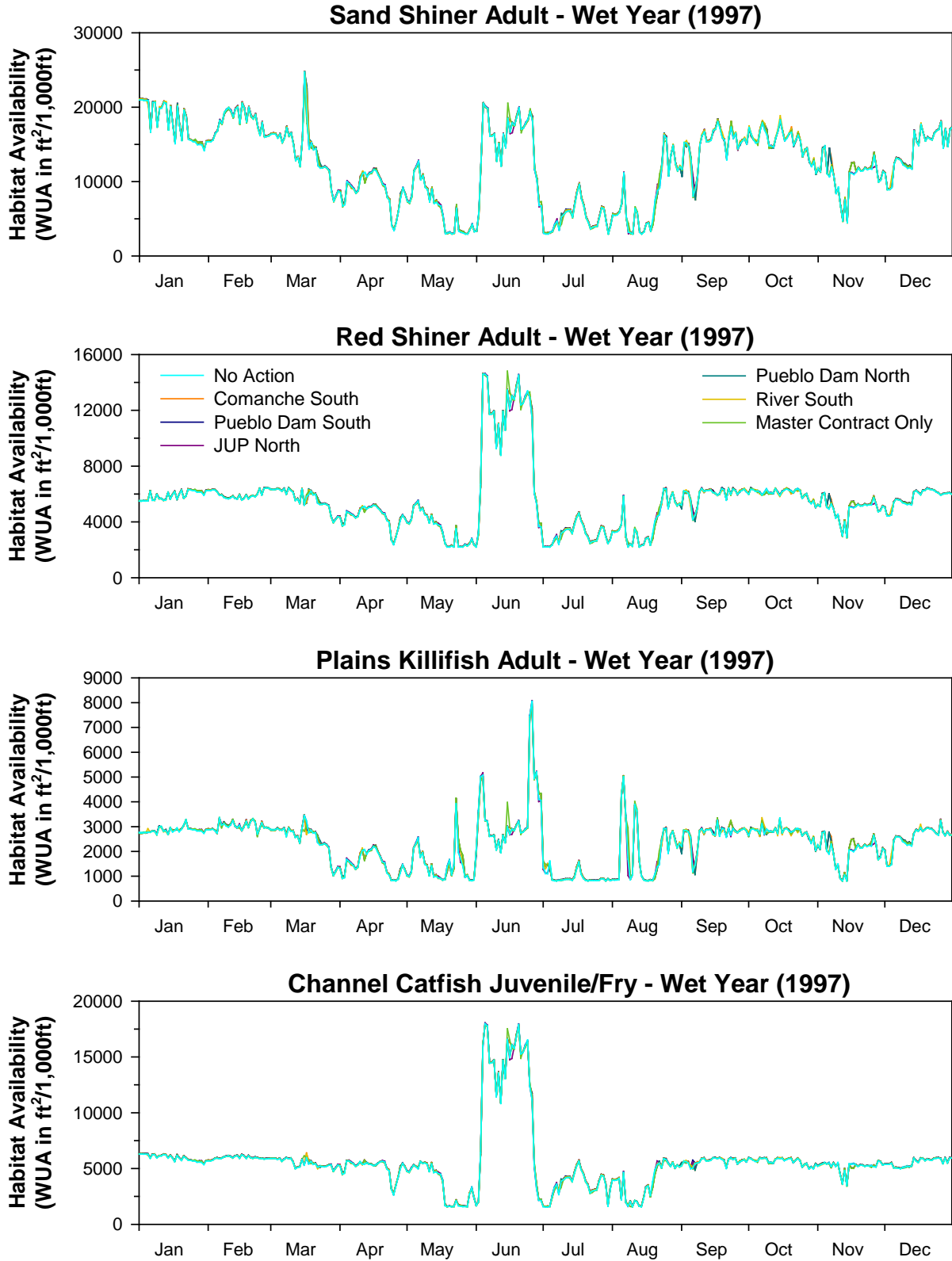









Figure 139. Cumulative Effects Sand Shiner (Adult), Red Shiner (Adult), Plains Killifish (Adult), and Channel Catfish (Juvenile/Fry) Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 3 of the Lower Arkansas River








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Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 35. Cumulative Effects Summary of the Percent Change in Minimum Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for White Sucker, Flathead Chub, Sand Shiner (Adult), Red Shiner (Adult), Plains Killifish (Adult), and Channel Catfish (Juvenile/Fry), Lower Arkansas River Segment 3

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	221	241	239	236	241	207	239
spawning	2,515	2,425	2,425	2,493	2,425	2,323	2,446
fry	2,176	2,257	2,248	2,236	2,257	2,121	2,251
Flathead chub							
adult/juvenile	36,567	36,996	36,996	36,688	36,998	36,997	36,774
spawning	1,444	1,456	1,456	1,455	1,456	1,443	1,458
fry	4,803	4,835	4,837	4,808	4,837	4,837	4,832
Sand shiner	3,023	3,025	3,025	3,022	3,025	3,025	3,025
Red shiner	2,247	2,248	2,248	2,247	2,248	2,248	2,248
Plains killifish	836	833	833	835	833	833	834
Channel catfish	1,608	1,615	1,619	1,615	1,619	1,619	1,616
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	9%	8%	7%	9%	-6%	8%
spawning	--	-4%	-4%	<-1%	-4%	-8%	-3%
fry	--	4%	3%	3%	4%	-3%	3%
Flathead chub							
adult/juvenile	--	1%	1%	<1%	1%	1%	<1%
spawning	--	<1%	<1%	<1%	<1%	<-1%	<1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
Sand shiner	--	<1%	<1%	<-1%	<1%	<1%	<1%
Red shiner	--	<1%	<1%	<1%	<1%	<1%	<1%
Plains killifish	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
Channel catfish	--	<1%	<1%	<1%	<1%	<1%	<1%
Dry Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	245	240	246	255	263	237	253
spawning	8,051	7,651	7,498	8,087	7,527	8,225	8,128
fry	2,272	2,254	2,277	2,320	2,381	2,242	2,304
Flathead chub							
adult/juvenile	39,501	39,677	39,677	39,592	39,656	40,044	39,538
spawning	2,754	3,016	3,012	2,331	3,017	3,016	2,964
fry	6,709	6,552	6,552	6,628	6,570	6,223	6,676
Sand shiner	3,403	3,441	3,442	3,353	3,440	3,408	3,342
Red shiner	2,373	2,383	2,384	2,388	2,383	2,371	2,396
Plains killifish	840	833	833	833	838	833	839
Channel catfish	2,141	2,112	2,112	2,126	2,116	2,053	2,135
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							








Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
White sucker							
adult/juvenile	--	-2%	<1%	4%	8%	-3%	3%
spawning	--	-5%	-7%	<1%	-7%	2%	<1%
fry	--	<-1%	<1%	2%	5%	-1%	1%
Flathead chub							
adult/juvenile	--	<1%	<1%	<1%	<1%	1%	<1%
spawning	--	10%	9%	-15%	10%	10%	8%
fry	--	-2%	-2%	-1%	-2%	-7%	<-1%
Sand shiner	--	1%	1%	-1%	1%	<1%	-2%
Red shiner	--	<1%	<1%	<1%	<1%	<-1%	<1%
Plains killifish	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
Channel catfish	--	-1%	-1%	<-1%	-1%	-4%	<-1%
Wet Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	324	336	325	325	336	325	433
spawning	2,252	2,198	2,198	2,230	2,198	2,198	2,192
fry	4,318	4,338	4,344	4,318	4,344	4,343	4,338
Flathead chub							
adult/juvenile	21,266	21,349	21,350	21,350	21,349	21,348	21,265
spawning	1,444	1,441	1,442	1,444	1,441	1,442	1,443
fry	4,849	4,837	4,852	4,850	4,847	4,845	4,851
Sand shiner	3,022	3,021	3,021	3,021	3,021	3,021	3,022
Red shiner	2,248	2,247	2,247	2,248	2,247	2,247	2,247
Plains killifish	835	834	834	834	833	834	833
Channel catfish	1,608	1,614	1,623	1,609	1,613	1,622	1,616
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	3%	<1%	<1%	3%	<1%	33%
spawning	--	-2%	-2%	<-1%	-2%	-2%	-3%
fry	--	<1%	<1%	<-1%	<1%	<1%	<1%
Flathead chub							
adult/juvenile	--	<1%	<1%	<1%	<1%	<1%	<-1%
spawning	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
fry	--	<-1%	<1%	<1%	<-1%	<-1%	<1%
Sand shiner	--	<-1%	<-1%	<-1%	<-1%	<-1%	<1%
Red shiner	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
Plains killifish	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
Channel catfish	--	<1%	<1%	<1%	<1%	<1%	<1%








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Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 36. Cumulative Effects Summary of the Percent Change in Median Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for White Sucker, Flathead Chub, Sand Shiner (Adult), Red Shiner (Adult), Plains Killifish (Adult), and Channel Catfish (Juvenile/Fry), Lower Arkansas River Segment 3

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	1,045	1,124	1,067	1,101	1,099	996	1,086
Spawning	17,569	17,585	17,595	17,737	17,570	17,981	17,497
fry	5,364	5,364	5,367	5,364	5,368	5,369	5,360
Flathead chub							
adult/juvenile	75,879	75,821	75,881	75,893	75,808	75,427	75,836
spawning	4,440	4,314	4,383	4,456	4,382	4,270	4,384
fry	23,471	23,516	23,519	23,578	23,485	23,534	23,167
Sand shiner	17,847	17,511	17,753	17,609	17,615	18,056	17,671
Red shiner	5,558	5,574	5,584	5,582	5,573	5,518	5,536
Plains killifish	2,906	2,898	2,904	2,877	2,895	2,907	2,897
Channel catfish	5,698	5,684	5,699	5,696	5,698	5,684	5,719
Change in Median Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	7%	2%	5%	5%	-5%	4%
spawning	--	<1%	<1%	<1%	<1%	2%	<-1%
fry	--	<-1%	<1%	<-1%	<1%	<1%	<-1%
Flathead chub							
adult/juvenile	--	<-1%	<1%	<1%	<-1%	<-1%	<-1%
spawning	--	-3%	-1%	<1%	-1%	-4%	-1%
fry	--	<1%	<1%	<1%	<1%	<1%	-1%
Sand shiner	--	-2%	<-1%	-1%	-1%	1%	<-1%
Red shiner	--	<1%	<1%	<1%	<1%	<-1%	<-1%
Plains killifish	--	<-1%	<-1%	<-1%	<-1%	<1%	<-1%
Channel catfish	--	<-1%	<1%	<-1%	0%	<-1%	<1%
Dry Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	955	971	974	956	972	960	1,003
spawning	19,752	19,916	19,918	19,702	19,917	19,903	20,066
fry	5,391	5,389	5,389	5,385	5,387	5,385	5,394
Flathead chub							
adult/juvenile	75,858	76,005	75,996	75,885	76,005	75,840	76,051
spawning	6,718	6,972	6,956	6,713	6,889	6,737	6,924
fry	25,763	26,131	26,153	25,987	25,930	25,995	25,705
Sand shiner	18,232	18,164	18,152	18,227	18,162	18,214	18,027
Red shiner	5,625	5,622	5,618	5,609	5,625	5,619	5,652
Plains killifish	2,846	2,859	2,868	2,857	2,870	2,847	2,855
Channel catfish	5,957	5,937	5,933	5,941	5,940	5,950	5,943
Change in Median Habitat Availability (%) Compared to No Action Alternative							

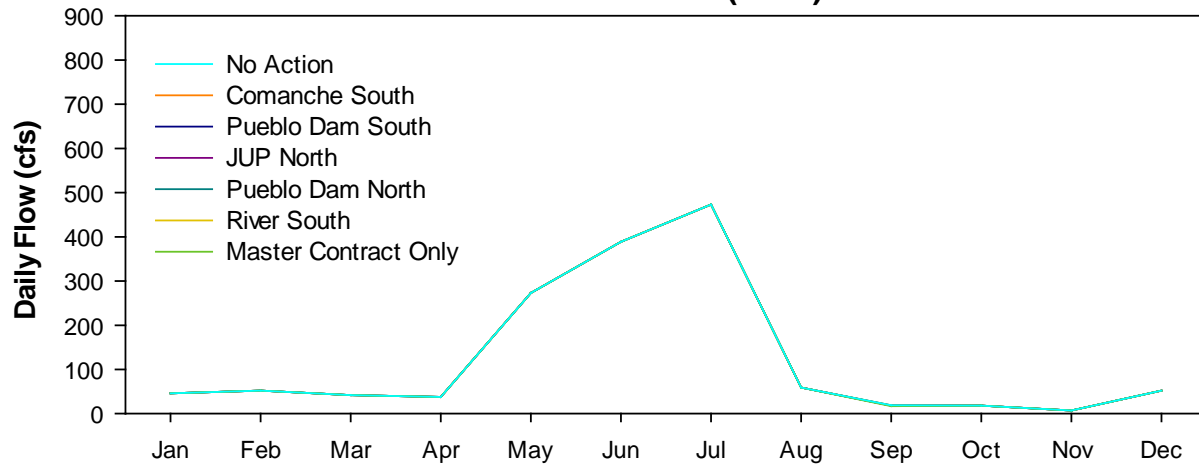
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Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

