Steelhead Spawner Enumeration in Inkaneep Creek – 2008

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February 2009

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EXECUTIVE SUMMARY

Steelhead salmon that return to the Canadian Okanagan Basin migrate from the ocean via the Columbia River then into Okanagan River and through Zosel Dam at the outlet of Osoyoos Lake. The video counter at Zosel Dam enumerated 162 adult steelhead (adipose-clipped and unmarked) migrating into Osoyoos Lake between January and May, 2008. Less than this number should be expected to spawn in the Canadian portion of the Okanagan Basin, due to accessible spawning creeks on the American side of Osoyoos Lake North of Zosel Dam. Arterburn and Miller (2008) estimate 116 steelhead spawned in the Canadian Okanagan basin.

The general timing of steelhead/rainbow trout spawning in Inkaneep Creek maintained consistent with 2006 and 2007 to the end of April and 1st week of May. The fish fence on Inkaneep detected migration within the creek beginning April 15 with peak dates between April 27 – 29 and again May 4, 2008. The fish fence enumerated a total of 59 steelhead/rainbow trout.

Of the 59 fish captured, 5 were adipose clipped and of hatchery origin, with the remaining being a wild population. The fish fence caught 22 males and 32 females with 8 undetermined. The sex ratio was slightly lower than witnessed in 2006 at 0.69. Male steelhead/rainbow trout averaged 46 ± 11 cm long compared to the females that averaged 44 ± 11 cm long.

A total of six redds were observed in Canadian Okanagan Basin water-bodies surveyed in the spring of 2008, all in Inkaneep Creek. Redds in Inkaneep Creek were observed on May 4 and May 12.

ACKNOWLEDGEMENTS

We would like to thank the Osoyoos Indian Band, and local landowner Sam Baptiste for allowing access to the survey sites. Funding for this section of the Okanagan Basin Monitoring and Evaluation Program is provided through the Colville Confederated Tribes by the Bonneville Power Administration (BPA).

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Citation: Folks, S., M. Squakin, T. Kozlova., 2008. Steelhead spawner enumeration in Inkaneep Creek – 2008. Within the Okanagan Basin Monitoring and Evaluation Program (OBMEP). Prepared by the Okanagan Nation Alliance Fisheries Department, Westbank, BC.

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1.0 INTRODUCTION

1.1 Project Background

According to Traditional Ecological Knowledge (TEK) as well as a series of historical accounts, steelhead salmon (*Oncorhynchus mykiss*) were found throughout the Okanagan Basin (Clemens *et al*. 1939; Atkinson 1967; Fulton 1970; Ernst 2000; Rae 2005), a sub-basin of the Columbia Basin. Okanagan steelhead (also known as Upper Columbia summer steelhead) numbers have declined to such an extent that they have been re-listed as an endangered species since 2007 (NOAA 2007). There is limited data about the population size and distribution of steelhead in the Canadian portion of the Okanagan Basin (Rae 2005).

In 2008, the Okanagan Nation Alliance (ONA) working with the Colville Confederated Tribes surveyed the presence and distribution of steelhead spawners in the accessible portions of the Canadian Okanagan Basin as part of the Okanagan Basin Monitoring and Evaluation Program (OBMEP). OBMEP was created to establish a basin wide status and trend monitoring program with a 20 year life-span (Colville Tribes 2003). Within this program an annual estimation of steelhead spawner numbers (redd surveys) is completed to complement habitat surveys (including water quality and quantity surveys) and other biological surveys. This is the fourth year of the OBMEP program, while being the third year of steelhead spawner surveys in the Canadian portion of the Okanagan Basin, of which only two years of the spawner surveys have included a fish fence.

1.2 Project Objectives

To annually enumerate adult steelhead spawners returning to the Okanagan River Basin, a fish fence in Inkaneep Creek was monitored. Also modified redd surveys in Inkaneep Creek were conducted. The end objective is to determine steelhead spawner abundance and distribution.

Specific objectives for the Inkaneep Creek fish fence include,

- Re-installation and maintenance of the fish fence on the lower reach of Inkaneep Creek throughout the spawner returns (April to May),
- Enumeration of all upstream migrating fish (primarily steelhead and rainbow trout), and
- Collection of biological information including fish length and ratio of male to female trout.

Specific objectives for the redd surveys included:

- Focus redd survey efforts to regions previously determined to have significant numbers of steelhead redds (Long *et al.* 2006; Benson and Squakin, 2007).
- Utilize a fish fence in conjunction with redd surveys to determine spawner abundance and distribution.

1.3 Study Area

The area of the Canadian Okanagan Basin currently accessible to migrating steelhead salmon occurs downstream of McIntyre Dam. McIntyre Dam (24km upstream of Osoyoos Lake on the main stem Okanagan River) was constructed without fish passage in 1920 (Long 2005a). Downstream of McIntyre Dam, two large tributaries flow into the Okanagan system; Vaseux Creek flows into the Okanagan main stem while further downstream Inkaneep Creek flows into the north basin of Osoyoos Lake. Inkaneep Creek was the focus of this year's steelhead spawner surveys conducted in the spring of 2008 based on previous years sampling. In 2006 (Long and Squakin 2006) it was determined that Inkaneep Creek was the most productive of the creeks surveyed. In order to maximize enumeration efficiency, Inkaneep Creek was chosen for the fish fence.

In Inkaneep Creek, 3.7 km of its 23.5 km length is accessible to migrating salmon due to a 6 m high waterfall (Walsh and Long 2005). The entire 3.7 km length of Inkaneep Creek was surveyed for steelhead redds as well as the monitoring of steelhead migrations through a fish fence located 625 m from the mouth of the creek.

In response to the lack of fish passage at McIntyre Dam, the ONAFD and other groups have lobbied to enable fish passage. Currently funding has been secured to install 5 overshot gates at McIntyre Dam which will provide access upriver. These gates are expected to be installed during 2009. Currently, pre overshot gate installation, McIntyre Dam can be operated for short periods of time in the spring freshet in such a way that migration of salmon is possible, thus a main tributary upstream of McIntyre Dam, Shuttleworth Creek may be included in future enumerations.

