

Final Report  
Powers Ranger District  
Rogue River – Siskiyou National Forest  
Harlequin Duck Survey 2009-2010

## Intro

The harlequin duck (*Histrionicus histrionicus*) is a short-distance east-west migrant that moves to breeding streams from Pacific coastal areas (Cooper and Wright, 1998). The ducks breed on fast moving streams and winter along rocky coastlines in the ocean surf. Inland, the harlequin duck dives for food in strong currents or fast-flowing streams, looking for prey on or near the bottom. Their diet is almost exclusively aquatic invertebrates, but also insects and a few small fish (Bellrose 1976, Cornell).

Harlequin ducks migrate northward and inland in spring, arriving at their breeding areas in the intermountain western U.S. late-April through mid-May, with males departing for west coast molting areas soon after females begin incubating (Spahr et al. 1991). Breeding females move to the coast later depending on breeding success and whether or not females abandon young. Non-breeding females also remain on rivers through the incubation period. Successful females and juveniles arrive on the coast in mid to late September. Some coastal breeding populations are probably non-migratory (Cooper and Wright, 1998). Young accompany their mothers to coastal molting or wintering areas in the late summer (Regehr et al. 2001).

Harlequin ducks typically nest on the ground in well-concealed locations, usually on mid-stream islands (Wiggins 2005) although successful nest sites have also been located in tree cavities or cliff ledges which afford safety from high water (Street 1999). Occasionally harlequin ducks may nest up to 45m away from a stream (EUG BLM), but nests are typically located close (within 10m) to water and have some degree of vertical cover close to the nest (Bruner 1997, Robertson and Goudie 1999). Nests may also be situated at the base of trees, on piles of woody debris, under fallen logs, or on sheltered banks (Robertson and Goudie 1999). They will sometimes nest beside mountain lakes and lake outlets. They tend to breed in the same area in successive years (NatureServe 2007). The female harlequin lays her eggs in a mass of down; after the eggs are laid, the male migrates to the coast to molt (Street 1999).

The harlequin duck winters on the coast as far south as central California, and nests on inland rivers as far east as Montana. The harlequin duck has been documented on National Forests in both Oregon and Washington (COL, CRG, DES, GIP, MBS, MTH, OKW, OLY, RRS, SIU, UMP, WAW, WIL) and four BLM districts in Oregon (CB, EU, RO, SA).

In Oregon, records of arrival on inland streams can be found from the first week of March, including a few reports of pairs (Dowlan 1996). Breeding occurs primarily on the rivers in northern Oregon, with occasional records from the Umpqua drainage. A pair was on Lost Creek in the McKenzie drainage in January, 1992, and an unspecified

number of ducks was reported from the McKenzie in late February, 1991. Pairs are seen on breeding streams in greatest numbers between the second week of April and the end of May, though a few records of pairs can be found through June. Some of these late observations appear to represent late-nesting or non-nesting pairs (Dowlan 1996).

Harlequin ducks have been the focus of management actions in eastern North America, the Pacific Northwest, and in the Rocky Mountain states due to concern over declining populations. Relative to other species of ducks, they occur at low population densities and exhibit high breeding site fidelity, low reproductive rates, and delayed reproduction. All of these traits contribute to making harlequin duck populations particularly slow to recover from habitat degradation or loss (Wiggins 2005). The harlequin duck was recently (01/2008) added to the R6 Regional Forester's Special Status Species List.

The primary factors thought to be responsible for local declines in the number of harlequin ducks are the degradation of breeding streams, such as damming, and human disturbance (such as rafting and other river-associated recreation) during the breeding season. In many areas, the vast majority of harlequin ducks breed on National Forest System lands, thus human recreation use of breeding streams during the summer months has the potential to cause stream abandonment or to decrease reproductive success (Wiggins 2005). Hunting harlequin ducks contributes directly to mortality. Winter hunting is currently allowed in the state of Washington, despite the harlequin being listing as a priority species for the state. Wiggins (2005) has suggested that even a low level of hunting pressure is likely to have a significant impact on population stability in the western United States. Activities such as logging, road-building, and mining may act to increase sedimentation along breeding streams that may affect its food source. Livestock grazing may also represent a threat to harlequin duck nesting habitat. In areas with heavy livestock grazing, livestock may directly disturb nesting activities of female harlequin ducks (Wiggins 2005).