							
Species/Life Stage	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
White sucker							
adult/juvenile	--	2%	2%	<1%	2%	<1%	5%
spawning	--	<1%	<1%	<-1%	<1%	<1%	2%
fry	--	<-1%	<-1%	<-1%	<-1%	<-1%	<1%
Flathead chub							
adult/juvenile	--	<1%	<1%	<1%	<1%	<-1%	<1%
spawning	--	4%	4%	<-1%	3%	<1%	3%
fry	--	1%	2%	<1%	<1%	<1%	<-1%
Sand shiner	--	<-1%	<-1%	<-1%	<-1%	<-1%	-1%
Red shiner	--	<-1%	<-1%	<-1%	<1%	<-1%	<1%
Plains killifish	--	<1%	<1%	<1%	<1%	<1%	<1%
Channel catfish	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
Wet Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	2,826	2,804	2,804	2,836	2,787	2,815	2,810
spawning	12,062	11,927	11,949	12,143	11,926	11,944	11,878
fry	5,376	5,370	5,368	5,374	5,372	5,369	5,375
Flathead chub							
adult/juvenile	77,885	77,882	77,824	77,875	77,890	77,727	77,711
spawning	9,000	9,035	9,036	9,036	9,035	9,035	9,000
fry	20,430	20,588	20,423	20,123	20,442	20,112	20,430
Sand shiner	12,837	12,954	12,955	12,858	12,996	12,858	12,892
Red shiner	5,558	5,551	5,530	5,548	5,551	5,532	5,561
Plains killifish	2,635	2,646	2,645	2,635	2,646	2,644	2,639
Channel catfish	5,542	5,523	5,507	5,542	5,524	5,527	5,520
Change in Median Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	<-1%	<-1%	<1%	-1%	<-1%	<-1%
spawning	--	-1%	<-1%	<1%	-1%	<-1%	-2%
fry	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
Flathead chub							
adult/juvenile	--	<-1%	<-1%	<-1%	<1%	<-1%	<-1%
spawning	--	<1%	<1%	<1%	<1%	<1%	<-1%
fry	--	<1%	<-1%	-2%	<1%	-2%	<-1%
Sand shiner	--	<1%	<1%	<1%	1%	<1%	<1%
Red shiner	--	<-1%	<-1%	<-1%	<-1%	<-1%	<1%
Plains killifish	--	<1%	<1%	<1%	<1%	<1%	<1%
Channel catfish	--	<-1%	<-1%	<1%	<-1%	<-1%	<-1%

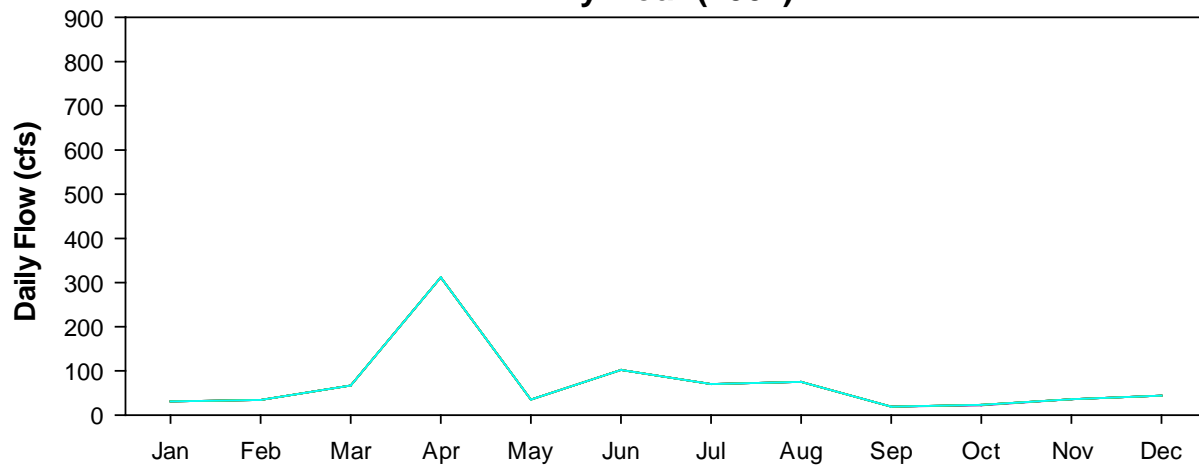
Arkansas Valley Conduit EIS

Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

**Lower Arkansas River, Segment 4 – John Martin Reservoir to Kansas State Line
Normal Year (2005)**



Dry Year (2004)



Wet Year (1997)

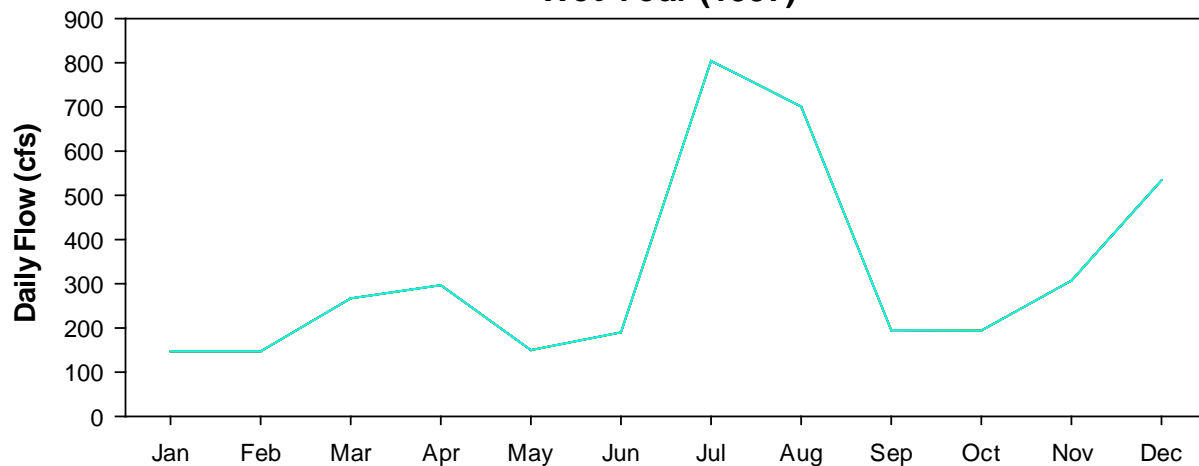
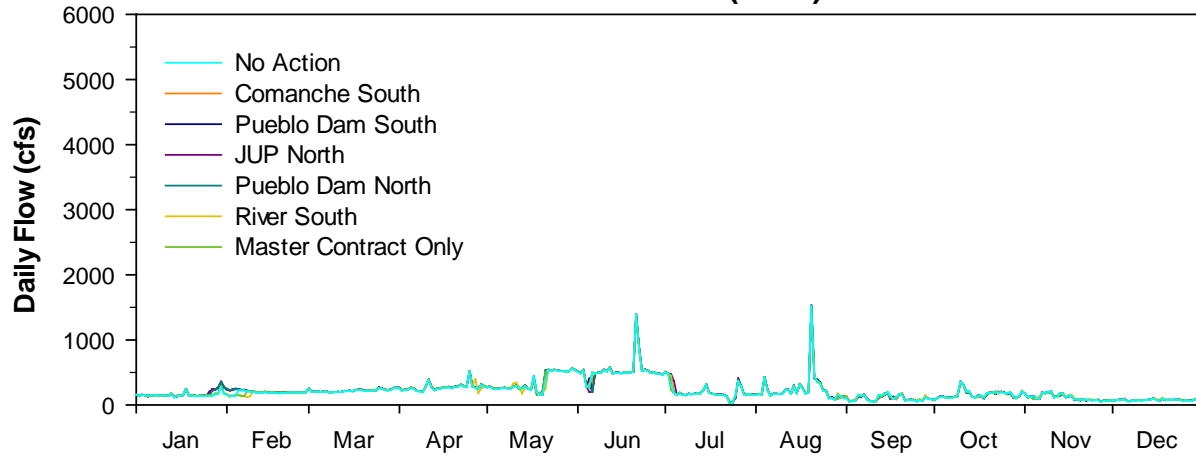


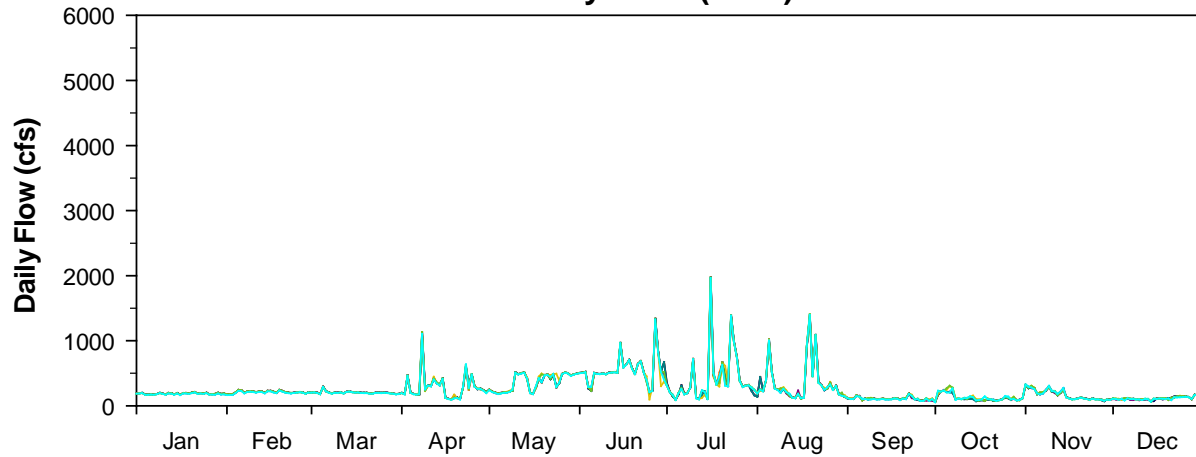
Figure 140. Cumulative Effects Mean Monthly Streamflow for All Alternatives for Segment 4 of the Lower Arkansas River at the Granada Gage

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Fountain Creek, Segment 3 – Security to County Line
Normal Year (2005)



Dry Year (2004)



Wet Year (1997)

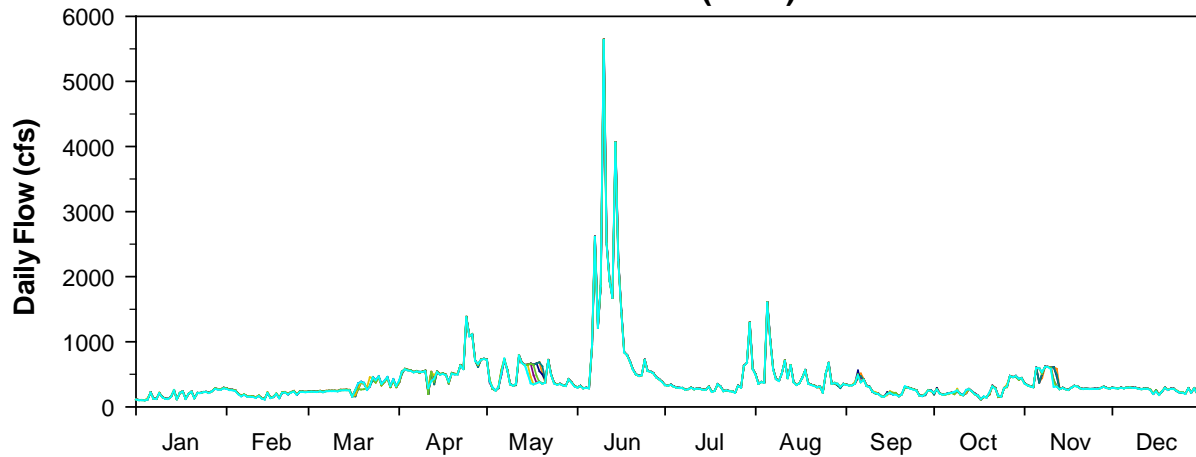


Figure 141. Cumulative Effects Daily Hydrology for All Alternatives for Segment 3 of Fountain Creek at the Near Fountain Gage

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

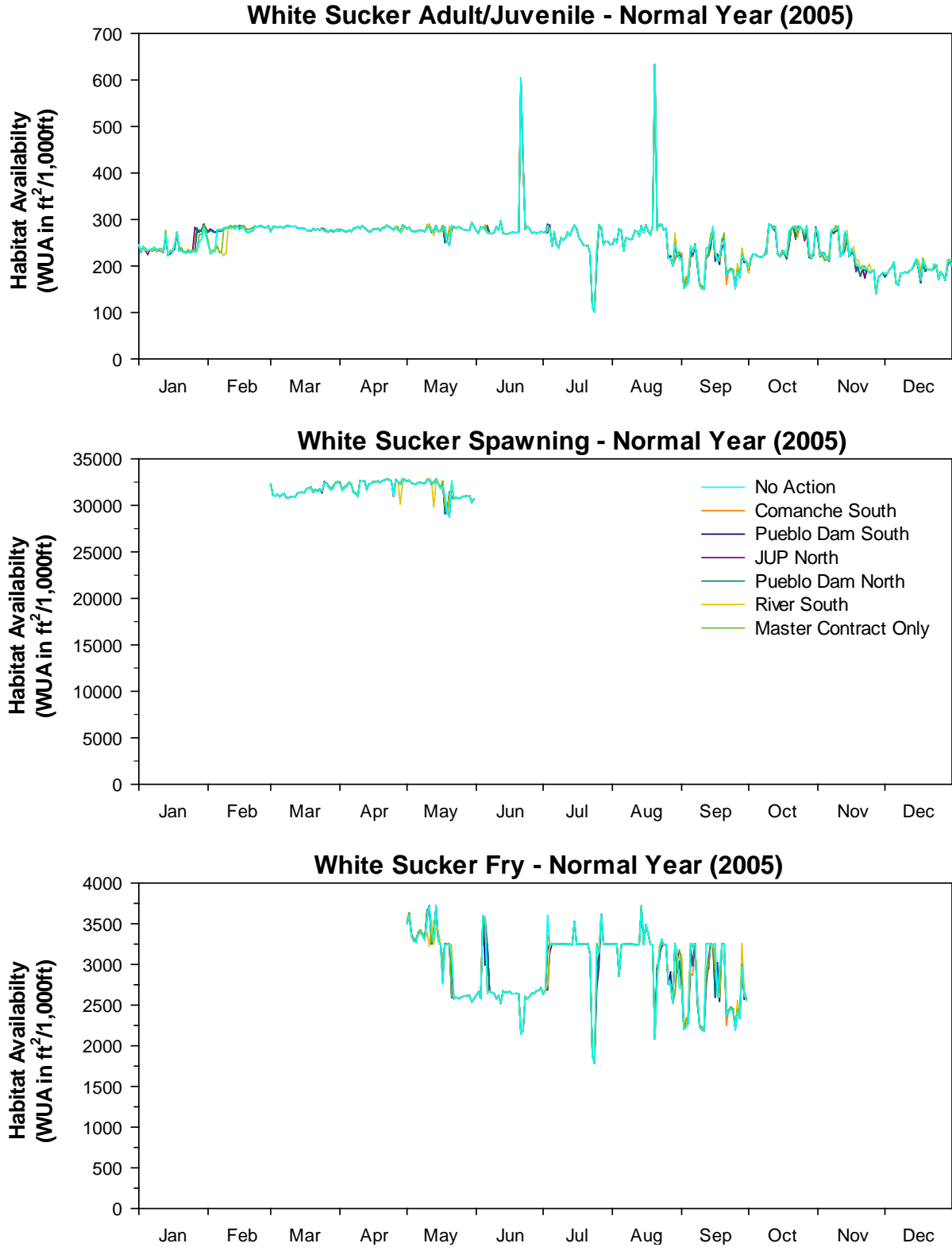


Figure 142. Cumulative Effects White Sucker Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 3 of Fountain Creek