Steelhead spawning distribution and timing estimates are currently based on redd surveys and fish fence data from Inkaneep Creek (Fig. 1).

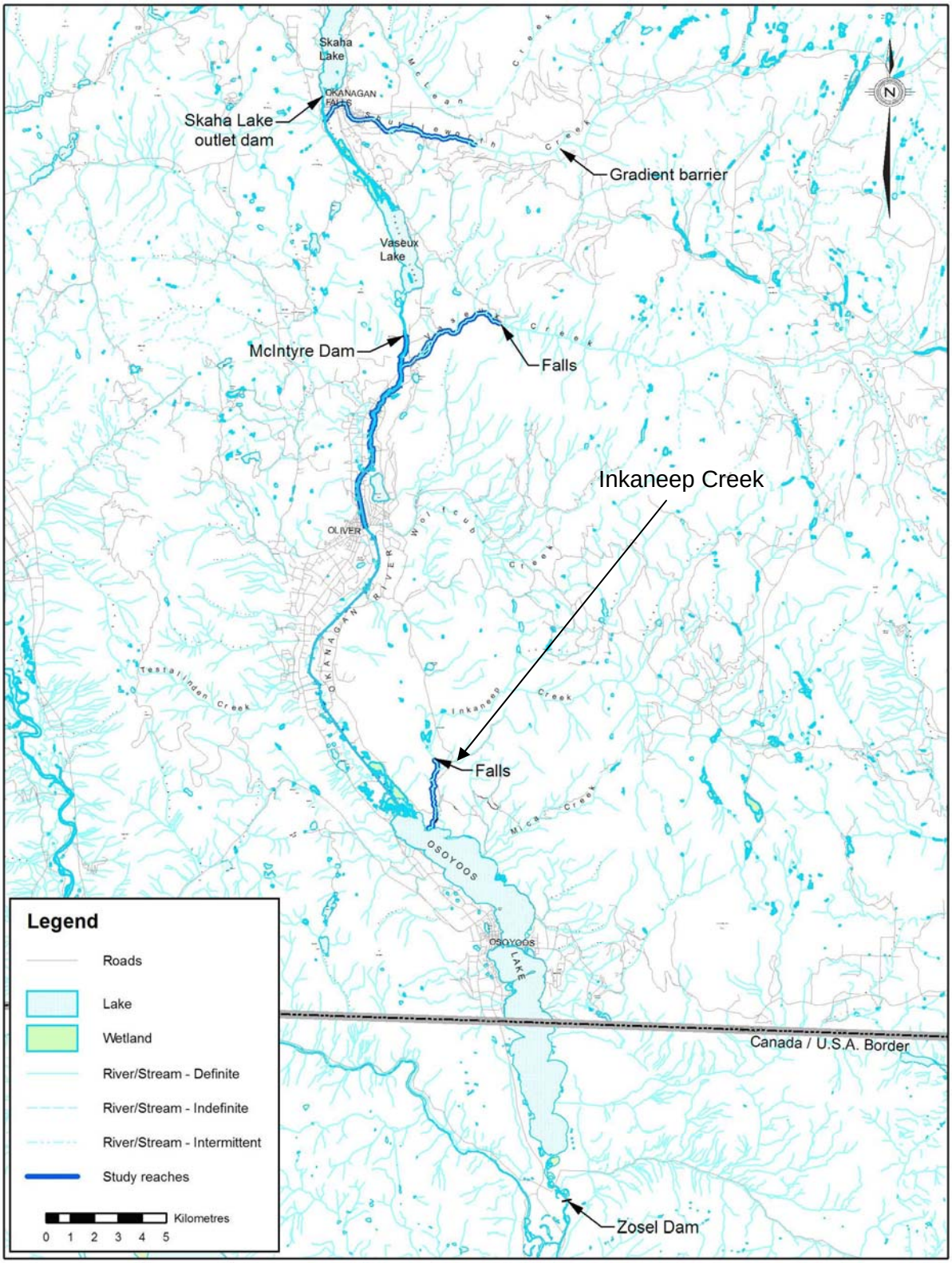

Figure 1. Canadian Okanagan Basin steelhead/rainbow trout study area

2.0 METHODS

2.1 Inkaneep Creek Fish Fence Monitoring

This is the third year of the steelhead/rainbow spawner monitoring within the Canadian Okanagan Basin, while the second year in which a fish fence has been used on Inkaneep Creek. In 2006 it was determined that a fish fence provided good enumeration results compared to the sampling season in 2007 which relied primarily on redd surveys. The fence was installed on March 31st, 2008 and located 625m from the mouth of Inkaneep Creek (GPS N49.00077220, W119.50360) and later moved (May 5) downstream (N49.07220 and W119.50354) due to freshet flows. The fence was constructed during low flow conditions at mean depths of approximately 1.77m (WSC 2008). Inkaneep Creek typically experiences flash flood flow dynamics where the water levels in the creek are prone to changing over a short time period (Long 2000). In response to this, the fish fence was constructed in the new location 50 m upstream of the previous fish fence site (Long *et al.* 2006) in order to reduce the likelihood of failure. However, despite such efforts the fence was compromised May 5, 6, and 7th, 2008.

As a result of the propensity of the fish fence to become compromised during peak flow periods, the fish fence was removed mid May 2008. This, according to the Water Survey of Canada (WSC), was prior to the peak freshet flow of the spring of 2008 which occurred between May 20th and 25th, 2008 (WSC 2008).

Counts of steelhead/rainbow trout migrating into Inkaneep Creek to spawn were conducted April 7th to May 15th, 2008. Installation of the fish fence occurred before the early steelhead spawners migrated into the system, based on peak dates from previous years sampling (Long *et al.* 2006, Benson and Squakin, 2008). The fence was located at the top of a riffle, where the capture box could sit in the deeper waters of a pool (Fig. 2, Fig. 3). The fence panels were set up across the creek to herd the fish into the capture box.

