

Grand Rapids Fish Hatchery

2016/17 Annual Report



Prepared by Manitoba Hydro

Walleye – Vermillion River (2016 year-class)

Adult Walleye were collected in Vermillion River by local field crews in spring 2016. An estimated 409,350 eggs were collected from 16 females and fertilized with the milt of 19 males on May 18, 2016 (Table 1). Eggs were sent to Grand Rapids Fish Hatchery (GRFH) on the same day and surface disinfected on arrival to GRFH. Eggs were incubated in well water to reduce the risk of exposing fish to pathogens (e.g., virus). An estimated 231,080 fry hatched (56.5%; Table 1) from May 30 to June 6 and were released at the mouth of Vermillion River on June 7. Fry were marked with oxytetracycline (OTC) prior to release.

Table 1. Estimated number of eggs collected and fry hatched from Vermillion River Walleye in 2016

Location	Fertilization Date	# Females Spawned	# Males Spawned	Jar Label	Green Eggs		Eyed Eggs		Estimated Hatch (%)
					Quantity of Eggs (L)	Estimated Total	Quantity of Eggs (L)	Estimated Total	
Vermillion River	18-May-16	16	19	V1	0.950	187,150	0.675	123,998	66.3
				V2	1.100	222,200	0.725	107,083	48.2
						409,350		231,080	56.5



Photo 1. Capturing Walleye broodstock and collecting Walleye eggs on the Vermillion River, MB.

Walleye – Saskatchewan River (2016 year-class)

Adult Walleye were collected in the Grand Rapids Generating Station tailrace (Saskatchewan River) in spring 2016 by North South Consultants and held in outdoor tanks at GRFH. A total of 171,625 eggs from 2 females were fertilized with the milt of 9 males on June 20 & 21 (Table 2). Eggs were surface disinfected following fertilization and incubated in well water. An estimated 155,693 fry hatched (90.7%; Table 2) from June 2 to 8 and were released back into the Saskatchewan River at Lovers Point Boat Launch on June 8 & 10. Fry were marked with OTC prior to release.

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Table 2. Estimated number of eggs collected and fry hatched from Saskatchewan River Walleye in 2016

Location	Fertilization Date	# Females Spawned	# Males Spawned	Jar Label	Green Eggs		Eyed Eggs		Estimated Hatch (%)
					Quantity of Eggs (L)	Estimated Total	Quantity of Eggs (L)	Estimated Total	
Sask River	20-May-16	1	3	S1	0.375	73,125	0.390	62,400	85.3
Sask River	21-May-16	1	6	S2	0.500	98,500	0.525	93,293	94.7
						171,625		155,693	90.7



Photo 2. Electrofishing for Walleye broodstock downstream of the Grand Rapids Generating Station, and holding Saskatchewan River Walleye broodstock at the Grand Rapids Fish Hatchery.

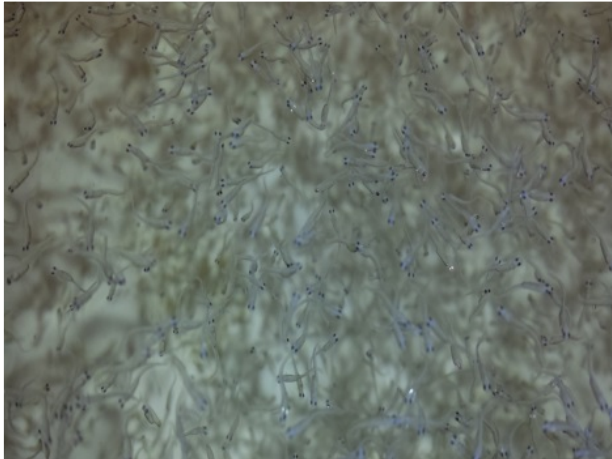


Photo 3. Larval Walleye at Grand Rapids Fish Hatchery; stocking larval Walleye into the Saskatchewan River at Grand Rapids.

Lake Sturgeon – Landing River (2015 year-class)

A total of 1,294 fingerlings were kept at GRFH over the 2015/16 winter. Sturgeon were maintained on well water to reduce the risk of exposing fish to pathogens (e.g., virus) which could be present in river water. Overwinter survival in the hatchery was over 95% (Table 3). Sturgeon were implanted with a passive integrated transponder (PIT) tag prior to release.