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

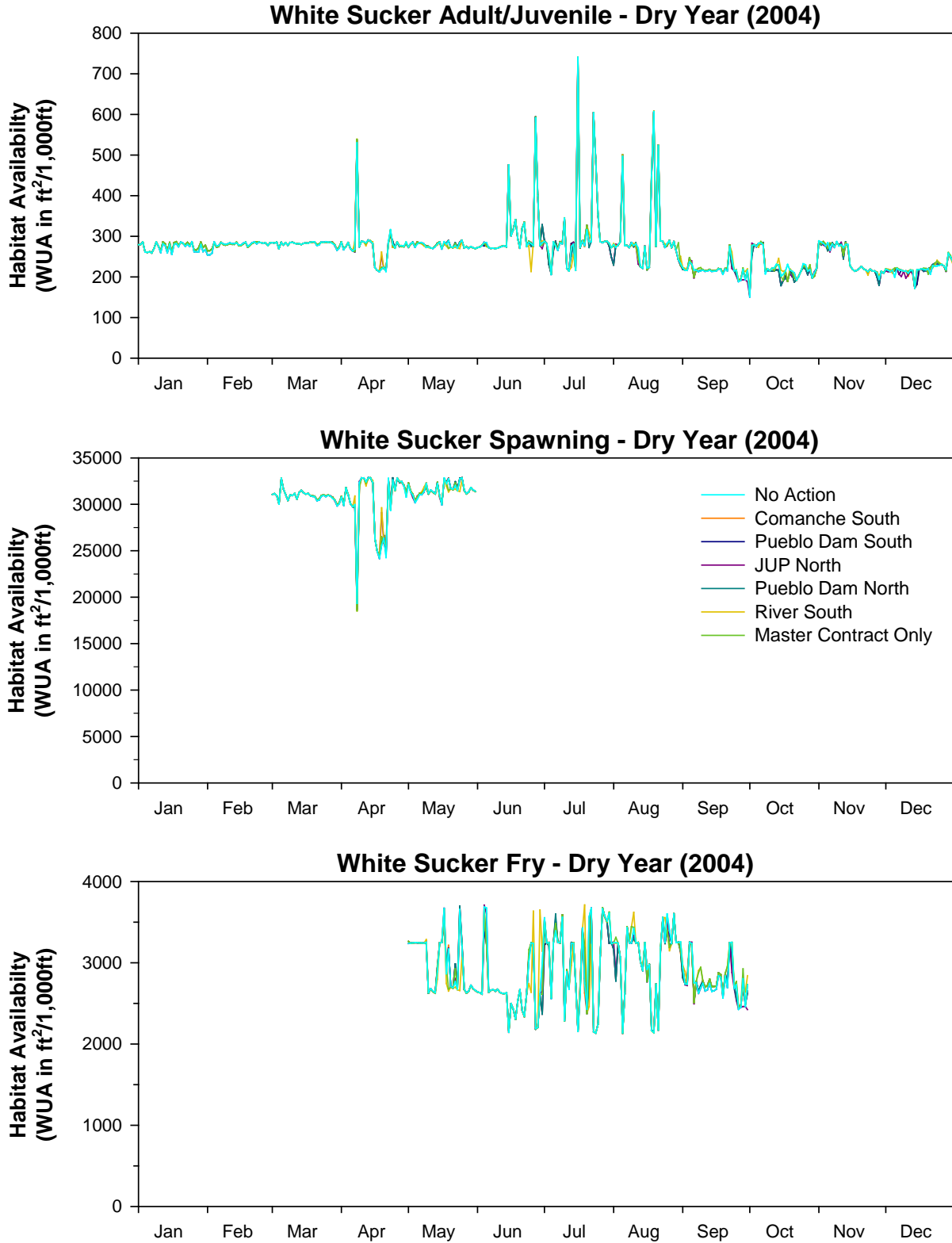


Figure 143. Cumulative Effects White Sucker Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 3 of Fountain Creek

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

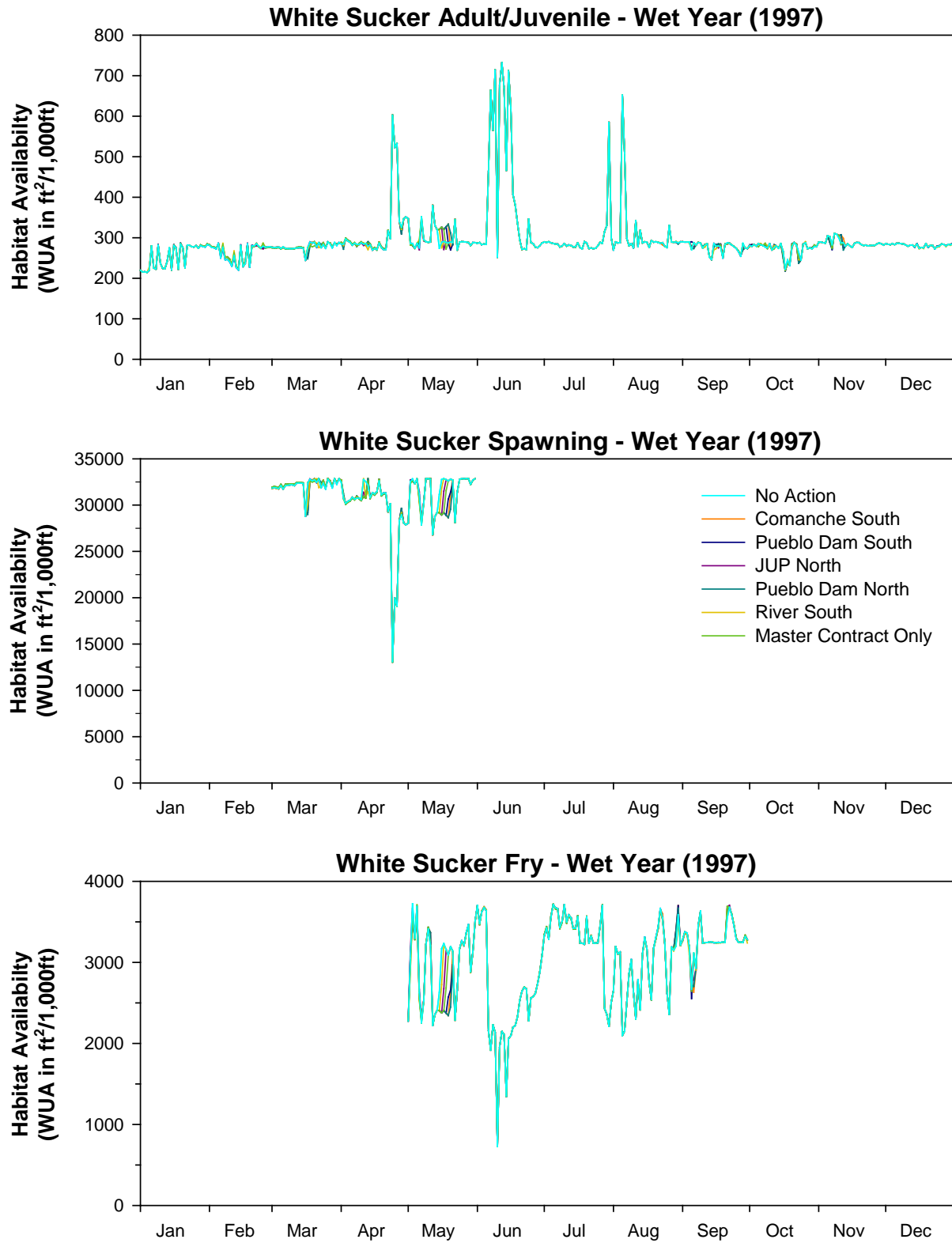


Figure 144. Cumulative Effects White Sucker Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 3 of Fountain Creek

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

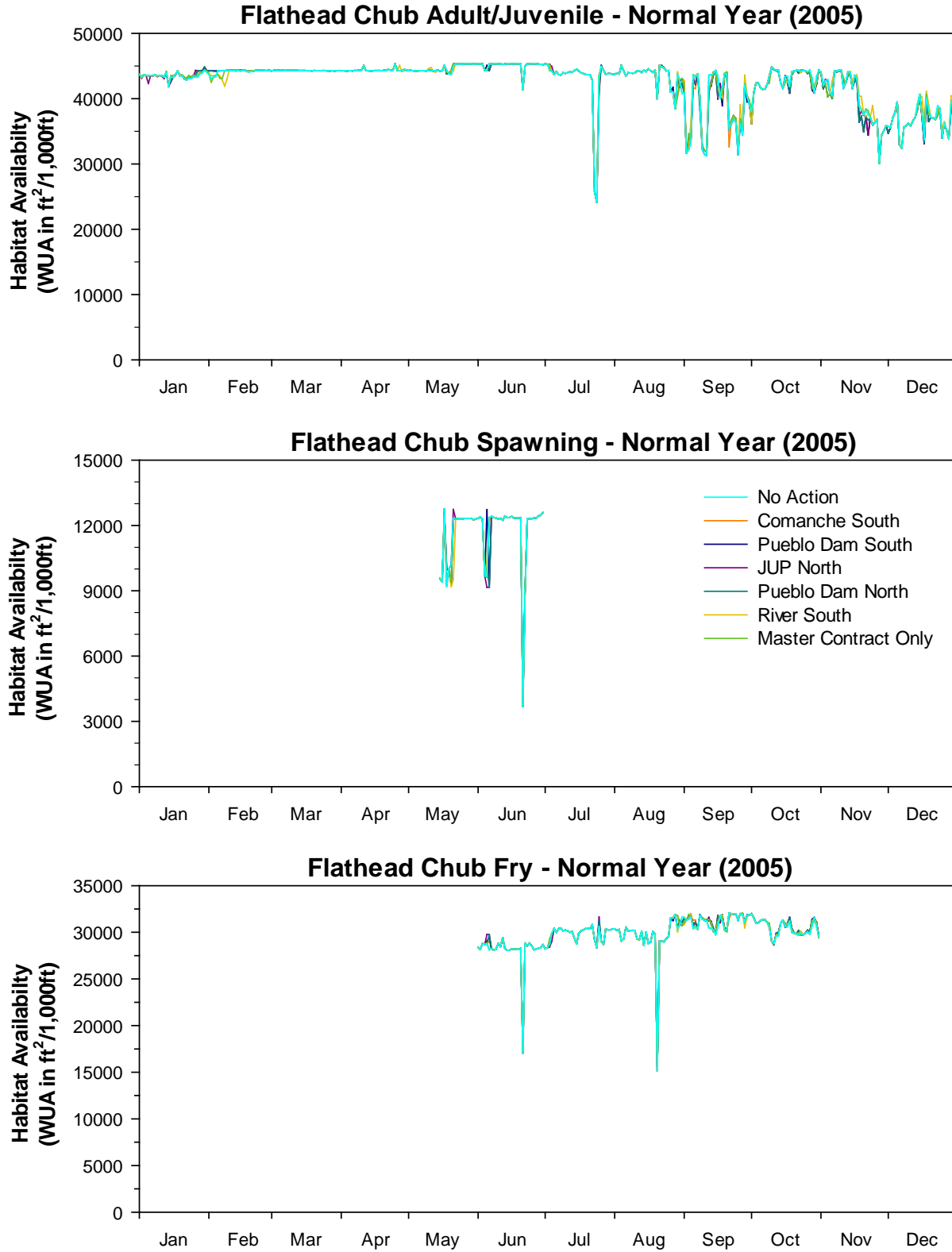


Figure 145. Cumulative Effects Flathead Chub Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 3 of Fountain Creek