### **Background**

On September 16, 2007, while camping on the Powers Ranger District, district wildlife biologist John Lowe happened to observe a hen and three juvenile harlequin ducks foraging in the South Fork Coquille River. It was a chance sighting and is the first documented breeding record for Coos County and the South Oregon Coast, and the first confirmed sighting on the South Fork Coquille within Forest Service lands. There have been other unconfirmed reports of sightings on nearby Elk River and Sixes River in the past, however, it is not known if these sightings occurred on National Forest lands. No previous surveys have been conducted on the Powers Ranger District. It is also unknown if this was the first attempted and/or first successful breeding occurrence on the District/Forest, and whether or not this is the only breeding location on the district.

### **Method**

Potential survey locations were identified in the office using ArcGIS and aerial photos, with field verification occurring prior to and during the first survey visit. Initially, 67 miles of river and stream were identified for the survey. The survey was then shortened to 34 miles after field verification due to: access issues, lack of habitat, and adjacent

ongoing recreational activities. “Adjacent ongoing recreational activities” include: popular camping areas on the survey route where there were no vegetative barriers between the recreation site and the water (e.g. river bars), active mining claims during a portion of the survey period.

Key habitat features that were specifically searched for during the field verification and survey included: rocky “islands” with vegetation and areas along the banks that included vertical cover such as vegetation, woody debris and high-water overhangs. Each survey reach contained at least one key habitat feature.

Timing of the survey was based on information compiled for Region 6 by Teresa Stone, Umpqua NF and from local knowledge (date of confirmed district sighting). Survey protocol methodology was adapted from Cassirer et al. (1996), whose protocol was based primarily on species biology in Region 2.

The survey consisted of the surveyor(s) walking upstream and looking for ducks in the water and on the stream banks. While walking upstream, the surveyor would periodically pause to scan further upstream with binoculars. This was done to prevent missing any ducks that might flush and hide in the vegetation or fly further upstream and be continually missed by the surveyor as they continued on. Short portions of the survey route were close enough to a road that the surveyor could walk on the road instead of being in the stream. Each survey reach start and stop point was GPSed and input into GIS for mapping. This ensured that the survey coverage was consistent between survey visits.

## Results

No harlequin ducks were observed during the two survey visits in **2009**. Survey visit #1 was conducted between May 15 and July 27, covering 31.35 miles of stream. Survey visit #2 began on July 28 and ended August 6 covering 26.01 miles. The difference in miles surveyed between the two visits was due to water levels and miner/camper activity. During visit #1, two survey reaches (2.96 miles) in Elk River were inaccessible due to high water. During visit #2 in the Lower South Fork Coquille River, 3.3 miles of survey were dropped after visit one/field verification due to lack of habitat and 3.25 miles were dropped due to miner/camper activity. Also during visit #2, the 1.75 mile Blackberry Creek survey reach was initially started but dropped due to low water levels. Two other survey reaches were shortened during the second visit due to low water levels.

Although no harlequin ducks were observed, approximately 65 foothill yellow-legged frog (*Rana boylei*) egg masses, approximately 44 adults and multiple hundreds of tadpoles were found during the survey. Foothill yellow-legged frog is a R6 sensitive species. Two new osprey nests were found on the district as a result of the survey. Two wood duck (*Aix sponsa*) hens with 10 and 8 ducklings respectively, 5 common merganser (*Mergus merganser*), 2 mallard (*Anas platyrhynchos*), multiple solitary sandpiper (*Tringa solitaria*) and numerous American dipper (*Cinclus mexicanus*) were also observed.

In **2010**, during the first survey visit, one female harlequin duck was observed on July 8. This sighting occurred within 500 meters of the 2007 observation. Survey Visit #1 was conducted between July 7 and July 26 and covered 31 miles of stream. Survey visit #2 occurred on the reaches of the lower South Fork Coquille and one reach on the upper South Fork Coquille during August 24 and 25 covering 10 miles of stream. There were also multiple visits to the observation site between August 25 and September 22, but no harlequin ducks were observed.

Approximately 20 foothill yellow-legged frog adults and multiple hundreds of tadpoles were found during the survey. There was one red legged frog (*Rana aurora*) and 2 pacific giant salamander larvae (*Dicamptodon tenebrosus*), 1 wood duck hen, multiple solitary sandpipers and numerous American dipper also observed.

