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Steelhead Movements in the Upper Yakima Basin, Winter 2003-2004

U.S. Department of the Interior
Bureau of Reclamation

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Mission Statement

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to tribes.

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The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Steelhead Movements in the Upper Yakima Basin, Winter 2003/2004

By

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Introduction

Middle Columbia River steelhead, *Oncorhynchus mykiss*, including Yakima River populations, was listed as threatened on March 25, 1999 (Federal Register 64:14517-14528). Critical habitat was designated on February 16, 2000 and includes the Yakima River (Federal Register 65:7764-7787; however, the status of middle Columbia steelhead populations are under review, Federal Register 67:6215-6220). The Bureau of Reclamation (Reclamation) is consulting with the National Marine Fisheries Service to determine type and level of impacts from Reclamation operations on the upper Yakima Basin population of steelhead. Recently, the National Marine Fisheries Service proposed that all *O. mykiss* (wild, hatchery, and resident rainbow) be protected under the Endangered Species Act (Federal Register 69:31354-31359).

The Yakima River flows from Keechelus Lake for about 320 km (200 miles) to join the Columbia River near Richland, Washington (Figure 1). The Yakima River basin is one of the most intensively irrigated and managed river basins in the western United States (Rinella et al. 1992; Fuhrer et al. 1996; Reclamation 2000). Water development began in the 1800's and today the basin is a complex system of storage reservoirs, mainstem dams and smaller diversions, hydropower facilities and over 3,200 km (2000 miles) of conveyance canals (Rinella et al. 1992; Reclamation 2000). Winter flows are reduced while summer flows increased to meet irrigation and flood control needs.

Yakima River adult steelhead enter the Columbia River in spring/summer, move into the Yakima River in the fall, and spawn the following spring (Hockersmith et al. 1995). Telemtry studies in the late 1980's in the Yakima basin identified several steelhead populations including Satus Creek, Toppenish Creek, Naches River, and the Upper Yakima (Hockersmith et al. 1995). Of these, the upper Yakima run was the smallest with < 5% of tagged fish moving above Roza Dam (Hockersmith et al. 1995). Video and actual fish counts at Prosser and Roza Dams over the last 10 years (1994/95 – 2003/04) suggest that about 5% of the Yakima steelhead run has continued to use the upper portion of the basin (average 1,893 fish at Prosser, 504-4,525; average of 92 fish at Roza Dam, 14-238). Resident rainbow trout co-occurs with the anadromous steelhead in the Yakima system and studies suggest the two forms are not reproductively isolated in the upper basin (Pearsons et al. 1998; Reclamation 2000).

Roza Dam located about 12 miles north of the town of Yakima was built in 1939-1940 with two roller gates for spillway purposes (Reclamation 2002; Figure 1). The main fish ladder in the east abutment was also built in 1939 but was only functional when the Roza Pool was full. Thus, over the following decades, there were periods when the pool was down for dam and screen maintenance and the ladder was not in operation. In 1988, the ladder was modified with a low-level entrance to allow year-round upstream passage. A fish counting/trap facility (Roza Fish Trap) was also built and is monitored by the Yakama Nation. The Roza Canal on the west bank is screened by a drum screen and trash rack structure and is sampled seasonally to intercept and tag juvenile outmigrants. Large fish can move downstream through this structure but most are believed to pass under the dam roller gates. Reclamation currently targets a minimum flow of 11.32 m^3sec (400

cubic feet/sec) below Roza Dam for fish passage but flows may range to 1,471.6 m^3sec (52,000 cubic feet/sec) in the spring (Reclamation 2002). Flows for power generation may be subordinated to improve fishery flows below Roza Dam (roller gates may be tucked so water and fish flow over the top or lifted so water and fish pass underneath).

Our objectives are to gain a better understanding of steelhead habitat use and needs in the upper Yakima system. Steelhead may spawn more than once and typically attempt to return to the ocean after spawning. Thus, we will also try to evaluate how successful adult passage is at Roza Dam (up and downstream). This report is our second annual report and summarizes our findings from the winter 2003/2004.

Methods

We gastrically implanted 118 adult *O. mykiss* at the Roza fish trap with a 6- month radiotransmitter (16mm wide, 46mm long, and weighing 16g in air). Fish were collected for 24 hours then bypassed into an anesthetic (MS-222) tank and measured (fork length, FL, and postorbital length, POL, cm), weighed (gm), checked for external marks, sexed, scanned for a pit-tag (pit-tagged if none present), scales removed for age analysis, and condition noted. Fish were then placed in a trough and a transmitter gently inserted into the stomach via the mouth. A thick rubber band was placed about a third of the way along the transmitter to improve its retention in the fish's stomach. The antenna trailed out the mouth and was crimped to flow back alongside the fish's body. All radiotagged fish were released into Roza Pool within 2 hours after implant. As last year, we attached a transmitter to the first large "steelhead appearing" fish that ascended the Roza fish ladder (up to 118 radiotransmitters). Thus, we radiotagged only the first portion of a "large" run and miss the later arriving fish.

We used mobile tracking, aerial surveys 91.4 – 121.9 m (300 - 400 feet) above the river, and a system wide aeries of fixed stations to monitor fish movements. The watershed was tracked frequently so that we were not out of contact with the tagged fish for more than a few days. River kilometers (miles) were determined using the mouth of the Columbia River as River Kilometer (RK) (River Mile, RM) 0. Fixed data logging stations included Bonneville Dam (RK 233.7, RM146.1), The Dalles (RK 306.4, RM 191.5), John Day Dam (RK 344.9, RM 215.6), McNary Dam (RK 467.2, RM 292.0), mouth of the Yakima River (RK 536.3, RM 335.2), Prosser Dam (RK 611.7, RM 382.3), Sunnyside Dam (RK 702.4, RM 439), Terrace Heights Bridge (RK 717.4, RM 448.4), lower Naches River (RK 731.2, RM 457), Roza Dam (RK 741.1, RM 463.2), Town Ditch Dam (RK 794.7, RM 496.7), lower Tanuem Creek (RK 802.1, RM 501.3), lower Swauk Creek (RK 808.2, RM 505.1), lower Teanaway River (RK 818.1, RM 511.3), Yakima River just downstream of the Cle Elum River (RK 833.3, RM 520.8; Figure 1). Appendix 1 contains all tracking data. RK 536.3 (RM 335.2) was used for the confluence of the Yakima and the Columbia rivers (after the River Mile Index, Yakima River) and all Yakima River sites were adjusted accordingly.

Results

A total of 209 adult steelhead ascended the Roza Dam ladder and fish trap in February (n=13), March (n=132), April (n=62) and June (n=1) 2004 (Figure 2). Scale readings suggested most of these fish were four (one salt, three fresh water marks, N=107) and five (one or two salts, three or four fresh water, N=35). Sixty fish had scales that were regenerating and could not be read. Only one of these fish was a hatchery steelhead (determined from scale features). No fish fell back over Roza Dam and reascended the fish ladder.

Of the 209 upper Yakima fish, 117 wild and 1 hatchery steelhead (discussed at end of results) were radiotagged. Wild females averaged 50.1 cm POL (n=80, 61.1 cm FL, 2.4 kg) and wild males averaged 49.4 cm POL (n=37, 62.2 cm FL, 2.3 kg; Table 1).

All of the radiotagged steelhead were released in good condition (one fish immediately regurgitated the transmitter and was released). However, 12 fish were known to or appeared to have regurgitated the transmitter soon after release (10.3 %). Of the remaining 105 radiotagged steelhead, seven fish yielded little or no information and were excluded from the analyses (i.e., all believed lost to anglers or river otters).

The remaining 98 active wild steelhead exhibited a variety of short and long distance movements, presumably spawning related (Table 2). The majority moved upstream after release (99.0 %). More than half moved into a tributary presumably to spawn (59.2%). Forty fish (40.8%) remained in the mainstem Yakima River above Roza Dam. The most upstream movement was a female just below Easton Dam (74 miles upstream of Roza Pool release site).

One female moved 2 miles up Cherry Creek and another fish (a male) moved 2.5 miles up the Wilson Creek-Naneum Creek system.

Seven fish (three males, four females, 7.1%) moved into Taneum Creek in March (25, 29) and April (1, 5, 9, 12; Figures 3, 3a). Six of the seven ascended the Bruton Diversion Dam about 1.6 miles up Taneum Creek. Two fish (male and female) presumably spawned in the riffle just below the second diversion dam (Taneum Diversion, about 2.4 miles upstream). These fish then headed downstream. Another male – female pair were together in late March about 5.5 miles up Taneum Creek. This female remained in Taneum Creek through early April, then headed out and downstream. The male was one of four radiotagged fish that moved above both the Taneum Diversion and the Knudson Diversion (about river mile 3), and was one of three to continue up to the Taneum Creek Campground (about 9 miles upstream). This male was paired with another radiotagged female in the riffle behind the campground, then moved higher in the system. The fourth female remained in the lower 1 mile of Taneum Creek for about 10 days where she presumably spawned, then left and was last located in lower Yakima valley. One male moved in and out of Taneum Creek twice (April 1 and 6).

Nine fish (five females, four males, 9.2%) moved into Swauk Creek in March (Figures 4, 4a). One of these was a female that was first pittagged at Roza in January 2002, radiotagged and tracked to Swauk Creek in March 2003, and again tracked to Swauk

Creek in March 2004. This fish spawned in the same 0.2 mile area in Swauk Creek both years (and paired with a radiotagged male both years). Two other females also presumably spawned in the same area in March 2004. Both the remaining two females (later arrivals to the Swauk system) moved higher upstream to the Liberty Creek confluence (about 11 miles up Swauk Creek). One continued further upstream to the Swauk Creek campground area (19 miles upstream) then returned downstream. One male-female pair spent several days and presumably spawned in the Williams Creek confluence reach. Two radiotagged males also moved to the same area and one moved over a mile into Williams Creek.

Thirty-eight fish (19 males, 19 females, 38.8 %) entered the Teanaway drainage (Figures 5-8a). Fish used the West (n= 11), Middle (n=9), and North Forks (n=15) including Stafford and Standup creeks, and the mainstem Teanaway (n= 12). Six males and one female used more than one of the Teanaway tributaries. The female entered the lower reaches only of the West and Middle Fork and then moved 15 miles upstream to the upper North Fork reach and was paired with a male radiotagged steelhead. The six males moved throughout the three forks and four were paired with radiotagged females in different spawning reaches. Over 10 pairings of radiotagged males-females were located in the Teanaway mainstem and three tributaries in March and April. Several fish moved about 20 miles up the North Fork and one pair moved into Stafford Creek and Standup Creek. Several pairs used the lower 10-11 miles of the West and Middle Forks.

One male radiotagged steelhead moved about 3.5 miles up the Cle Elum River in mid April. He remained in the area for a week and then was lost to the study. Two females were located briefly in the confluence of the Cle Elum and one of these moved upstream to the base of Easton Dam (about river mile 202).

One fish moved downstream (1.0 %) immediately following release. We had little contact with this fish but she was captured and placed in the kelt reconditioning program at the Chandler Juvenile Fish Facility (B. Bosch, Yakama Indian Nation).

At least 58 kelts successfully moved downstream through Roza Dam from March through May (including two in March, 27 in April, and seven in May; Figure 9). Of the 58 fish, 13 moved downstream during the manipulated gate operations on April 27-29 and May 4-6 (Figure 9). During these periods, power was subordinated at the Roza Powerhouse, the Roza Dam east gate was tucked for part of the time releasing up to 1,250 cfs, and fish moved downstream. Thirty one Roza kelts were recovered at the Chandler Juvenile Fish Facility and placed in the kelt reconditioning program (B. Bosch, Yakama Nation, personal communication).

Of the remaining 27 fish, 17 moved downstream at least to the mouth of the Yakima River. Fourteen were last contacted at Bonneville Dam (one female was captured at McNary Dam, the Roza radiotransmitter replaced with a 30 day-juvenile radiotransmitter and the fish was last heard from in the Portland, Oregon area, R. Wertheimer, personal communication).

Five Roza steelhead were radiotagged and released just above Prosser Dam in December 2003 (T. Newsome, Yakama Nation, personal communication). These fish had been captured in the late spring 2003 and placed into the kelt reconditioning program at the Chandler Juvenile Fish Facility. One of the five (female) moved up to the Sulphur Creek area near Sunnyside Dam where she presumably spawned. The remaining four fish either regurgitated the transmitters or were lost to the study through angling/predation.

We tracked one male hatchery steelhead (62 cm FL, 48 cm POH, 2.4 kg). He moved below Roza Dam and was located seven miles up Wenas Creek in Selah Valley. This fish did not have an adipose fin clip.

Conclusions

Steelhead arrived at the Roza fish trap from February through June with the peak times in March (n= 132, mid-March in particular) and April (n=62). The arrival of these fish in the upper Yakima River may be related to the various high flow events throughout the spring, and the consequent muddying of the river (Figure 2). Some fish moved quickly to a presumed spawning site while others took more time (Figures 3-5a,b,c,d). We stopped implanting radiotransmitters March 19 (2004) and thus, have no information on the subsequent 90 steelhead that moved up though Roza Dam later that spring.

More than half (59.2%) of the radiotagged wild steelhead moved into a tributary during the 2004 spawning season. These fish exhibited a strong fidelity to each drainage. There was no straying among tributaries, but six wild males moved throughout the Teanaway system. Presumed and observed spawning areas include the Teanaway drainage (mainstem and all three forks), Swauk Creek drainage, Taneum Creek, lower Cle Elum River, Wilson Creek, Cherry and Naneum creeks, and the mainstem Yakima River. Females continued to dominate the wild steelhead run ascending the Roza fish ladder (75%, 53 males, 155 females). We presume that all steelhead spawned although as last year, only several pairs were tracked and observed in a specific area. We plan to collect more diurnal-24hr behavior and possibly actual observations in 2005.

Six wild steelhead (all females) clearly homed to the upper Yakima River (three to a tributary, one to the mainstem, and two unknown spawning location). One female returned to Swauk Creek to the same river reach a second year.

This year we located 15 male-female pairings on presumed spawning grounds in the three main tributaries (Teanaway River, Swauk and Taneum creeks). All of these involved radiotagged male and female wild steelhead. Most often, the female headed out of the system and the male moved to another location. We heard of a steelhead caught with a rainbow trout in a beaver pool in Umtanum Creek but don't know if this pair spawned there. We observed no spawning activity between radiotagged steelhead and other *O. mykiss* in 2004.

At least 58 kelts moved downstream through Roza Dam (13 study fish during Roza gate manipulations) and at least 15 continued into the Columbia River (14 to Bonneville Dam

reach). These movements suggest that steelhead were able to negotiate the Yakima and Columbia River barriers on their outmigration with some success. We will continue to evaluate the relationship between flows and gate tuck/opening for fish passage at Roza Dam in 2005.

Over all tag retention was better this year than last (we switched to a smaller transmitter), although still higher than in mainstem Columbia River steelhead studies. This may be due in part to the high angling pressure both above and below Roza Dam and the removal of some transmitters.

Acknowledgements

We particularly thank Joe Hoptowit and Gerry Lewis of the Yakama Nation for their help with fish handling and tracking. We thank Dan Joosten (University of Idaho) and Bill Bosch (Yakama Nation) for their help with accessing information in basinwide databases. We thank Scott Kline (Reclamation) for assisting with the evaluation of fish passage and flow-gate opening at Roza Dam. We thank John Sneva (Washington Department of Fish and Wildlife) for aging the fish scales. We thank Reclamation's Upper Columbia Area Office and the Denver Research Office (Technical Service Center) for funding this program. Judy Lyons provided invaluable assistance with data management.

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Table 1. Length and Weight of Adult Steelhead, Upper Yakima River, Winter 2003-2004.

