

**PALLID STURGEON PROPAGATION**  
**2004**  
**Garrison Dam NFH**

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**Background/Introduction**

The Pallid Sturgeon Recovery Plan (1993) established guidance for collection of wild brood fish, propagation, research needs, and reintroduction of progeny to accomplish recovery goals. This hatchery's role in the recovery effort focuses on the development of techniques for spawning and rearing of pallids and propagation for augmentation. Pallid Sturgeon propagation at Garrison Dam NFH began in 1997. Successful spawning has occurred annually since 1998. Both the 1999 and 2000 year classes propagated at Garrison were destroyed after being identified positive for Pallid Sturgeon Iridovirus (PSIV). April 2002 marked the first stocking of yearling (2001 year class) pallids from this facility. Recapture data from the stocked fish indicates that short term growth rates in the wild are comparable to that achieved in the hatchery; further suggesting that the hatchery reared fish are adjusting well to the Missouri River and it's selection of food. Recapture numbers are not sufficient to draw any conclusions on survival however, survival from this facility is comparable to other hatcheries based on the number of recaptures available.

**Objectives**

Objectives for this year will again emphasize augmentation. All four hatcheries used in past pallid propagation will be utilized in 2003 and if possible, Valley City NFH will again come on line for pallid research and propagation. We will attempt to collect four females and sixteen males for spawning at Garrison Dam NFH. Additional family lots produced in the Upper Basin at either Miles City or above Fort Peck will also be 'backed up' at Garrison Dam NFH. Pairing for family lots will be based on results from the Genetics Lab at UC Davis. We plan on producing (4) 1X4 matings using the twenty broodfish on station and others at Miles City SFH. Milt will be flown between the two facilities to provide the best theoretical family lots. Additional milt may be collected both above Fort Peck and in the Confluence during the spawning run which will be used in the repository and possibly to replace any nonviable males currently held as broodstock. We will also evaluate fertilization rates using cryopreserved milt from both the 0.5 and 5ml straws and experiment with optimal incubation temperatures. Total planned production from Garrison Dam includes 13,200 five inch fingerlings; 4,100 seven inch fish; and 3,700 nine inch Spring stocked fish.

Miles City SFH will be supplied with eight adults, four males and four female. In addition to spawning in June they will be culturing four family lots from 2003 to a tagable size prior to stocking in RPA #2 later in the summer. Miles City SFH will create (4) 1 X 3 matings producing 12 family lots. Six family lots will be held at Miles City SFH. The remainder will be transferred

to Bozeman NFH and Garrison Dam NFH. Miles City will be producing 3,000 Fall fingerlings; 2,000 spring stocked fish; and 1,000 Summer stocked fish.

Bozeman FTC will be propagating 2003 progeny for stocking RPA #1 and taking the lead spawning riverside again on the CM Russell Refuge. Eggs from this spawning event will be held at both the Bozeman hatchery and Garrison Dam NFH. Bozeman FTC will also be able to bring in eggs from both Miles City and Garrison Hatcheries for propagation.

## Spring Capture 2004

April 20- Four boats out fishing at about 9:00. Water flows are low, temperature is 47 F. Three fish caught quickly at the confluence in a single set. One of the three is CART # 34. Blood is drawn from all three and put on ice. The tagged fish, 115525534A is released. The other two, 7F7D376F73 (38#) and 7F7D3C555D (39#) are loaded on the truck for Miles City SFH. At 9:45 another three fish are netted in a single drift. One of the three, CART #30, had it's external tag ripped off. This fish was injected with Nuflor and released. The other two were cathetered. Eggs were recovered from 115716093A, a fish that had been captured previously with a irrigation gasket around it's head. The fish looked like it had recovered rather well. The third fish appears to be a male, 220F0E6207. At 10:00 CART #2 is captured, blood drawn and released. At 10:15 CART #144 is captured and released. 10:20 CART #28 is captured, tag dangling from one wire. The tag was removed and the fish given an injection of Nuflor. Ten minutes later, CART #50 is captured, a blood sample taken and the fish released. At 11:30 a fifth boat joined in. Ten minutes later pallid 1F4B225A1A is captured. This fish has been collected nearly annually - nicknamed the 'snake' for it's unusual body shape. At noon two fish are collected in a single drift 7F7F066452, a suspect male (actually a 25 pound female), and 115551683A, a female confirmed by catheter. Both fish are loaded on the tank headed for Miles City SFH. That ended the collections for Miles City and the driver headed off. Antibiotic injections for the Miles City fish were given at the hatchery while off-loading.

