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Cc: Smith, Michelle; Sokolowski, Rosana
Subject: 2012 Canada goose nest survey summary

Rocky Reach Wildlife Forum Members,

Please find attached the annual survey summary for the Canada goose nest monitoring effort along Rocky Reach and Rock Island reservoirs. The report is required to be submitted to the RRWF annually by July 31.

Bald eagle nest surveys for the 2012 season are currently under way. The 2012 nesting activity report is due to the RRWF by Sept. 30 2012 following conclusion of the nesting season.

Wishing you all a safe and successful field season.



Goose Nesting
ummary 2012.pdf.

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Goose Nesting along Rock Island and Rocky Reach Reservoirs in 2012



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Introduction

The Chelan County PUD monitors Great Basin Canada goose (*Branta canadensis ssp. moffittii*) nests each spring along Rock Island Reservoir on the Columbia River in compliance with Federal Energy Regulatory (FERC) requirements. Monitoring along Rocky Reach Reservoir was initiated as mitigation for a proposed pool rise which was never implemented. Monitoring Canada goose nesting along Rocky Reach continues as requested by the Rocky Reach Wildlife Forum under the new license. Monitoring began on Rock Island in 1975 as part of a proposed pool rise that was approved by the FERC. Monitoring along Rocky Reach began in 1982. Nests initiated both on natural substrates and in man-made structures are monitored. Chelan PUD provides and or maintains the man-made nesting structures for Canada geese along both reservoirs.

This annual report summarizes goose nesting along Rock Island and Rocky Reach reservoirs for the 2012 nesting season. This report also compares the 2012 goose nesting season with previous seasons.

Study Area

Present

The project area is located along the Columbia River in North-central Washington State. The surveys take place along the Rock Island and Rocky Reach reservoirs from river miles 453.6 to 509.8. Chelan and Douglas counties border the west and east sides of the reservoirs, respectively. Steep cobble and dirt banks comprise much of the reservoir shoreline. Shrub steppe vegetation, fruit orchards, parks, residential, and industrial areas occupy areas up-slope from the riparian edge of the river. Geese prefer to nest on small islands in the reservoirs, blending in with the rocks and low vegetation. The small islands are highly preferred over the shoreline for nesting, because they offer increased protection from predators and good visibility of the surroundings. When threatened, the geese can escape to the safety of the water, where few predators can attack them.

The vegetative cover of the islands is characterized by the shrub steppe habitat that covers most of central Washington. Shrub steppe vegetation is dominated by big sagebrush (*Artemisia tridentata*), rabbitbrush (*Chrysothamnus spp.*), and bluebunch wheatgrass (*Pseudoroegneria spicata*).

Chelan PUD provides man-made nest structures (nest tubs) along Rock Island and Rocky Reach reservoirs for Canada goose nesting. The Exhibit S for Rock Island Dam commits Chelan PUD to maintain a minimum of 11 nest structures along Rock Island Reservoir. In 1989, Chelan PUD erected 15 nest structures along Rocky Reach Reservoir to off-set expected losses from a proposed 3-foot pool rise. Washington Department of Fish and Wildlife (WDFW) erected several goose nest structures along Rocky Reach Reservoir in the early 1980's, of which Chelan PUD currently monitors. As of the beginning of the 2012 nesting season, there were 13 goose nest tubs along Rock Island Reservoir and 20 tubs along Rocky Reach Reservoir.

Historically

During the winter of 1996-97, the portion of the Columbia River between Rock Island Dam and Winesap (Oklahoma Gulch) was opened to Canada goose hunting. Prior to that winter, goose hunting had been closed within 1/4 mile of that portion of the Columbia River. The liberalized goose hunting boundaries

were in response to public requests to reduce goose numbers in parks and golf courses. The subspecies of goose that nests in this area is largely non-migratory. Increased fall and winter goose hunting along the Columbia River in the Wenatchee area likely harvests a large proportion of resident geese. This may result in less nesting geese along the reservoirs the following spring.

Continued development of properties along the Columbia River in the Wenatchee area has introduced hunting closures along the Douglas County side of Rock Island Reservoir between Highway bridges 2 and 28. As the area continues to grow, further restrictions on waterfowl hunting may be imposed, potentially reducing the effect of hunting on local goose populations. With considerable development along the Chelan County shoreline, waterfowl hunting opportunities are very limited along this stretch of Rock Island Reservoir.