	N	Fork Length (cm) mean	(range)	Postorbital Length (cm) mean	(range)	Weight (kg) mean	(range)
Female							
All	154	61.2	(53-76)	50.3	(43-62)	2.3	(1.4-5.2)
Radiotag	80	61.1	(53-76)	50.1	(43-62)	2.4	(1.4-5.2)
Male							
All	53	62.5	(56-71)	49.6	(44-57)	2.3	(1.6-3.5)
Radiotag	37	62.2	(56-70)	49.4	(44-55)	2.3	(1.6-3.5)

Table 2. Summary of steelhead movements in the Upper Yakima Basin, winter 2004 based on radiotelemetry data (of 98 active fish).

Location of Presumed Spawning	# Radiotagged Steelhead
Mainstem Yakima River (between Roza Dam and Easton Dam)	40
Teanaway Drainage	38
Swauk Creek	9
Taneum Creek	7
Cle Elum River	1
Cherry Creek	1
Wilson Creek	1
Unknown Yakima River below Roza Dam	1

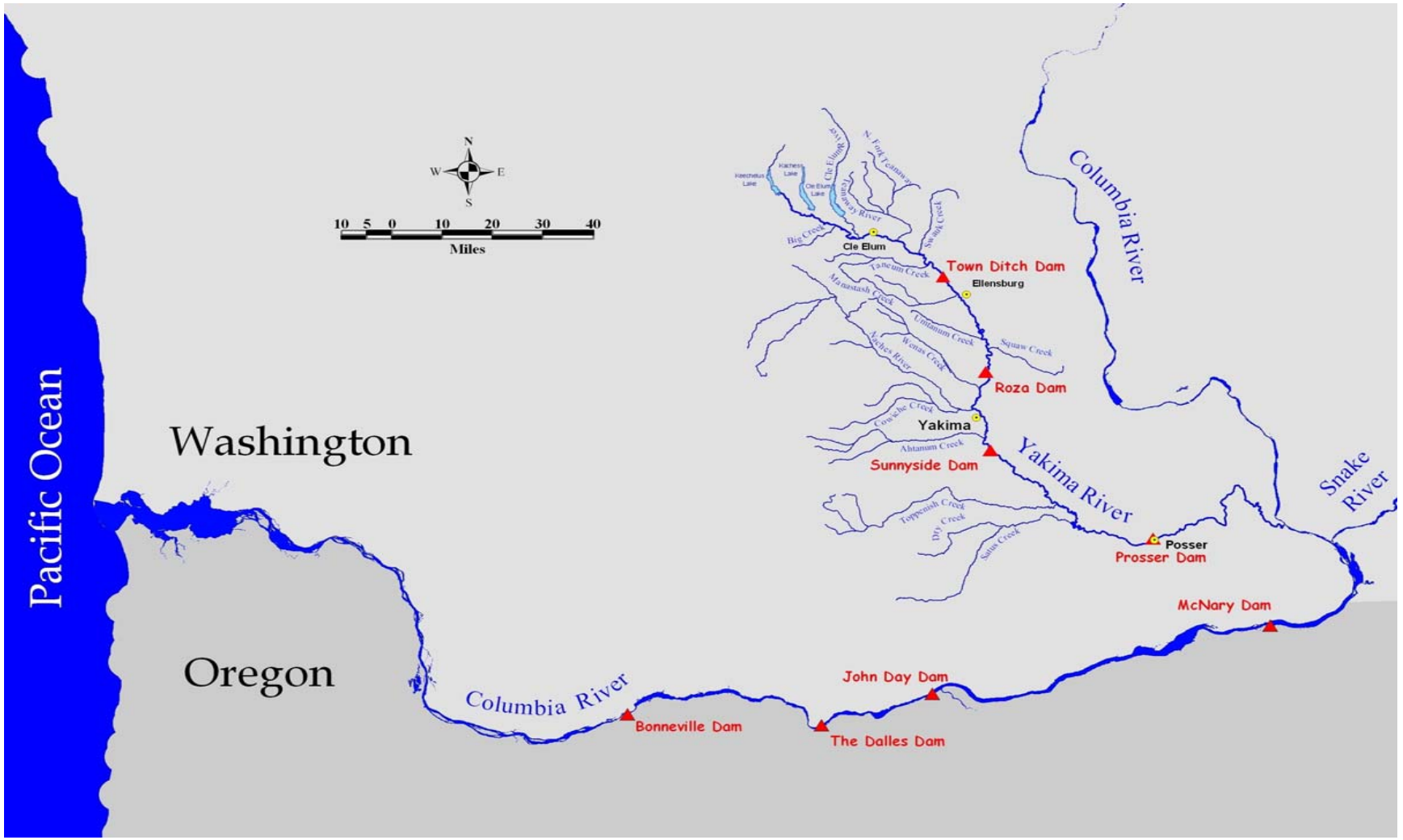

Figure 1. Map of the Yakima River Basin, WA.

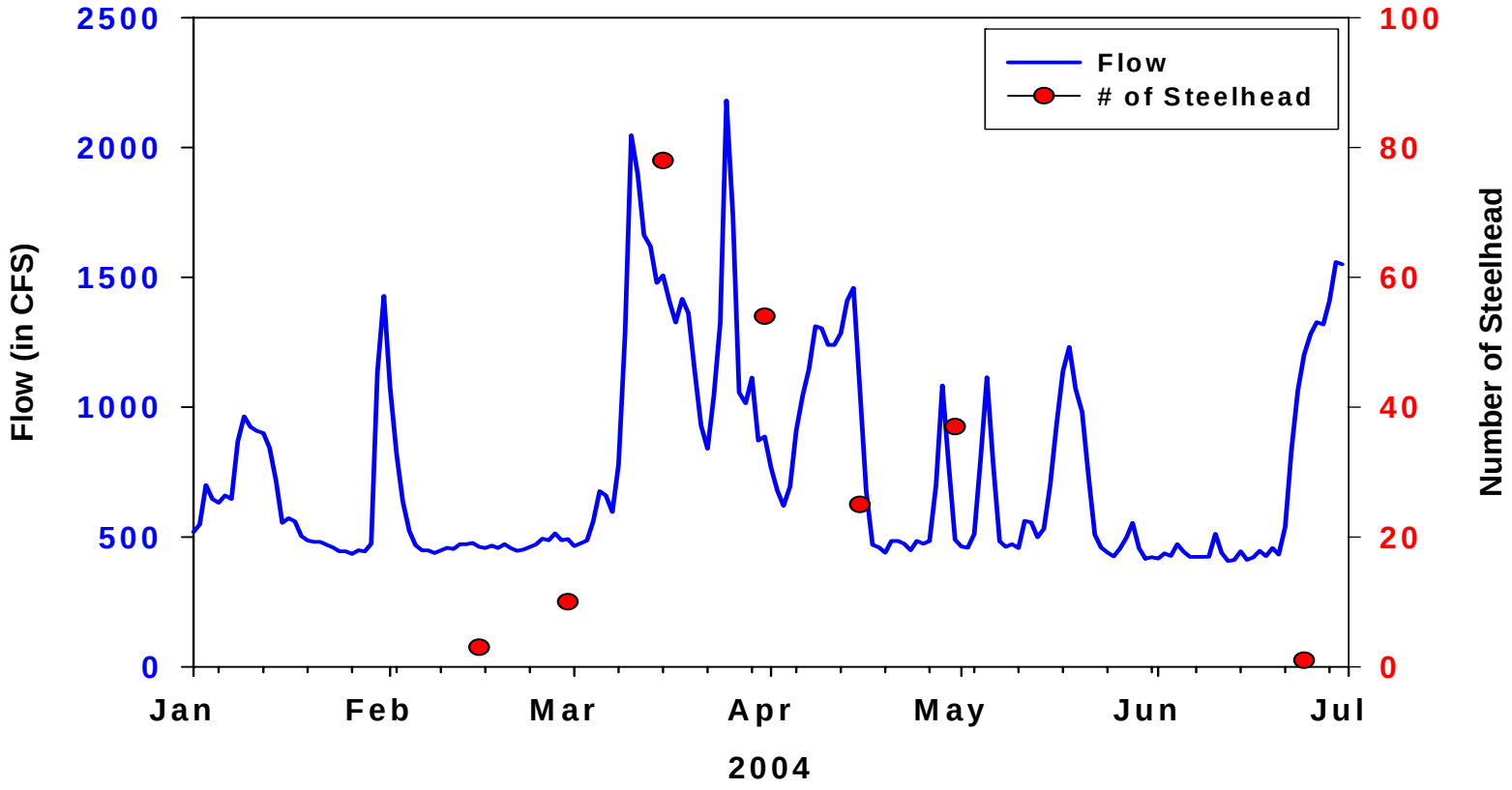

Figure 2. Relationship between flows and steelhead migrating upstream at Roza Dam, Yakima River, Washington, winter 2004.

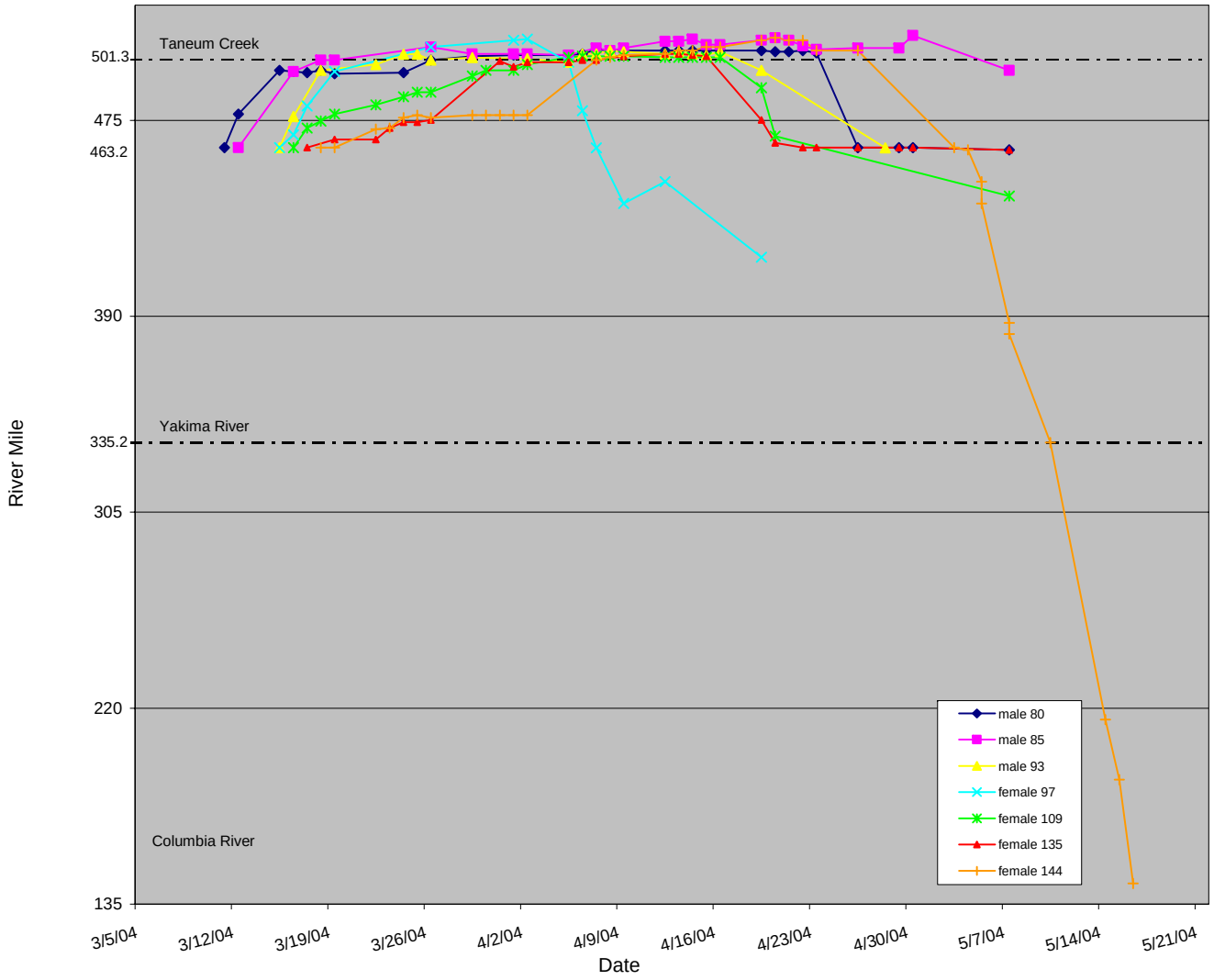

Figure 3. Movements of 7 wild steelhead in Taneum Creek, Yakima River, winter 2004. River Mile 0 = mouth of the Columbia River. River Mile 463.2 = release site.

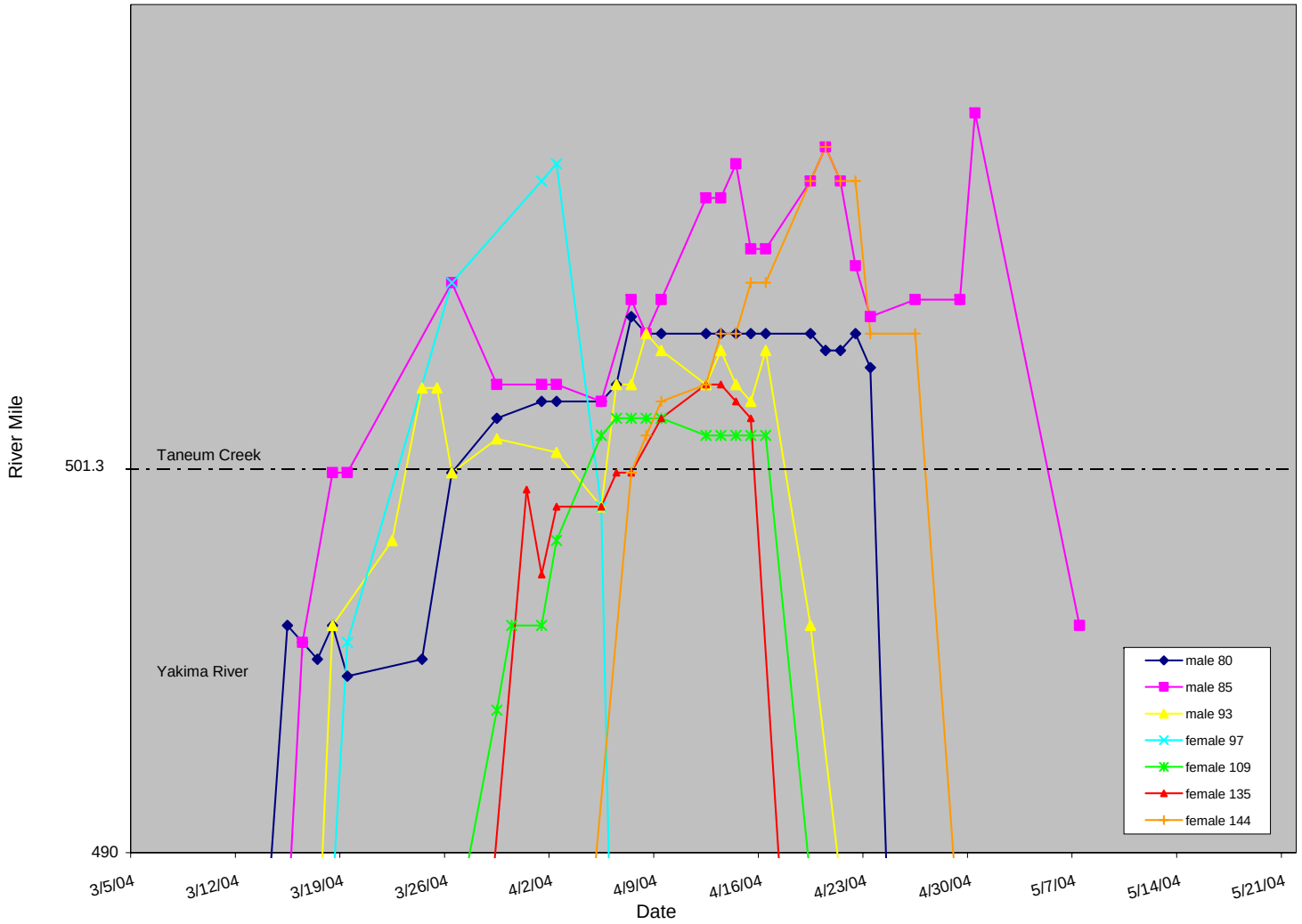

Figure 3a. Movements of 7 wild steelhead in Taneum Creek (between river mile 490 in the Yakima River and the lower 11 miles of Taneum Creek; see Figure 3 for complete movement patterns), winter 2004. River Mile 0 = mouth of the Columbia River.