At 1:30 a 40 pound fish is captured and injected, 2204583665/7F7F066A40. Two fish are captured at 2:40, 220F0F7677 a 39 pound fish and 1F47606357, a 45 pound fish. We were unable to collect blood from the second fish (I noticed while trying to draw Nuflor from the container that the syringe has very little vacuum pressure which might be why some of the fish haven't given blood). At 3:20 the final fish was brought in, 1F4A3E1445, a 43 pound male. This fish has been previously cryopreserved but no progeny have been produced. The fish was injected and loaded. At 4:20 the truck for Garrison Dam NFH left. There were a total of seventeen fish collected, all but one recaptures. Two of the seventeen were gravid females (including the lone 'new' fish).

April 21- Five boats fishing, two fish collected immediately off the boat ramp, one a transmittered fish CART # , the second a suspect male. The suspect male, 1F477B3A65, was loaded on the tank - after it was determined to be a previously spawned fish which had lost it's internal tag (CART #38) it was released. At ~11:00 a second transmittered fish was captured

and released. This fish was at the hatchery last year, injected but produced no milt - potentially a female. At 11:30 the third transmitted fish, CART #44 is picked up and released. CART #46 is captured at 12:30, blood taken and fish released. At 12:15 two fish are collected in a single drift, 1F477B4E51 (55lbs) and 1F4A312640 (42 lbs). The smaller fish is a confirmed male from the spawn attempt at Miles City in 1995. The larger of the two was biopsied in 1997 at GAD but sex was not determined conclusively. It was catheterized and no eggs were found. Both fish were loaded on the tank for transport to Garrison Dam NFH. At 1:50 an immature female (by catheter) was brought in. Blood was taken and after discussion it was decided to implant a transmitter in the fish. Dave Fuller performed the implant, the fish was given an injection of Nuflor (0.03cc/lb) and released downstream. A couple other CART tagged fish were recaptured from yesterday and released. At 2:00 a male captured up the Yellowstone was brought in. This fish, 1F53312736 / 1F52167900, was a 36 pound suspect male. At 3:30 pallid #3A65 which was captured and released earlier today was recaptured. At 3:45 a 62 pound female was brought in. This fish was a 'new' fish. The fish was catheterized to collect an egg sample and was given an injection of Nuflor. The egg sample was collected in a vial with saline rather than formalin to allow the eggs to be boiled prior to fixing. It was hoped that with a more uniform round shape achieved during water hardening and boiling the PI would be more precise. At 4:10 the distribution unit left for the hatchery.

April 22- Five boats fishing. First drift in the Confluence a 'new' pallid is collected, blood sample taken and PIT tag 114476216A inserted. Another male CART #27 is captured, tag torn off. This fish is injected with Nuflor and released. At 10:40 a third pallid is captured, #115679374A. Blood is taken from this fish is a 38 pound suspect male. It is injected with Nuflor and loaded on the tank without cathetering. Total time from capture to loading 10 minutes. 10:54 another "new" fish is captured in the Confluence (south shore). Blood is taken from this 41 pound fish, 114473737A, it is given a Nuflor injection and loaded on the tank. At 11:05 CART #2 , 1F4A27214F, is captured, blood taken and released. At 11:45 pallid #115529097A is captured up the Yellowstone River. The fish is weighed, injected with Nuflor and loaded. Another 'new' fish is captured along the south bank of the Confluence. Blood is drawn from this fish is a 33 pound female. The fish is catheterized, injected with Nuflor, PIT tagged (454910202B) and loaded. The eggs are placed on ice in saline. At 3:40 a large female is brought in from about 6 miles up the Yellowstone. The fish is PIT tagged, 11555495A, weighted at 65 pounds and loaded. At 4:05 a suspect male is captured, 115552116A, and loaded on the second distribution unit. Later another suspect male is captured, 220E5F4928. These two fish are sent off to Garrison Dam NFH following the 3 females and 3 males that left earlier.

April 23 - Five fish collected, two new fish and three recaptures, two known males and one unknown. The larger 64 pound fish was catheterized at the hatchery - no eggs were collected. This fish was injected with Nuflor. Another fish, 7F7E55466D was also suspected a female at capture but didn't appear gravid when observed at the hatchery. This fish and the two other fish were not injected.

April 26 - At the hatchery the two fish that were suspected females from Friday's capture were catheterized to reconfirm their status. In both cases the catheter failed to collect eggs. This time all four fish collected on Friday were given Nuflor injections as well as female 11555495A.

After discussing the potential benefits of Nuflor on stressed animals with Dr. Allert, the decision was made to have all fish injected. Fin clips were taken from all fish that have not had a genetics analysis performed. The fin clips were divided with part sent to the University of California, Dr May, and to Steve Krentz to forward to SIU.

April 28 - Two males (220C7D0429 & 7F7D291A07) were collected in the Confluence, blood samples taken and the fish released.