Figure 2. Inkaneep Creek fish fence at first location

Figure 3 Inkaneep Creek fish fence at second downstream location

The fish fence was checked daily from April 7th to May 15th, 2008. At each check the sampling box was monitored for fish presence. All fish were noted, irrespective of species, and steelhead/rainbow trout (Figure 4) were bio-sampled. Biological sample data included: nose fork length (cm), sex, adipose presence, fin clip, and scale samples[1]. All diligence was taken in order to minimize both handling and stressing fish. The fish were then released into a pool within close proximity to the sampling box and were monitored during recovery. Additionally daily fence maintenance occurred, insuring there were no breaches in the fence. Lastly it was insured that Wenatchee hatchery (unclipped adipose) fish, indicated by their red dye eye marks, were not released.

Figure 4. Male steelhead/rainbow trout sampled May 2008

2.2 Redd Surveys

Based on the failure of previous years surveys (2006, 2007) to significantly detect and quantify steelhead/rainbow spawner redds, the redd survey methodology was modified to include only Inkaneep Creek. Redd detection has previously been difficult within Okanagan River tributaries located in Canada due to high turbidity and high freshet flows. The decision to modify the surveys was made in order to allocate resources to a

[1] These samples will be processed in 2009 for aging and stable isotope analysis to determine exposure to marine environments.

stream particularly productive in terms of Canadian Okanagan Basin (COB) steelhead/rainbow spawner numbers (Long *et al.* 2006; Benson and Squakin, 2008).

Combined with the fish fence - a method proven to provide good enumeration results, redd surveys were conducted to ameliorate the fence counts whereby distribution within Inkaneep Creek could be assessed. Redd surveys, as mentioned; in previous years have proven difficult to provide for a viable data set with which confident distribution results could be determined. Thus, with improved enumeration in Inkaneep Creek along with continually improving data from Zosel Dam the remaining the number of steelhead can be determined however, distribution will remain difficult to determine.

Redd surveys were conducted by two ONAFD personal versed in redd survey methodology. The surveys took place concurrently with the fence on two days in early May after fish were observed in the fish fence (Arterburn *et al.* 2007; Benson and Squakin, 2008)[2]. The entire reach accessible to steelhead/rainbow, below the permanent fish barrier on Inkaneep Creek, was surveyed in an upstream manner. The quality of each survey was recorded at the time the enumeration occurred similar to standardized protocols from the ONA sockeye salmon (*Oncorhynchus nerka*) enumerations (Alexis & Wright 2004). Information collected to determine the quality of the counts include;

- water clarity (water depth of visibility),
- weather (cloud cover, brightness, precipitation),
- survey crew,
- start and end time for the survey.

The number and location (GPS) of redds were recorded as well as any note of live or dead fish present and the quality of the survey. Redds were verified by at least two trained crew members. Locations and physical data were entered into a Trimble Geo XT GPS data logger in accordance with Arterburn *et al*. (2007). In order to prevent double-counting of existing redds, confirmed redds were marked with flagging tape tied to a tree or bush on the adjacent stream bank. The flag was marked with survey date, number of redds, and location and distance of the redd from the flag.

As in past years (Long *et al.* 2006; Benson and Squakin, 2008) the VDS reach was not surveyed due to the limited steelhead/rainbow trout spawning activity (Long 2004; Long 2005b; Audy and Walsh 2006; Long *et al*. 2006; Wodchyc *et al*. 2007).

[2] Due to budget constraints only two days were spent conducting Redd surveys.

3.0 RESULTS

3.1 Inkaneep Fish Fence Monitoring

The Inkaneep fish fence was monitored for 39 days (April 7 to May 15, 2008) after which the fence was disassembled prior to the peak freshet flow, which in previous years has blown out the fence (Long *et al.* 2006; Benson and Squakin, 2008). During the sampling period of the fish fence a total of 59 steelhead/rainbows were enumerated, while 1 fish was dead and unspawned at time of sampling, and two additional undetermined escapees were also present. Examining the daily migration patterns of steelhead/rainbow trout at the Inkaneep fish fence (Figure 5) indicates that peak migration occurred on April 27-29th, and again May 4th.

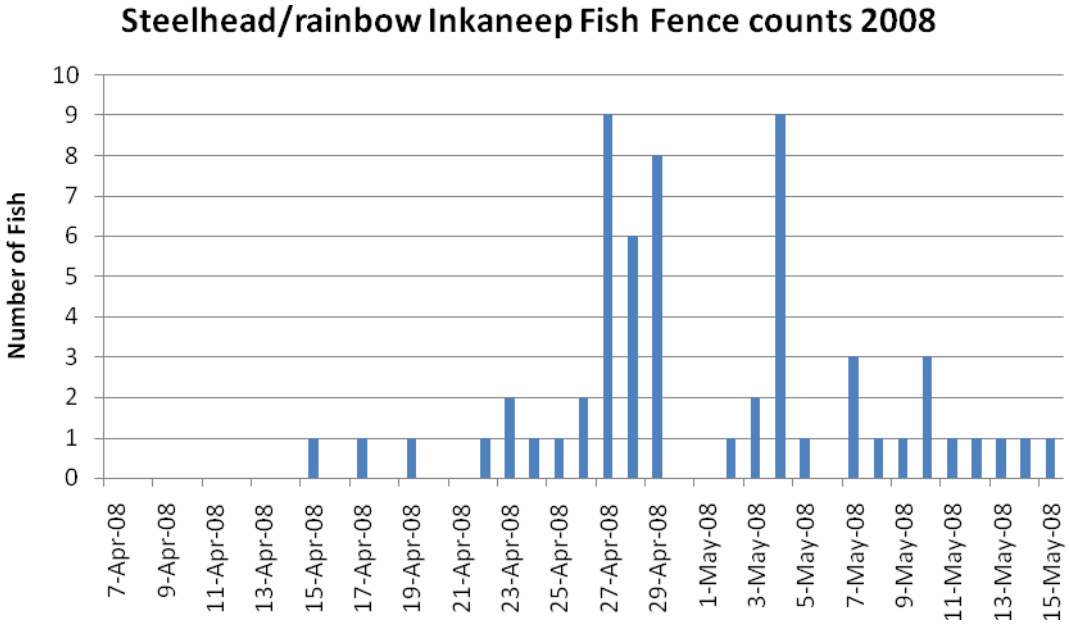

Figure 5. Daily counts of steelhead/rainbow trout through the Inkaneep fish fence