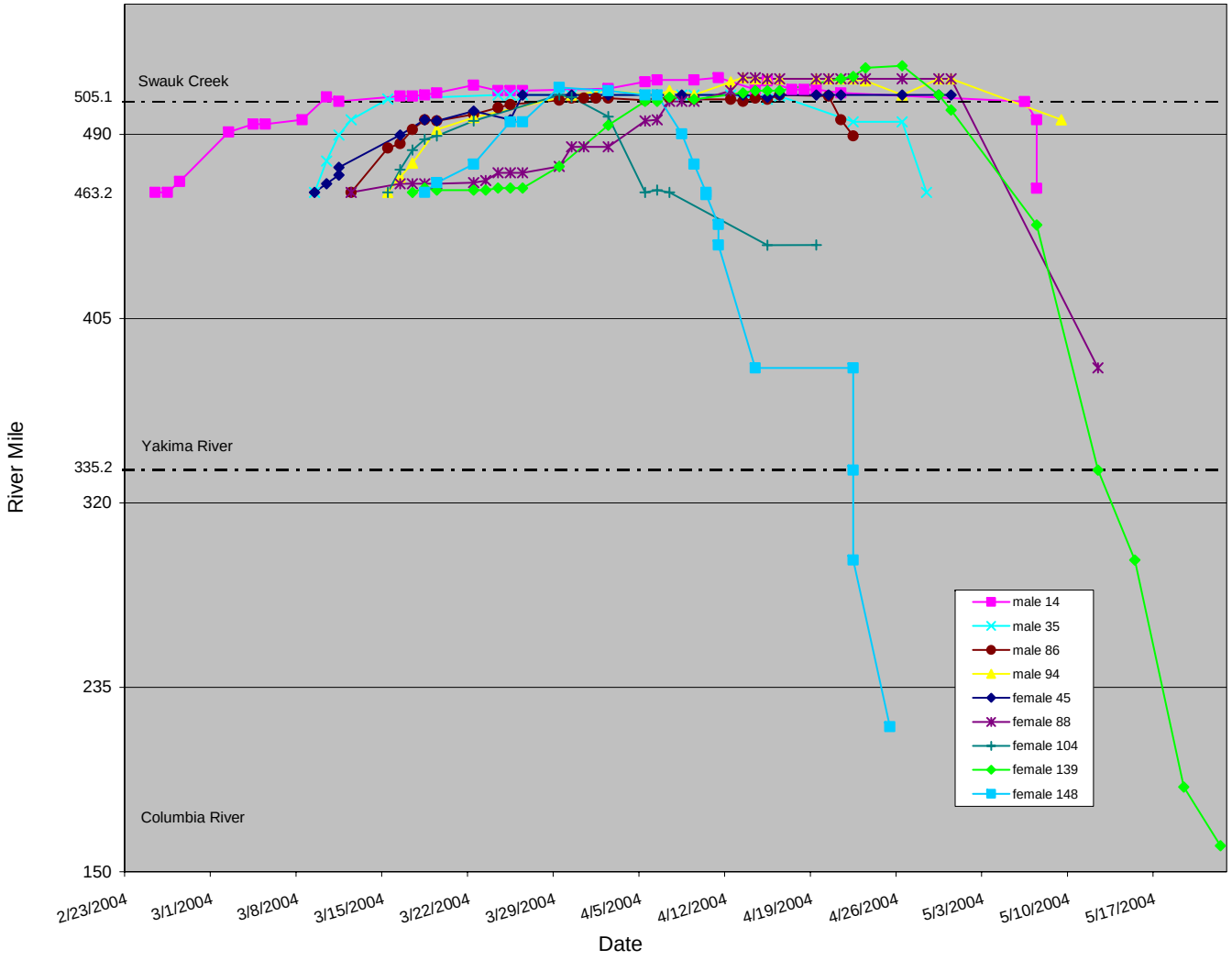

Figure 4. Movements of 9 wild steelhead in Swauk Creek, Yakima River, winter 2004. Fish #14 moved 1 mile up Williams Creek (11 miles above mouth of Swauk Creek). River Mile 0 = mouth of the Columbia River. River Mile 463.2 = release site.

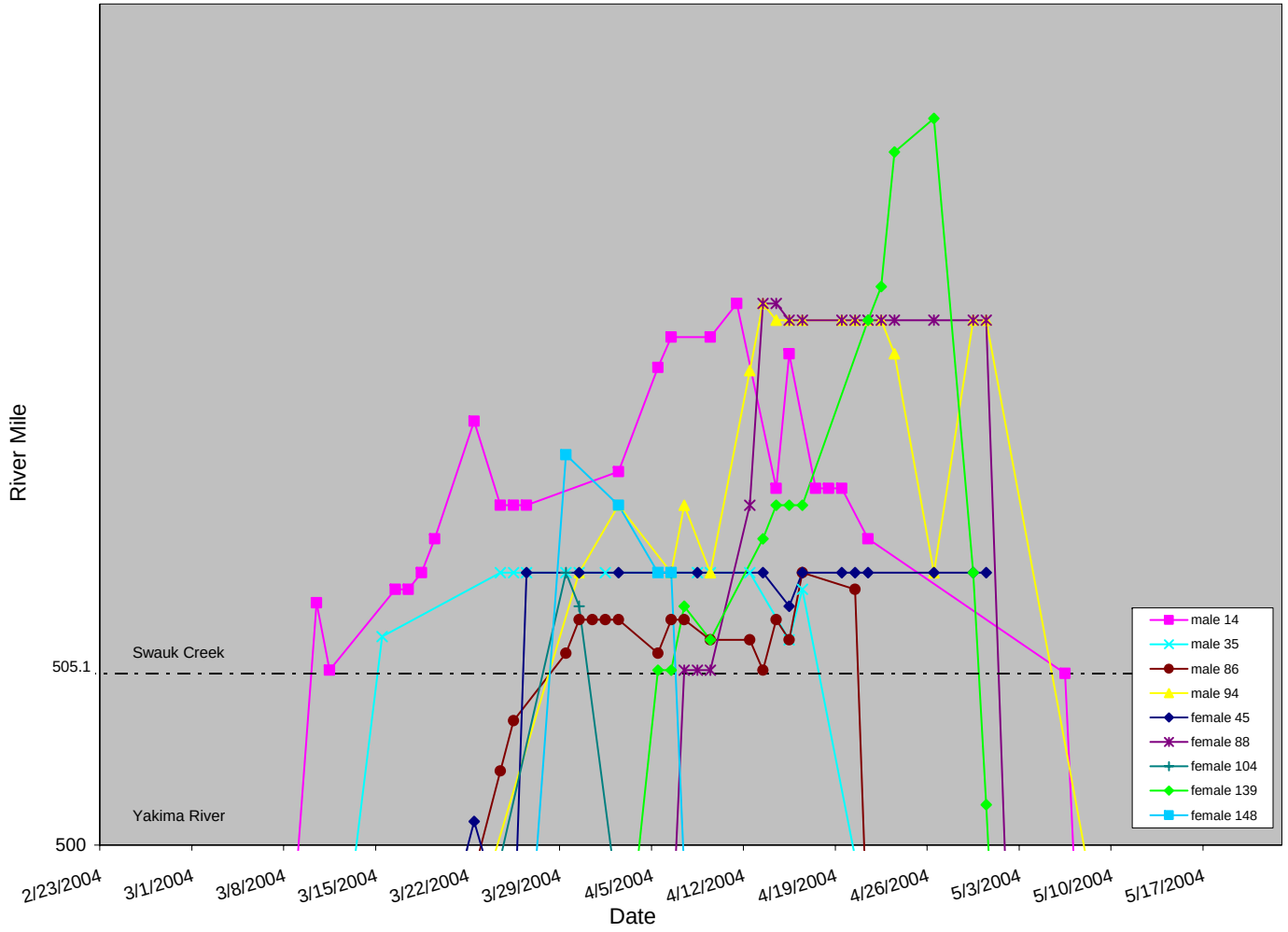

Figure 4a. Movements of 9 wild steelhead in Swauk Creek (between river mile 500 in the Yakima River and the lower 20 miles of Swauk Creek; see Figure 4 for complete movement patterns), winter 2004. Fish #14 moved 1 mile up Williams Creek (11 miles above mouth of Swauk Creek). River Mile 0 = mouth of the Columbia River.

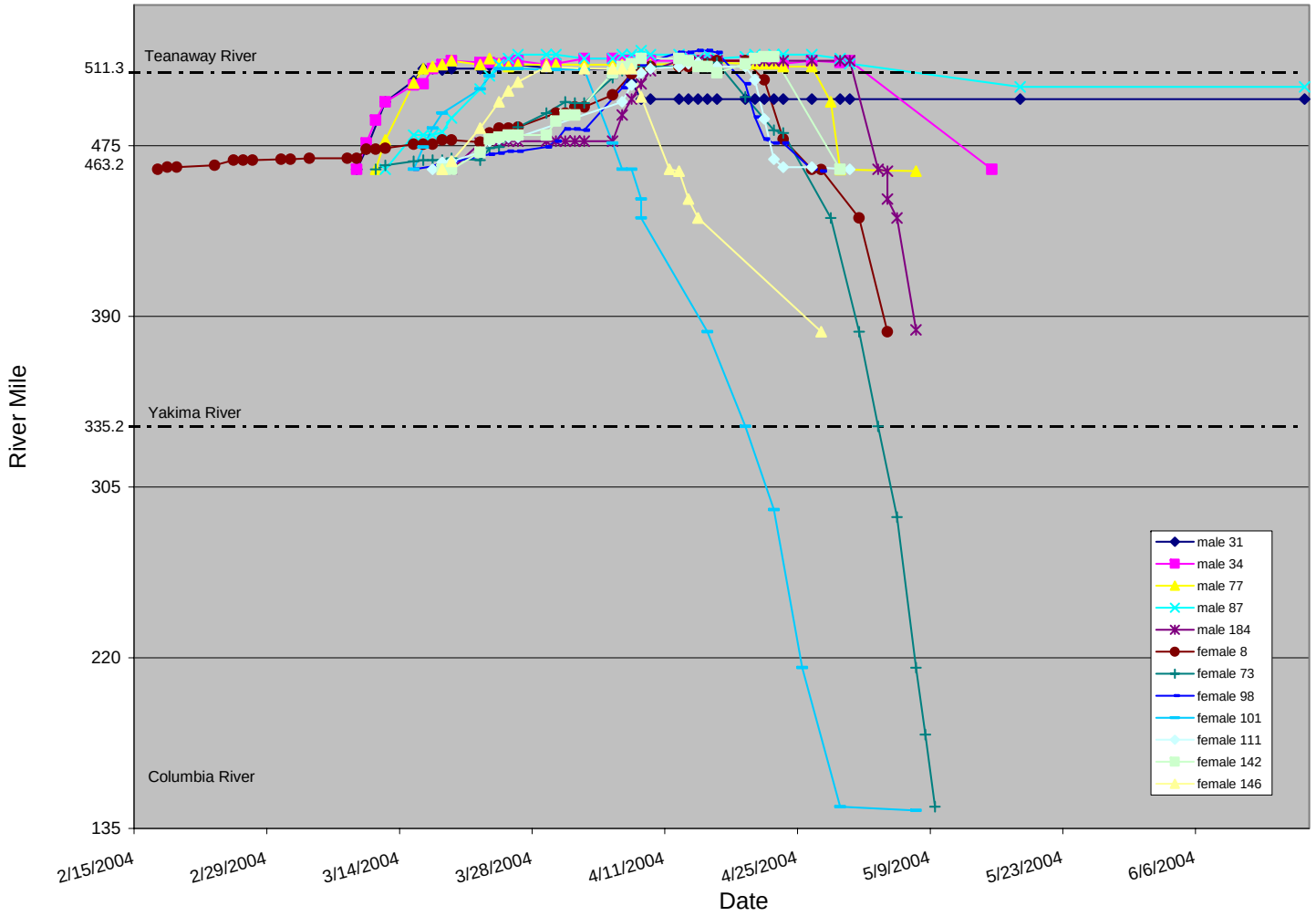

Figure 5. Movements of 12 wild steelhead in the mainstem Teanaway River, Yakima River, winter 2004. River Mile 0 = mouth of the Columbia River. River Mile 463.2 = release site.

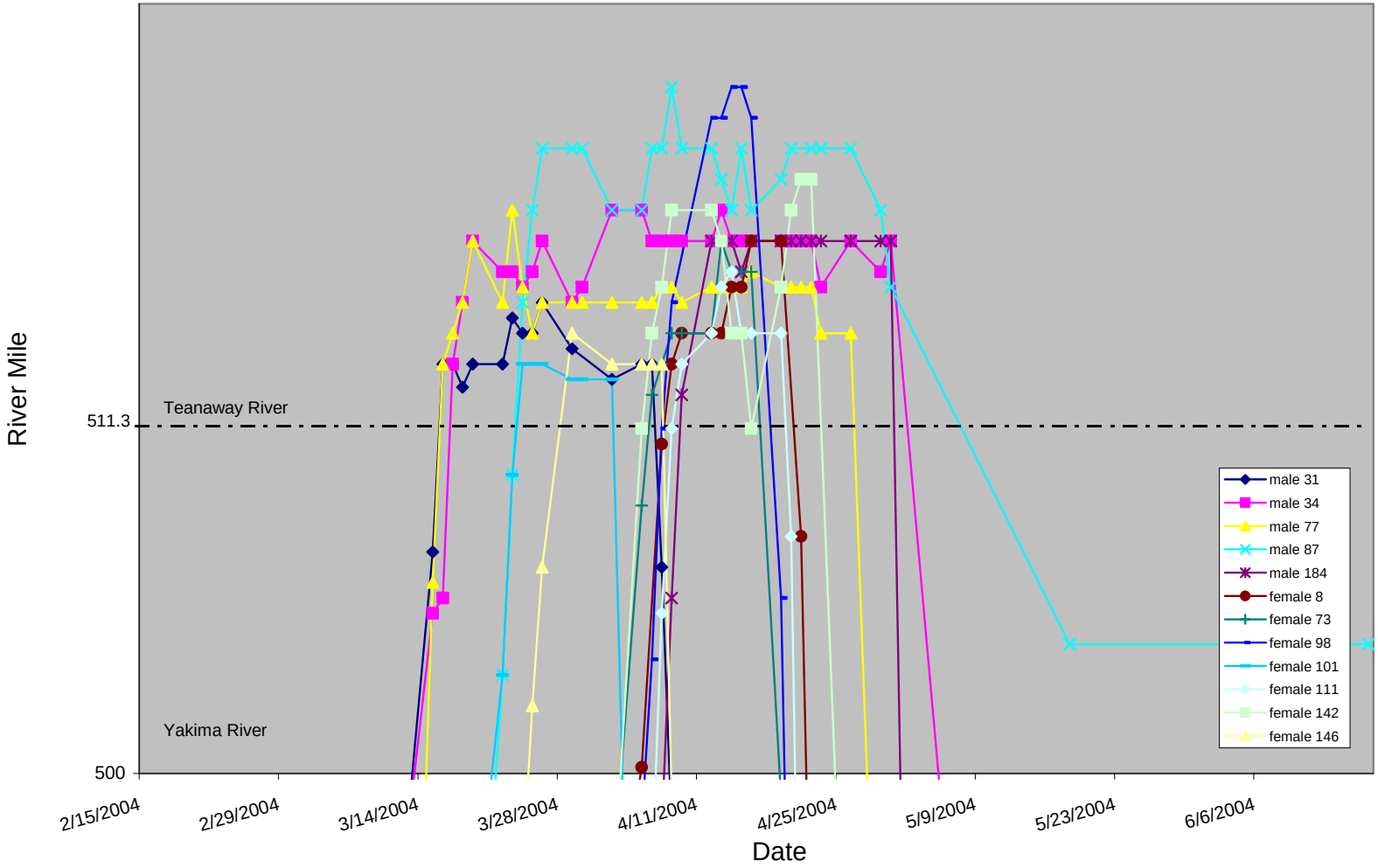

Figure 5a. Movements of 12 wild steelhead in the mainstem Teanaway River (between river mile 500 in the Yakima River and the lower 11.6 miles in the Teanaway River; see Figure 5 for complete movement patterns), winter 2004. River Mile 0 = mouth of the Columbia River.