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

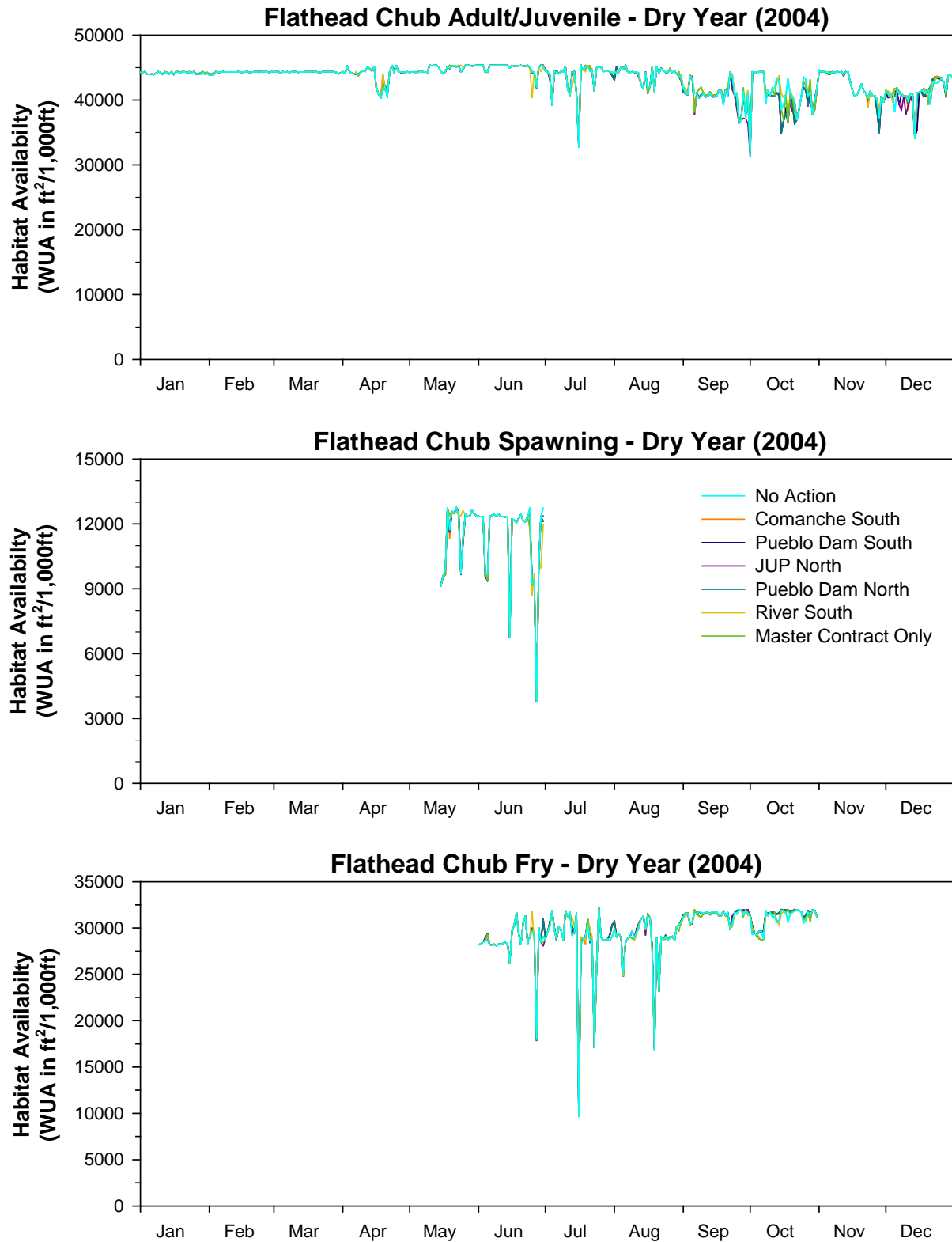


Figure 146. Cumulative Effects Flathead Chub Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000 ft]) for Seven Alternatives during a Dry Year for Segment 3 of Fountain Creek

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

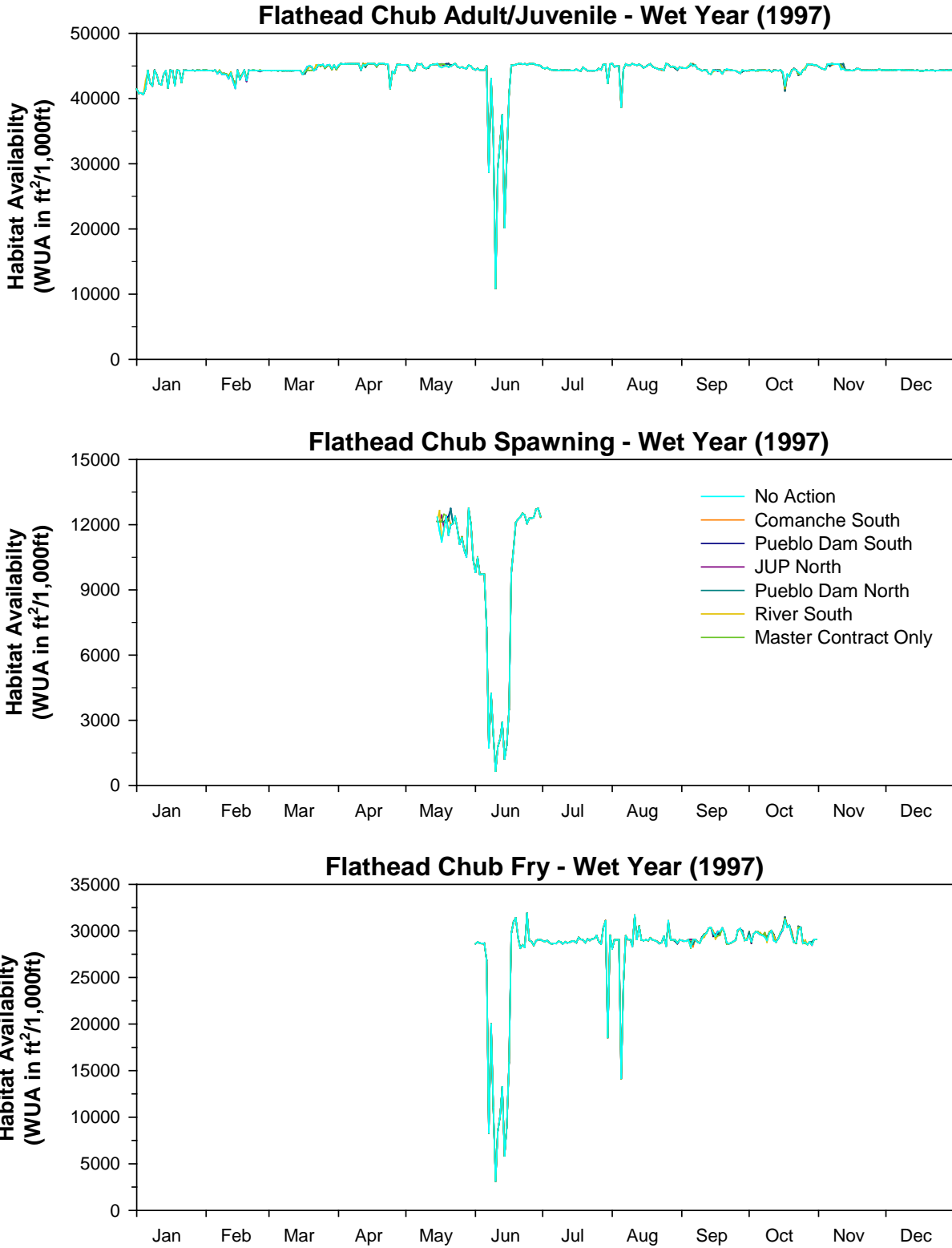


Figure 147. Cumulative Effects Flathead Chub Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 3 of Fountain Creek

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

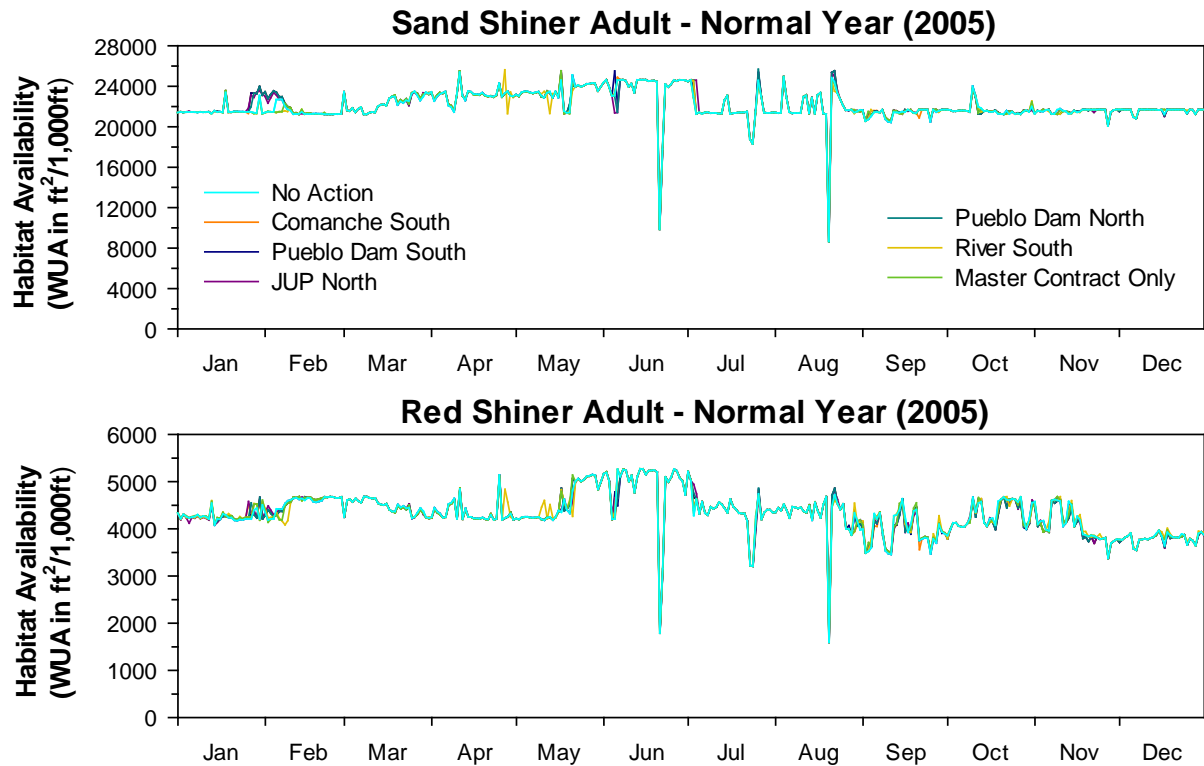


Figure 148. Cumulative Effects Sand Shiner (Adult) and Red Shiner (Adult) Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 3 of Fountain Creek

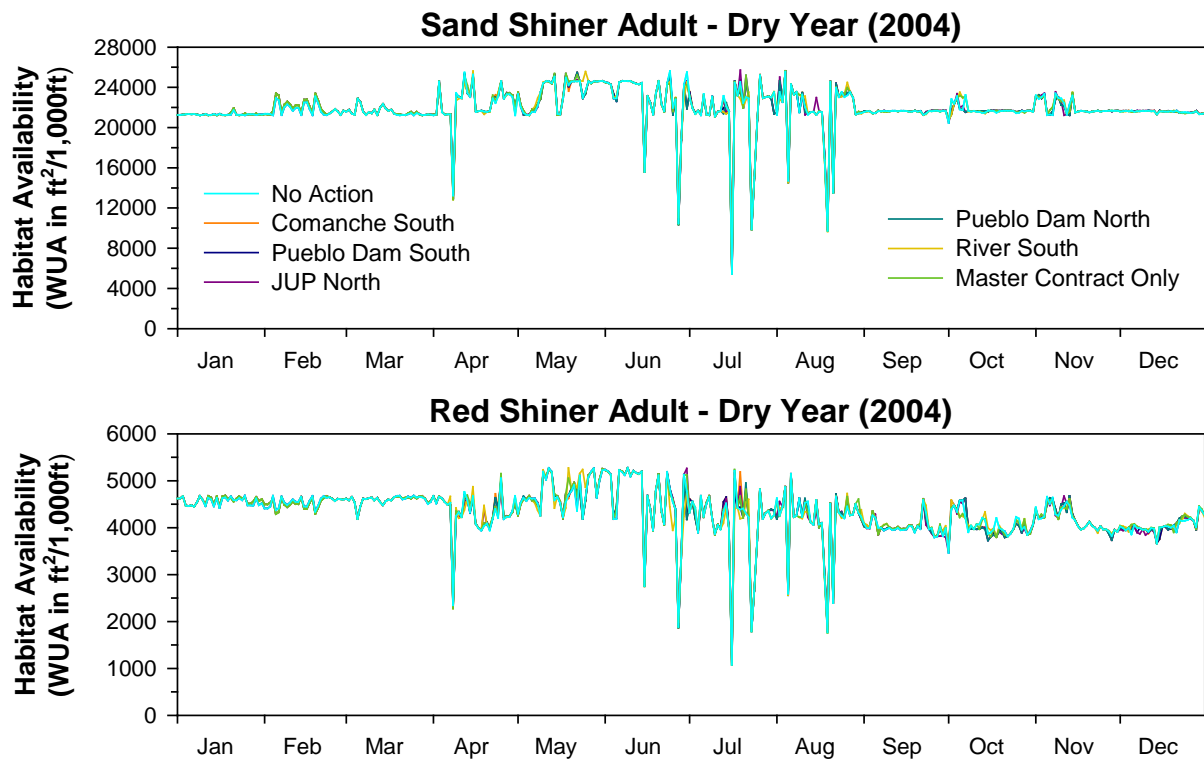


Figure 149. Cumulative Effects Sand Shiner (Adult) and Red Shiner (Adult) Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 3 of Fountain Creek