### **Discussion**

The date in which Harlequin duck surveys can begin on the Powers Ranger District relies heavily on the flow levels of the streams and rivers. While the majority of the South Fork Coquille and Elk rivers flow alongside roads, conducting surveys from those roads is only possible for short intermittent lengths due to vegetation blocking the view. In order to properly survey any potential habitat on the district, surveyors need to be able to safely walk along the banks, in the water, and be able to cross from bank to bank in the water. The ability to cross the streams is necessary in order to navigate steep banks, rock walls and deep pools. Occasionally, swimming is the best and quickest option. Flow levels also change the lengths of the survey reaches and can add or eliminate reaches during the survey period.

The winter of 2006/2007 produced a large amount of snow for the area and it stayed on the ground longer than usual. This factor, along with heavy spring rains, provided conditions that kept water levels in the rivers and streams higher for a longer period of time. This possibly created better nesting and brood rearing conditions for harlequin ducks that may have led to the 2007 observation.

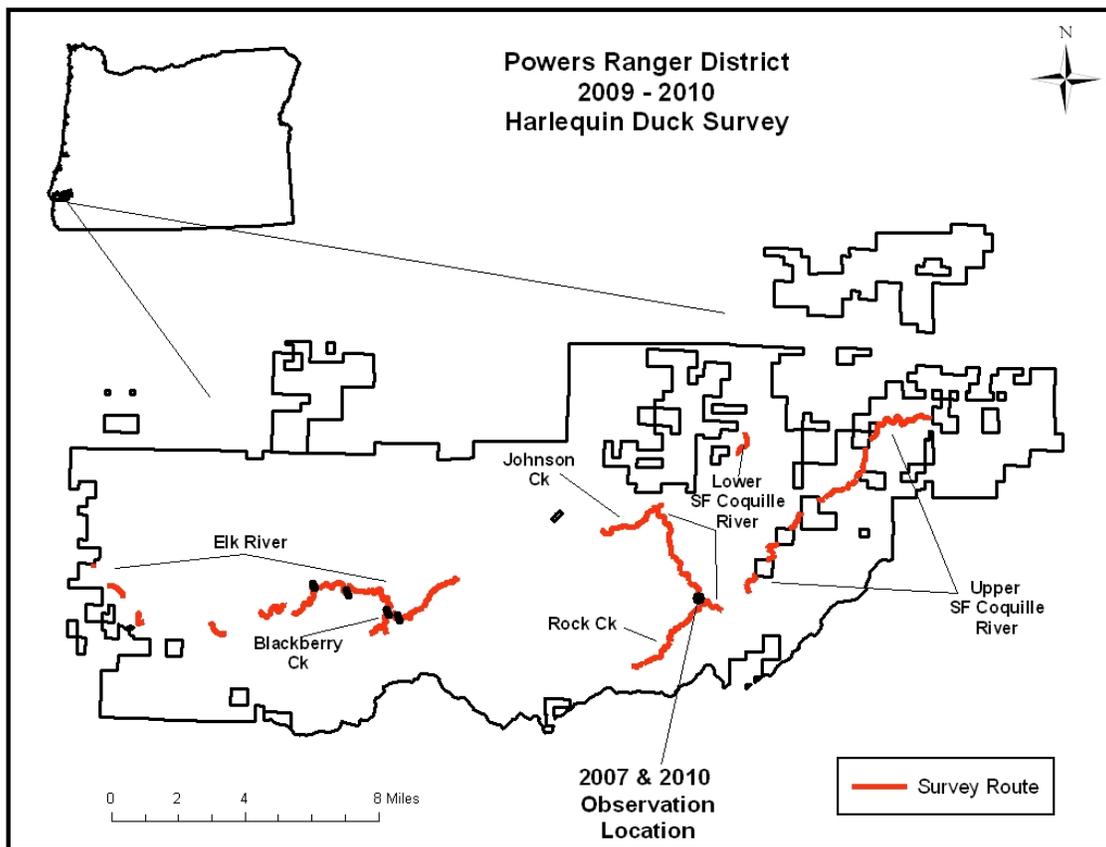
The winter of 2008/2009 was less severe, comparatively, and thus contributed to an earlier summer low flow level. It is possible that if harlequin ducks did nest on the district in 2009, they may have nested earlier than in 2007.