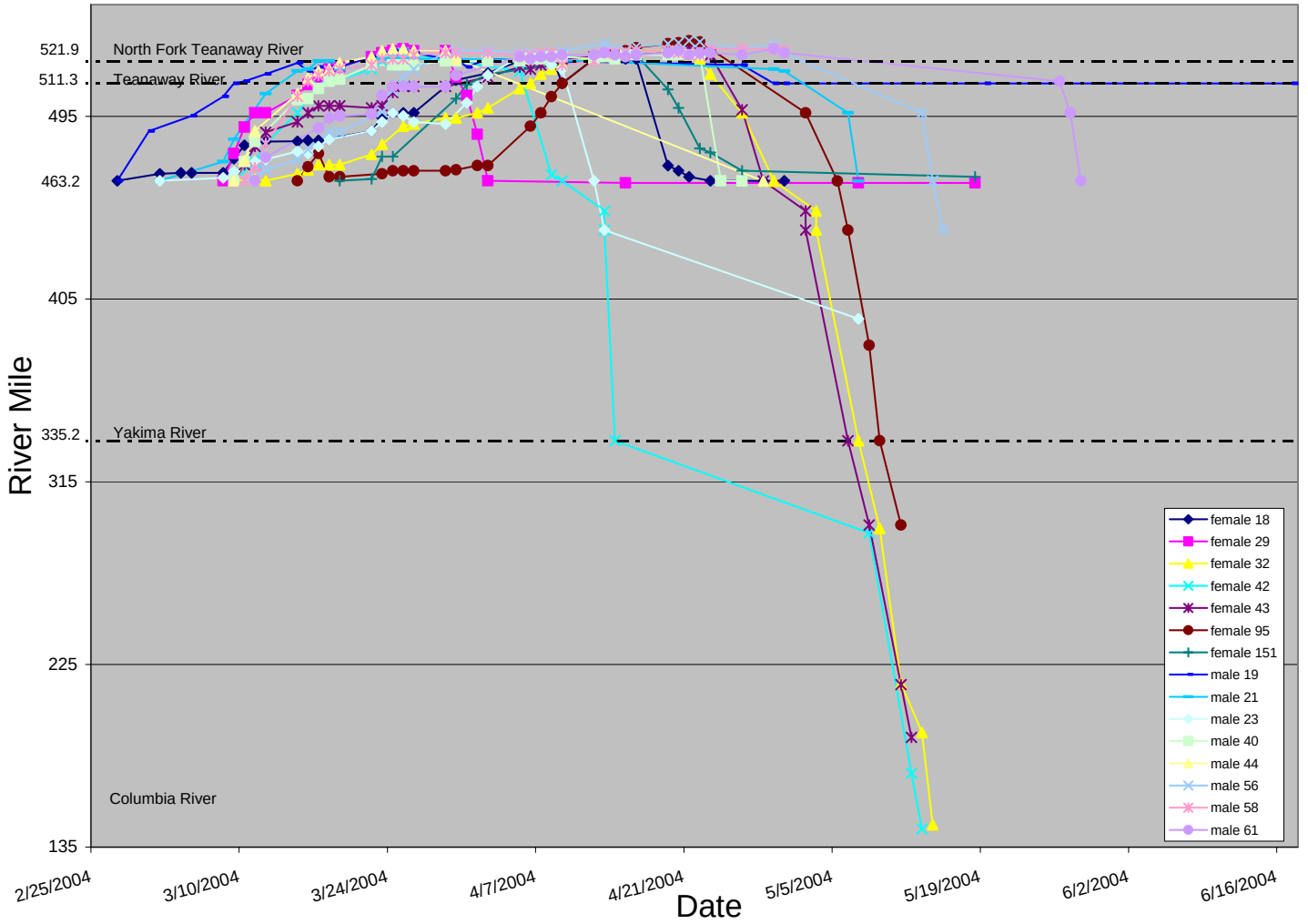

Figure 6. Movements of 15 wild adult steelhead into the North Fork Teanaway River, Yakima River, winter 2004; female 151, males 19, 21, 44 also used other Teanaway tributaries. Male 56 and female 95 moved into Stafford (2 miles) and Standup (1 mile) Creeks (about 19 miles above mouth of the Teanaway River. River Mile 0 = mouth of the Columbia River. River Mile 463.2 = release site.

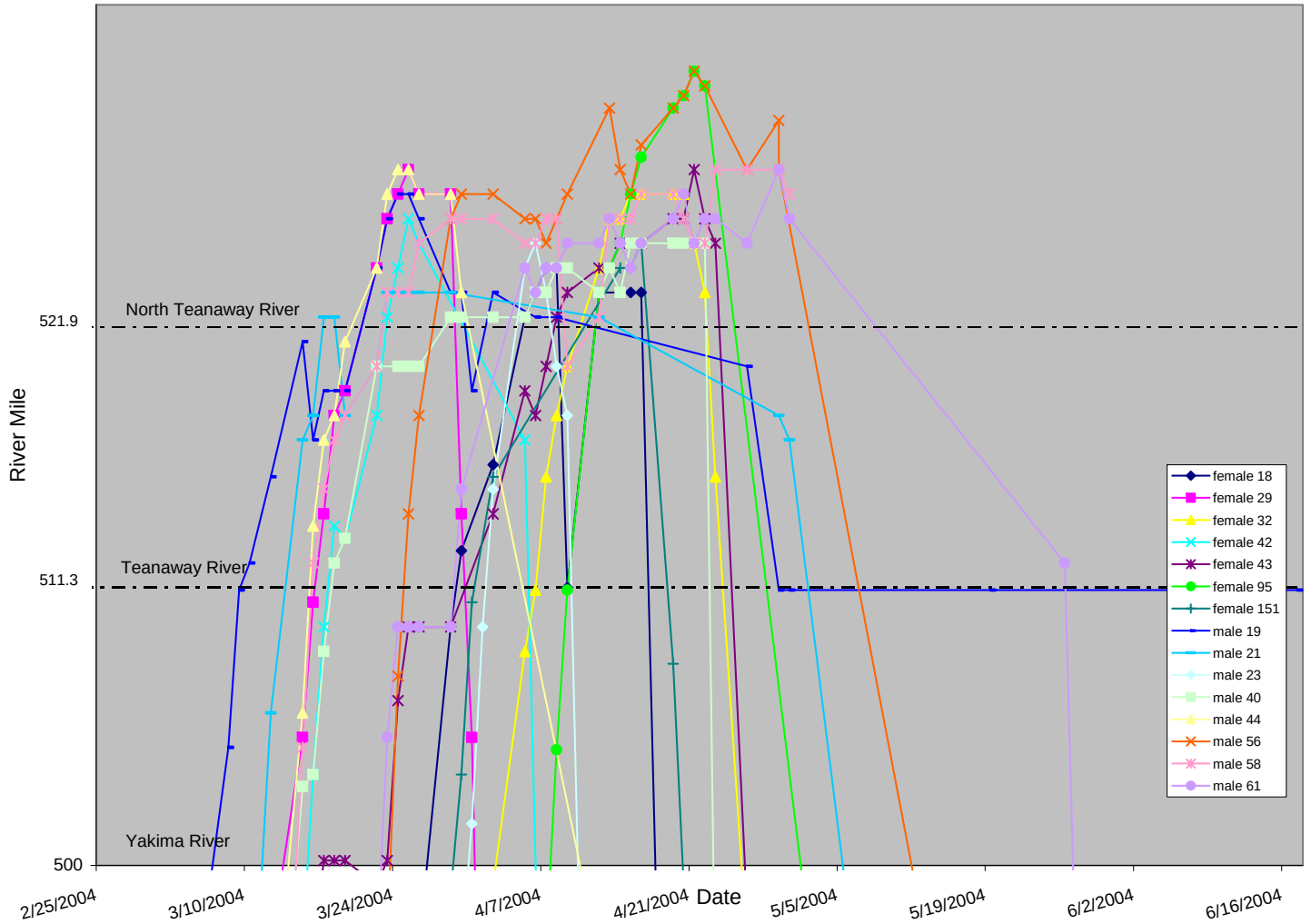

Figure 6a. Movements of 15 wild adult steelhead into the North Fork Teanaway River, Yakima River, winter 2004; female 151, males 19, 21, 44 also used other Teanaway tributaries. Male 56 and female 95 moved into Stafford (2 miles) and Standup (1 mile) Creeks (about 19 miles above mouth of the Teanaway River). River Mile 0 = mouth of the Columbia River.

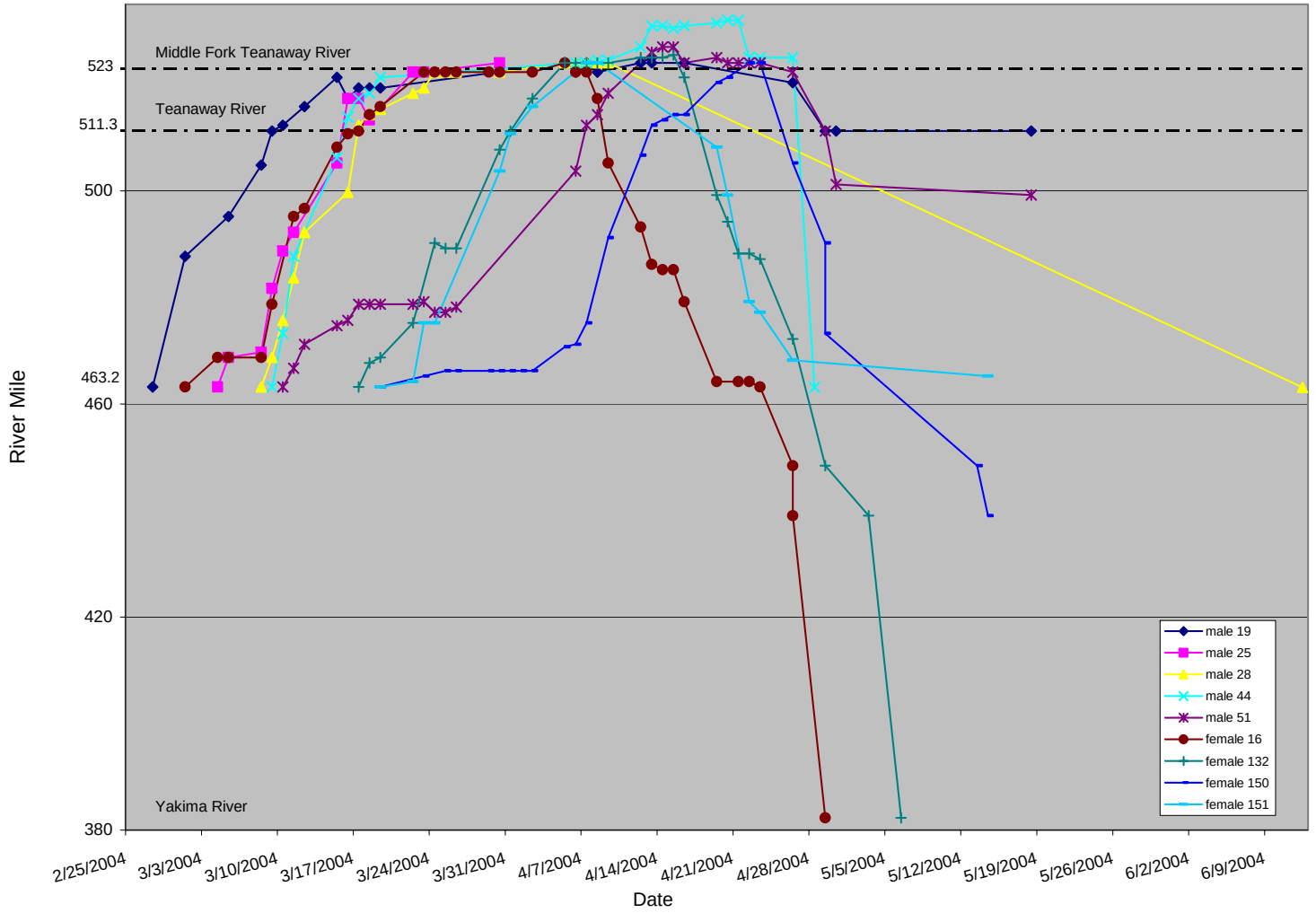

Figure 7. Movements of 9 wild adult steelhead into the Middle Fork Teanaway River, Yakima River, winter 2004; female 151 and males 19, 25, 28, 44, 51 also used other Teanaway tributaries. River Mile 0 = mouth of the Columbia River. River Mile 463.2 = release site.

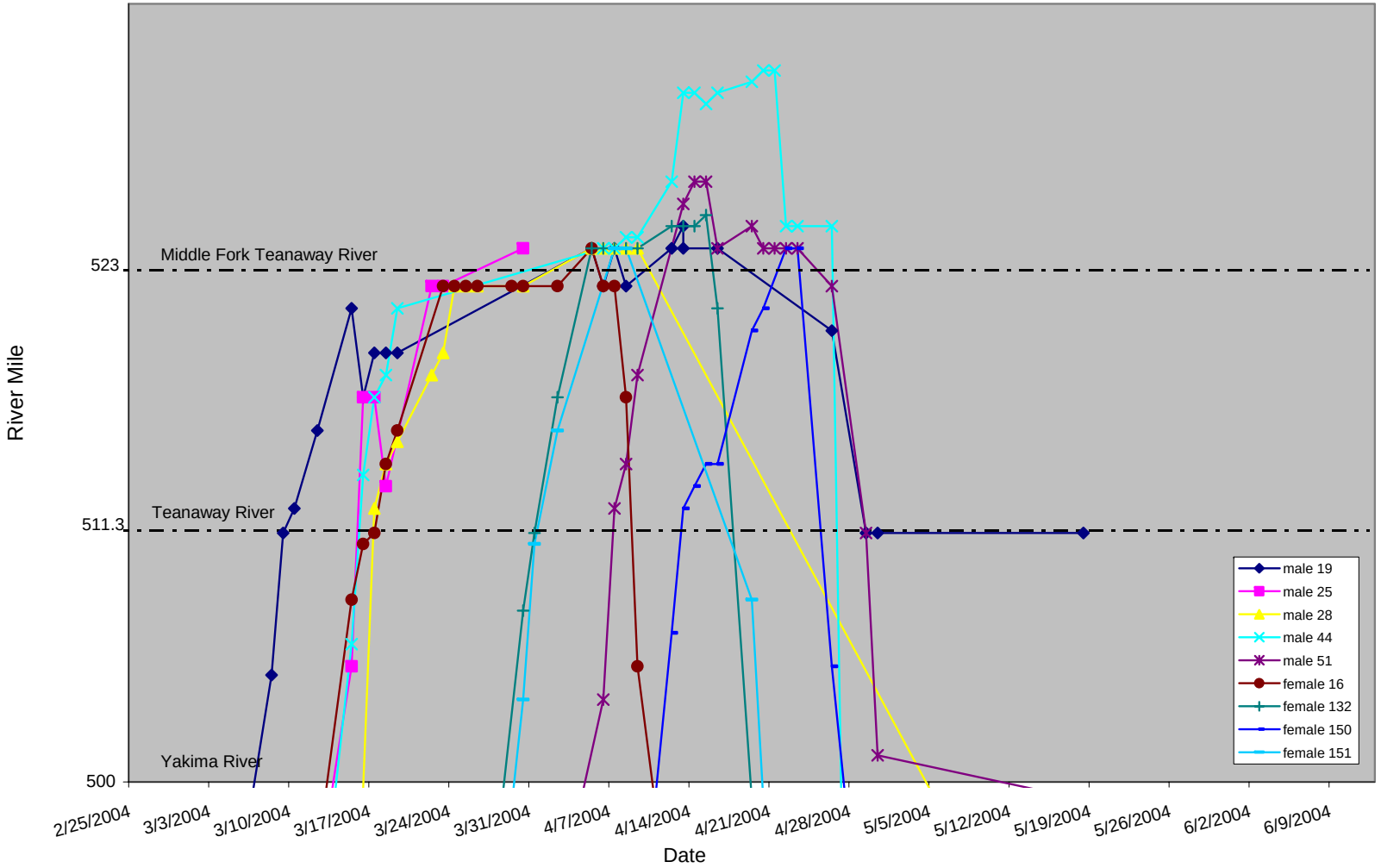

Figure 7a. Movements of 9 wild adult steelhead into the Middle Fork Teanaway River (between river mile 500 in the Yakima River and the lower 9 miles in the Middle Fork; see Figure 7 for complete movement patterns), winter 2004; female 151 and males 19, 25, 28, 44, 51 also used other Teanaway tributaries. River Mile 0 = mouth of the Columbia River.