Table 3. Monthly survival (%), transfers and releases for Landing River sturgeon (2015 year-class) at GRFH. Adjustments following fish counts were included when discrepancies with data records occurred.

LOT	Families	Month-Year	Start of Month	Recount Adjustment	# Fish Removed			End of Month	Monthly Survival
					Mortality	Transfer	Release		
LKST-LR-15	8 - 2Fx4M	Oct-15	5,103	-68	20 ^a	10 ^b	3,711	1,294	99.8
LKST-LR-15	8 - 2Fx4M	Nov-15	1,294	0	0	0	0	1,294	100.0
LKST-LR-15	8 - 2Fx4M	Dec-15	1,294	0	3	0	0	1,291	99.8
LKST-LR-15	8 - 2Fx4M	Jan-16	1,291	0	5	0	0	1,286	99.6
LKST-LR-15	8 - 2Fx4M	Feb-16	1,286	-1	4	0	0	1,281	99.7
LKST-LR-15	8 - 2Fx4M	Mar-16	1,281	-2	3	0	0	1,276	99.6 to 99.8
LKST-LR-15	8 - 2Fx4M	Apr-16	1,276	0	6	0	0	1,270	99.5
LKST-LR-15	8 - 2Fx4M	May-16	1,270	0	0	0	1,270	0	100.0
Total (LR-15)			5,103	-71	41	10	4,981	0	97.8 to 99.2

^a 8 euthanized and sent for virus testing

^b 4 sent to The Pas aquarium; 6 sent to Winnipeg (360 Portage) aquarium

In May 2016 a total of 1,270 Landing River yearlings (2015 year-class) were released from shore into Pipestone Lake (n = 447), Sea Falls (n = 408) and Little Playgreen Lake (n = 415; Table 4). Spring yearlings had an average total length of 271 mm (range: 128 to 339 mm) and an average weight of 74.4 g (range: 9.1 to 145.0 g).

Table 4. Stocking dates and locations for Landing River sturgeon (2015 year-class) in 2016

Lake Sturgeon			Stocking			
Facility	Lot ID	Family	Date	Number	Age (months)	Site Description
GRFH	LKST-LR-15	F1xM2/M4	17-May-16	105	11	Pipestone Lake (Cross Lake Bridge)
GRFH	LKST-LR-15	F1xM3/M5	17-May-16	104	11	Pipestone Lake (Cross Lake Bridge)
GRFH	LKST-LR-15	F2xM2/M4	17-May-16	119	11	Pipestone Lake (Cross Lake Bridge)
GRFH	LKST-LR-15	F2xM3/M5	17-May-16	119	11	Pipestone Lake (Cross Lake Bridge)
Pipestone Lake (Yearlings) = 447						
GRFH	LKST-LR-15	F1xM2/M4	19-May-16	101	11	Sea Falls
GRFH	LKST-LR-15	F1xM3/M5	19-May-16	102	11	Sea Falls
GRFH	LKST-LR-15	F2xM2/M4	19-May-16	105	11	Sea Falls
GRFH	LKST-LR-15	F2xM3/M5	19-May-16	100	11	Sea Falls
Sea Falls (Yearlings) = 408						
GRFH	LKST-LR-15	F1xM2/M4	24-May-16	108	11	L. Playgreen Lake (Norway House Landing)
GRFH	LKST-LR-15	F1xM3/M5	24-May-16	109	11	L. Playgreen Lake (Norway House Landing)
GRFH	LKST-LR-15	F2xM2/M4	24-May-16	101	11	L. Playgreen Lake (Norway House Landing)
GRFH	LKST-LR-15	F2xM3/M5	24-May-16	97	11	L. Playgreen Lake (Norway House Landing)
Little Playgreen Lake (Yearlings) = 415						

Lake Sturgeon – Burntwood River (2015 year-class)

A total of 23 fall fingerlings were kept at GRFH over the 2015/16 winter. Fish were maintained on well water to reduce the risk of exposing them to pathogens (e.g., virus). Overwinter survival in the hatchery was 100% (Table 5). Sturgeon were implanted with a PIT tag prior to release.

Table 5. Monthly survival (%), transfers and releases for Burntwood River sturgeon (2015 year-class) at GRFH. Adjustments following fish counts were included when discrepancies with data records occurred.