Based on data collected by both ONAFD and the Colville Confederated Tribes (CCT) peak steelhead/rainbow trout timing for 2008 has been consistent to the latter half of April and the 1st week of May compared to previous years. Arterburn *et al.* (2007) make mention that this time period is also experienced in Washington State tributaries to the Okanagan River. These peak dates tend to correlate with peak water flows through Inkaneep Creek monitored at the Water Survey of Canada water gauge 08NM200 (Fig. 6). The fish fence was installed during water levels of <1.8m. On the peak migration days (April 27 – 29, and May 4) the water levels and discharge within Inkaneep Creek are rising or have risen (Fig 6.). Also, the small peak of 3 fish noted on April 14, a corresponding increase in streamflow levels also occurred (Fig. 6).

It should be noted that on a number of brief occasions, the fence was compromised by a combination of either flows/vandalism and/or other factors. In each case a section of the fence adjacent to the stream bank was compromised, where a passable hole was present. Fish counts on April 24 and 25 may have been compromised due to intentional removal of a number of the aluminum rods that make up the fish fence. During this time period, pre and post, at most 2 – 3 fish were enumerated per sampling period. Also May 5th, 6th, and 7th there were stability issues with the fish fence. The morning sampling crews note structural alterations to the fence, likely due to stream flow. In response to this, the fence on May 5 was moved downstream approximately 20m and did not cover the stream for approximately 5 midday hours. Figure 6 demonstrates drastic changes in daily flow in Inkaneep Creek. It is possible that during this period there may have been continued peak runs of steelhead, as per Figure 5, in which 9 – 10 fish were observed daily. However, despite brief alterations to the fish fence, the overall count of steelhead/rainbows was a success.

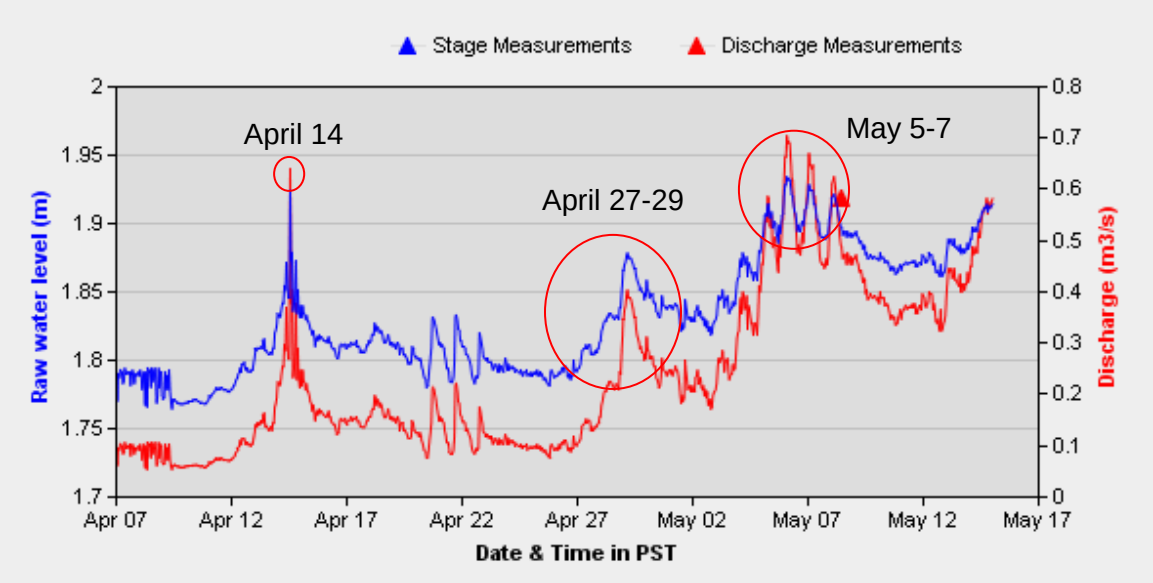

Figure 6. Water levels (blue) and discharge (red) in Inkaneep Creek at station 08NM200 (WSC 2008).

The fish fence data from Long *et al.* (2006) corroborates the timing witnessed this season, with peak migration periods broadly during the last week of April into the 1st week of May. In 2006 the fish fence was operated over a longer time period to note pre and post peak spawning events. This time period failed to note additional spawners, safe for 1 fish later May (May 17), outside of the sampling period used this season.

3.1.1 Biological Sampling of Inkaneep Creek steelhead/rainbow trout

Of the 59 fish captured, 5 were adipose clipped and of hatchery origin (Appendix A). Therefore the majority (91.53%) of the fish enumerated are most likely a wild population of steelhead/rainbow trout. The fish fence caught 22 males, 32 females, and 5 undetermined (Figure 7). The sex ratio of 0.69 represented a slightly lower than previously witnessed sex ratio of 0.85 (Long *et al.* 2006); however, sex determination of the unknown fish may make up for this variance. Also, Osoyoos Lake is noted has having adfluvial rainbow trout that could be as large as their steelhead counterparts (Long *et al.* 2006). The level of interaction between these adfluvial residents and the anadromous steelhead is unknown.

Male steelhead/rainbow trout averaged 46 ± 11 cm long compared to the females that averaged 44 ± 11 cm long (Table 1). Compared to results collected in 2006 returning numbers to Inkaneep Creek are similar.