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

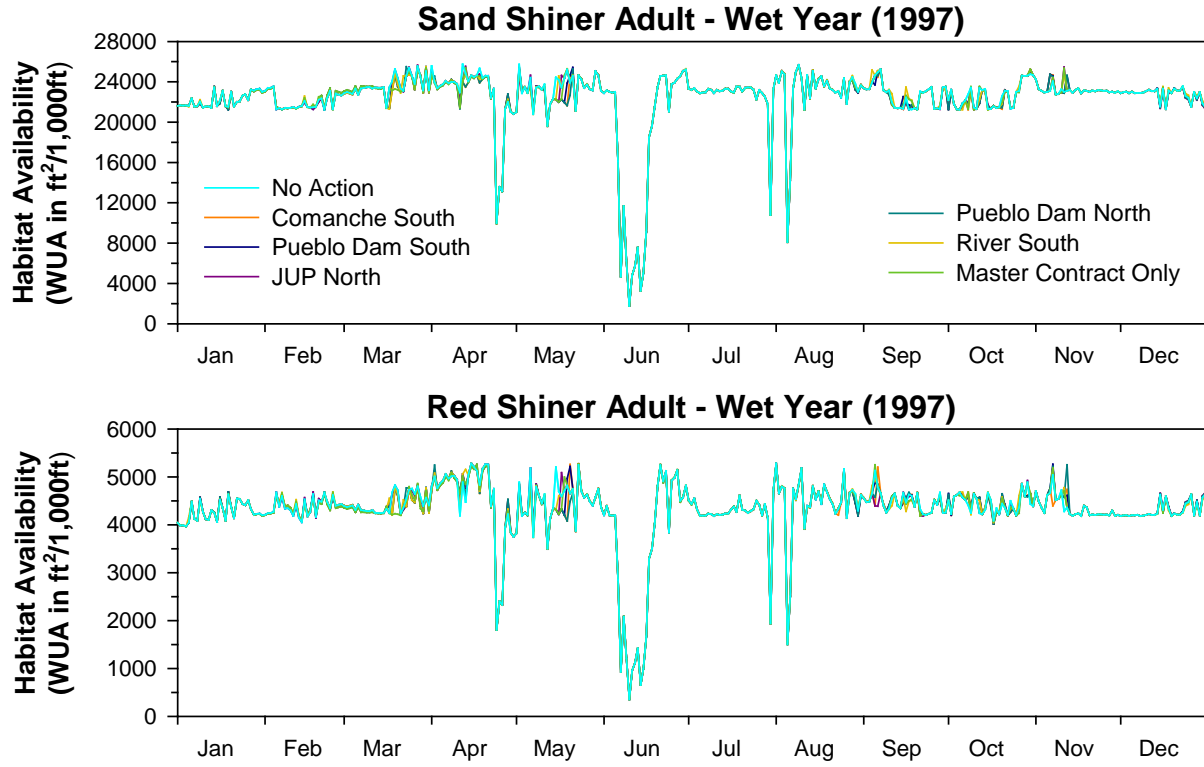









Figure 150. Cumulative Effects Sand Shiner (Adult) and Red Shiner (Adult) Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 3 of Fountain Creek








Arkansas Valley Conduit EIS

Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 37. Cumulative Effects Summary of the Percent Change in Minimum Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for White Sucker, Flathead Chub, Sand Shiner (Adult), and Red Shiner (Adult), Fountain Creek Segment 3








Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	102	102	102	102	102	102	102
spawning	28,787	29,134	29,155	28,788	29,105	29,341	29,342
fry	1,784	1,785	1,785	1,784	1,785	1,784	1,785
Flathead chub							
adult/juvenile	24,191	24,199	24,195	24,191	24,197	24,191	24,197
spawning	3,675	3,675	3,675	3,675	3,675	3,675	3,675
fry	15,137	15,136	15,136	15,136	15,136	15,136	15,136
Sand shiner	8,665	8,665	8,665	8,665	8,665	8,665	8,665
Red shiner	1,598	1,598	1,598	1,598	1,598	1,598	1,598
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	<1%	<1%	0%	<1%	0%	<1%
spawning	--	1%	1%	<1%	1%	2%	2%
fry	--	<1%	<1%	0%	<1%	0%	<1%
Flathead chub							
adult/juvenile	--	<1%	<1%	0%	<1%	0%	<1%
spawning	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
fry	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
Sand shiner	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
Red shiner	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
Dry Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	151	158	158	151	158	158	158
spawning	19,332	18,682	18,703	19,532	18,830	18,530	18,541
fry	2,134	2,134	2,134	2,131	2,134	2,134	2,131
Flathead chub							
adult/juvenile	31,392	32,249	32,251	31,392	32,249	32,242	32,249
spawning	3,814	3,788	3,799	3,801	3,789	3,955	3,799
fry	9,701	9,682	9,682	9,701	9,682	9,682	9,682
Sand shiner	5,461	5,450	5,450	5,461	5,450	5,450	5,450
Red shiner	1,080	1,078	1,078	1,080	1,078	1,078	1,078
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	4%	4%	0%	4%	4%	4%
spawning	--	-3%	-3%	1%	-3%	-4%	-4%
fry	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**








Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Flathead chub							
adult/juvenile	--	3%	3%	0%	3%	3%	3%
spawning	--	<1%	<1%	<1%	<1%	4%	<1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
Sand shiner	--	<1%	<1%	<1%	<1%	<1%	<1%
Red shiner	--	<1%	<1%	<1%	<1%	<1%	<1%
Wet Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	215	215	215	215	215	215	215
spawning	13,097	13,052	13,081	13,097	13,052	13,081	13,056
fry	728	728	728	728	728	728	728
Flathead chub							
adult/juvenile	10,907	10,912	10,905	10,907	10,912	10,905	10,912
spawning	658	659	658	658	659	658	659
fry	3,160	3,161	3,160	3,160	3,161	3,160	3,161
Sand shiner	1,776	1,777	1,776	1,776	1,777	1,776	1,777
Red shiner	354	354	354	354	354	354	354
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	0%	0%	0%	0%	0%	0%
spawning	--	<1%	<1%	0%	<1%	<1%	<1%
fry	--	<1%	<1%	0%	<1%	<1%	<1%
Flathead chub							
adult/juvenile	--	<1%	<1%	0%	<1%	<1%	<1%
spawning	--	<1%	<1%	0%	<1%	<1%	<1%
fry	--	<1%	<1%	0%	<1%	<1%	<1%
Sand shiner	--	<1%	<1%	0%	<1%	<1%	<1%
Red shiner	--	<1%	<1%	0%	<1%	<1%	<1%

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 38. Cumulative Effects Summary of the Percent Change in Median Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for White Sucker, Flathead Chub, Sand Shiner (Adult), and Red Shiner (Adult), Fountain Creek Segment 3

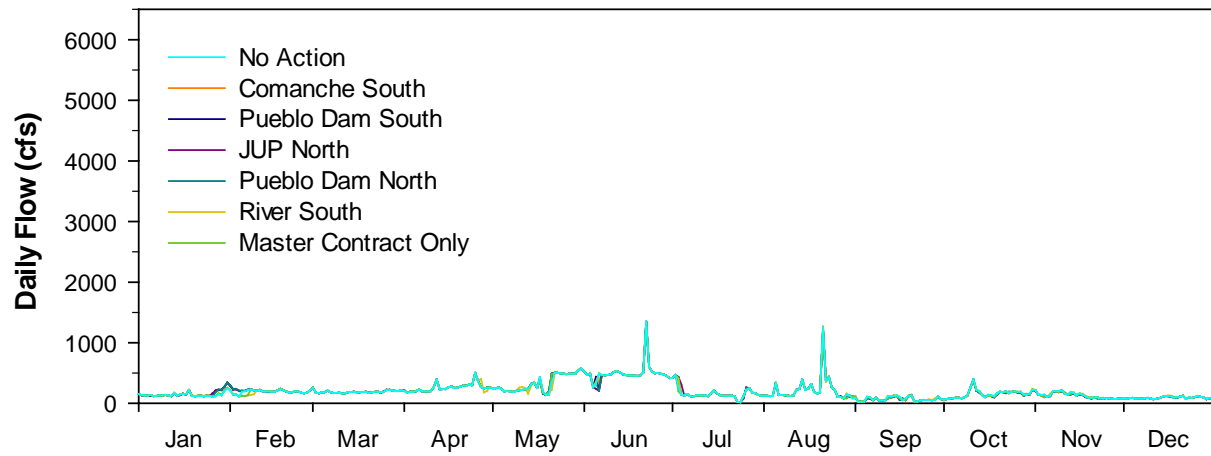
Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	271	271	271	272	271	270	271
Spawning	31,922	31,997	32,001	32,005	32,001	31,979	31,997
fry	3,229	3,048	3,064	3,084	3,041	3,236	3,163
Flathead chub							
adult/juvenile	44,176	44,250	44,247	44,255	44,250	44,146	44,167
spawning	12,325	12,322	12,324	12,325	12,322	12,324	12,326
fry	30,150	30,166	30,167	30,161	30,167	30,150	30,106
Sand shiner	21,691	21,693	21,695	21,693	21,696	21,671	21,683
Red shiner	4,306	4,292	4,293	4,307	4,292	4,321	4,292
Change in Median Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	<1%	<1%	<1%	<1%	<-1%	<-1%
spawning	--	<1%	<1%	<1%	<1%	<1%	<1%
fry	--	-6%	-5%	-4%	-6%	<1%	-2%
Flathead chub							
adult/juvenile	--	<1%	<1%	<1%	<1%	<-1%	<-1%
spawning	--	<-1%	<-1%	0%	<-1%	<-1%	<1%
fry	--	<1%	<1%	<1%	<1%	0%	<-1%
Sand shiner	--	<1%	<1%	<1%	<1%	<-1%	<-1%
Red shiner	--	<-1%	<-1%	<1%	<-1%	<1%	<-1%
Dry Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	274	274	274	274	274	274	275
spawning	31,159	31,163	31,163	31,163	31,163	31,163	31,163
fry	2,803	2,798	2,798	2,765	2,775	2,800	2,873
Flathead chub							
adult/juvenile	44,271	44,272	44,274	44,270	44,267	44,268	44,279
spawning	12,339	12,330	12,333	12,339	12,333	12,341	12,334
fry	29,964	30,234	30,211	30,094	30,294	30,099	29,961
Sand shiner	21,662	21,662	21,663	21,670	21,661	21,653	21,661
Red shiner	4,398	4,400	4,408	4,412	4,400	4,380	4,395

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

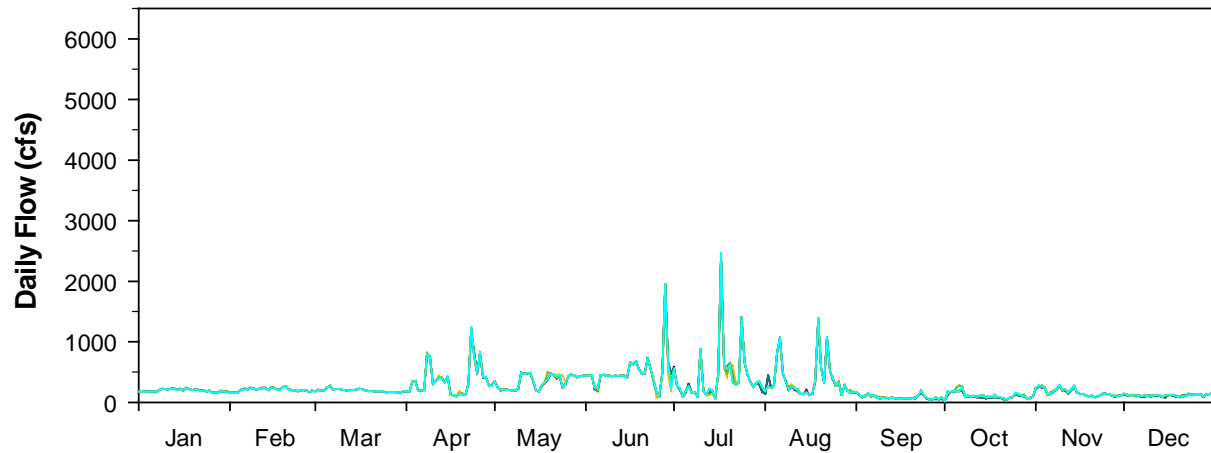
							
Species/Life Stage	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Change in Median Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	<-1%	<-1%	<-1%	<-1%	<-1%	<1%
spawning	--	<1%	<1%	<1%	<1%	<1%	<1%
fry	--	<-1%	<-1%	-1%	-1%	<-1%	3%
Normal Year							
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Flathead chub							
adult/juvenile	--	<1%	<1%	<-1%	<-1%	<-1%	<1%
spawning	--	<-1%	<-1%	<-1%	<-1%	<1%	<-1%
fry	--	<1%	<1%	<1%	1%	<1%	<-1%
Sand shiner	--	<1%	<1%	<1%	<-1%	<-1%	<-1%
Red shiner	--	<1%	<1%	<1%	<1%	<-1%	<-1%
Wet Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	282	283	283	282	283	282	283
spawning	32,105	31,895	31,759	31,885	31,896	31,892	31,953
fry	3,209	3,212	3,207	3,213	3,211	3,209	3,212
Flathead chub							
adult/juvenile	44,358	44,357	44,357	44,360	44,357	44,357	44,357
spawning	11,393	11,772	11,790	11,517	11,772	11,442	11,547
fry	28,995	28,994	29,016	29,029	28,988	29,016	29,016
Sand shiner	23,076	23,026	23,016	23,065	23,034	23,057	23,065
Red shiner	4,365	4,365	4,375	4,371	4,363	4,372	4,354
Change in Median Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	<1%	<1%	0%	<1%	<-1%	<1%
spawning	--	<-1%	-1%	<-1%	<-1%	<-1%	<-1%
fry	--	<1%	<-1%	<1%	<1%	<1%	<1%
Flathead chub							
adult/juvenile	--	<-1%	<-1%	<1%	<-1%	<-1%	<-1%
spawning	--	3%	3%	1%	3%	<1%	1%
fry	--	<-1%	<1%	<1%	<-1%	<1%	<1%
Sand shiner	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
Red shiner	--	<-1%	<1%	<1%	<-1%	<1%	<-1%

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

**Fountain Creek, Segment 4 – County Line to Arkansas River
Normal Year (2005)**



Dry Year (2004)



Wet Year (1997)