LOT	Families	Month-Year	Start of Month Total	Recount Adjustment	# Fish Removed			End of Month Total	Monthly Survival (%)
					Mortality	Transfer	Release		
LKST-BWR-15	3 - 1Fx3M	Oct-15	23	0	0	0	0	23	100.0
LKST-BWR-15	3 - 1Fx3M	Nov-15	23	0	0	0	0	23	100.0
LKST-BWR-15	3 - 1Fx3M	Dec-15	23	0	0	0	0	23	100.0
LKST-BWR-15	3 - 1Fx3M	Jan-16	23	0	0	0	0	23	100.0
LKST-BWR-15	3 - 1Fx3M	Feb-16	23	0	0	0	0	23	100.0
LKST-BWR-15	3 - 1Fx3M	Mar-16	23	0	0	0	0	23	100.0
LKST-BWR-15	3 - 1Fx3M	Apr-16	23	0	0	0	0	23	100.0
LKST-BWR-15	3 - 1Fx3M	May-16	23	0	0	0	23	0	100.0
TOTAL (BWR-15)			23	0	0	0	23	0	100.0

On May 31, 2016 all 23 Burntwood River yearlings (2015 year-class) were released back into the Burntwood River (Table 6). Manitoba Hydro boat patrol crews assisted with the release of 20 sturgeon. The remaining 3 sturgeon were stocked from shore during a ceremonial release. Spring yearlings had an average total length of 318 mm (range: 267 to 376 mm) and an average weight of 148.1 g (range: 87.5 to 204.5 g).

Table 6. Stocking dates and locations for Burntwood River sturgeon (2015 year-class) in 2016

Lake Sturgeon			Stocking			
Facility	Lot ID	Family	Date	Number	Age (months)	Stocking Location
GRFH	LKST-BWR-15	F1xM1/3/4	31-May-16	20	12	Burntwood River; Downstream of First Rapids
GRFH	LKST-BWR-15	F1xM1/3/4	31-May-16	3	12	Burntwood River; Orr Creek Boat Launch
Burntwood River (Yearlings) = 23						



Photo 4. Lake Sturgeon yearlings at the Grand Rapids Fish Hatchery; implanting a yearling Lake Sturgeon with a PIT tag; Trailer used to transport Lake Sturgeon from Grand Rapids Fish Hatchery to stocking locations.

Lake Sturgeon – Landing River (2016 year-class)

Spawning adult Lake Sturgeon were collected in the Nelson River (near Landing River) by Nelson River Sturgeon Board field staff. To help synchronize egg and milt collection, adults were injected with a Gonadotropin Releasing Hormone (GnRH; Product No. H-4070, Bachem Americas, Inc., Torrance, CA, USA; Table 7). Eggs from 2 females were mixed with the milt of 3 males on May 27, 2016 to create 6 family groups. An estimated 167,570 eggs were brought back to GRFH (Table 8) and disinfected with Ovadine (Syndel Canada, Nanaimo, BC) for 10 minutes at 100 ppm.



Photo 5. Landing River spawn camp; pools where broodstock are held; capturing Lake Sturgeon broodstock at Landing River; fertilizing Lake Sturgeon eggs.

A small amount of unfertilized eggs (F1 = 300 ml, F2 = 300 ml) were transported to GRFH for the University of Manitoba. Eggs were fertilized in the Research Building and placed in a multi-stressor unit for the duration of the study. Only eggs from F1 were used in the experiment. The eggs from F2 were discarded because they looked bad. Eggs were not surface disinfected following fertilization. Sturgeon held in the Research Building are not included in GRFH's overall hatch and survival estimates.

Hatch at GRFH occurred from June 5 to 8, 2016. Overall hatch was estimated to be 36% (F1 = 51%; F2 = 19%) resulting in an estimated 60,608 larvae (Table 8). Overall survival was 70% from hatch to the end of February, 2017. Mortality was highest during the first two months post-hatch. Mortalities are common during the onset of feeding when brine shrimp is first offered and during the diet transition from brine shrimp to bloodworm. Overwinter survival has been nearly 100% (Table 9).