Table 1. Length of Canadian Okanagan Basin male and female steelhead/rainbow trout in 2006 and 2008

	Count		Length		Std Dev		Min		Max	
	2006	2008	2006	2008	2006	2008	2006	2008	2006	2008
Female	27	32	45	44	9	11	16	16	59	60
Male	23	22	49	46	11	11	31	20	76	67
Unknown	14	5								

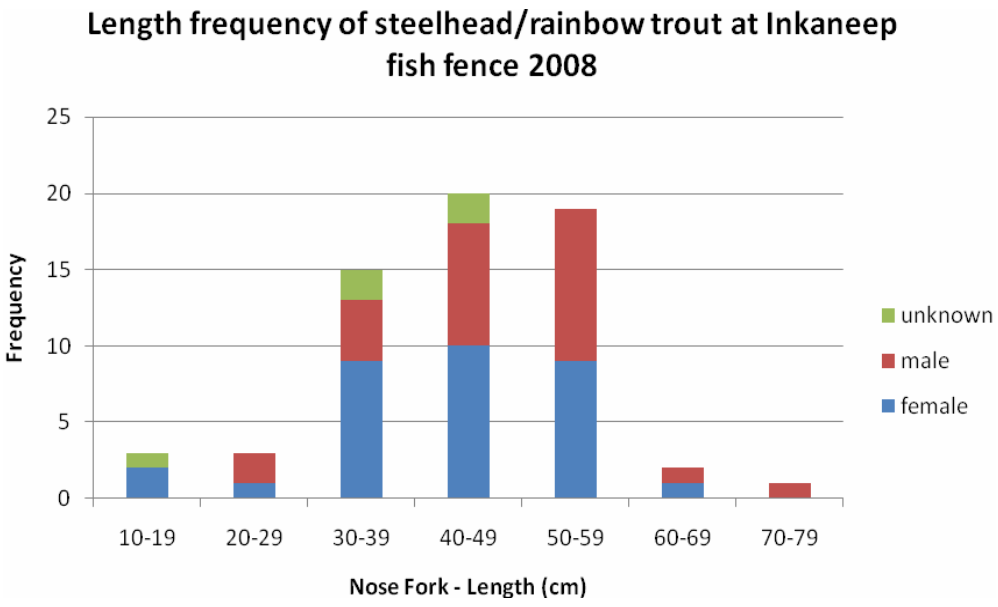

Figure 7. Length frequency of steelhead/rainbow trout at Inkaneep fish fence 2008

3.2 Redd Survey Results

Inkaneep Creek was surveyed twice by ONAFD members versed in redd survey methodology. A total of 6 redds were observed in Inkaneep Creek in the spring of 2008 (Table 2).

Table 2. Inkaneep Creek redd survey data

Waterbody	No of redds	GPS	Water clarity	Date	Comments
Inkaneep Creek	2	N 49.07206 W 119.50360	10-15cm	4-May-08	Cattle crossing present
Inkaneep Creek	4	Unavailable[3]	1m	12-May-08	

Based on the number of fish sampled within the fish fence, the observation of 6 redds (Figure 8) speaks to both a lack of sufficient effort to account for all spawning steelhead/rainbow, but also the decreased value of redd surveys in population estimates in the Canadian Okanagan Basin (COB). While Arterburn *et al.* (2007) note that redd surveys in American Okanagan Tributaries (AOT) are well founded, within the COB alternative sampling measures must be considered.

Based on previous years sampling, the majority of the redds detected were located in Inkaneep Creek and Vaseux (Table 3). However in 2007 difficult redd survey conditions provided minimal results thus redd surveys for 2008 were conducted in only Inkaneep Creek. Given the presence of redds in Vaseux and Shuttleworth Creeks, and the Okanagan River in previous years it can be assumed that there were redds present within these Creeks for 2008; however, there is insufficient data to produce quantitative estimates for these creeks for this year.

Table 3. Steelhead Redd surveys in the Canadian Okanagan Basin

Redd Locations	2006	2007	2008
Inkaneep	10	2	6
Vaseux	10	1	
Okanagan	2		
Shuttleworth		1	

[3] GPS coordinates unavailable due to gear malfunction. These redds were located near (within 100m) the redds indicated on May 4, 2008