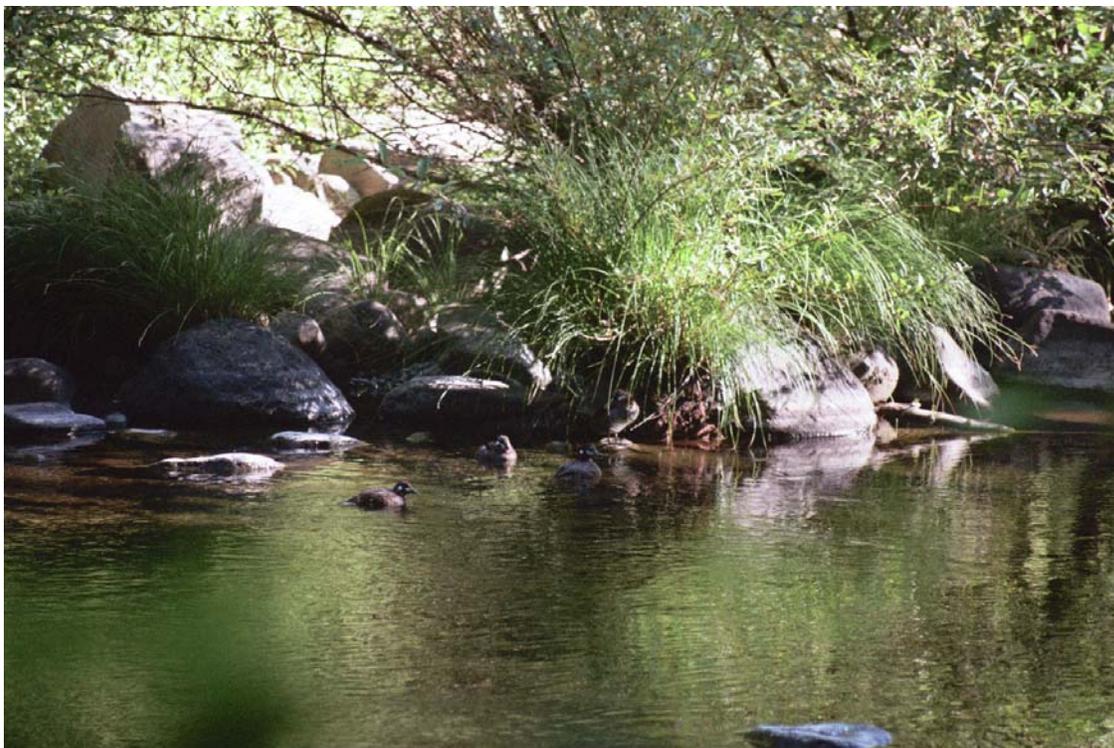
The winter of 2009/2010 was relatively mild on the district compared to 06/07. However, heavy spring rainfall contributed to high stream flow levels until mid-June. As a result, safe survey conditions did not occur until early July and water levels dropped rapidly throughout the remainder of summer shortening the survey period. Also during the 2010 survey, the timing between Visits 1 and 2 was greater than the previous year in order to include the timing of the 2007 observation. The drawback to this plan was that water levels in the streams dropped quicker than expected reducing the amount of survey area.

Although the two year protocol survey has been completed, the Powers Ranger District will continue to monitor the two observation locations multiple times throughout the breeding season on an annual basis. Other high quality habitat reaches will also continue to be visited when opportunities arise.