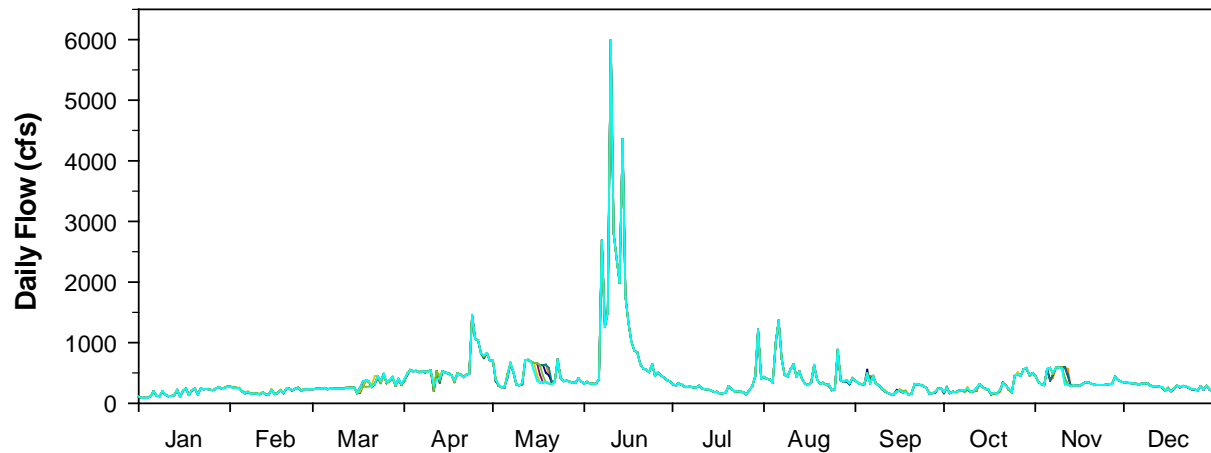


Figure 151. Cumulative Effects Daily Hydrology for All Alternatives for Segment 4 of Fountain Creek at the Pueblo Gage

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

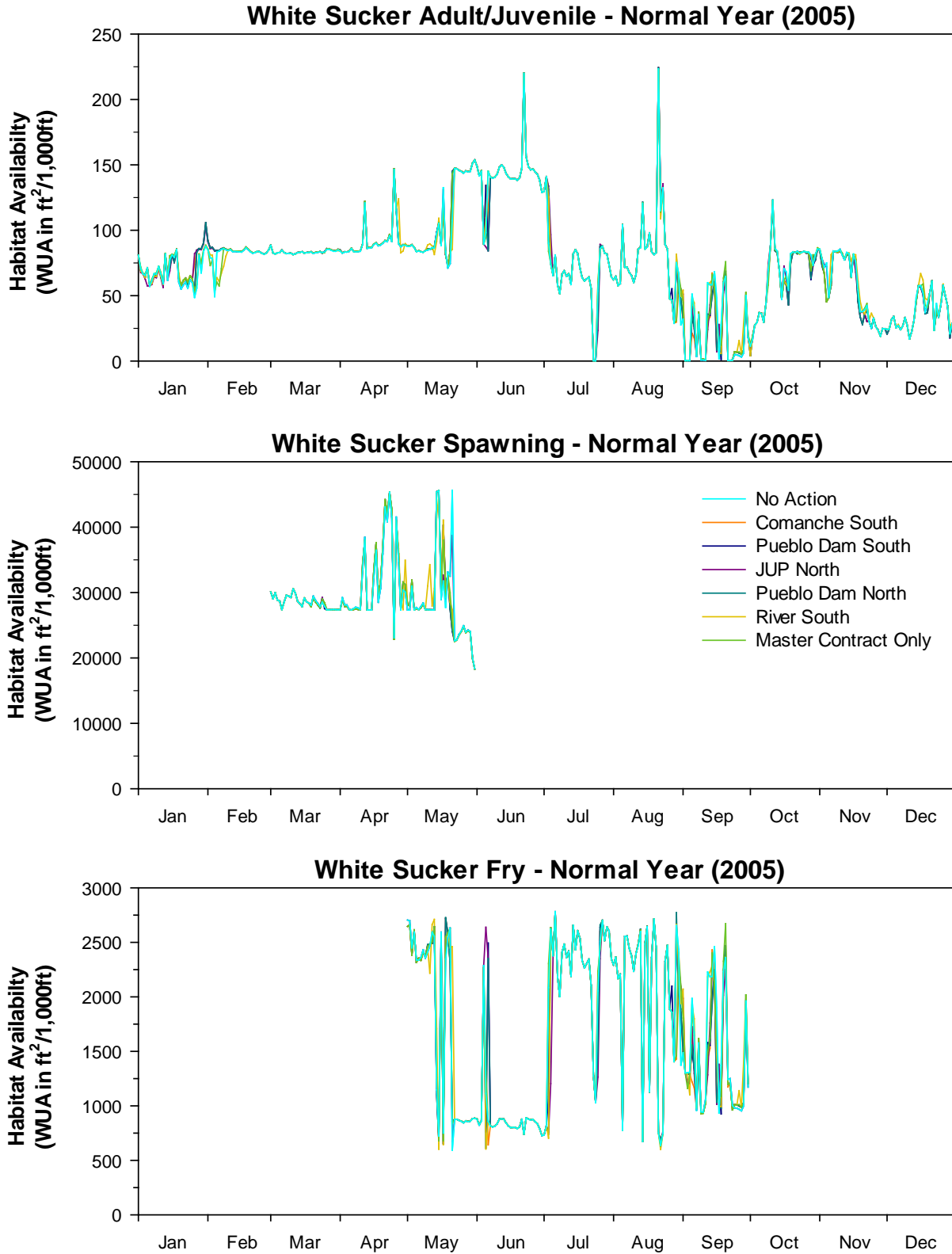


Figure 152. Cumulative Effects White Sucker Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 4 of Fountain Creek

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

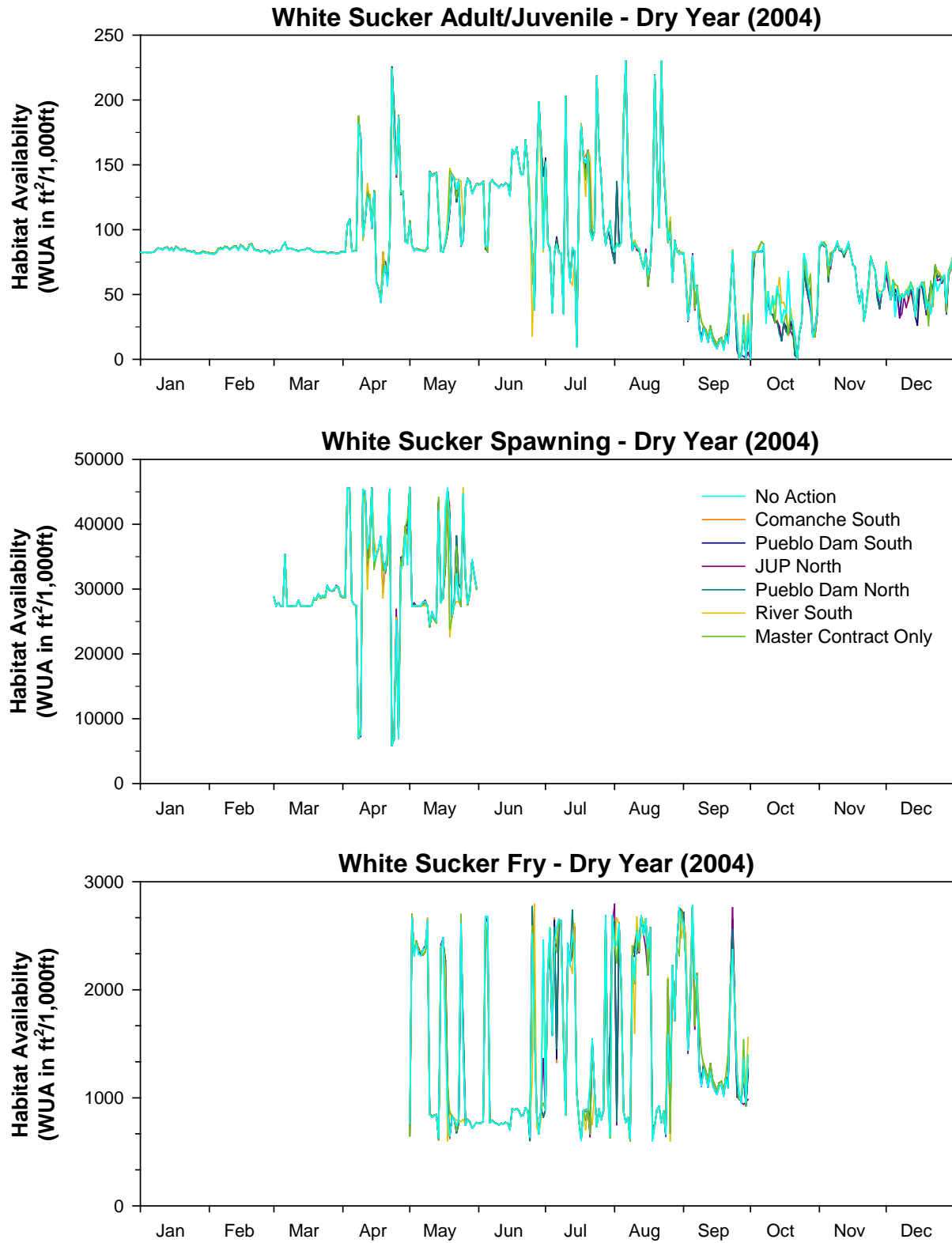


Figure 153. Cumulative Effects White Sucker Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 4 of Fountain Creek

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

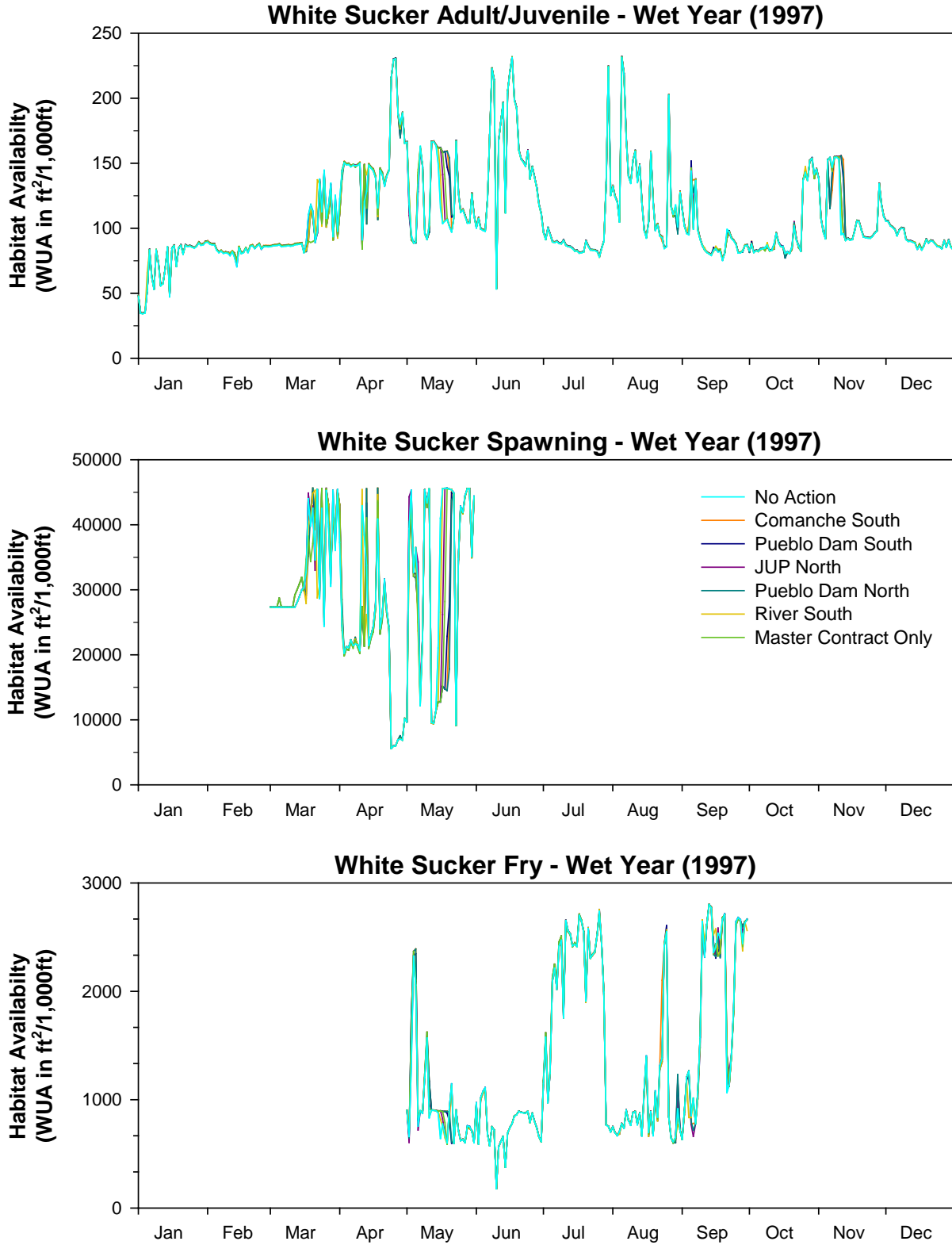


Figure 154. Cumulative Effects White Sucker Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 4 of Fountain Creek