Methods

Man-made Nests

Chelan PUD maintains and monitors man-made elevated goose nesting structures (nest tubs) along Rock Island (n = 13) and Rocky Reach reservoirs (n=20). The nest tubs consist of either: pre-fabricated fiberglass tubs or tire tubs on elevated platforms. The pre-fabricated fiberglass tubs are mounted on metal poles with concrete footings and situated on small islands along the reservoirs. Tire tubs are constructed by using old vehicle tires and bolting them to a triangular-shaped platform elevated by metal legs. Some of the metal support legs are encased in PVC pipe to further deter mammalian predators from climbing into the structures. Additionally, rock rings or driftwood “blinds” are assembled from materials on-site and provide enhanced bowls for geese to nest in but are not counted as man-made elevated nest platforms, as these are only on-site enhancements to natural nest sites. Prior to nesting season, field crews prepared the nest tubs with fresh straw as a nesting substrate. Necessary repairs or modifications to the structures are also done during the pre-season preparations.

Geese prefer to nest in close proximity to water and where they can readily escape from potential dangers. Geese practice site fidelity, i.e., they nest in the same locations year after year. Many of these well-used natural ground nests are marked with flagging or numbers on nearby rocks (for identification purposes) from past years. Domestic goose nests were removed from the data set prior to analysis.

Surveys

Chelan PUD generally begins nest surveys in late March. In 2012, the surveys for Rock Island and Rocky Reach reservoirs began on 26 March and 27 March, respectively.

Chelan PUD biologists conducted surveys along each reservoir four to five times during the 2012 nesting season, depending on the duration of nesting activity. Generally, each nest was visited an average of 3 times per season—one visit during initiation, confirmation of incubation, and following hatch. During our surveys, we determined the location and number of nests encountered, number of eggs laid, and the fate of each nest attempt (including causes of predation and other unsuccessful nesting attempts). Nests were documented if they had at least one egg in them. Successful nests were those from which at least one egg hatched and at least one gosling left the nest.

Results and Discussion

Along Rock Island Reservoir, Canada geese initiated 84 nests. All nests were monitored to determine fate with the exception of 1 nest in the Rock Island forebay. High flows related to run-off created an unsafe condition within the Rock Island Dam Forebay. Flows had not subsided by the writing of this report. A second nest was initiated by a domestic goose. Both of these nests were removed from the data set for further analysis.

A total of 434 eggs were laid in the 82 remaining nests. Sixty-three nests (77%) were successful in producing goslings. The eggs had a hatch rate of 73%, with 317 eggs hatching. Five nests containing 29 eggs were attempted in available goose tubs maintained by the Chelan PUD. All five of those nests were successful in producing goslings ($n = 25$). By comparison, 59 of 78 (76%) natural nests along the reservoir fledged goslings. Of the 405 eggs laid in natural nests, 292 (72%) hatched. The average clutch size for all goose nests in 2012 (calculated from successful nests only) was 5.25 eggs/nest. The average number of goslings fledged per nest (calculated from successful nests only) was 4.61 goslings/nest.

Along Rocky Reach Reservoir, geese attempted 70 nests. However, 1 nest was initiated by a Canada-domestic hybrid goose. The nest was successful, fledging 5 goslings out of 6 eggs. This nest was removed from the data set prior to analysis. Out of the 69 remaining Canada goose nests, 51 of those nests (74%) were successful. A total of 369 eggs were laid in the 69 nests. The eggs had a hatch rate of 76%, with 280 goslings fledged. Twenty nests containing 111 eggs were attempted in goose tubs provided by Chelan PUD. Fifteen of those nests (75%) were successful in producing goslings ($n = 83$). Five nests in goose tubs were unsuccessful. Three of the nests were destroyed by avian predators, and 1 additional nest was destroyed by a mammal. In 1 other nest tub, eggs were laid and incubated through most of the season, but were abandoned for unknown reasons. The nest was later found to have contained infertile eggs. By comparison, of 49 natural nests along the reservoir, 36 (73%) fledged goslings. Of the 258 eggs laid in natural nests, 197 (76%) fledged from the nests. The average clutch size was 5.65 eggs/nest.

Unsuccessful Nests

Rock Island Reservoir had a total of 18 failed Canada goose nests along the Reservoir in 2012. All of these failed nests were located on natural substrates. Ten of the nest failures were attributed to abandonment for unknown reasons. These abandoned nests did not exhibit signs of predation, such as broken eggs or adult carcasses in the vicinity.

The long, cold spring may have attributed to the failure of some of the clutches. One additional nest was found with all 7 goslings dead in the nest. The adults may have been pushed off the nest sometime around hatching and the goslings became hypothermic. An additional 7 nests failed due to destruction by either mammalian or avian predators.

Rocky Reach Reservoir had 18 instances of failed Canada goose nests in 2012. Of these nests that failed, 13 were located on natural substrates and 5 were located in nest tubs. Sixteen nests were documented as being destroyed by mammalian or avian predators and 2 additional nests were abandoned for unknown reasons. Nests along both reservoirs suffered some loss of eggs to avian or

mammalian predation and infertile or dead eggs but were able to successfully hatch goslings following the partial loss of eggs.