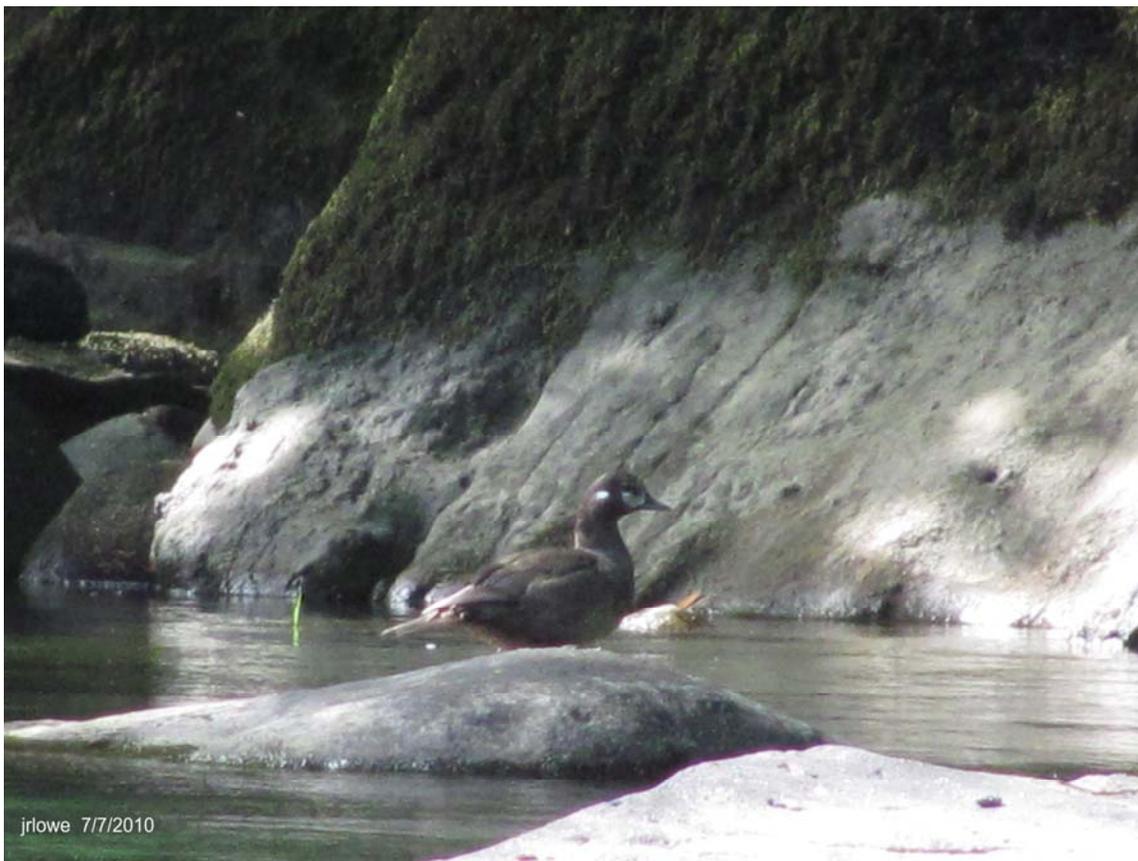
**Questions:**

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**2007 Observation**



**2010 Observation**

2009 Powers Ranger District						
Harlequin Duck Survey Timetable						
Location	Length - Miles	Visit 1	Time	Visit 2	Time	Notes
<b>Lower South Fork Coquille River</b>						
boundary to Coal Ck	3.3	5/19/2009	1212-1550			no habitat - dropped
416836 4738464 to Myrtle Grove CG to mouth Johnson Ck	0.99	5/21/2009	0900-1120			2nd visit dropped due to miner/camper activity
Johnson Ck mouth to Sucker Ck jet.	2.26	6/8/2009	0855-1312			2nd visit dropped due to miner activity
Island CG to Curved Bridge to Rock Ck Bridge	2.14	5/26/2009	0930-1340	7/30/2009	0920-1200	
Rock Ck Bridge to 411380 4727152	1.7	5/20/2009	0821-1520	7/21/2009	0830-1430	
Curved Bridge to 415717 4729753	0.36	6/17/2009	1025-1418	7/30/2009	1438-1517	2nd visit shortened due to low water
413214 4733068 to Ferris Ford Bridge	0.83	6/8/2009	1350-1505	8/3/2009	0945-	
Ferris Ford Bridge to Daphne Grove CG	0.35	6/9/2009	0819-	8/3/2009	-1130	
Daphne Grove CG to Island CG	1.57	6/9/2009	-1150	8/3/2009	1145-1300	
mouth Johnson Ck to 413187 4733402	1.37	5/27/2009	0930-1300	8/3/2009	0930-1045	
<b>Upper South Fork Coquille River</b>						
417036 4730698 to private (road slide)	0.79	6/9/2009	1225-1430	8/5/2009	1400-1545	
Buck Ck CG to 422590 4737611	1.25	6/10/2009	1315-1506	7/28/2009	1115-1244	
418982 4733720 to Buck Ck CG	1.98	6/10/2009	1030-1230	7/28/2009	1030-1100	includes some from road
Wooden Rk to Foggy Ck	1.92	6/11/2009	1130-1530	8/3/2009	1340-1540	
Lockhart area	0.96	6/9/2009	1445-1500	7/28/2009	0912-1020	visit 1 from road
<b>Elk River</b>						
boundary to 385346 4731869	0.13	7/7/2009	0953-1019	8/4/2009	0919-0952	
386063 4730978 to Bald Mtn Ck	0.71	7/7/2009	1033-1140	8/4/2009	1026-1050	
5502 to 387605 4729188	0.67	7/7/2009	1200-1235	8/4/2009	0900-1000	
391017 4729085 to 391804 4728661	0.76	7/7/2009	1311-1320	8/4/2009	1150-1400	visit 1 from road
394957 4729730 to Butler Bar	1.39			8/4/2009	1157-1404	visit 1 high water/access issues
393378 4729689 to 394700 4730051	1.57			8/4/2009	1010-1115	visit 1 high water/access issues
Butler Bar to Milbury Ck	1.39	7/22/2009	0943-1230	8/6/2009	0850-1111	
Milbury Ck to Blackberry Ck	2.55	7/22/2009	0953-1252	8/6/2009	0855-1140	
Blackberry Ck	1.75	7/20/2009	1103-1420	8/6/2009		2nd visit dropped due to low water
Blackberry Ck to McCurdy Ck	0.56	7/22/2009	1233-1250	8/6/2009	1125-1140	
McCurdy Ck to 402933 4731367	1.06	7/27/2009	1005-1445	8/6/2009	1242-1357	2nd visit shortened due to low water