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Table 7. Landing River broodstock information and hormone use in 2016

Population	M/F	Floy Tag ID	Hatchery ID	Weight (Kg)	Injection Date	Injection Time	GnRH (µg/Kg)	Solution		
								GnRH (µl) ^a	Ringer's (µl) ^b	Total (µl)
Landing River	Female	NE 01313	F1	28.1	25-May	19:24	3	8.5	555.5	564
					26-May	07:07	13	36.7	527.3	564
Landing River	Female	NE 00106	F2	28.1	25-May	19:22	3	8.5	555.5	564
					26-May	07:05	13	36.7	527.3	564
Landing River	Male	NE 04680	M1 ^c	10.0	25-May	19:30	1.5	1.5	198.5	200
					26-May	07:10	6.5	6.5	193.5	200
Landing River	Male	NE 04683	M2 ^c	11.8	25-May	19:26	1.5	1.8	234.2	236
					26-May	07:13	6.5	7.7	228.3	236
Landing River	Male	NE 00902	M3	9.5	25-May	19:28	1.5	1.4	188.6	190
					26-May	07:12	6.5	6.2	183.8	190
Landing River	Male	NE 01742	M4	7.3	25-May	19:28	1.5	1.1	144.9	146
					26-May	07:14	6.5	4.7	141.3	146
Landing River	Male	NE 04243	M5	17.2	25-May	19:29	1.5	2.6	343.4	346
					26-May	07:09	6.5	11.2	334.8	346

^a GnRH solution = 10µg GnRH per µl

^b Saline solution used to transport GnRH into fish muscle during injections

^c No milt at time of fertilization; male not used in 2016 program

Table 8. Estimated number of eggs collected and larvae hatched for Landing River sturgeon (2016 year-class)

Population	Fertilization Date	Family	Jar Label	Quantity of Eggs (L)	Estimated # Eggs	Estimated Fertilization (%)	Estimated # Larvae
Landing River	27-May	F1 x M3	LR-F1xM3-1	0.450	15,435	54	8,335
Landing River	27-May	F1 x M3	LR-F1xM3-2	0.450	15,435	53	8,181
				Total (F1xM3)	30,870	53	16,515
Landing River	27-May	F1 x M4	LR-F1xM4-1	0.400	15,600	49	7,644
Landing River	27-May	F1 x M4	LR-F1xM4-2	0.400	15,600	49	7,644
				Total (F1xM4)	31,200	49	15,288
Landing River	27-May	F1 x M5	LR-F1xM5-1	0.425	13,473	51	6,871
Landing River	27-May	F1 x M5	LR-F1xM5-2	0.425	13,473	51	6,871
				Total (F1xM5)	26,945	51	13,742
				Total (F1)	89,015	51	45,545
Landing River	27-May	F2 x M5	LR-F2xM5-1	0.225	8,775	19	1,667
Landing River	27-May	F2 x M5	LR-F2xM5-2	0.225	8,775	19	1,667
				Total (F2xM5)	17,550	19	3335^a
Landing River	27-May	F2 x M3	LR-F2xM3-1	0.425	17,553	31	5,441
Landing River	27-May	F2 x M3	LR-F2xM3-2	0.425	17,553	31	5,441
				Total (F2xM3)	35,105	31	10,883
Landing River	27-May	F2 x M4	LR-F2xM4-1	0.350	12,950	34	4,403
Landing River	27-May	F2 x M4	LR-F2xM4-2	0.350	12,950	34	4,403
				Total (F2xM4)	25,900	34	8,806^b
				Total (F2)	78,555	19^c	15,063^c
				Overall Total	167,570	36^c	60,608^c

^a Actual number = 2,193 larvae

^b Actual number = 1,987 larvae

^c Number based on actual larvae counts from F2xM5 and F2xM4

Table 9. Monthly survival for Landing River sturgeon (2016 year-class)