April 29- Two males (1F4A0B1A72 & 7F7F072442) and two females (recapture 1F521F363A & new 454B380D60) were collected. Blood samples were taken as well as egg samples. The two females were transported to Miles City SFH. End of collections.

## Spawning

Egg samples from female candidates were collected at capture for all but one female (#11555495A). The Polarity Index (PI) for the fish was calculated, voucher specimens preserved in 10% formalin, and a photo documentation assembled. The average PI of the three fish held at Garrison on April 21/22 were as follows: #216A - 0.12, #516A - 0.16, #202B - 0.20(variable). The two fish at Miles City that were preserved were #093A - 0.12, and #683A - 0.17.

The adults at Garrison Dam were held in water temperatures approximating those found in the Yellowstone and Missouri Rivers during the months preceding spawning. To alleviate concerns of stress, the females and selected males were held in a covered tank. Lights in that corner of the facility were kept off and visitors were not allowed to view the fish. A window was installed adjacent to the tank (6/25) to provide any photoperiod cues they may have lacked in the past using artificial lighting.

June 7 - we collected eggs from the four females to run maturation tests. The results of the progesterone tests were 100% positive for two females, #216A and #495A. The assay was run for 16 hours, temperature range 15-18.3°C ( 59-65°F). The water temperature in the tank is 58°F. The nucleus had migrated to the edge of the egg in the other two but had remained intact in all cases. A control was run with ETOH with no breakdown. The polarity index was documented for all four females with three fish in the acceptable range(0.06-0.09) and one very close (0.109). Based on PI values at capture, egg development is progressing as expected. Blood was collected at this time and analyzed for sex hormones and cortisol levels (Molly Webb, OSU) and clinical chemistry (Alan Allert, USGS).

June 9 - two males (1F4A3E1445 and 1F4A312640) were injected with LH-RH at 10:45am. The following morning at 11:00am 150 mls of milt is collected from each fish. The milt was taken by truck to the spawning site on the upper Missouri River. Spawning there began in the early morning hours of June 12. Four families were created, two with the milt from here and two from males collected at the site (7F7D487531 and 7F7E42795C). A third male was collected (1F4A4B5973) but not used as progeny from this fish were created in 2001 and stocked in all RPA's.

June 10 - data was received back from UC Davis on the genetics of the fish. Parings were made as follows based on Nei and Rogers genetic distances (Table 1).

June 13 - milt was again taken from the two males injected on the 9th, 1F4A3E1445 and 1F4A312640. The milt was stored in the refrigerator in oxygenated bags for cryopreservation. Milt from the three Fort Peck males was also brought back for cryopreservation.

June 14 - initial injections were given for the two females , 216A and 495A at 0.05 mg/kg. Males received the total dose of 0.02 mg/kg. The following morning milt was collected from the males at 8:00 am. Five of the six injected males were producing sperm. Milt collected from male 1F53312736 did not contain sperm cells. The two females were given the resolving dose of LH-RH at 8:40 am. Salt was again added to the tank after handling as the standard protocol.

A trial was set up to determine optimal incubation temperatures (Tables 7 & 8). Eggs from a single spawning attempt were divided equally into 5 treatment groups. These treatment groups were further divided into three replicates. The eggs were placed in separate jars bowls and fertilized at the final incubation temperatures. The temperatures chosen were 12, 16, 18, 20, 24 °C (53.6, 60.8, 64.4, 68.0, 75.2°F).

June 16 - eggs were recovered from both females at the 12:30 am check. The previous check at 9:30 pm amounted to a burst of abdominal fluid for both fish. Ovulation progressed well for female #216A. Eggs flowed well by palpation at each of seven collections. After the final collection, a 3ml sample of blood was collected for chemical analysis. The second female had very small egg collections but eggs appeared to be viable in all but the final attempt on the morning of June 17. Received milt from two males collected in the Upper Missouri River by the Montana FWP crew - the males were dubbed 'Lew' (114A4B5973) and 'Fred' (7F7E42795C). Milt from Lew previously cryopreserved (2001) was used to produce a family lot with female 216A. The newly received milt from both males was cryopreserved.

The afternoon of June 20 eggs were moved to the hatching tanks in anticipation of hatch. By morning hatch was progressing rapidly. Jars that held in excess of 200 mls of eggs were moved to other tanks to keep total fry numbers per tank near the target of 3,000.