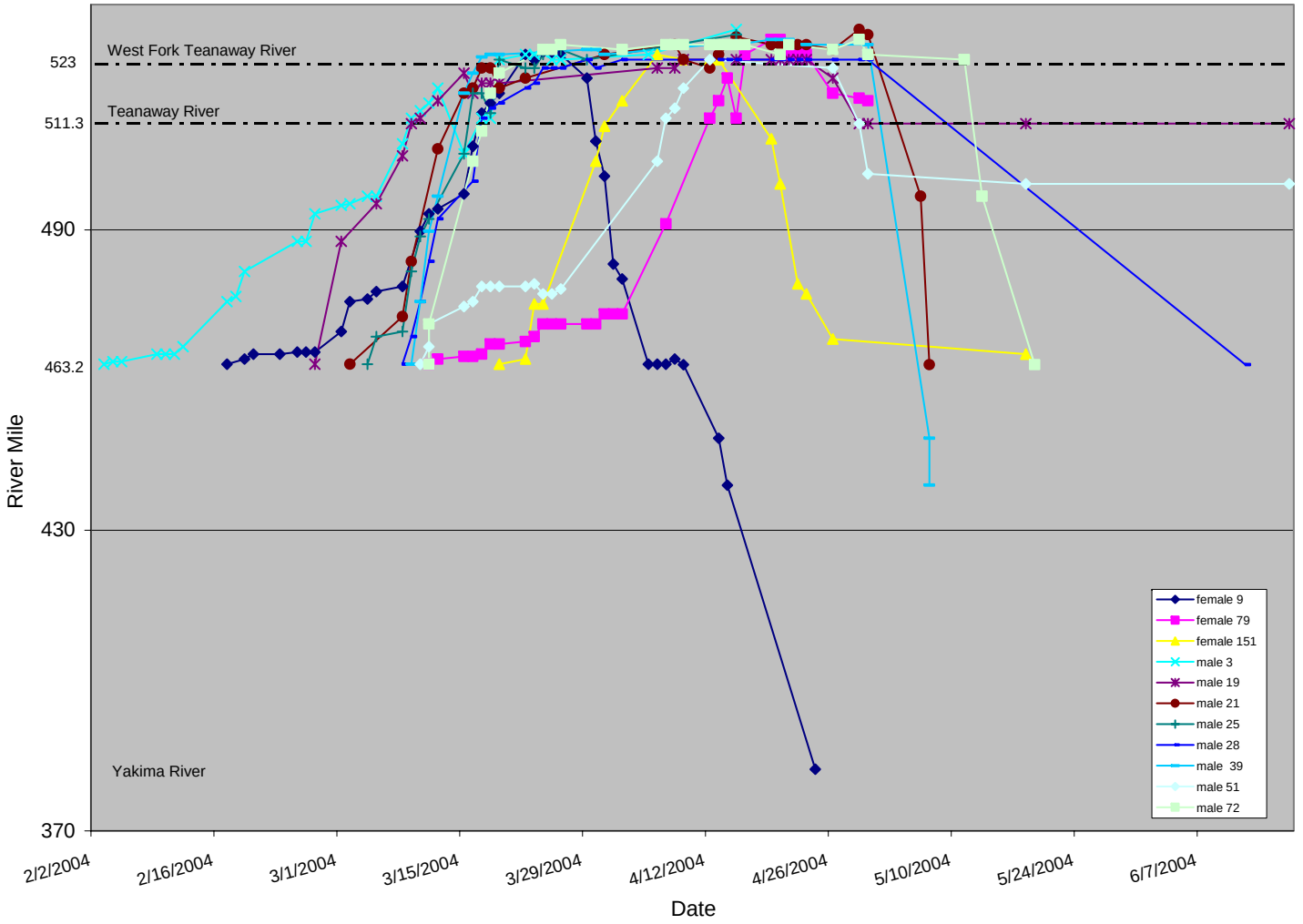

Figure 8. Movements of 11 wild steelhead in the West Fork Teanaway River, Yakima River, winter 2004; female 151 and males 19, 21, 25, 28, 51 also used other Teanaway tributaries. River Mile 0 = mouth of the Columbia River. River Mile 463.2 = release site.

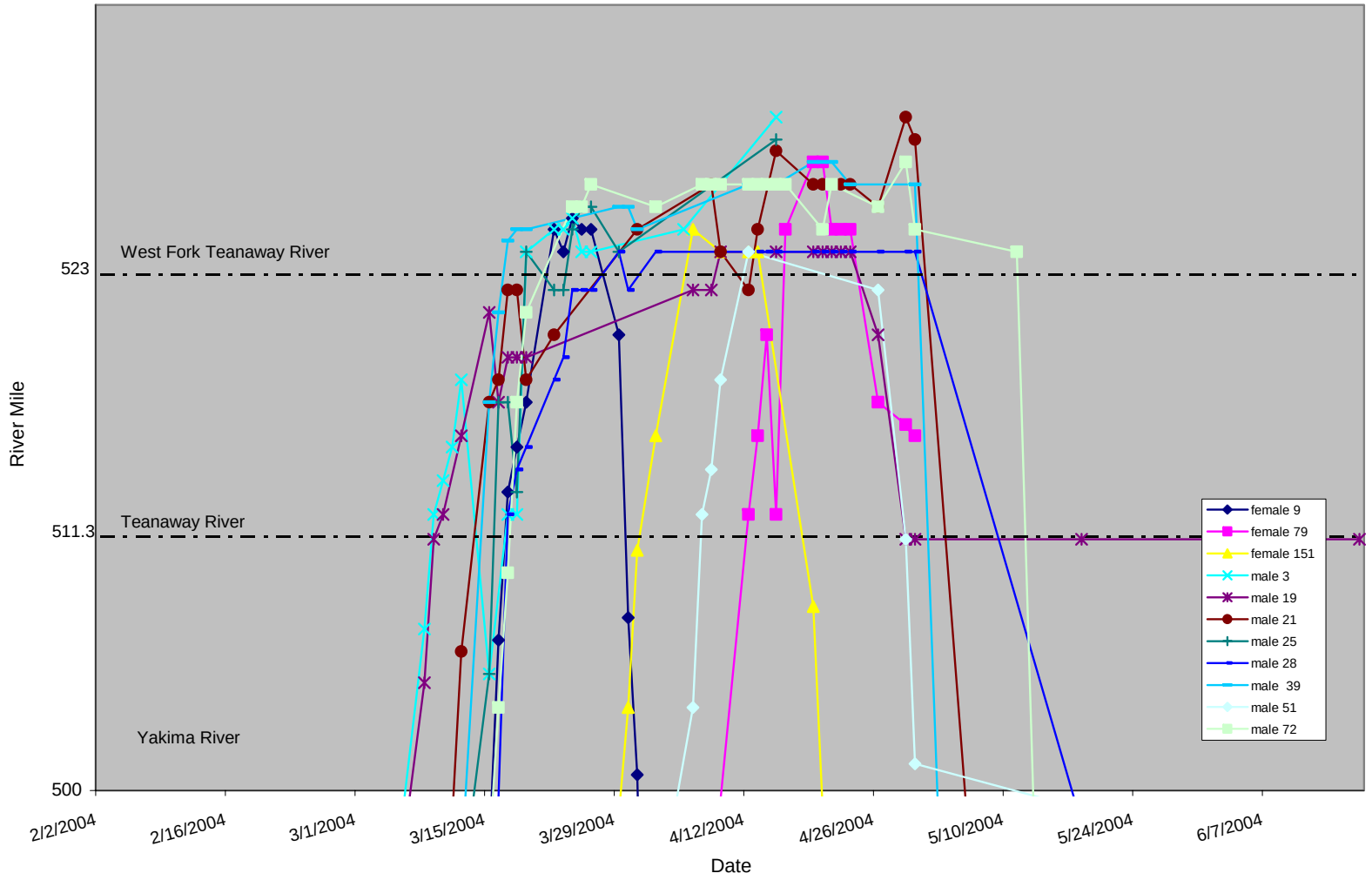

Figure 8a. Movements of 11 wild steelhead in the West Fork Teanaway River, Yakima River (between river mile 500 in the Yakima River and the lower 11 miles of the West Fork; see Figure 8 for complete movement patterns), winter 2004, female 151 and males 19, 21, 25, 28, 51 also used other Teanaway tributaries. River Mile 0 = mouth of the Columbia River.

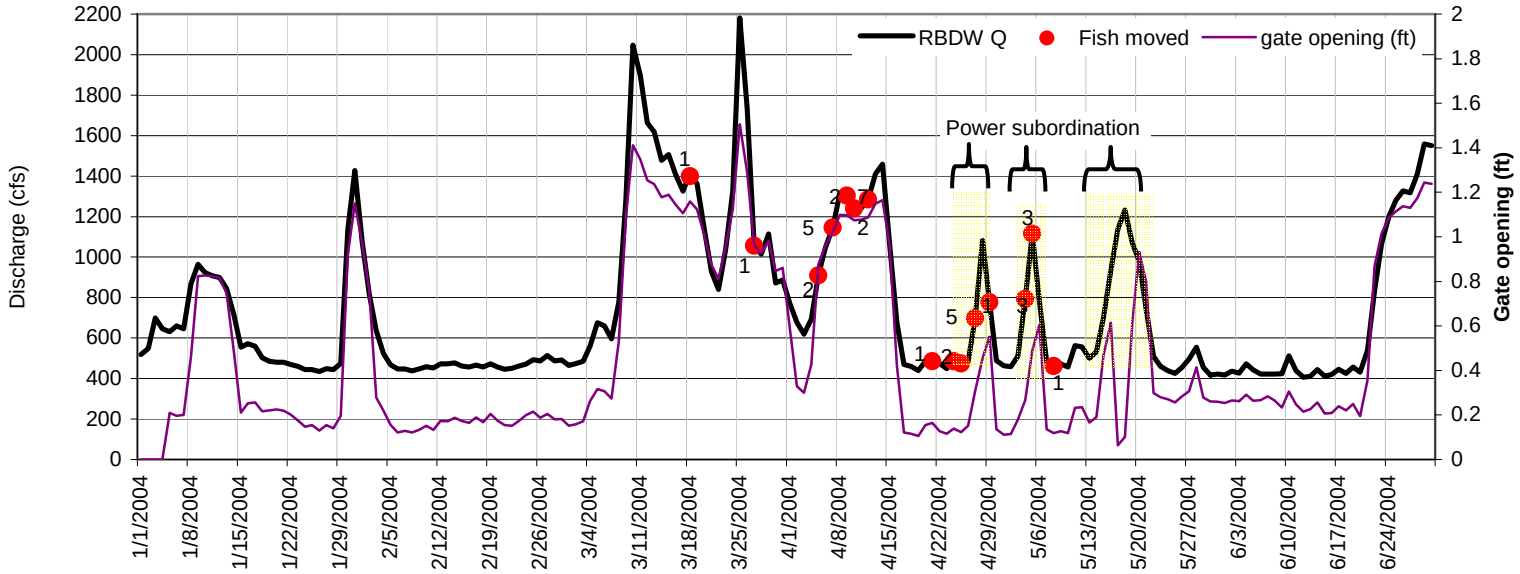

Figure 9. Relationship between Yakima River flows below Roza Dam, Roza Dam east gate opening, and downstream movement of steelhead kelts, winter-spring 2004.

Appendix 1. Summary of radiotagged steelhead data, Upper Yakima River, winter 2004, (data are river miles from the mouth of the Yakima River (0) except for tributaries and the Columbia River, where 0 is the mouth of each system) (Bon = Bonneville Dam, Dal = The Dalles Dam, JD = John Day Dam, McN = McNary Dam, Yak = Yakima River, Tea = Teanaway River, NTea = North Fork Teanaway River, WTea = West Fork Teanaway River, MTea = Middle Fork Teanaway River, Swk = Swauk Creek, CleE = Cle Elum, Tan = Taneum Creek, Ter = Terrace Heights, Umt = Umtanum Creek, POL = postorbital length, FL = fork length)

Tag #	Sex	Age	POL (cm)	FL (cm)	Weight lbs	Origin	2/2/2004	2/3/04	2/4/04	2/5/04	2/6/04	2/7/04	2/8/04
3	M	r.1	48	59	4.4	wild		R 128	128.5	128.5			
5	F	3.1	53	64	5.1	wild	R 128	129	129	129			
7	F	2.1	51	61	5.9	wild					R 128		
8	F	r.1	50	61.5	5.5	wild							
9	F	2.1	47.5	57.5	4.3	wild							
10	F	2.1	49.5	59.5	5.2	wild							
11	F	2.1	46	56	4	wild							
13	F	2.1	47	57.5	4.3	wild							
14	M		45	56	3.6	wild							
15	F	2.1	44	54	3.2	wild							
16	F	r.1s1	57	71	7.4	wild							
17	F	r.1	49	59	4.8	wild							
18	F	2.1	48	58	4.7	wild							
19	M	r.1	55	70	7.8	wild							
20	F	2.1	53	63	5.5	wild							
21	M	2.1	49	59	4.6	wild							
22	F	r.1	47	57	4.5	wild							
23	M	2.1	45	58	3.5	wild							
24	M	2.1	55	69	7	wild							
25	M	2.1	50	61	4.8	wild							
26	F	r.1	48	57	4.3	wild							
27	M	2.1	47	59	3.9	wild							
28	M	2.1	51	64	5.3	wild							
29	F	r.1s1	56	70	7.6	wild							
30	M	3.1	54	69	7.5	wild							
31	M	r.1	50	64	5.5	wild							
32	F	2.1	46	56	4.1	wild							
33	F	3.1	48	58	4.3	wild							
34	M	3.1	47	58	4.3	wild							
35	M	2.1	49	61	5	wild							
36	F	3.1	49	62	5.4	wild							
37	F	3.1	51	62	5.8	wild							

Tag #	2/9/04	2/10/04	2/11/04	2/12/04	2/13/04	2/14/04	2/15/04	2/16/04	2/17/04	2/18/04	2/19/04	2/20/04	2/21/04
3	130	130	130	131.5					140.5	141.5	146.5		
5	129	129	129	129					129	129	129	129	
7	132	132	132	132					136.5	136.5	140.5	144	
8									R 128	129	129		
9									R 128		129	130	
10											R 128	129	
11											R 128	129	
13												R 128	
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
32													
33													
34													
35													
36													
37													