LOT	Families	Month-Year	Start of Month Total	Recount Adjustment	# Fish Removed			End of Month Total	Monthly Survival (%)
					Mortality	Transfer	Release		
LKST-LR-16	6 - 2Fx3M	Jun-16	60,608	0	16,943	6,330 ^c	30,143	7,192	72.0
LKST-LR-16	6 - 2Fx3M	Jul-16	7,192	0	800	10 ^d	0	6,382	88.9
LKST-LR-16	6 - 2Fx3M	Aug-16	6,382	-88	58	4,284 ^e	0	1,952	97.7 to 99.1
LKST-LR-16	6 - 2Fx3M	Sep-16	1,952	0	10	10 ^d	0	1,932	99.5
LKST-LR-16	6 - 2Fx3M	Oct-16	1,932	0	0	14 ^f	1,099	819	100.0
LKST-LR-16	6 - 2Fx3M	Nov-16	819	0	0	10 ^d	0	809	100.0
LKST-LR-16	6 - 2Fx3M	Dec-16	809	0	0	10 ^d	0	799	100.0
LKST-LR-16	6 - 2Fx3M	Jan-17	799	0	1	0	0	798	99.9
LKST-LR-16	6 - 2Fx3M	Feb-17	798	0	2	10 ^d	0	786	99.7
Total (LR-16)			60,608	-88	17,814	10,678	31,242	786	70.5 to 70.6

^c 60 euthanized and sent for virus testing; 6,270 for UofM study

^d Euthanized for UofM study

^e 10 euthanized for UofM study; 4,274 sent to Jenpeg Grow-out Facility

^f 10 euthanized for UofM study; 4 sent to Winnipeg (360 Portage) aquarium

A number of Landing River sturgeon were transported to other facilities in 2016 (Table 9). A total of 6,270 Landing River larvae were set aside for Dr. Gary Anderson (University of Manitoba). Some mortality occurred prior to transport. On June 27, 2016 a total of 5,850 larvae were transferred to the University of Manitoba. On August 11, 2016 a total of 4,274 small fingerlings were transferred to the Jenpeg Grow-out Facility, operated by the Nelson River Sturgeon Board.



Photo 6. Jenpeg Grow-out Facility.

On June 30, 2016 a total of 30,143 larvae were released with assistance from Manitoba Hydro boat patrol crews into the Nelson River at a location downstream of the Jenpeg Generating Station (Table 10). On October 6, 2016 a total of 1,099 fall fingerlings were released from shore into Pipestone Lake at the Kichi Sipi Bridge (Table 10). Fingerlings had an average total length of 116 mm (range: 90 to 150 mm) and an average weight of 5.7 g (range: 2.5 to 11.4 g).

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Jenpeg Grow-out Facility released approximately 4,200 fall fingerlings into the upper Nelson River. Fingerlings had an average total length of 135 mm (range: 110 to 150 mm) and an average weight of 9.5 g (range: 5.9 to 12.3 g). Manitoba Sustainable Development field staff released approximately half of the fingerlings by boat into Kiskittogisu Lake near Whiskey Jack Landing. The other half was released from shore into Little Playgreen Lake (Norway House Landing).

A total of 819 fingerlings were kept overwinter in the Hatchery Building to be stocked as yearlings in 2017. Some sturgeon were held in the Research Building overwinter for the University of Manitoba. Study fish will be euthanized and sampled in March 2017.

Table 10. Stocking dates and locations for Landing River sturgeon (2016 year-class) in 2016

Lake Sturgeon			Stocking			
Facility	Lot ID	Family	Date	Number	Age (months)	Site Description
GRFH	LKST-LR-16	F1xM3	30-Jun-16	8,727	0	Jenpeg (Downstream of Gen. Station)
GRFH	LKST-LR-16	F1xM4	30-Jun-16	8,839	0	Jenpeg (Downstream of Gen. Station)
GRFH	LKST-LR-16	F1xM5	30-Jun-16	6,043	0	Jenpeg (Downstream of Gen. Station)
GRFH	LKST-LR-16	F2xM3	30-Jun-16	6,534	0	Jenpeg (Downstream of Gen. Station)
Jenpeg (Larvae) = 30,143						
GRFH	LKST-LR-16	F1xM3	6-Oct-16	220	4	Pipestone Lake (Kichi Sipi Bridge)
GRFH	LKST-LR-16	F1xM4	6-Oct-16	222	4	Pipestone Lake (Kichi Sipi Bridge)
GRFH	LKST-LR-16	F1xM5	6-Oct-16	191	4	Pipestone Lake (Kichi Sipi Bridge)
GRFH	LKST-LR-16	F2xM3	6-Oct-16	201	4	Pipestone Lake (Kichi Sipi Bridge)
GRFH	LKST-LR-16	F2xM4	6-Oct-16	42	4	Pipestone Lake (Kichi Sipi Bridge)
GRFH	LKST-LR-16	F2xM5	6-Oct-16	223	4	Pipestone Lake (Kichi Sipi Bridge)
Pipestone Lake (Fingerlings) = 1,099						
Jenpeg	LKST-LR-16	F1xM3/4/5; F2xM3/5	14-Oct-16	2,100	4	Kiskittogisu Lake (near Whiskey Jack Landing)
Kiskittogisu Lake (Fingerlings) = 2,100^a						
Jenpeg	LKST-LR-16	F1xM3/4/5; F2xM3/5	14-Oct-16	2,100	4	L. Playgreen Lake (Norway House Landing)
Little Playgreen Lake (Fingerlings) = 2,100^a						