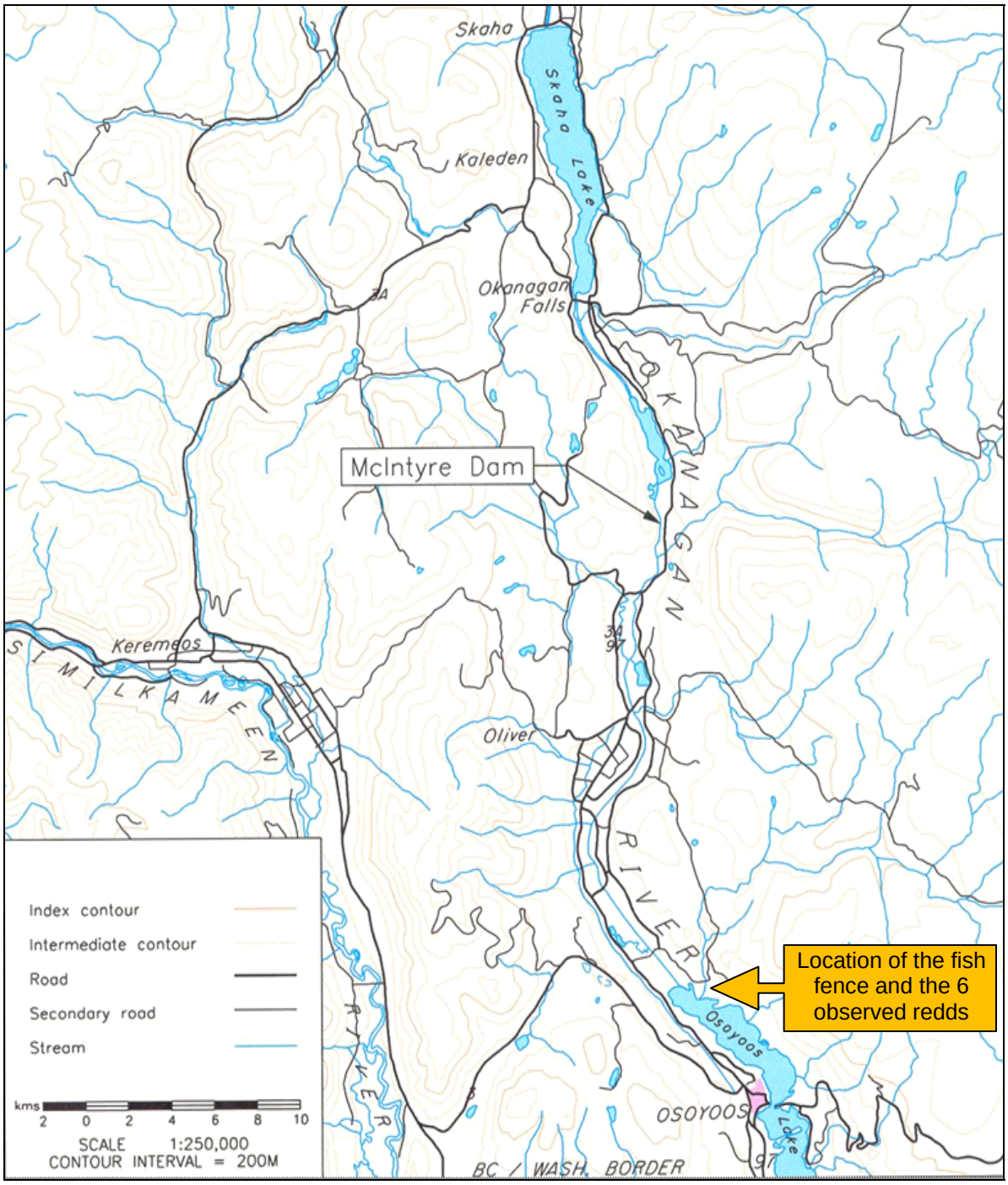

Figure 8 Location of steelhead/rainbow trout redds in the Okanagan Basin, 2008.

4.0 DISCUSSION AND RECOMMENDATIONS

Steelhead returning to the Canadian Okanagan Basin migrates up the Columbia River, enter the Okanogan River in Washington, then pass through Zosel Dam at the Osoyoos Lake outlet. The video counter at Zosel Dam counted a total of 162 hatchery and wild adult steelhead (or possibly rainbow trout) a 10% increase over the same time period as 2007, but a 40% reduction over the same time period as in 2006 (Figure 9).

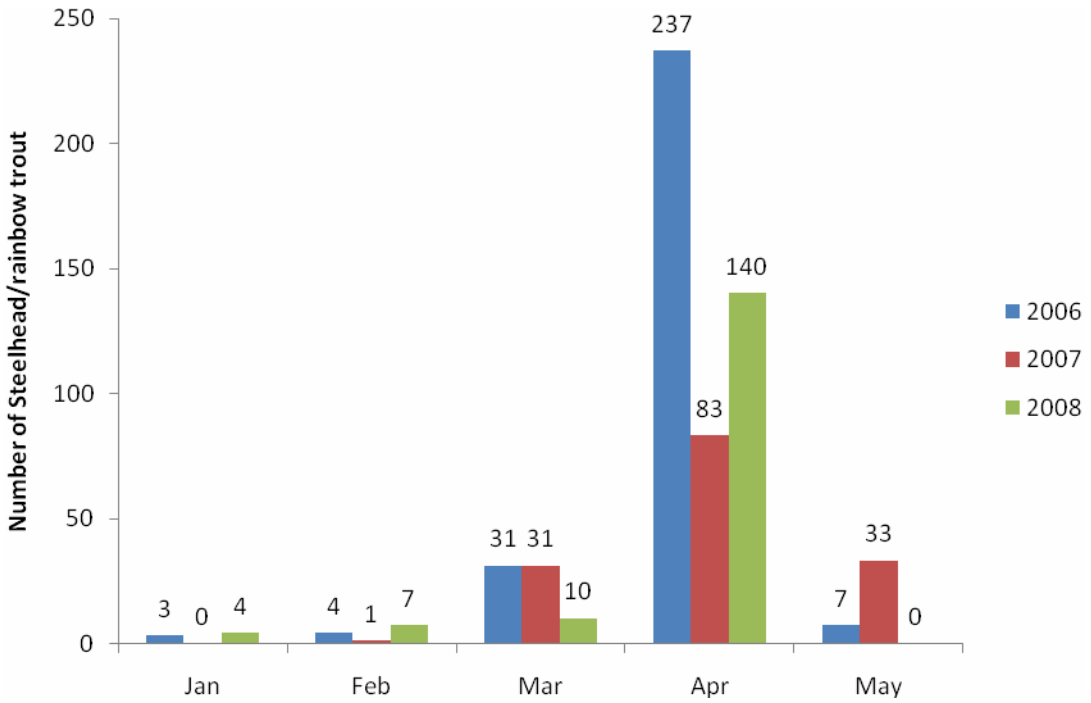

Figure 9 Adult steelhead (hatchery and wild) migrations through the Zosel Dam fish counter for 2006-2008 (Long et al. 2006; Benson and Squakin 2008; Columbia River DART 2008).

Within the American portion of the Southern Basin of Osoyoos Lake both Nine Mile and Tonasket Creeks host populations of spawning steelhead/rainbow trout (Arterburn *et al.* 2007). These numbers should be subtracted from the numbers presented as Zosel dam counts; however, as mentioned in Arterburn *et al.* (2007) enumerations within these creeks has proven difficult due to private land ownership and access to the creeks. Future amelioration of these counts is required to improve both the estimates of escapement within these creeks as well as steelhead/rainbow trout entering the Canadian Okanagan Basin (COB).

Of the steelhead/rainbow trout entering the COB it has been noted by Long *et al.* (2006) and Benson and Squakin (2008) that the majority return to Inkaneep Creek. In 2008

more sampling effort was allocated to this stream. Enumeration results provided a count of 59 adults migrating past the Inkaneep Creek fish fence. These results demonstrate a consistent migration pattern to that of previous years (late April to Early May peak). However, this seasons sampling continued to demonstrate limitations of the current fish fence utilized by the ONAFD. The fish fence is structurally unable to withstand freshet flows within Inkaneep Creek. As a result there are periods in which the fence is navigable to fish thereby reducing the reliability of the total spawner counts. Despite these flaws however the count for the 2008 season represents a good portion of the steelhead/rainbow trout that spawn within the COB.