Tag #	2/22/04	2/23/04	2/24/04	2/25/04	2/26/04	2/27/04	2/28/04	2/29/04	3/1/04	3/2/04	3/3/04	3/4/04	3/5/04
3				152.5	152.5	158			159.7	160		161.5	161.5
5		129		129	129	129			129	129		129	129
7		146								2 Che		2 Che	2.25 Che
8		130		132.5	132.5	132.5			133	133		133.5	
9		130		130.4	130.4	130.4			134.5	140.5		141	142.5
10		129		129	129	129			129	129		129	129
11		132		144	144.5	148.5			158	159		159	159
13		130		130	130	130.4			130	130		130	130
14				R 128	128	133				155.8		159.5	159.5
15					R 128	130.4			130.6	130.6		130.6	130.6
16									R 128			133.5	133.5
17						R 128			133.5	133.5		133.5	133.5
18						R 128				131.5		132	132
19						R 128			152.5				160
20										R 128			
21										R 128			
22										R 128		129	129
23										R 128			
24												R 128	131
25												R 128	133.5
26													R 128
27													
28													
29													
30													
31													
32													
33													
34													
35													
36													
37													

Tag #	3/6/04	3/7/04	3/8/04	3/9/04	3/10/04	3/11/04	3/12/04	3/13/04	3/14/04	3/15/04	3/16/04	3/17/04	3/18/04
3			172	1 Tea	2.5 Tea	4 Tea	7 Tea			170		1 Tea	1 Tea
5			129	129	129	129	129			129	129	129	129
7					136	129							
8			133.5	135.5	138	138	138.5			140.5	140.5	140.5	142.5
9			143.5		154.5	158	159			162	171.5	2 Tea	4 Tea
10			129	129	129	129	129			129	129	129	129
11			159	159	159	159	159			159	159	159	159
13			129.6	130	130	130	130			130	130	130	130
14					172	170					2.5 Swk	2.5 Swk	3 Swk
15			130	131	131.5	130	130			130	130	130	130
16			133.5	143.5		160	161.5			173	175.5	176	3 Tea
17			133.5	133.5	134	133.5	133.5			133.5	133.5	133.5	133.5
18			132	139	145.5	147.4	147.4			147.5	148	148	
19			169.6	176	1 Tea		4.5 Tea			10 Tea	6 Tea	8 Tea	8 Tea
20			138.5	142.5	145	145	146.5						151.5
21			137.5	148.5			171			6 Tea	7 Tea	11 Tea	11 Tea
22			129.6	134	141	148.5	152				145.5	136	128
23			129.6	132.5		137.5	138.5			142.5	141.5	145	148.5
24			131.5	131.5	131.5	131.5	131.5			131.5	131.5	131.5	131.5
25			134.5	146.5	153.5	157				170	6 Tea	6 Tea	2 Tea
26			129	129	129	129	129			136	138.5	140.5	142.5
27			R 128	134	147.4	155.8	157				168.5		179.5
28			R 128	133.5	140.5	148.5	157				164.5	1 Tea	3 Tea
29			R 128	141.5	154.5	161.5	161.5			170	175.5	3 Tea	7 Tea
30				R 128	134	141				147	147.5	147.5	
31				R 128	138		161.5			172	2 Tea	2 Tea	1.25 Tea
32				R 128		129	128			131.5	133.5	136	136
33				R 128	136	143.5	153.5				162	168.5	170
34				R 128	141	152.5	161.5			170	170.5	2 Tea	4 Tea
35				R 128	142.5	154.5	161.5			171			
36				R 128	131.5	131.5	131.5			132	132	132	132
37				R 128	135.5	138	139.5			139.5	139.5	140.5	140.5

Tag #	3/19/04	3/20/04	3/21/04	3/22/04	3/23/04	3/24/04	3/25/04	3/26/04	3/27/04	3/28/04	3/29/04	3/30/04	3/31/04
3	1 WTea			2 WTea	2 WTea	2.5 WTea	1 WTea	1 WTea					
5	129			129	129	129	129	129			129	129	129
7													
8	142.5			141.5	146	148.5	148.5	149				156	156
9	6 Tea			2 WTea	1 WTea	2.5 WTea	2 WTea	2 WTea			9 Tea	172.5	165.5
10	129			129	129	129	129	129			129	129	129
11	159			159	159	159	159	159			159	159	159
13	130			130	130	130	130	130			130	130	130
14	4 Swk			7.5 Swk		5 Swk	5 Swk	5 Swk					
15	130			130	130	130	130	130			130	130	130
16	4.5 Tea				11 Tea	11 Tea	11 Tea	11 Tea			11 Tea	11 Tea	
17	133.5			133.5	133.5	133	133	133			133	133	133
18				152.5	159	161.5		161.5			174.5	1.5 Tea	
19	8 Tea			13 NTea	15 NTea	16 NTea	16 NTea	15 NTea			12 NTea	12 NTea	8 NTea
20													
21	7 Tea			9 Tea	12 NTea	12 NTea	12 NTea	12 NTea			12 NTea		2 WTea
22													
23				152.5	157	161.5	160	157			156		166.5
24	131.5			131.5	131.5	131	131	131			131	131	131
25	1 WTea			11 Tea	11 Tea	2 WTea	3 WTea	3 WTea			1 WTea	1 MTea	
26	143.5			143.5	144	142	142	133					
27	179.5				179	179.5	179.5	179.5			177.5	177.5	177.5
28	4 Tea			7 Tea	8 Tea	11 Tea	11 Tea	11 Tea			1 WTea	11 Tea	
29	8 Tea			13 NTea	15 NTea	16 NTea	17 NTea	16 NTea			16 NTea	3 Tea	170
30													
31	2 Tea			2 Tea	3.5 Tea	3 Tea	3 Tea	4 Tea			2.5 Tea		
32	136			141	146		155	156			159	159	
33	170			165.5	170	170	170	170			170	170	170
34	6 Tea			5 Tea	5 Tea	4.5 Tea	5 Tea	6 Tea			4 Tea	4.5 Tea	
35						3 Swk	3 Swk	3 Swk			3 Swk	3 Swk	
36	131.5			132	132	131	131	131			131	131	131
37	140			140	140	138	138	138			138	138	138

Tag #	4/1/04	4/2/04	4/3/04	4/4/04	4/5/04	4/6/04	4/7/04	4/8/04	4/9/04	4/10/04
3					2 WTea					
5	129	129			129	129	129	129	129	
7										
8	159	159			165		175.5	2 Tea	3 Tea	
9	148	145			128	128	128	129	127.9	
10	129	129			129	129	129	129	129	
11	159	159			159	159	159	159	159	
13	130	130			130	130	130	130	130	
14		6 Swk			9.1 Swk	10 Swk	1 Liberty Cr	1 Liberty Cr	10 Swk	
15	130	130			130	130	130	130	130	
16		11 Tea			1 MTea	11 Tea	11 Tea	6 Tea	170	
17	133	133			133	133	133	133	133	
18		5 Tea			11 Tea	12 NTea	13 NTea	13 NTea		
19		12 NTea			1 MTea	11 Tea	1 MTea	11 Tea	1 WTea	
20										
21								4 WTea	1 WTea	
22										
23	174.5	4 Tea			13 NTea	14 NTea	12 NTea	9 Tea	7 Tea	
24	131	131			131	131	131	131	131	
25										
26	103.8 Sny									
27	177.5	177.5			177.5	177.5	177.5	177.5	177.5	
28		1 WTea			1 MTea	1 MTea	1 MTea	1 MTea	1 MTea	
29	151	128								
30		148								
31		1.5 Tea			2 Tea	2 Tea	171.5	163	163	
32	161.5	164			173.5	176	4.5 Tea	7 Tea	9 Tea	
33	170	170			170	170	170	170	170	
34		7 Tea			7 Tea	6 Tea	6 Tea	6 Tea	6 Tea	
35	3 Swk				3 Swk	3 Swk		3 Swk	3 Swk	
36	131	131			131	131	131	131	131	
37	138	138			138	138	138	138	138	

Tag #	4/11/04	4/12/04	4/13/04	4/14/04	4/15/04	4/16/04	4/17/04	4/18/04	4/19/04	4/20/04
3					7 WTea					
5		129	129	129	129	129			129	129
7					117.1 Yak					
8		3 Tea	3 Tea	4.5 Tea	4.5 Tea	6 Tea			6 Tea	6 Tea
9			113.2 Ter	103.8 Sny						
10		129	129	129	129	129			129	129
11		159	159	159	159	159			159	159
13		130	130	130	130	130			130	130
14		11 Swk		1 Liberty Cr	5.5 Swk	9.5 Swk			5.5 Swk	5.5 Swk
15		130	130	130	130	130			130	130
16		158	151	150	150	144			129	
17		133	133	133	133	133			133	133
18		12 NTea			12 NTea	12 NTea			135.5	133
19		1 MTea	2 MTea	1 MTea	1 WTea	1 MTea			1 WTea	1 WTea
20					153					
21		11 Tea	2 WTea		5.5 WTea				4 WTea	4 WTea
22					113.2 Ter					
23		128, 113.2 Ter	103.8 Sny							
24		131	131	131	131	131			131	131
25					6 WTea					
26										
27		180	181.5	186	186	2 CleE			2.5 CleE	2.5 CleE
28		1 WTea	1 WTea	1 WTea	1 WTea				1 WTea	1 WTea
29					127					
30										
31		163	163	163	163	163			163	163
32		13 NTea	15 NTea	15 NTea	16 NTea	16 NTea			16 NTea	16 NTea
33		170	170	170	170	170			170	170
34		6 Tea	7 Tea	6 Tea	6 Tea	6 Tea			6 Tea	6 Tea
35		3 Swk			1 Swk	2.5 Swk				
36		131	131	131	131	131			131	131
37		138	138	138	138	138			138	138

Tag #	4/21/04	4/22/04	4/23/04	4/24/04	4/25/04	4/26/04	4/27/04	4/28/04	4/29/04
3									
5	129		129			129			129
7									
8	172.5		143			128	127.9		
9				47.1 Psr					
10	129	129	129			129			
11	159	159	159			159			159
13	130	130	130			130			130
14	5.5 Swk	4 Swk							
15	130	130				130			130
16	129	129	128			113.2 Ter, 103.8 Sny			47.1 Psr
17	133	133	133			133			133
18	130		128			128		127.9	
19	1 WTea	1 WTea	1 WTea			9 Tea			176
20			151.5						
21		4 WTea	4 WTea			3 WTea			7 Tea
22									
23									
24	131	131	131			131			131
25									
26							47.1 Psr		
27	3.5 CleE	2 CleE							
28	1 WTea	1 WTea	1 WTea			1 WTea			1 WTea
29									
30									
31	163	163	163			163			163
32	14 NTea	12 NTea	4.5 Tea			161.5			128, 127.9
33	170	170	170			170			170
34	6 Tea	6 Tea	4.5 Tea			6 Tea			5 Tea
35		160.5				160.5		128	
36	131	131	131			131			131
37	138	138	138			138			138

Tag #	4/30/04	5/1/04	5/2/04	5/3/04	5/4/04	5/5/04	5/6/04	5/7/04	5/8/04
3									
5	129								
7									
8		103.8 Sny			47.1 Psr				
9									
10	129								
11	159								
13	130								
14									127.9
15	130								
16									
17	133								
18	128								
19	176								
20									
21	6 Tea						161.5	127.9	
22									
23								60 Yak	
24	131								
25									
26									
27									
28	1 WTea								
29								127	
30								118	
31	163								
32				113.2 Ter, 103.8 Sny				0 Yak	
33	170								
34	6 Tea								
35									
36	131								
37	138								

Tag #	5/9/04	5/10/04	5/11/04	5/12/04	5/13/04	5/14/04	5/15/04	5/16/04	5/18/04
3									
5									
7									
8									
9									
10									
11									
13									130
14									
15									
16									
17									133
18									
19									176
20									
21									
22									113.2 Ter
23									
24									131
25									
26									
27			185.6						
28									
29									127
30									
31									163
32	292 Col		215 JD Col		191.5 Dal Col	146.1 Bon Col			
33									170
34							128		
35									
36									
37									138

Tag #	5/19/04	5/20/04	5/21/04	5/22/04	5/26/04	5/27/04	5/28/04	6/12/04	6/17/04
3									
5									
7									
8									
9									
10									
11									
13									
14									
15									
16									
17									
18									
19									176
20									
21									
22									
23									
24									
25									
26									
27									
28								127.9	
29									
30									
31									163
32									
33									170
34									
35									
36									
37									

Tag #	Sex	Age	POL (cm)	FL (cm)	Weight lbs	Origin	2/2/04	2/3/04	2/4/04	2/5/04	2/6/04	2/7/04	2/8/04
38	F	r.1	46	56	4.2	wild							
39	M	2.1	47	59	4.2	wild							
40	M	2.1	48	61	5	wild							
41	F	3.1	49	60	4.5	wild							
42	F	r.1	51	61	4.8	wild							
43	F	2.1	49	60	5.1	wild							
44	M	2.1	49	60.5	4.6	wild							
45	F	2.1	46	56	4	wild							
46	F	2.1	51	61	4.8	wild							
47	M	2.1	52	65	5.7	wild							
48	M	r.1	53	66	6.2	wild							
49	F	r.1	49	59	4.9	wild							
50	M	2.1	48	61	4.6	wild							
51	M	2.1	49	61	4.8	wild							
52	F	r.1	45	55	3.9	wild							
53	F	3.2s	62	74	8.4	wild							
54	M	2.1	49	64	5.3	wild							
55	M	r.1	54	69	6.8	wild							
56	M	2.1	50	64	4.8	wild							
57	F	2.1	48	59	4.9	wild							
58	M	2.1	46	57	3.8	wild							
59	F	2.2	60	73	8.5	wild							
60	F	2.1	54	65	6.1	wild							
61	M	2.1	47	59	4.1	wild							
62	F	2.1	52	63	5.7	wild							
72	M	2.1	50	63	5	wild							
73	F	2.1	45	55	3.3	wild							
74	F	r.1	48	60	4.9	wild							
75	M	2.1	46	58	4	wild							
76	F	r.2	62	76	10.2	wild							
77	M	r.1	47	60	4.5	wild							
78	F	r.1	47	58	3.8	wild							
79	F	2.1	43	53	3.3	wild							
80	M	r.1	44	56	4	wild							
81	M	1.1	48	62	5.4	hatchery							

Tag #	2/9/04	2/10/04	2/11/04	2/12/04	2/13/04	2/14/04	2/15/04	2/16/04	2/17/04	2/18/04	2/19/04	2/20/04	2/21/04
38													
39													
40													
41													
42													
43													
44													
45													
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62													
72													
73													
74													
75													
76													
77													
78													
79													
80													
81													

Tag #	2/22/04	2/23/04	2/24/04	2/25/04	2/26/04	2/27/04	2/28/04	2/29/04	3/1/04	3/2/04	3/3/04	3/4/04	3/5/04
38													
39													
40													
41													
42													
43													
44													
45													
46													
47													
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56													
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59													
60													
61													
62													
72													
73													
74													
75													
76													
77													
78													
79													
80													
81													

Tag #	3/6/04	3/7/04	3/8/04	3/9/04	3/10/04	3/11/04	3/12/04	3/13/04	3/14/04	3/15/04	3/16/04	3/17/04	3/18/04
38				R 128	129					129	129	129	
39				R 128	140.5	154.5	161.5			6 Tea	10 Tea	1.5 WTea	2 WTea
40				R 128	137.5	147.4				168	168.5	173.5	1Tea
41				R 128		129	128			128	128	128	128
42				R 128		137.5	146.5			161.5	168.5	174.5	2.5 Tea
43				R 128	136	145	152			157	161.5	165	165
44				R 128	138	152.5				171	2.5 Tea	6 Tea	7 Tea
45				R 128	132	136	139.5				154.5		161.5
46					R 128	131.5	131.5			131.5	131.5	131.5	131.5
47					R 128	138	145.5			154.5	157	157	155
48					R 128	129	129			129	129	129	129
49					R 128	131.5	138.5			140.5	143.5		
50						R 128	130			130	130	129.5	130
51					R 128	131.5	136			139.5	140.5	143.5	143.5
52					R 128	129	128				129	129	129
53					R 128	129	128			128	128	128	128
54					R 128	133.5	139.5			1 Wil	1 Nan	2 Nan	
55					R 128	142.5	157				161.5	168.5	171
56					R 128	130	133.5			138.5	143.5		152
57					R 128	133.5	139.5				140.5	155	155
58					R 128	134.5	146.5			169.6	1 Tea	4 Tea	6 Tea
59						R 128	131.5			134.5	139	146	
60						R 128							
61						R 128	139.5					154	159
62						R 128	132			145		156	161.5
72						R 128	136				168.5	174.5	6 Tea
73						R 128	130			132	132.5	132.5	132.5
74						R 128	139.5						
75						R 128	130			130	130	130	130
76						R 128	148.5			180	177.5	177.5	
77						R 128	142.5			171	2 Tea	3 Tea	4 Tea
78						R 128	128						129
79						R 128	129			129.5	129.5	130	132
80						R 128	142.5				161	160.5	161.5
81						R 128							