^a estimated number of sturgeon



Photo 7. Stages of Lake Sturgeon Development: Egg (spring), Larvae (summer), Fingerlings (fall) and yearlings (one year old, spring)

Lake Sturgeon – Birthday Rapids (2016 year-class)

Spawning adult Lake Sturgeon were collected in the Nelson River (downstream of Birthday Rapids) by field staff from North South Consultants. To help synchronize egg and milt collection, adults were injected with GnRH (Table 11). Eggs from 2 females were mixed with the milt of 1 male on May 31, 2016 to create 2 family groups. . An estimated 497,500 eggs were brought back to GRFH (Table 12) and disinfected with Ovadine for 10 minutes at 100 ppm.



Photo 8. Birthday Rapids spawn camp; holding tank for broodstock; collecting milt from a male Lake Sturgeon; collecting eggs from a female Lake Sturgeon.

There were some challenges encountered during the egg collection. Cool ambient river temperatures (10°C) combined with the injection of a relatively small amount of hormone (16 µg/Kg) led to a delay in egg release and the threat of not being able to transport eggs back to GRFH the same day. To encourage egg release, the temperature of the tank holding the females was increased by stopping the flow of fresh water and re-circulating the tank water. Over a 4.5 hour period the temperature increased from 10°C to 16°C, at which time eggs were released. Broodstock were then returned to a tank of fresh river water (12°C). Unfortunately, both females did not survive. One female died overnight in the tank and the other was found dead in the river shortly following release. Both fish were buried following a tobacco offering.

Field staff believe the females died due to temperature shock and have discussed alternative methods of handling broodstock under similar conditions in the future, including:

- Increasing the dose of GnRH;
- Providing some fresh water to tanks at all times; and
- Slowly bringing the sturgeon down to ambient temperatures following a temperature increase.

It was also acknowledged by field staff that monitoring broodstock health needed to be a greater priority. In the future, one individual will be delegated to monitor broodstock health immediately following egg and milt collection.

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Table 11. Birthday Rapids broodstock information and hormone use in 2016

Population	M/F	Floy Tag ID	Hatchery ID	Weight (Kg)	Injection Date	Injection Time	GnRH (µg/Kg)	Solution		
								GnRH (µl) ^a	Ringer's (µl) ^b	Total (µl)
Birthday Rapids	Female	80375	F1	19.5	29-May	19:31	3.0	5.9	384.1	390.0
					30-May	07:05	13.0	25.4	364.6	390.0
Birthday Rapids	Female	94083	F2	29.1	29-May	19:30	3.0	8.7	573.3	582.0
					30-May	07:02	13.0	37.8	544.2	582.0
Birthday Rapids	Male	48926	M1 ^c	25.9	29-May			No primer dose		
					30-May	07:07	5.0	13.0	505.0	518.0
Birthday Rapids	Male	107245	M2	10.0	29-May			No primer dose		
					30-May	07:08	5.0	5.0	195.0	200.0

^a GnRH solution = 10µg GnRH per µl

^b Saline solution used to transport GnRH into fish muscle during injections

^c No milt at time of fertilization; male not used in 2016 program

Hatch at GRFH occurred from June 9 to 11, 2016. Overall hatch was estimated to be 88% (F1 = 83%; F2 = 93%; Table 12). Overall survival was 87% from hatch to the end of February, 2017. Overwinter survival has been greater than 95% (Table 13). Some accidental mortality occurred in January (n = 5) as a result of fish jumping out of tanks and on the night of February 18 (n = 36) when equipment problems caused reduced oxygen levels in one tank of fish. These issues have been resolved.