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

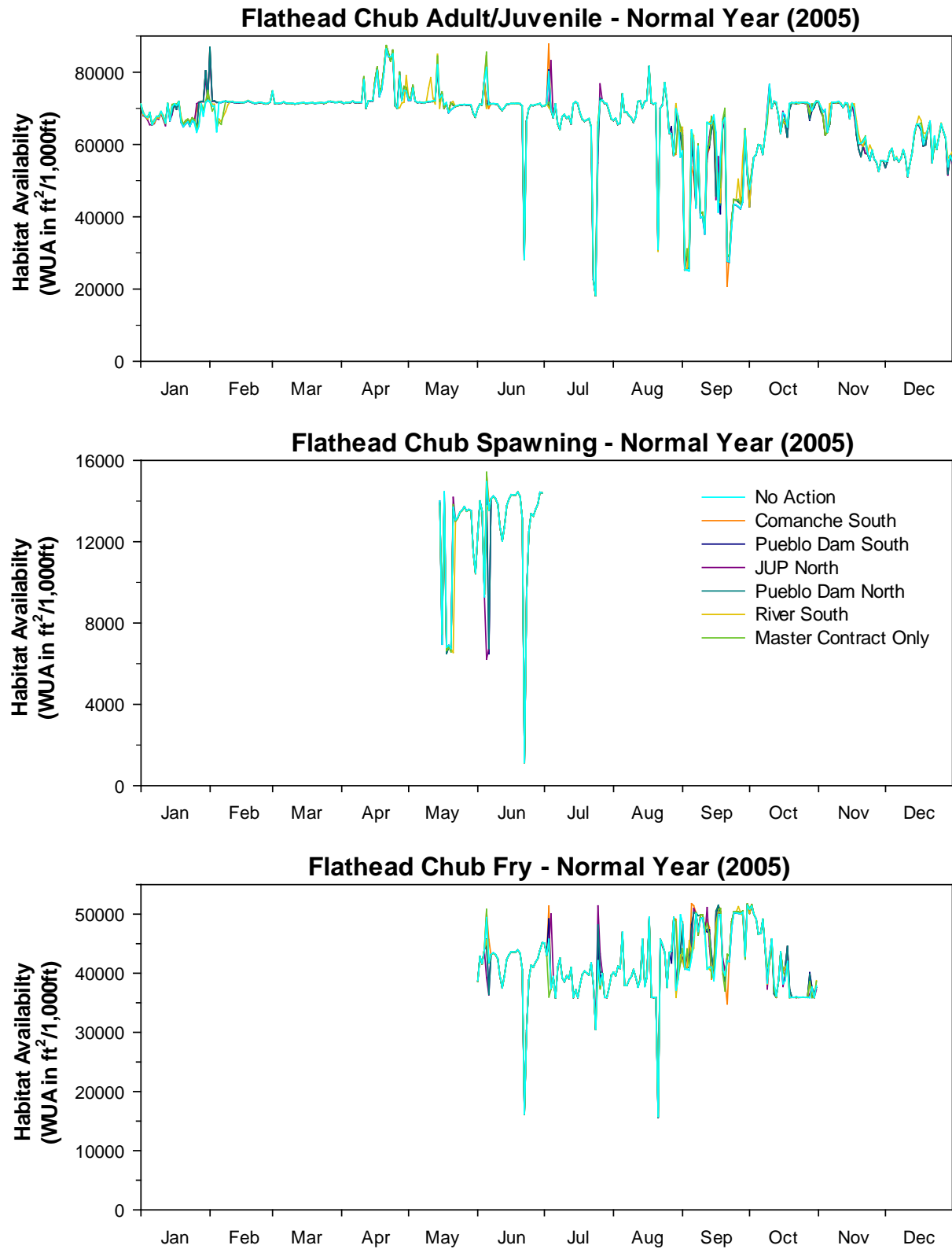


Figure 155. Cumulative Effects Flathead Chub Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 4 of Fountain Creek

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

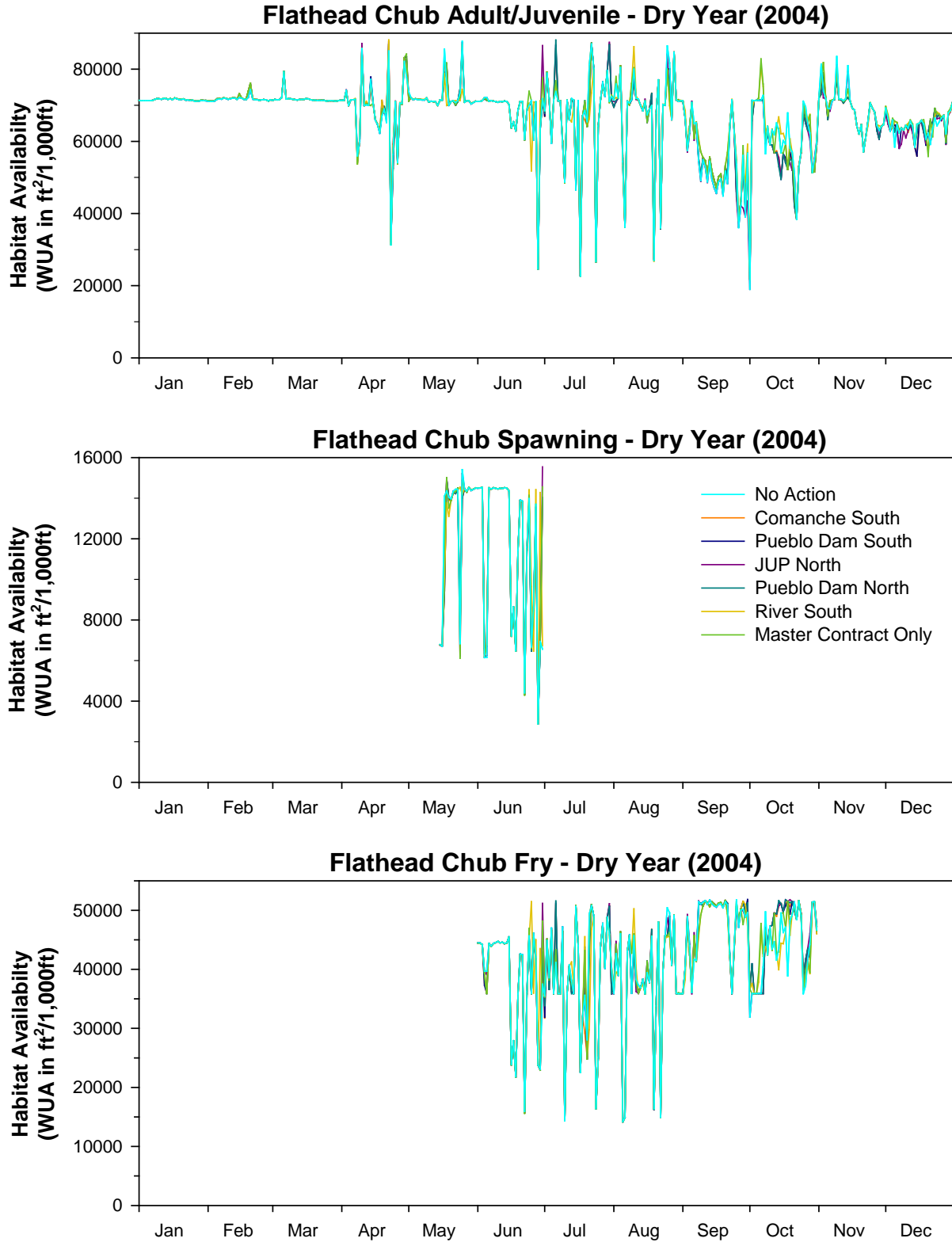


Figure 156. Cumulative Effects Flathead Chub Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 4 of Fountain Creek

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

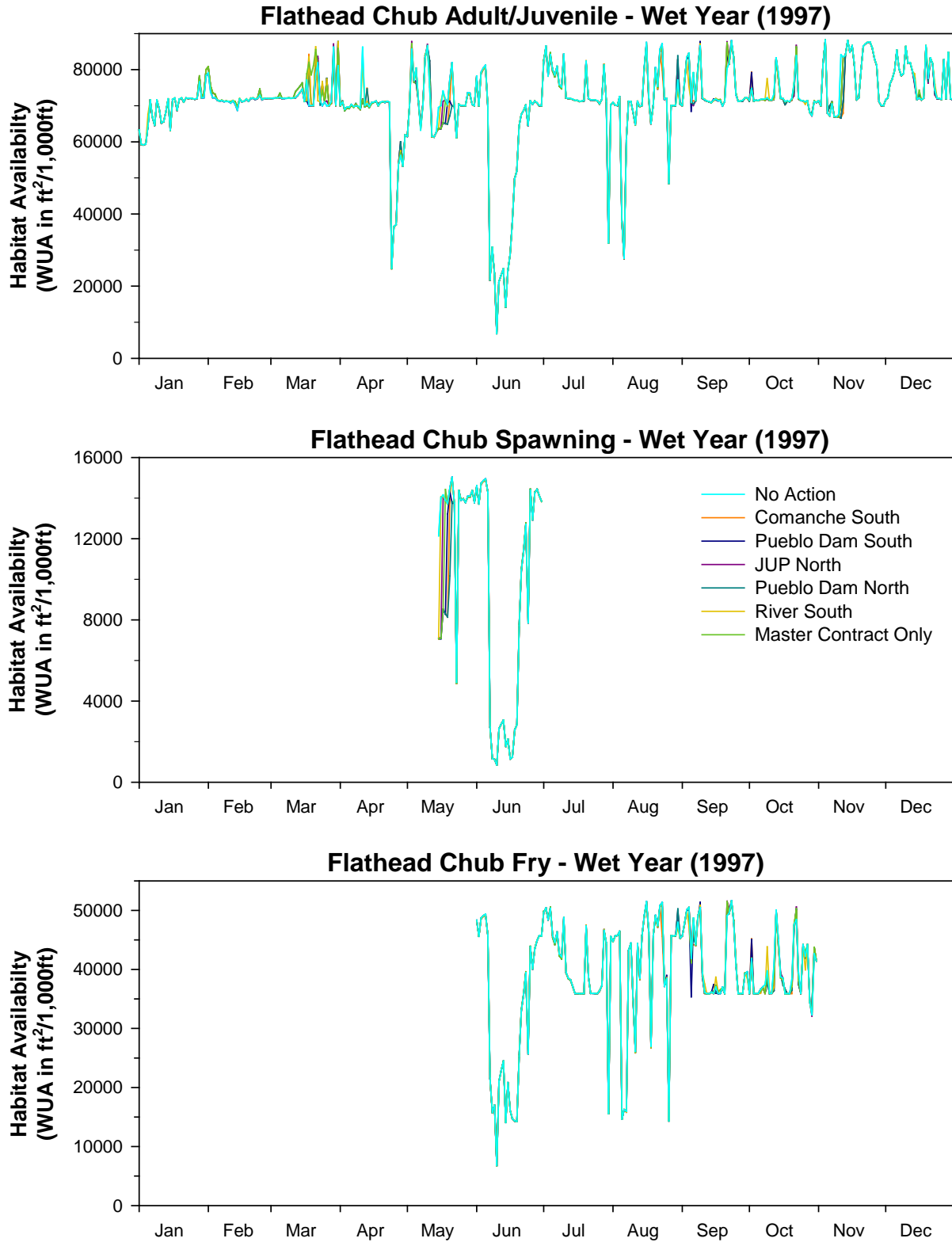


Figure 157. Cumulative Effects Flathead Chub Adult/Juvenile, Spawning, and Fry Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 4 of Fountain Creek

**Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)**

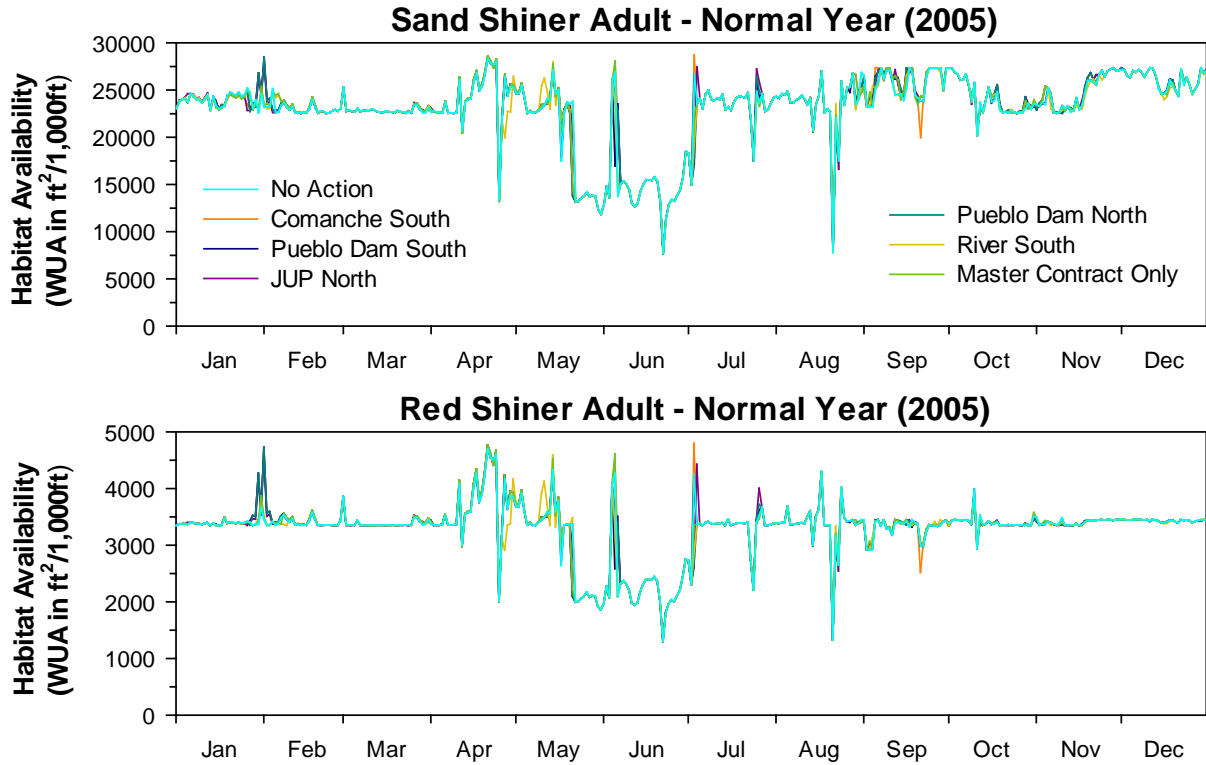


Figure 158. Cumulative Effects Sand Shiner (Adult) and Red Shiner (Adult) Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Normal Year for Segment 4 of Fountain Creek