No Canada goose nest failures or partial losses were attributed to flooding by high water in 2012. However, one domestic goose nest was flooded along Rock Island Reservoir. Abundant snowpack and cool, wet conditions such as those observed during 2011 brought Columbia River flows near levels not observed since 1997. Peak flows did not occur until the last week of June. The majority of goose nests along both reservoirs had fledged by mid-June.

Program Summary

Goose nesting along Rock Island Reservoir has produced an annual average of 355 goslings. In 2012, 317 goslings fledged. Slightly fewer nests were initiated in 2012 compared to the average. However, it was the highest number of nests initiated along the reservoir since 2001. The average clutch size for 2012 was slightly less than the post-reservoir rise average, as was the percent of nest success (Table 1). The increase in the number of nests initiated seems to be a result of more nests initiated in the Rock Island Forebay at Rock Island. The islands in the forebay account for a majority of the nests along the Reservoir. From 1990 – 1999, the average number of nests initiated on the islands in the forebay averaged 58.4. From 2000 – 2009, that average has dropped to 25.3. The reason for this decline is unknown but may be related to the increased amount of riparian vegetation that now occurs on these islands. Thus far, from 2010 – 2012, the average number of nests initiated is 36. The long-term average (following the pool rise prior to the 1978 nesting season) is 37.2 nests on the islands in the Rock Island forebay.

The percent of successful nests (74%) for 2012 along Rocky Reach Reservoir was above average. The average success rate from 1983-2012 is 68%. Clutch size at 5.7 for 2012 is below the average of 6.1 (Table 2). Rocky Reach Reservoir had a higher than average number of fledged goslings (n = 280).

There has been an increase in mammalian predators such as mink and raccoon on both reservoirs since 2000, when a Washington State voter initiative was passed that greatly restricted furbearer trapping techniques. Common ravens have been observed nesting on cliffs along the reservoirs, and may account for some of the destroyed nests and eggs, especially eggs predated from man-made structures that are difficult for mammalian predators to access.

Porter's Pond Island has had a number of predation events during the last few years. This island is larger than most preferred by Canada geese for nesting. The large surface area in combination with many goose nests has in the past, allowed predators to destroy the majority of nests on the island. During the 2012 season, only 1 nest on Porter's Pond Island in the Rock Island Reservoir was destroyed by predators. Additionally, two other nests on this island lost eggs to predators and were subsequently abandoned. During 2011, no predation events on Canada goose nests were recorded on the island. During 2010, all 4 goose nests on Porter's Pond were destroyed by avian predators. During 2009, American crows destroyed 6 of 7 Canada goose nests there and during the previous nesting season, 7 of 10 nests were destroyed by crows. From 2001 – 2012, Canada geese have initiated an average of 8.8 nests annually on Porter's Pond Island.

Along Rock Island Reservoir, nests in man-made structures were less successful than natural nests, with a success rate of 63% (compared with 90% for the natural nests). Man-made nests along Rocky Reach Reservoir were slightly more successful than natural nests. Of 3 failed nests in man-made structures along Rocky Reach Reservoir, 2 were abandoned for unknown reasons and 1 was found to

contain un-hatched eggs. An unusually wet and cold spring for 2011 may have contributed to nest failures.

One instance of a nesting domestic goose was documented along Rock Island Reservoir. The nest contained 2 eggs and was later found to have been destroyed by high water. Although many apparent “hybrid” geese (Canada x domestic cross) were observed along Rocky Reach Reservoir, only 1 was found to be nesting. These “hybrid” geese were seen most frequently in an area approximately 2 - 3 miles upstream from Turtle Rock Island.

Banded and Collared Geese

From 2009 - 2012 WDFW banded Canada geese during the molt period, when most geese are nearly flightless. Birds were banded at two locations in the Wenatchee Valley; being Rock Island Golf Course and Wenatchee Confluence State Park or Walla Walla Park. During the 2009 effort, adult birds were marked with both leg bands and numbered PVC neck collars. Hatch-year birds were marked with leg bands only. During similar efforts in 2010 - 2012, only leg bands were used to mark both adults and juvenile birds.

During Chelan PUD goose nest surveys in 2012, many of these banded geese were seen at nest sites along Rock Island Reservoir. At least one collared goose nested on the large island in the Rock Island dam forebay, although many more were observed. However, it was unknown if they were nesting on the island or simply travelling with family groups, as the geese flushed upon our entry to the island making it impossible to read digits on neck collars or observe presence of leg bands. Additionally, of 11 nests located on Porter’s Pond Island, 9 were tended to by at least 1 adult with a leg band. Three of those nests were observed with both adults being leg-banded.