Table 12. Estimated number of eggs collected and larvae hatched for Birthday Rapids sturgeon (2016 year-class)

Population	Fertilization Date	Family	Jar Label	Quantity of Eggs (L)	Estimated # Eggs	Estimated Fertilization (%)	Estimated # Larvae
Birthday Rapids	31-May	F1 X M2	BDR F1-1	0.800	40,000	85	34,000
Birthday Rapids	31-May	F1 X M2	BDR-F1-2	0.800	40,000	83	33,200
Birthday Rapids	31-May	F1 X M2	BDR-F1-3	0.850	42,500	85	36,125
Birthday Rapids	31-May	F1 X M2	BDR-F1-4	0.850	42,500	78	33,150
Birthday Rapids	31-May	F1 X M2	BDR F1-5	0.550	27,500	81	22,275
Birthday Rapids	31-May	F1 X M2	BDR-F1-6	0.550	27,500	86	23,650
			Total (F1)		220,000	83	182,400
Birthday Rapids	31-May	F2 X M2	BDR-F2-1	1.250	46,250	96	44,400
Birthday Rapids	31-May	F2 X M2	BDR-F2-2	1.250	46,250	95	43,938
Birthday Rapids	31-May	F2 X M2	BDR-F2-3	1.250	46,250	94	43,475
Birthday Rapids	31-May	F2 X M2	BDR-F2-4	1.250	46,250	87	40,238
Birthday Rapids	31-May	F2 X M2	BDR-F2-5	1.250	46,250	91	42,088
Birthday Rapids	31-May	F2 X M2	BDR-F2-6	1.250	46,250	94	43,475
			Total (F2)		277,500	93	257,613
			Overall Total		497,500	88	440,013

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Table 13. Monthly survival for Birthday Rapids sturgeon (2016 year-class)

LOT	Families	Month-Year	Start of Month	Recount Adjustment	# Fish Removed			End of Month	Monthly Survival (%)
					Mortality	Transfer	Release		
LKST-BDR-16	2 - 2Fx1M	Jun-16	440,014	0	53,229	4,081 ^a	367,521	15,183	87.9
LKST-BDR-16	2 - 2Fx1M	Jul-16	15,183	0	3,443	0	8,780	2,960	77.3
LKST-BDR-16	2 - 2Fx1M	Aug-16	2,960	-63	66	0	0	2,831	95.6 to 97.8
LKST-BDR-16	2 - 2Fx1M	Sep-16	2,831	0	2	0	1,579	1,250	99.9
LKST-BDR-16	2 - 2Fx1M	Oct-16	1,250	0	0	0	0	1,250	100.0
LKST-BDR-16	2 - 2Fx1M	Nov-16	1,250	0	1	0	0	1,249	99.9
LKST-BDR-16	2 - 2Fx1M	Dec-16	1,249	0	1	0	0	1,248	99.9
LKST-BDR-16	2 - 2Fx1M	Jan-17	1,248	0	5 ^b	0	0	1,243	99.6
LKST-BDR-16	2 - 2Fx1M	Feb-17	1,243	-25	36 ^c	0	0	1,182	95.1 to 97.1
TOTAL (BDR-16)			440,014	-88	56,783	4,081	377,880	1,182	87.1

^a 60 euthanized and sent for virus testing; 4,021 for UofM

^b Jumped out of tank

^c Equipment problem overnight causing inadequate water flow and aeration to a single tank

A total of 4,081 Birthday Rapids larvae were set aside for Dr. Gary Anderson (University of Manitoba) in June 2016. Some mortality occurred prior to transport. On June 27, a total of 3,941 larvae were transferred to the University of Manitoba (Table 13).

On June 21 & 23, 2016 an estimated 367,521 yolk-sac larvae were released by boat into Gull Lake (n = 192,167) and Stephens Lake (n = 175,354) with assistance from North South Consultants field staff (Table 14).

On July 26, 2016 a total of 8,780 larvae were released into Stephens Lake by boat with assistance from North South Consultants field staff (Table 14). Larvae had an average total length of 39 mm (range: 30 to 48 mm) and an average weight of 0.27 g (range: 0.10 to 0.50 g).