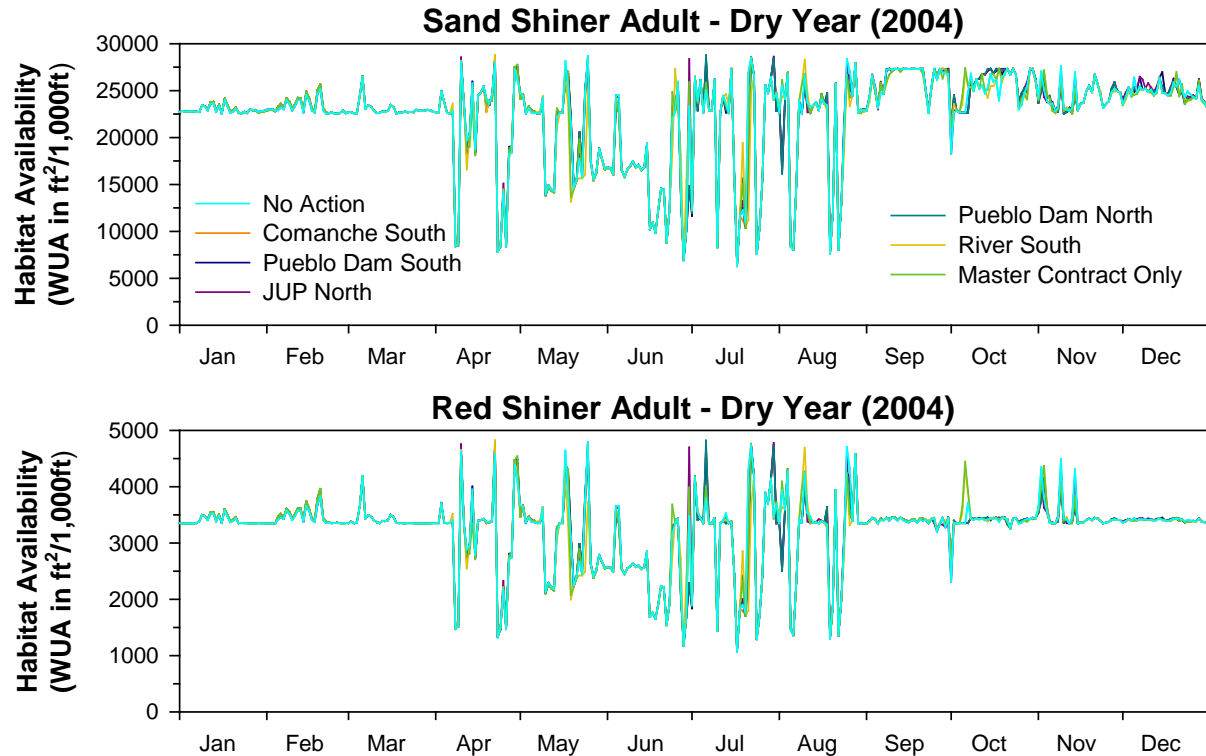


Figure 159. Cumulative Effects Sand Shiner (Adult) and Red Shiner (Adult) Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Dry Year for Segment 4 of Fountain Creek

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

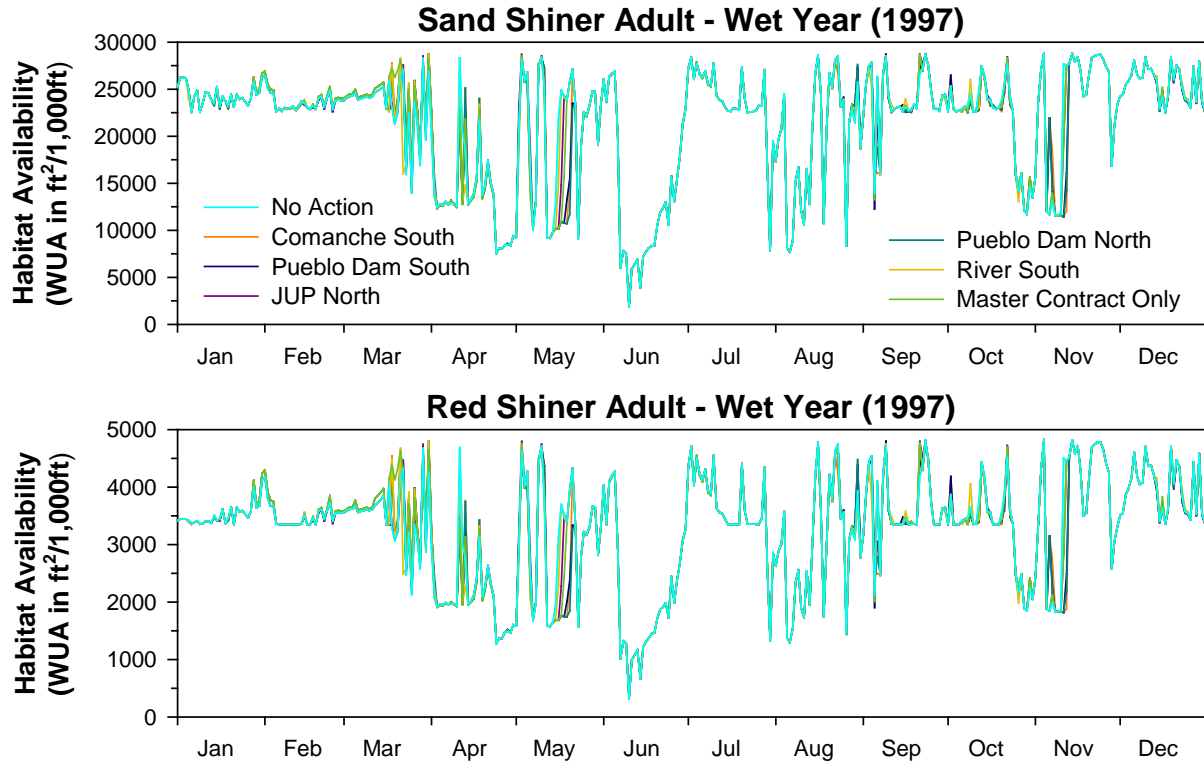
















Figure 160. Cumulative Effects Sand Shiner (Adult) and Red Shiner (Adult) Habitat Availability (WUA [ft²/1,000ft]) for Seven Alternatives during a Wet Year for Segment 4 of Fountain Creek

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 39. Cumulative Effects Summary of the Percent Change in Minimum Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for White Sucker, Flathead Chub, Sand Shiner (Adult), and Red Shiner (Adult), Fountain Creek Segment 4








Species/Life Stage							
	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Normal Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	0	0	0	0	0	0	0
spawning	18,333	18,286	18,286	18,333	18,286	18,285	18,286
fry	592	642	654	660	613	599	632
Flathead chub							
adult/juvenile	18,159	18,178	18,169	18,159	18,174	18,159	18,174
spawning	1,140	1,140	1,140	1,140	1,140	1,140	1,140
fry	15,735	15,641	15,641	15,641	15,641	15,818	15,747
Sand shiner	7,696	7,696	7,696	7,696	7,696	7,696	7,696
Red shiner	1,304	1,304	1,304	1,304	1,304	1,304	1,304
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	<1%	<1%	0%	<1%	0%	<1%
spawning	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
fry	--	8%	10%	11%	4%	1%	7%
Flathead chub							
adult/juvenile	--	<1%	<1%	0%	<1%	0%	<1%
spawning	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
fry	--	<-1%	<-1%	<-1%	<-1%	<1%	<1%
Sand shiner	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
Red shiner	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
Dry Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	0	0	0	0	0	0	0
spawning	5,829	5,873	5,860	5,835	5,861	5,834	5,835
fry	600	601	601	608	601	601	601
Flathead chub							
adult/juvenile	19,005	21,819	21,824	19,005	21,819	21,795	21,819
spawning	2,879	2,886	2,886	2,879	2,886	2,885	2,886
fry	14,185	14,143	14,204	14,161	14,216	14,212	14,161
Sand shiner	6,300	6,349	6,350	6,320	6,328	6,368	6,304
Red shiner	1,067	1,076	1,076	1,071	1,072	1,079	1,068
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	15%	15%	0%	15%	15%	15%
spawning	--	<1%	<1%	<1%	<1%	<1%	<1%
fry	--	<1%	<1%	1%	<1%	<1%	<1%

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)








Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
Flathead chub							
adult/juvenile	--	15%	15%	0%	15%	15%	15%
spawning	--	<1%	<1%	<1%	<1%	<1%	<1%
fry	--	<-1%	<1%	<-1%	<1%	<1%	<-1%
Sand shiner	--	<1%	<1%	<1%	<1%	1%	<1%
Red shiner	--	<1%	<1%	<1%	<1%	1%	<1%
Wet Year							
Minimum Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	35	35	35	35	35	35	35
spawning	5,623	5,620	5,622	5,623	5,620	5,622	5,620
fry	182	182	182	182	182	182	182
Flathead chub							
adult/juvenile	6,799	6,802	6,798	6,799	6,802	6,798	6,802
spawning	848	848	848	848	848	848	848
fry	6,761	6,764	6,759	6,761	6,764	6,759	6,764
Sand shiner	1,891	1,892	1,891	1,891	1,892	1,891	1,892
Red shiner	320	321	320	320	321	320	321
Change in Minimum Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	0%	0%	0%	0%	0%	0%
spawning	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
fry	--	<1%	<-1%	0%	<1%	<-1%	<1%
Flathead chub							
adult/juvenile	--	<1%	<-1%	0%	<1%	<-1%	<1%
spawning	--	<1%	<-1%	0%	<1%	<-1%	<1%
fry	--	<1%	<-1%	0%	<1%	<-1%	<1%
Sand shiner	--	<1%	<-1%	0%	<1%	<-1%	<1%
Red shiner	--	<1%	<-1%	0%	<1%	<-1%	<1%

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Table 40. Cumulative Effects Summary of the Percent Change in Median Habitat Availability (WUA in ft²/1,000 ft) in a Normal, Dry, and Wet Year for All Alternatives Compared to the No Action Alternative for White Sucker, Flathead Chub, Sand Shiner (Adult), and Red Shiner (Adult), Fountain Creek Segment 4

Species/Life Stage							
	No Action	Comanche South	Pueblo Dam South	JUP North	Pueblo Dam North	River South	Master Contract Only
Normal Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	82	83	83	83	83	82	82
Spawning	28,124	28,069	27,949	28,227	28,069	28,354	28,170
fry	1,858	1,432	1,577	1,523	1,497	1,889	1,637
Flathead chub							
adult/juvenile	70,668	70,724	70,826	70,880	70,754	70,578	70,609
spawning	13,553	13,538	13,521	13,522	13,520	13,520	13,538
fry	40,813	40,977	40,976	41,151	40,981	40,925	40,976
Sand shiner	23,679	23,699	23,699	23,710	23,701	23,624	23,721
Red shiner	3,378	3,383	3,383	3,383	3,383	3,378	3,381
Change in Median Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	<1%	<1%	<1%	<1%	<-1%	<-1%
spawning	--	<-1%	<-1%	<1%	<-1%	<1%	<1%
fry	--	-23%	-15%	-18%	-19%	2%	-12%
Flathead chub							
adult/juvenile	--	<1%	<1%	<1%	<1%	<-1%	<-1%
spawning	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
fry	--	<1%	<1%	<1%	<1%	<1%	<1%
Sand shiner	--	<1%	<1%	<1%	<1%	<-1%	<1%
Red shiner	--	<1%	<1%	<1%	<1%	<1%	<1%
Dry Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	84	84	84	83	84	84	84
spawning	28,768	28,678	28,678	28,768	28,678	28,497	28,564
fry	1,103	1,098	1,070	1,053	1,070	1,068	1,113
Flathead chub							
adult/juvenile	71,115	71,101	71,094	71,113	71,101	71,114	71,142
spawning	14,342	14,026	14,026	14,346	14,049	14,293	14,294
fry	43,433	44,097	43,909	44,263	43,895	43,646	43,780
Sand shiner	23,240	23,222	23,183	23,070	23,190	23,309	23,320
Red shiner	3,377	3,378	3,378	3,372	3,375	3,381	3,382
Change in Median Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	<-1%	<-1%	<-1%	<-1%	<1%	<1%
spawning	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
fry	--	<-1%	-3%	-5%	-3%	-3%	<1%

Arkansas Valley Conduit EIS
Appendix H.5 – Aquatic Resources Env. Cons. (Compared to No Action)

Species/Life Stage	 No Action	 Comanche South	 Pueblo Dam South	 JUP North	 Pueblo Dam North	 River South	 Master Contract Only
Normal Year							
Change in Median Habitat Availability (%) Compared to No Action Alternative							
Flathead chub							
adult/juvenile	--	<-1%	<-1%	<-1%	<-1%	<-1%	<1%
spawning	--	-2%	-2%	<1%	-2%	<-1%	<-1%
fry	--	2%	1%	2%	1%	<1%	<1%
Sand shiner	--	<-1%	<-1%	<-1%	<-1%	<1%	<1%
Red shiner	--	<1%	<1%	<-1%	<-1%	<1%	<1%
Wet Year							
Median Habitat Availability (WUA in ft²/1,000 ft)							
White sucker							
adult/juvenile	93	93	93	93	93	93	93
spawning	28,391	27,354	27,362	27,369	27,355	27,366	27,362
fry	905	904	904	905	901	901	905
Flathead chub							
adult/juvenile	71,487	71,423	71,436	71,480	71,463	71,488	71,517
spawning	13,746	12,763	12,926	13,722	11,479	13,763	13,695
fry	39,394	38,773	38,779	39,383	38,746	38,779	39,322
Sand shiner	23,260	23,187	23,164	23,217	23,156	23,259	23,266
Red shiner	3,390	3,368	3,360	3,365	3,369	3,388	3,397
Change in Median Habitat Availability (%) Compared to No Action Alternative							
White sucker							
adult/juvenile	--	<-1%	<-1%	<-1%	<-1%	<-1%	<-1%
spawning	--	-4%	-4%	-4%	-4%	-4%	-4%
fry	--	<-1%	<-1%	0%	<-1%	<-1%	<-1%
Flathead chub							
adult/juvenile	--	<-1%	<-1%	<-1%	<-1%	<1%	<1%
spawning	--	-7%	-6%	<-1%	-16%	<1%	<-1%
fry	--	-2%	-2%	<-1%	-2%	-2%	<-1%
Sand shiner	--	<-1%	<-1%	<-1%	<-1%	<-1%	<1%
Red shiner	--	<-1%	<-1%	<-1%	<-1%	<-1%	<1%