Tag #	3/19/04	3/20/04	3/21/04	3/22/04	3/23/04	3/24/04	3/25/04	3/26/04	3/27/04	3/28/04	3/29/04	3/30/04	3/31/04
38	129				128	129	129	129				129	129
39	2 WTea										3 WTea	3 WTea	2 WTea
40	2 Tea			9 Tea		9 Tea	9 Tea	9 Tea			11 Tea	11 Tea	
41	128			128		128	128	128			128	128	128
42	2 Tea			7 Tea	11 Tea	13 NTea	15 NTea	14 NTea					
43	165			164	165	171.5	174.5	174.5			174.5		
44	10 Tea			13 NTea	16 NTea	17 NTea	17 NTea	16 NTea			16 NTea	12 NTea	
45	161			165.5			161.5	3 Swk				3 Swk	
46	132			131.5	131.5	131	131	131			131	131	131
47	155			158	159		159	159			159	159	159
48				129	129	129	129	129			129	129	129
49				154	155	155	155	155					
50	130			130	130	130	130	130			130	130	130
51	143.5			143.5	144	142	142	143					
52	129			128	128	129	129	129			128	128	128
53	128			128	128	128	128	128			128	128	128
54				1.5 Nan	2.5 Nan	2.5 Nan	2 Nan	2 Nan			1.5 Nan	1.5 Nan	
55				174	175.5	178.5						180.5	
56	152				162	172.5	3 Tea	7 Tea			15 NTea	16 NTea	
57	155			143.5	132.5		129	129					129
58	7 Tea			9 Tea	12 NTea	12 NTea	12 NTea	14 NTea			15 NTea	15 NTea	
59	152.5				170	174.5	176	176.5			180.5	180.5	
60													
61	160			161	170	174.5	174.5	174.5			174.5	4 Tea	
62	161.5			168	172.5	173.5	172.5	171.5			170.5	171.5	171.5
72	10 Tea					3 WTea	3 WTea	4 WTea					
73	133.5			132.5	138.5	139	144	149			156		161.5
74				151.5	152							140	129
75	130			130	130	130	130	130			130	130	130
76							144				129	129	129
77	6 Tea			4 Tea	7 Tea	4.5 Tea	3 Tea	4 Tea			4 Tea	4 Tea	
78								129					129
79	132			132.5	133.5	136	136	136			136	136	138
80	160					160.5		166			1.5 Tan		
81													

Tag #	4/1/04	4/2/04	4/3/04	4/4/04	4/5/04	4/6/04	4/7/04	4/8/04	4/9/04	4/10/04
38	129	129			129	129				
39										
40		11 Tea			11 Tea	12 NTea	12 NTea	13 NTea	13 NTea	
41	128	128			128	128	128	128	128	
42					6 Tea			131	128	
43		3 Tea			8 Tea	7 Tea	9 Tea	11 Tea	12 NTea	
44						1 MTea	1 MTea	1.5 MTea	1.5 MTea	
45		3 Swk				3 Swk		3 Swk		
46	131	131			131	131	131	131	131	
47	159	159				159		159	157	
48	129	129					129	129	129	
49										
50	130	130			130	130	130	130	130	
51						168.5	1 Tea	3 Tea	7 Tea	
52	128	128			129	129		129	129	
53	128	128			128	128	128	128	128	
54					135.5	129	129	129	129	
55	180	180			180	180		180	180	
56		16 NTea			15 NTea	15 NTea	14 NTea	15 NTea	16 NTea	
57	129	129					129		129	
58		15 NTea			14 NTea	14 NTea	15 NTea	15 NTea	9 Tea	
59									156	127.9
60										
61					13 NTea	12 NTea	13 NTea	13 NTea	14 NTea	
62	171.5	171.5			171.5	171.5	171.5	171.5	171.5	
72		3 WTea					4 WTea	4 WTea	4 WTea	
73	161	161			173.5	1 Tea	2 Tea	3 Tea	3 Tea	
74	129	129					128		128	
75	130	130			130	130	130	130	130	
76	128	130			128	128, 129	130	128	113.2 Ter, 103.8 Sny	
77		4 Tea			4 Tea	4 Tea	4.5 Tea	4.5 Tea	4 Tea	
78	129	129			129	129	128	129	129	
79	138	138					156			
80	2 Tan	2 Tan			2 Tan	2.5 Tan	4.5 Tan	4 Tan	4 Tan	
81										

Tag #	4/11/04	4/12/04	4/13/04	4/14/04	4/15/04	4/16/04	4/17/04	4/18/04	4/19/04	4/20/04
38					129				128	128
39		4 WTea	4 WTea	4 WTea	4 WTea				5 WTea	5 WTea
40		12 NTea	13 NTea	12 NTea	14 NTea	14 NTea			14 NTea	14 NTea
41		128	128	128	128	128			128	128
42			113.2 Ter, 103.8 Sny		0 Yak					
43		13 NTea	13 NTea	14 NTea	14 NTea	14 NTea			15 NTea	15 NTea
44		4 MTea	8 MTea	8 MTea	7.5 MTea	8 MTea			8.5 MTea	9 MTea
45			3 Swk		2	3 Swk			3 Swk	3 Swk
46			131	131	131	131			131	131
47		138	128	128	128	128				
48		129	129	129	129	128			129	128
49		131	128					103.8 Sny		
50		130	130	130	130	130			130	130
51		1 WTea	3 MTea	4 MTea	4 MTea	1 MTea			2 MTea	1 MTea
52		129	129	129	129	128			129	129
53		128	128	128	128	128			128	128
54		129		129	129	129			128	128
55		180	180	180	180	180			180	177.5
56			19.5 NTea	17 NTea	16 NTea	18 NTea			19.5 NTea	1.1 Staff
57			113.2 Ter	103.8 Sny						
58		11 Tea	15 NTea	15 NTea	15 NTea	16 NTea			16 NTea	15 NTea
59	113.2 Ter				106.6					
60					127					
61		14 NTea	15 NTea	14 NTea	13 NTea	14 NTea			15 NTea	16 NTea
62			152.5	146	145	145			145	145
72		4 WTea	4 WTea	4 WTea	4 WTea	4 WTea				2 WTea
73		3 Tea	6 Tea	5 Tea	5 Tea	5 Tea			164	
74		128	128	128	128				128	128
75		130	130	130	130	130			130	130
76						47.1 Psr				
77		4.5 Tea	4.5 Tea	4.5 Tea	4.5 Tea	5 Tea			4.5 Tea	4.5 Tea
78		128		129	129	128			128	128
79		1 Tea	4.5 Tea	9 Tea	1 WTea	2 WTea			5 WTea	5 WTea
80		4 Tan	4 Tan	4 Tan	4 Tan	4 Tan			4 Tan	3.5 Tan
81					7 Wen					

Tag #	4/21/04	4/22/04	4/23/04	4/24/04	4/25/04	4/26/04	4/27/04	4/28/04	4/29/04
38	129					129			129
39	5 WTea		4 WTea						
40	14 NTea	14 NTea	161.5	128		127.9			
41	128	128	128			128			128
42									
43	17 NTea	15 NTea	14 NTea			163		127.9	
44	9 MTea	2 MTea	2 MTea			2 MTea		127.9	
45	3 Swk					3 Swk			3 Swk
46	131	131	131			131			131
47									
48	129		129			129			129
49									
50	130	130	130			130			130
51	1 MTea	1 MTea	1 MTea			11 Tea			176
52	129	129	129			128			129
53	128	128	128			128			128
54	128	128	128			128			129
55	177		154						
56	2.1 Staff	1.5 Staff	1 Stand			17 NTea			19 NTea
57	47.1 Psr			0 Yak					
58	14 NTea	14 NTea	17 NTea			17 NTea			17 NTea
59									
60							127		
61	14 NTea	15 NTea	15 NTea			14 NTea			17 NTea
62	145		146.5			129			128
72	4 WTea					3 WTea			5 WTea
73		147.5	146					103.8 Sny	
74	128		128			129			128
75	130	130	130			130			130
76									
77	4.5 Tea	4.5 Tea	3 Tea			3 Tea		161.5	128, 127.9
78	129	129	129			128			129
79	2 WTea	2 WTea	2 WTea			6 Tea			5 Tea
80	3.5 Tan	4 Tan	3 Tan			128			128
81									

Tag #	4/30/04	5/1/04	5/2/04	5/3/04	5/4/04	5/5/04	5/6/04	5/7/04	5/8/04
38	129								
39	4 WTea							113.2 Ter, 103.8 Sny	
40									
41	128								
42									293.7 McN Col
43			113.2 Ter, 103.8 Sny				0 Yak		293.7 McN Col
44									
45	3 Swk								
46	131								
47									
48	129								
49									
50	130								
51	166								
52	129								
53									
54	129								
55									
56	17 NTea								
57				215.1 JD Col	181.7 Col	144 Bon Col			
58	16 NTea								
59								106	
60								127	
61	15 NTea								
62	128							127	
72	2 WTea								
73		47.1 Psr		0 Yak		290 Col		215.1 JD Col	181.7 Col
74	128								
75	130								
76									
77								127	
78	129								
79	4.5 Tea								
80	128							127	
81									

Tag #	5/9/04	5/10/04	5/11/04	5/12/04	5/13/04	5/14/04	5/15/04	5/16/04	5/18/04
38									
39									
40									
41									
42				171.39 Col	144.03 Bon Col				
43			215.08 JD Col	189.04 Col					
44									
45									
46									131
47									
48									129
49									
50									
51									164
52									
53									
54									129
55									127
56					161.5	127.9	103.8 Sny		
57									
58									
59									106
60									127
61									
62									127
72			1 Tea		161.5				
73	145.8 Bon Col								
74									
75									
76									
77									
78									
79									
80									
81									

Tag #	5/19/04	5/20/04	5/21/04	5/22/04	5/26/04	5/27/04	5/28/04	6/12/04	6/17/04
38									
39									
40									
41									
42									
43									
44									
45									
46									
47									
48									
49									
50									
51									164
52									
53									
54									
55									
56									
57									
58									
59									
60									
61					1 Tea	161.5	128		
62									
72	127.9								
73									
74									
75									
76									
77									
78									
79									
80									
81									

Tag #	Sex	Age	POL (cm)	FL (cm)	Weight lbs	Origin	2/2/04	2/3/04	2/4/04	2/5/04	2/6/04	2/7/04	2/8/04
82	F	2.1	47	58	4.2	wild							
83	F	r.1	49	59	4.4	wild							
84	F	2.1	49	60	4.9	wild							
85	M	2.1	44	57	3.8	wild							
86	M	2.1	52	66	6.7	wild							
87	M	2.1	54	69	6.9	wild							
88	F	r.1	49	60	4.9	wild							
89	F	2.1	47	59	4.7	wild							
90	F	2.1	46	55	3.7	wild							
91	F	3.1	47	58	4.4	wild							
92	F	3.1	49	60	4.8	wild							
93	M	2.1	50	64	5.8	wild							
94	M	2.1	50	63	5.3	wild							
95	F	3.1s1	55	67	6.5	wild							
96	F	2.1	47	58	4.9	wild							
97	F	3.1	46	57	3.8	wild							
98	F	r.1	46	57	4.2	wild							
99	F	2.1	52	63	5.8	wild							
100	F	2.1	53	64	5.8	wild							
101	F	r.1	51	61	5	wild							
102	F	r.1	49	60	5.1	wild							
103	M	2.1	52	67	5.7	wild							
104	F	2.1ss	57	71	11.6	wild							
105	F	r.1	50	61	5	wild							
106	F	2.1s	55	69	7.1	wild							
107	F	2.1	51	63	6.1	wild							
108	F	r.1	55	68	8.1	wild							
109	F	2.2	55	66	5.1	wild							
110	F	2.1	49	59	4.4	wild							
111	F	2.1	49	59	4.6	wild							
112	F	2.1	51	62	5	wild							
132	F	2.1	51	63	5.8	wild							
133	F	3.1	50	62	5.2	wild							
134	M	2.1	53	66	5.5	wild							
135	F	r.1	48	58	4.4	wild							
136	F	2.1	45	56	3.2	wild							
137													

Tag #	2/9/04	2/10/04	2/11/04	2/12/04	2/13/04	2/14/04	2/15/04	2/16/04	2/17/04	2/18/04	2/19/04	2/20/04	2/21/04
82													
83													
84													
85													
86													
87													
88													
89													
90													
91													
92													
93													
94													
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107													
108													
109													
110													
111													
112													
132													
133													
134													
135													
136													
137													

Tag #	2/22/04	2/23/04	2/24/04	2/25/04	2/26/04	2/27/04	2/28/04	2/29/04	3/1/04	3/2/04	3/3/04	3/4/04	3/5/04
82													
83													
84													
85													
86													
87													
88													
89													
90													
91													
92													
93													
94													
95													
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101													
102													
103													
104													
105													
106													
107													
108													
109													
110													
111													
112													
132													
133													
134													
135													
136													
137													

Tag #	3/6/04	3/7/04	3/8/04	3/9/04	3/10/04	3/11/04	3/12/04	3/13/04	3/14/04	3/15/04	3/16/04	3/17/04	3/18/04
82							R 128			142.5	148.5	155	159.5
83							R 128			129	129	129	129
84							R 128			134.5	136.6	142.5	147.5
85							R 128				161		166
86							R 128			148.5	150.5	157	161.5
87							R 128			145	145	145	146.5
88							R 128				132	132	132
89							R 128			129	129	129	129
90							R 128			138.5	141.5	141.5	142.5
91										R 128	130	131.5	132.5
92										R 128	128	128	
93										R 128	141.5		161.5
94										R 128	135	141.5	
95										R 128	129	129	130
96										R 128	129.5	132.5	134.5
97										R 128	133.5	146	
98										R 128		129.5	131.5
99										R 128	131.5	134.5	136
100										R 128	131.5	140.5	150.5
101										R 128	139	148.5	156
102										R 128	129.5	130	131.5
103										R 128	130	132	136
104										R 128	138.5	147.5	152.5
105										R 128			128
106											R 128	129.5	137.5
107											R 128	132.5	132.5
108											R 128	129	146.5
109											R 128	136.5	139.5
110												R 128	129
111												R 128	131.5
112												R 128	133.5
132												R 128	132.5
133												R 128	
134												R 128	129
135												R 128	
136												R 128	132.5
137													