On September 27 & 29, 2016 a total of 1,579 fall fingerlings were released by boat into Gull Lake (n = 780) and Stephens Lake (n = 799; Table 14) with assistance from Manitoba Hydro boat patrol crews. Fingerlings had an average total length of 111 mm (range: 90 to 130 mm) and an average weight of 5.3 g (range: 2.7 to 7.9 g).

A total of 1,250 fingerlings were kept overwinter in the Hatchery Building to be stocked as yearlings in 2017.

Table 14. Stocking dates and locations for Birthday Rapids sturgeon (2016 year-class)

Lake Sturgeon			Stocking			
Facility	Lot ID	Family	Date	Number	Age (months)	Stocking Location
GRFH	LKST-BDR-16	F1xM2	21-Jun-16	81,648	0	Birthday Rapids
GRFH	LKST-BDR-16	F2xM2	21-Jun-16	110,519	0	
Birthday Rapids (Yolk-sac Larvae) = 192,167						
GRFH	LKST-BDR-16	F1xM2	23-Jun-16	68,545	0	Stephens Lake
GRFH	LKST-BDR-16	F2xM2	23-Jun-16	106,809	0	
Stephens Lake (Yolk-sac Larvae) = 175,354						
GRFH	LKST-BDR-16	F1xM2	26-Jul-16	4,050	1	Stephens Lake
GRFH	LKST-BDR-16	F2xM2	26-Jul-16	4,730	1	
Stephens Lake (Larvae) = 8,780						
GRFH	LKST-BDR-16	F1xM2	27-Sep-16	547	3	Gull Lake
GRFH	LKST-BDR-16	F2xM2	27-Sep-16	233	3	
Gull Lake (Fingerlings) = 780						
GRFH	LKST-BDR-16	F1xM2	29-Sep-16	215	3	Stephens Lake
GRFH	LKST-BDR-16	F2xM2	29-Sep-16	584	3	
Stephens Lake (Fingerlings) = 799						



Photo 9. Feeding Lake Sturgeon – Brine Shrimp Hatchers at Grand Rapids Fish Hatchery (used to feed larval Lake Sturgeon); Fingerling Lake Sturgeon eating bloodworm at Grand Rapids Hatchery.

Numao Virus Testing

A subsample of GRFH fish from the Landing River (LR), Burntwood River (BWR) and Birthday Rapids (BDR) populations were tested for Numao Virus. Prior to the spring yearling release, a total of 60 fin tissue samples (LR = 42, BWR = 18) were collected from the 2015 year-class on April 4, 2016. All samples tested negative for Numao Virus.

Following the 2016 spring hatch, 120 whole body sturgeon samples from the Hatchery Building (LR = 60, BDR = 60) and 60 whole body sturgeon samples from the Research Building were collected on June 12, 2016. All samples tested negative for Numao Virus.

All samples were sent to RPC Labs in Fredericton, NB for analysis using a virus specific qPCR test.

GRFH Fish Inventory

At the end of February 2017, GRFH had a total of 2,019 sturgeon in the Hatchery Building and outdoor tanks for stocking and future educational/research purposes (Table 15). Sturgeon held in the Hatchery Building entered as disinfected eggs and have not been exposed to surface water as per permit conditions C2 & C3. Lake Sturgeon held outdoors have been exposed to both well water and surface water. There are no plans to stock or transfer these individuals in the immediate future.

An additional (and estimated) 500 sturgeon are being held in the Research Building for Dr. Gary Anderson, University of Manitoba (Table 15) until the end of March 2017.

All sturgeon at GRFH are currently fed a diet of frozen bloodworm with the exception of the Landing River sturgeon (2013 year-class) which are fed pellets.

Table 15. GRFH sturgeon numbers and sizes at the end of February 2017

Population (year class)	No.	Avg Length (mm)	Avg Weight (g)	Location (purpose)
Landing River (2016)	786	245	48.0	Hatchery Building (stocking)
Birthday Rapids (2016)	1,182	247	50.7	Hatchery Building (stocking)
Landing River (2016)	500*	-	-	Research Building (UofM research)
Landing River (2015)	8	324	115.7	Outdoor Tanks (education/research)
Landing River (2013)	37	527	647	Outdoor Tanks (education/research)
Landing River (2012)	1	488	510	Outdoor Tanks (education/research)
Landing River (2005-06)	5	699	1,900	Outdoor Tanks (education/research)
Total	2,519			

* Estimated number of study fish