Population estimates will be calculated for Inkaneep, Vaseux, and the Okanagan River upon further collection of data from within the COB. From ameliorated population data, distribution results will then be possible. While there are estimates from Arterburn *et al.* (2008) for Canadian tributaries to the Okanagan River, further analysis of said estimates is required for management decisions to be made.

In addition to distribution and population estimates, the interaction and role of adfluvial rainbow trout needs to be assessed. The level of interaction between these fish and anadromous steelhead/rainbow trout is unknown. The determination of the role of these fish in the life history of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) listed Okanagan Basin steelhead is of importance in determining the fate of this population.

Within the Canadian Okanagan basin Inkaneep Creek continues to appear to have the most steelhead spawners in the entire Canadian Okanagan Basin (Long *et al*. 2006; Arterburn *et al*. 2007b). Future steelhead spawner and habitat research, and management, due to budget constraints will focus on this tributary.

4.1 Recommendations

1. Future steelhead surveys should continue to focus on Inkaneep Creek, as this tributary has the strongest spawning run. A fish counting fence used in conjunction with improved Zosel Dam counts could be used to obtain a population estimate.

2. Operation of the Inkaneep Creek fish fence should follow the recommendations outlined by Long *et al*. (2006).

3. The Inkaneep fish fence should be reinforced to better cope with spring freshet flows in stream.

4. Currently, there is limited data on the adfluvial rainbow trout population in Osoyoos Lake. Strontium isotope analysis of the bio-samples collected from 2008 should be conducted. Also bio-sample collection should continue in 2009 to move towards better understanding the adfluvial/anadromous interaction and life history of Okanagan steelhead/rainbow trout.

5. Redd surveys on all Canadian Okanagan Basin (COB) tributaries and streams should be discontinued.

6. Continue to examine alternative enumeration methods to better determine distribution results of steelhead/rainbow trout within the COB.

7. The public should be informed as to the reasoning behind the fish fence to prevent future vandalism. Perhaps a fixed sign on site explaining both the structure and the project. As well as a press release to the community of Oliver and surrounding first nations should be employed.

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APPENDIX A – 2008 Redd Survey Raw Data

Date	Steelhead Biosampling							Other	Water	Water		Crew
2008	Fish #	Sex	Length (cm)	Adipose Clip	Fin Sample	Scale # (book-box)	Photo #	Fish	Temp °C	Level cm	°C	
7-Apr	-	-	-	-	-	-	-	-	8.2	-	-	CM/RF
7-Apr	-	-	-	-	-	-	-	-	8.7	-	-	MS/DH/CM
8-Apr	-	-	-	-	-	-	-	-	5.6	Up 2-5 cm	7	MS/DH
9-Apr	-	-	-	-	-	-	-	-	7.4	Low	10	MS/DH
10-Apr	-	-	-	-	-	-	-	-	-		-	MS/CM/DH
10-Apr	-	-	-	-	-	-	-	-	10		-	CM/AB
11-Apr	-	-	-	-	-	-	-	-	4.6	Low	6	MS/DH
11-Apr	-	-	-	-	-	-	-	-	11.5		-	CM/AB
12-Apr	-	-	-	-	-	-	-	-	7	Low	12	MS
12-Apr	-	-	-	-	-	-	-	-	13.4		21	CM/AB
13-Apr	-	-	-	-	-	-	-	-	8.7	Low	-	MS/NP
13-Apr	-	-	-	-	-	-	-	-	13.4		19	CM/AB
14-Apr	-	-	-	-	-	-	-	-	10.1	Up 10 cm	9	MS/DH
14-Apr	-	-	-	-	-	-	-	-	8.5		-	CM/RF
15-Apr	-	-	-	-	-	-	-	-	6.4		11	MS/JS
15-Apr	18650	M	59	N	Y	36541-1	1,2	-	8.8		-	CM/AB

16-Apr	-	-	-	-	-	-	-	-	4		-	MS/DH
16-Apr	-	-	-	-	-	-	-	-	10.3		-	CM/DG
17-Apr	18651	-	49	N	Y	36541	-	-	5.5		-	MS/DH
17-Apr	-	-	-	-	-	-	-	-	11.3		-	CM/RF
18-Apr	-	-	-	-	-	-	-	-	5.4		-	MS/DH
18-Apr	-	-	-	-	-	-	-	-	7.2		-	CM/RF
19-Apr	-	-	-	-	-	-	-	-	3.6		-	NP
19-Apr	18652		30	N	Y	36541-3	100-0063, -0064	-	7.2		4	CM/RF
20-Apr	-	-	-	-	-	-	-	-	3		-	NP/DH
20-Apr	-	-	-	-	-	-	100-0065	-	7.5		7	CM/RF
21-Apr	-	-	-	-	-	-	-	-	4.9	Low	7	MS/DH
21-Apr	-	-	-	-	-	-	-	-	8		-	CM/CRS
22-Apr	18653		39	N	Y	36541, #4	21	-	2.8		-	MS/DH
22-Apr	-	-	-	-	-	-	-	-	9.9		-	CM/DG
23-Apr	-	-	-	-	-	-	-	-	5		4	MS/DH
23-Apr	18654	F	58.5	N	Y	36541-5	1-3: 18654_A/B/C.JPG	-	7.3		-	CM/DG
23-Apr	18655	M	37	N	Y	36541-6	4-5: 18655_A/B.JPG	-	-		-	
24-Apr	-	-	-	-	-	-	-	-	5.2		10	MS/CM
24-Apr	18656	M	58	N	Y	36541-7	1		7.6		-	CM/DG