Interspecific Nest Competition

Canada geese initiating nests in existing osprey nests were documented on 2 occasions in 2005, 5 times in 2006, 6 times in 2007, 9 times in 2008, 6 times in 2009, 4 times in both 2010 and 2011, and 2 times in 2012. Canada geese begin nesting prior to the arrival of osprey in North-central Washington. When displaced from traditional nesting sites, ospreys have the tendency to build new nest structures nearby, frequently atop distribution and transmission line structures. Some structure configurations are not compatible with osprey nests and are at risk for power outages, pole fires, and are hazardous to the osprey and potential young. Current osprey nests are maintained so as to ensure the nests and structures are compatible.

In early 2009, Chelan County PUD experimented with covering of osprey nest platforms to deter geese from initiating nests. Of the 3 platforms that were covered, none were occupied by Canada geese. Covers were removed prior to return of osprey to territories. Following removal of the nest covers, all 3 of nests were occupied by breeding osprey. During early 2010 and 2011, 4 nests were covered to deter Canada geese from nesting in managed osprey nests. Following removal of the covers, osprey returned to each of these sites. In 2012, 5 nest covers were deployed. The covers prevented goose initiation in 4 osprey nests, but one was initiated at the Goodwin Bridge site, displacing the osprey from the nest platform. To avoid future potential conflict between nesting Canada geese and osprey, Chelan PUD may manage nests on a case-by-case basis to avoid displaced osprey and reduce risks to system reliability.

Acknowledgements

This project is conducted by the Public Utility District No. 1 of Chelan County in part to fulfill dam license requirements for Rock Island and Rocky Reach. Kelly Cordell-Stine, Eric Degman, and Michael Shermer prepared nesting tubs for the season and conducted nest surveys along the reservoirs.

Table 1. Canada goose nesting along Rock Island Reservoir.

Year	# of initiated nests	Avg. clutch size	% successful nests	# successful nests	# Goslings fledged
1975	38	5.8	64%	24	139
1976	48	5.4	79%	38	205
1977	46	5.5	72%	33	172
<i>*6.1 foot reservoir rise was prior to the 1978 nesting season</i>					
1978	41	5.9	88%	36	188
1979	38	5.5	89%	34	184
1980	41	5.5	90%	37	179
1981	48	5.5	73%	35	199
1982	51	5.5	88%	45	245
1983	67	6.0	78%	52	257
1984	67	6.3	81%	54	306
1985	62	5.7	77%	48	267
1986	72	5.8	76%	55	305
1987	90	6.1	83%	75	417
1988	102	5.9	80%	82	416
1989	99	5.8	77%	76	407
1990	110	5.9	79%	85	432
1991	134	5.9	84%	105	569
1992	150	5.7	82%	117	627
1993	143	5.6	79%	110	577
1994	146	5.6	84%	122	635
1996	178	5.3	76%	136	707
1997	110	5.9	80%	88	457
1998	81	5.9	84%	68	377
1999	79	5.9	84%	66	379
2000	77	5.8	81%	62	340
2001	84	5.7	75%	63	346
2002	75	5.4	77%	58	297
2003	73	5.9	79%	58	328
2004	63	5.7	89%	56	309
2005	66	5.8	76%	50	286
2006	63	6.1	79%	50	264
2007	65	5.9	86%	56	315
2008	63	6.9	81%	51	292
2009	63	5.8	68%	43	240
2010	62	5.8	82%	51	267
2011	78	5.6	87%	68	351
2012	82	5.3	73%	63	317

Post-reservoir rise Avg. 83 5.8 81% 66 355

Table 2. Canada goose nesting along Rocky Reach Reservoir.

Year	# of initiated nests	Avg. clutch size	% successful nests	# successful nests	# Goslings fledged
1983	44	6.2	48%	21	110
1984	33	7.3	39%	13	76
1985	30	6.0	40%	12	66
1986	35	5.6	60%	21	118
1987	47	6.4	66%	31	183
1988	52	6.4	62%	32	190
1989	58	6.0	62%	36	225
1990	61	6.8	54%	32	191
1991	73	6.4	58%	39	225
1992	80	6.7	59%	47	268
1993	67	6.4	63%	40	256
1994	58	6.1	67%	39	214
1995	75	6.3	69%	52	284
1996	75	6.1	69%	52	280
1997	60	6.2	75%	45	261
1998	47	6.0	77%	36	203
1999	39	6.1	79%	31	182
2000	52	5.9	67%	35	195
2001	47	6.3	85%	40	225
2002	45	6.0	84%	38	215
2003	53	6.4	77%	41	238
2004	58	6.2	69%	40	229
2005	54	5.2	89%	48	247
2006	57	6.0	79%	41	222
2007	45	6.2	96%	43	244
2008	45	6.9	80%	36	204
2009	44	5.1	61%	27	126
2010	49	6.0	67%	33	180
2011	59	5.5	75%	44	214
2012	69	5.7	74%	51	280
Average:	54	6.1	68%	37	205