Tag #	3/19/04	3/20/04	3/21/04	3/22/04	3/23/04	3/24/04	3/25/04	3/26/04	3/27/04	3/28/04	3/29/04	3/30/04	3/31/04
82	161.5			165.5	179	179.5	179.5	179.5			179.5	179.5	179.5
83	129			129	129	129	129	129			129	129	129
84	146.5			130, 141.5	134.5	134	134	134			129	129	
85	166							5.5 Tan			2.5 Tan		
86	161			164		167	168.5				170.5	171.5	171.5
87	153.5			168	174.5	4 Tea	7 Tea	9 Tea			9 Tea	9 Tea	
88	132			132.5	133.5	137	137	137			140	149	149
89	129			129	129	129	129	129			129	129	129
90	143.5			146.5		152	152	152			160.5	160.5	160.5
91	134.5			138.5	145	150					155	155	155
92	128			128	128	128	128	128			128	128	128
93				164		168.5	168.5	166			167		
94	157			162.5								3 Swk	
95	130				131.5	133	133	133			133	133.5	
96	136			136.5	142	144	148.5	148			150.5	155	155
97	161							5.5 Tan				8.5 Tan	
98	131.5				135.5	136	137	137			139	142	148
99	139.5			138.5	140	138	138	138			138	138	138
100					161	168.5	175.5	176.5			182.5	182.5	183
101				168	174.5	2 Tea	2 Tea	2 Tea			1.5 Tea	1.5 Tea	
102	133.5			135.5	138.5	137	137	137			137	137	137
103	142.5			140	132	130	131	131			129		
104	154			161							3 Swk	3 Swk	
105	128			128	128	128	128	128			128	128	128
106	141.5			145.5			157	157				161.5	161.5
107	132.5			132.5	132.5	132	132	132			129	129	129
108	154			161	168	167	170.5	172.5				171.5	161.5
109	142.5			146.5		150	152	152			159	161.5	
110				130	130	131	133	141			168.5	172.5	176.5
111	132			136.5	142	143	144	144					
112	137.5			142.5			148.5	149					149
132	133.5			140		155	154	154				172.5	176
133	128			142.5			160.5	161.5			176	181.5	181.5
134	130				129	129	129	129					129
135	131.5			131.5	136.5	139	139	140					165.5
136	132.5			132.5	136.5	136	136	136			139	140	148
137													

Tag #	4/1/04	4/2/04	4/3/04	4/4/04	4/5/04	4/6/04	4/7/04	4/8/04	4/9/04	4/10/04
82	179.5	170.5			142	142	138	128	128	
83	129	129			129	129	129		129	
84		129			128	128			128	
85	2.5 Tan	2.5 Tan			2 Tan		5 Tan	4 Tan	5 Tan	
86	171.5	171.5			170.5	171.5	171.5		1 Swk	
87		7 Tea			7 Tea	9 Tea	9 Tea	11 Tea	9 Tea	
88		149			161	161.5	170	170	170	
89	129	129			129		129		129	
90	161	161			161	160.5	160.5		160.5	
91	155	155								
92	128	128			128	128	128	128	128	
93		0.5 Tan			165	2.5 Tan	2.5 Tan	4 Tan	3.5 Tan	
94		5 Swk				3 Swk	5 Swk		3 Swk	
95	135.5	135.5				155	161.5	169.5	176	
96	155	157			159		159		159	
97	8.5 Tan	9 Tan			165	144	127.9		103.8 Sny	
98	148	147.5				168.5	176	4 Tea		
99	138	138			138	138	138		138	
100	183	183			135					
101		1.5 Tea			141	128	128	113.2 Ter, 103.8 Sny		
102	137	137			141	143.5	148		157	
103	129	129			129	129	129	128	129	
104		163			128	129	128			
105	128	128			128	128	128		128	
106	162	162			168.5			164	164	
107		129				128	128		128	
108	148	136.5				113.2 Ter, 103.8 Sny				
109		164			1 Tan	1.5 Tan	1.5 Tan	1.5 Tan	1.5 Tan	
110	176.5	176.5			168.5	160.5	141		113.2 Ter	103.8 Sny
111						161.5	170	176	2 Tea	
112	149	149			149		149			
132		6 Tea			1 MTea	1 MTea	1 MTea	1 MTea	1 MTea	
133	181.5	181.5					201	201	201.9	
134					129	129		129	129	
135	163	165			165	166	166		1.5 Tan	
136							137			
137										

Tag #	4/11/04	4/12/04	4/13/04	4/14/04	4/15/04	4/16/04	4/17/04	4/18/04	4/19/04	4/20/04
82			113.2 Ter, 103.8 Sny							
83		129	129	129	129	129			129	129
84		128		128	129	128			128	128
85		8 Tan	8 Tan	9 Tan	6.5 Tan	6.5 Tan			8.5 Tan	9.5 Tan
86		1 Swk	170 Swk	171.5	1 Swk	3 Swk				2.5 Swk
87		9 Tea	8 Tea	7 Tea	9 Tea	7 Tea			8 Tea	9 Tea
88		5 Swk	11 Swk	11 Swk	10.5 Swk	10.5 Swk			10.5 Swk	10.5 Swk
89		129	129	129	129	129			129	129
90		160.5	160.5	160.5	160.5	160.5			160.5	160.5
91										
92		128	128	128	128	128			128	128
93		2.5 Tan	3.5 Tan	2.5 Tan	2 Tan	3.5 Tan				
94		9 Swk	11 Swk	10.5 Swk	10.5 Swk	10.5 Swk			10.5 Swk	10.5 Swk
95		12 NTea	13 NTea	14 NTea	16 NTea	17.5 NTea			19.5 NTea	1.1 Staff
96		133	134	134	134	134			134	134
97										
98		10 Tea	10 Tea	11 Tea	11 Tea	10 Tea			170.5	154
99		128			103.8 Sny					
100			113.2 Ter	103.8 Sny					47.1 Psr	
101					47.1 Psr				0 Yak	
102		159	159	159	159				135.5	135.5
103		129		129	129					
104					103.7				103.8 Sny	
105		128	128	128	128	128			128	128
106		164	164	164	142	129			129	
107		113.2 Ter	47.1 Psr	0 Yak		293.7 McN Col			215.1 JD Col	
108	0 Yak					293.75 McN captured				
109		1 Tan	1 Tan	1 Tan	1 Tan	1 Tan			154	133
110										
111		3 Tea	4.5 Tea	5 Tea	3 Tea	3 Tea			3 Tea	172.5
112		149		149	149				149	149
132		2 MTea	2 MTea	2 MTea	2.5 MTea	10 Tea			164	159
133		201.9	201	201	201	201			145	134
134				129	129	129			128	128
135		2.5 Tan	2.5 Tan	2 Tan	1.5 Tan				140	130
136					114.4					
137										

Tag #	4/21/04	4/22/04	4/23/04	4/24/04	4/25/04	4/26/04	4/27/04	4/28/04	4/29/04
82									
83	129	129	129			129			129
84									129
85	8.5 Tan	6 Tan	4.5 Tan			5 Tan			5 Tan
86	161.5	154							
87		9 Tea	9 Tea			9 Tea			7 Tea
88	10.5 Swk	10.5 Swk	10.5 Swk			10.5 Swk			10.5 Swk
89			129						
90	160.5	160.5	160.5			160.5			160.5
91									
92	128	128	128			128			
93			127.9						
94	10.5 Swk	10.5 Swk	9.5 Swk			3 Swk			10.5 Swk
95	2.1 Staff	1.5 Staff	1 Stand						
96	134	134				128		113.2 Ter, 103.8 Sny	
97									
98	143	141	141			128	127		
99									
100									
101		293.75 McN			215.1 JD Col				145.8 Bon Col
102	135.5	135.5	135.5			135.5		113.2 Ter	103.8 Sny
103			129			129			
104									
105	128	128	128						
106		129	129			128			
107						181.7 Col	144 Bon Col		
108									
109									
110		0 Yak							
111	153	133	129			129			
112	149								
132	153	153	152			137			113.2 Ter
133		129	130						
134	129	129	129			129			129
135		128	128			128			128
136									
137									

Tag #	4/30/04	5/1/04	5/2/04	5/3/04	5/4/04	5/5/04	5/6/04	5/7/04	5/8/04
82									
83	129								
84	128							128	
85	10.5 Tan							161.5	
86									
87	4.5 Tea								
88	10.5 Swk								
89	129								
90	160.5								
91									
92	128								
93									
94	10.5 Swk								
95			161.5			127.9	103.8 Sny		47.1 Psr
96					0 Yak				
97									
98									
99					47.1 Psr			0 Yak	
100									
101								144 Bon Col	
102					47.1 Psr			0 Yak	
103	129								
104									
105	128								
106	128								
107									
108									
109								107	
110									
111	128								
112									
132				103.8 Sny			47.1 Psr		
133									
134	129								
135	128							127	
136									
137									

Tag #	5/9/04	5/10/04	5/11/04	5/12/04	5/13/04	5/14/04	5/15/04	5/16/04	5/18/04
82									
83									
84									
85									
86									
87									169
88				47.1 Psr					
89									
90									
91									
92									
93									
94	161.5								
95	0 Yak		293.75 McN Col						
96			293.75 McN Col			215.1 JD Col			
97									
98									
99				215 JD Col		168 Col	144 Bon Col		
100									
101									
102			293.75 McN Col		215.1 JD Col	189 Dal Col		147.9, 145.8, 144 Bon Col	
103									129
104									
105									
106									
107									
108									
109									
110									
111									
112									
132									
133									
134									
135									
136									
137									

Tag #	5/19/04	5/20/04	5/21/04	5/22/04	5/26/04	5/27/04	5/28/04	6/12/04	6/17/04
82									
83									
84									
85									
86									
87									169
88									
89									
90									
91									
92									
93									
94									
95									
96	171.4 Col	145.8 Bon Col	144 Bon Col						
97									
98									
99									
100									
101									
102									
103									
104									
105									
106									
107									
108									
109									
110									
111									
112									
132									
133									
134									
135									
136									
137									

Tag #	Sex	Age	POL (cm)	FL (cm)	Weight lbs	Origin	2/2/04	2/3/04	2/4/04	2/5/04	2/6/04	2/7/04	2/8/04
138													
139	F	3.1	48	59	4.5	wild							
140	F	2.1	46	55	3.5	wild							
141	F	2.1	51	62	5.3	wild							
142	F	r.1	50	61	4.9	wild							
143	F	3.1	58	71	7.4	wild							
144	F	2.1s1	57	69	7.3	wild							
145	F	2.1	48	58	4.3	wild							
146	F	r	47	58	4.3	wild							
147	F	r.1	49	62	5.2	wild							
148	F	2.1	49	59	4.5	wild							
149	F	2.1	51	62	5.8	wild							
150	F	2.1	49	60	4.9	wild							
151	F	r.1	57	68	7	wild							
183	F	2.1	49	60	5	wild							
184	M	r.1	48	60	4.5	wild							

Tag #	2/9/04	2/10/04	2/11/04	2/12/04	2/13/04	2/14/04	2/15/04	2/16/04	2/17/04	2/18/04	2/19/04	2/20/04	2/21/04
138													
139													
140													
141													
142													
143													
144													
145													
146													
147													
148													
149													
150													
151													
183													
184													

Tag #	2/22/04	2/23/04	2/24/04	2/25/04	2/26/04	2/27/04	2/28/04	2/29/04	3/1/04	3/2/04	3/3/04	3/4/04	3/5/04
138													
139													
140													
141													
142													
143													
144													
145													
146													
147													
148													
149													
150													
151													
183													
184													

Tag #	3/6/04	3/7/04	3/8/04	3/9/04	3/10/04	3/11/04	3/12/04	3/13/04	3/14/04	3/15/04	3/16/04	3/17/04	3/18/04
138													
139												R 128	130
140												R 128	130
141													R 128
142													R 128
143													R 128
144													R 128
145													R 128
146													R 128
147													R 128
148													R 128
149													
150													
151													
183													
184													

Tag #	3/19/04	3/20/04	3/21/04	3/22/04	3/23/04	3/24/04	3/25/04	3/26/04	3/27/04	3/28/04	3/29/04	3/30/04	3/31/04
138													
139	129			129	129	130	130	130			140		
140				129	129	130	129	130			130	129	129
141												113.2 Ter	
142	128			136.5	143	144	145	145			145	152	155
143	133.5			141.5		152	154				159		
144	128			136	136.5	141	142	141			142	142	142
145	130			130	130	130	130	130			130	130	130
146	132			148.5		161.5	167	171.5			3 Tea		
147	128			134.5	143		154				160.5	161.5	161.5
148	132.5			141			160.5	160.5			1.5 Swk		
149	R 128				135.5	143	148.5	148			148	148	148
150	R 128				130		131	131			131	131	131
151	R 128			129	140	140						168.5	175.5
183	R 128			128	128		128	128			128	128	128
184	R 128			141	144	142	142	142			142	142	142

Tag #	4/1/04	4/2/04	4/3/04	4/4/04	4/5/04	4/6/04	4/7/04	4/8/04	4/9/04	4/10/04
138										
139		159			170	170	2 Swk		1 Swk	
140	129	129			129		129	129	129	
141					103.8 Sny					
142	155				176	3 Tea	4.5 Tea	7 Tea		
143	161.5				155	156	159	159	135	
144	142	142					166	1 Tan	2 Tan	
145	130	130			130	130	130	130	130	
146		2 Tea			2 Tea	2 Tea	2 Tea	164		
147		168.5			171.5	171.5		145	135.5	128
148		5 Swk			3 Swk	3 Swk		155	141	128, 127
149	148	148			148	148	148	148	148	
150	131	131			135.5	136	140		156	
151		4.5 Tea				2 WTea	1 MTea	1 MTea	1 WTea	
183	128	128			128	128	128	128	128	
184	142	142			142	155	163	170.5	1 Tea	

Tag #	4/11/04	4/12/04	4/13/04	4/14/04	4/15/04	4/16/04	4/17/04	4/18/04	4/19/04	4/20/04
138										
139			4 Swk	5 Swk	5 Swk	5 Swk				
140		129	129	129	129	129			129	129
141		47.1 Psr								
142		7 Tea	6 Tea	3 Tea	3 Tea	176			4.5 Tea	7 Tea
143										
144		2.5 Tan	4 Tan	4 Tan	5.5 Tan	5.5 Tan			8.5 Tan	9.5 Tan
145		130	130	130	130	130			130	130
146	128	127	113.2 Ter	103.8 Sny						
147	127	127			127.5					
148	113.2 Ter, 103.8 Sny			47.1 Psr						
149		148	148	148	148	148			148	148
150		171.5	1 Tea	2 Tea	3 Tea	3 Tea			9 Tea	10 Tea
151		1 WTea	1 WTea	13 NTea	13 NTea	14 NTea			173	164
183		128	128	128	128	128			128	128
184		6 Tea	6 Tea	6 Tea	5 Tea	6 Tea			6 Tea	6 Tea

Tag #	4/21/04	4/22/04	4/23/04	4/24/04	4/25/04	4/26/04	4/27/04	4/28/04	4/29/04
138									
139	10.5 Swk	11.5 Swk	15.5 Swk			16.5 Swk			3 Swk
140	129	129	129						129
141									
142	8 Tea	8 Tea							128
143									
144	8.5 Tan	8.5 Tan	4 Tan			4 Tan			
145	130	130	130			130			130
146							47.1 Psr		
147								113.2 Ter	
148		47.1 Psr, 0 Yak, 293.75 McN Col			216.9 JD Col				
149	148	148	148			148			148
150		1 MTea	1 MTea			170			155
151		144	142			133			
183	128	128	128			128			128
184	6 Tea	6 Tea	6 Tea			6 Tea			6 Tea

Tag #	4/30/04	5/1/04	5/2/04	5/3/04	5/4/04	5/5/04	5/6/04	5/7/04	5/8/04
138									
139	166							113, 103.8 Sny	
140									
141									
142									
143								52	
144				128	127	113.2 Ter, 103.8 Sny		52, 47.1 Psr	
145	130								
146									
147			103.8 Sny			47.1 Psr			
148									
149	148								
150	138							128	
151									
183	128								
184	6 Tea			128	127, 113.2 Ter	103.8 Sny		48	

Tag #	5/9/04	5/10/04	5/11/04	5/12/04	5/13/04	5/14/04	5/15/04	5/16/04	5/18/04
138									
139				0 Yak			293.7 McN Col		
140									
141									
142									
143									
144		0 Yak				215.1 JD Col	189 Col	144 Bon Col	
145									130
146									
147									
148									
149									
150	127				113.2 Ter	103.8 Sny			
151									130
183									
184									

Tag #	5/19/04	5/20/04	5/21/04	5/22/04	5/26/04	5/27/04	5/28/04	6/12/04	6/17/04
138									
139	189 Dal Col			162 Col					
140									
141									
142									
143									
144									
145									
146									
147									
148									
149									
150									
151									
183									
184									