25-Apr	-	-	-	-	-	-	-	-	7.3	37	-	CRS/AS
25-Apr	18657	F	35			36541-8	1-3.		10.6		-	CM/DG
26-Apr	-	-	-	-	-	-	-	-	5.8	38	-	MS/RF
26-Apr	18658	F	60	N	Y	36541-9	1-3.	-	10.9	37 - 38	-	CM/DG
26-Apr	18659	M	59	N	Y	36541-10	4-5.	-			-	
27-Apr	18660	F	39	N	Y	36541-11	Y	-	7.4	41	12	MS/RF
27-Apr	18661	F	52	N	Y	36541-12	Y	-	-		-	
27-Apr	18662	F	47	N	Y	36541-13	Y	-	-		-	
27-Apr	18663	F	58.5	Y	Y	36541-14	Y	-	-		-	
27-Apr	18664	F	37.5	N	Y	36541-15	Y	-	-		-	
27-Apr	18665	M	43	N	Y	36541-16	1	-	10.6	42	-	CM/DG
27-Apr	18666	M	52	N	Y	36541-17	2-3.	-	-		-	
27-Apr	18667	M	40	N	Y	36541-18	5	-	-		-	
27-Apr	18668	F	59	Y	Y	36541-19	6-7.	-	-		-	
28-Apr	18669	M	55.5	Y	Y	36541-20	Y	-	10.9		-	AS/RF
28-Apr	18670	F	39	N	Y	36541-21	Y	-	-		-	
28-Apr	18671	M	50.5	N	Y	36542-1	1	-	12.5	45	-	CRS/BL
28-Apr	18672	M	50	N	Y	36542-2	2	-	-		-	
28-Apr	18673	F	56	N	Y	36542-3	3	-	-		-	
28-Apr	18674	M	56	N	Y	36542-4	4	-	-		-	

29-Apr	18675	M	67	N	Y	36541-22	Y	1 RT	7	53	-	MS/RF
29-Apr	18676	F	47	N	Y	36541-23	Y	1 Sucker (fish #25)	-		-	
29-Apr	18677	F	44	N	Y	36541-24	Y	-	-		-	
29-Apr	18678	F	42	N	N	36541-25	Y	-	-		-	
29-Apr	18679	F	39	N	Y	36541-26	Y	-	-		-	
29-Apr	18680	F	54	N	N	36542-5	Y	-	-		-	
29-Apr	18681	F	59	N	Y	36542-6	1	-	8.8	52	-	CM/CRS
29-Apr	18682	F	47	N	Y	36542-7	2,3	-	-		-	
30-Apr	-	-	-	-	-	-	-	1 Sculpin Prickley (dead)	5.2	65	-	MS/RF/KL
1-May	-	-	-	-	-	-	-	-	5.8	55	-	CM/CRS/ WP
1-May	-	-	-	-	-	-	-	-	4.2		-	MS/RF
1-May	-	-	-	-	-	-	-	-	8.7		-	CRS/WP
2-May	18684		18	N	Y	36542-9	1, 2	-	11.4	50	-	CM/JS
3-May	18685	F	47	Y	Y	36542-10	MS Cellphone	1 RT	7.2	49	17	MS/RF
3-May	18686	M	39	Y	Y	36542-11	-	-	-		-	
3-May	-	-	-	-	-	-	-	-	10.9	50	-	CM/CRS
4-May	18688	-	43	N	Y	36542-12	Y	-	7	51	-	MS/RF
4-May	18689	M?	29	N	Y	36542-13	1	-	11	60	-	CRS/WP

4-May	18690	F	36	N	Y	36543-1	2	-	-		-	
4-May	18691	M	40	N	Y	36543-2	3	-	-		-	
4-May	18692	M?	40	N	Y	36543-3	4	-	-		-	
4-May	18693	F	52	N	Y	36543-4	5	-	-		-	
4-May	18694	M	42	N	Y	36543-5	6	-	-		-	
4-May	18695	M	38	N	Y	36543-6	7,8	-	-		-	
4-May	18696	F	39	N	Y	36543-7	9, 10	-	-		-	
5-May	18697	M	37	N	Y	36543-8	Y	-	7.8		-	MS/RF
5-May	-	-	-	-	-	-	-	-	11.2	22	-	CM/CL
6-May	-	-	-	-	-	-	-	-	6.8	high	-	MS/RF
6-May	-	-	-	-	-	-	-	-	10.3	30	-	CRS/CL
7-May	-	-	-	-	-	-	-	-	6.9		-	MS/RF
7-May	18698	M	50	N	Y	36543-9	1	Sucker	8.3	18	-	CRS/CL
7-May	18699	F	37	N	Y	36543-10	2,3	-	-		-	
7-May	18700	F	53	N	Y	36543-11	4	-	-		-	
8-May	18701	M	51	N	Y	36543-12	Y	-	6.1		-	MS/RF
8-May	-	-	-	-	-	-	-	-	7.7	24	-	CRS/CL
9-May	-	-	-	-	-	-	-	-	6.1	24	-	CM/RF/JS
9-May	18702	F	41.5	N	Y	36543-13	1, 2	-	10.3	20	-	CRS/CL
10-May	18703	M?	20.1	N	Y	36543-14	1	-	7.8	25		JS/JP

10-May	18704	F	18.5	N	Y	36543-15	1	-	8.7	22	15	CM/CL
10-May	18705	F	16	N	Y	36543-16	1	-	-		-	
11-May	-	-	-	-	-	-	-	-	7.6	19	12	MS/CT
11-May	18706	F	22	N	Y	36543-17	2	-	7.7	17	-	CL/JS
12-May	18707	F	48	N	Y	36543-18	Y	-	6.6		-	MS/RF
12-May	-	-	-	-	-	-	-	-	10.7	15	-	CL/JS
13-May	18708	-	49	N	Y	36543-19	RF Camera	3 Sucker	8.3	19	15	MS/RF/AS/CT/JP
13-May	-	-	-	-	-	-	-	-	8.4	18	-	CL/JS
14-May	18709	F	43	N	Y	36543-20	Y	-	7.5		16	MS/RF
14-May	-	-	-	-	-	-	-	-	9.3	24	-	CM/CL
15-May	18710	F	38	N	Y	36543-23	Y	6 Suckers	8.7		-	MS/RF