2010 Powers Ranger District						
Harlequin Duck Survey Timetable						
Location	Length - Miles	Visit 1	Time	Visit 2	Time	Notes
<b>Lower South Fork Coquille River</b>						
416836 4738464 to Myrtle Grove CG to mouth Johnson Ck	0.99	7/7/2010	1209-1540	8/24/2010	0920-1115	
Johnson Ck mouth to Sucker Ck jct.	2.26	7/7/2010	0815-1105			2nd visit dropped due to miner activity
Island CG to Curved Bridge to Rock Ck Bridge	2.14	7/8/2010	1110-1330	8/24/2010	1330-1430	2nd visit (Rock Ck portion 1.1mi) dropped due to low water
Rock Ck Bridge to 411380 4727152	1.7	7/13/2010	0743-1100			2nd visit dropped due to low water
Curved Bridge to Falls	0.36	7/13/2010	1115-1250	8/25/2010	0805-0900	
413214 4733068 to Ferris Ford Bridge	0.83	7/7/2010	1209-1540	8/24/2010	1330-1430	
Ferris Ford Bridge to Daphne Grove CG	0.35	7/7/2010	1209-1540	8/24/2010	1156-1307	
Daphne Grove CG to Island CG	1.57	7/8/2010	0750-1040	8/24/2010	1330-1430	
mouth Johnson Ck to 413187 4733402	1.37	7/7/2010	1209-1540	8/24/2010	0920-1115	
<b>Upper South Fork Coquille River</b>						
417036 4730698 to private (road slide)	0.79	7/9/2010	0800-0858	8/25/2010	0919-0953	
Buck Ck CG to 422590 4737611	1.25	7/14/2010	cont.			2nd visit dropped due to low water
418982 4733720 to Buck Ck CG	1.98	7/14/2010	0835-			2nd visit dropped due to low water
Wooden Rk to Foggy Ck	1.92	7/14/2010	-1452			2nd visit dropped due to low water
Lockhart area	0.96	7/9/2010	0915-1125			2nd visit dropped due to low water
<b>Elk River</b>						
boundary to 385346 4731869	0.13	7/19/2010	1015-1042			2nd visit dropped due to low water
386063 4730978 to Bald Mtn Ck	0.71	7/19/2010	1056-1149			2nd visit dropped due to low water
5502 to 387605 4729188	0.67	7/19/2010	1247-1318			2nd visit dropped due to low water
391017 4729085 to 391804 4728661	0.76	7/19/2010	1350-1417			2nd visit dropped due to low water
394957 4729730 to Butler Bar	1.39	7/20/2010	1050-1337			2nd visit dropped due to low water
393378 4729689 to 394700 4730051	1.57	7/20/2010	1000-1037			2nd visit dropped due to low water
Butler Bar to Milbury Ck	1.39	7/21/2010	1230-1430			2nd visit dropped due to low water
Milbury Ck to Blackberry Ck	2.55	7/22/2010	0900-1200			2nd visit dropped due to low water
Blackberry Ck	1.75	7/21/2010	0900-2315			2nd visit dropped due to low water
Blackberry Ck to McCurdy Ck	0.56	7/22/2010	1200-1230			2nd visit dropped due to low water
McCurdy Ck to 402933 4731367	1.06	7/26/2010	1115-1345			2nd visit dropped due to low water

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