June 29 - Female necropsy 495A. The fish was a 65 pound female and had very fatty ovaries. From the necropsy it appears that most of the eggs were spawned - we collected about 6,000 from this fish. The scar from the catheterization done June 7<sup>th</sup> looked good. The hole appeared completely healed over, water was forced into the duct and pressure applied - a pin hole spray of water came out. The gills of the fish looked good - no fungus or necrosis. The fish looked fine on June 25<sup>th</sup> - color was good. On June 28<sup>th</sup> it appeared pale and weak. There was bruising from the injection sites on the back of the fish and a ring on the left side. The vent was also red. At the time of the necropsy those areas were covered in fungus. When observed in the tank this morning it was laying on it's side, rigid. It's gills were bright red and it was operculating. Blood samples were taken. One sample was spun down, RBS taken out and frozen, blood smears were made. The following samples were sent to both the Bozeman FHC and Warm Springs FHC: 1) blood sample with HBSS on ice, 2) exudate from gut cavity in HBSS on ice, 3) blood sample in

vacutainer. These samples in Davidsons were preserved for Bozeman: Necrotic skin/muscle tissue, gill sample, kidney, spleen, pectoral fin, ovarian, GI tract.

Spoke with Kent Ware PL Bears Bluff re. Shortnose sturgeon. He indicated that they used a drug this year, gentamicin, that gave them good results treating internal infections on their post spawn females. The treatment rate was 6 mg/kg/treatment administered in three treatments six days apart. They had problems with vibriosis, gram negative bacteria infections. It was an effective treatment on 90% of the shortnose treated. In past years they had used baytril (5 injections at 1ml/10 lbs) in combination with 20-25 ppm furnace bath with mixed results. Brian Hickson of the Warm Springs FHC suggested Baytril at 10 mg/kg.

June 29 - By 6:00pm about half of the fry have changed from random tank movements to bottom oriented. Feeding was initiated ad lib. The following day the majority of the fry are bottom oriented. Feeding is being done with vibrator feeders.

July 1 - Loaded six males for the trip back to the confluence. Met Mike Rhodes from Miles City. The broodstock from Miles City were being released and one male (220F0E6207) was needed yet at Garrison to complete spawning activities. This male was transferred to Garrison's tank and hauled back to Garrison. Males released included 1F4A3E1445, 1F4A312640, 1F53312736, 115552116A, 7F7E55466D, 431565767B. Sample count on fry in G-8 (216A X 2777) - 825 fry (eleven day old) displaced 22 mls water = 37.5 per ml.

July 2 - Miles City eggs flown in at 12:30 - 100 mls each from nine family lots. The fish were spawned June 29<sup>th</sup> - 3 days earlier. Eggs were neurulized. Fry from the GAD spawn were released at the Culbertson, MT site. 30,000 twelve day old fry were released for the larval drift study.

July 4 - Sample count ( fourteen day old fry) 870 fry displaced 39 mls water = 22.3 per ml

July 5 - Eggs from Miles City Females 452 and D60 began hatching at 2:00 pm.

July 6 - Eggs from MC female 683A began hatching at 11:00 am.

July 7 - A family composed of 1 female (401E) and three males (?) from Miles City (6A40, 4E51, 374A) were brought to the hatchery. Tagging was done on the 2003 progeny - yellow elastomer crosswise to the snout, PIT tag (or CWT for the small fish). The fish were stocked at three sites by Blind Pony SFH staff - The group headed for Bellevue, Ne were stocked at the Plattsmouth Bridge instead as the Belluvue bridge access was blocked for construction. The other two sites were Leavenworth, KS and Booneville, MO. The fish hauled great in three 400 gallon compartments (the fourth compartment was left empty). The fish were hauled at 71 °F.

OTC marked fry for the release on the 8<sup>th</sup>. A 700 ppm solution was used. At three hours the fish looked fine. DO remained above 7 ppm and pH was buffered to 7.0. At five hours the fry were dead - pH at 7.4 and DO at 7.3 ppm.

July 8 - 25,000 fry were released as 17 day old fry near Culbertson for the larval drift study. Fry were taken from G-8 216A X 2777 (19.8/ml), T-83 216A X 2640 (13.3/ml) and T-67 216A X 446D (14.0/ml). Fry were boxed at 3,333 per box

July 12 - Injected female 202B and four males (6377, 7677, 374A, 6207) at 11:00 am.

July 13 - Injected female 202B with resolving dose at 8:00 am. Egg collection began at 1:00 pm with a collection of ~300 eggs. Eggs were collected about every 3 hours with good volumes taken. Milt on the other hand was hard to come by. On the first try, only #6357 was producing viable sperm. At 3:00 pm a second male #7677 provided good milt. At 6:15 pm we took milt from #374A - the milt was usable. Male #6207 is producing clear milt with very little sperm cells. We opted not to use this fish. Milt quality in #374A gave out on subsequent attempts to aspirate and milt that was collected earlier looks poor. Without another option we continued to use the earlier collected milt. Blood samples were taken from all four males while spermiating. Blood was taken from the female prior to administering the resolving dose and after spawning. Samples were spun down, serum taken off and frozen. Blood smears were also made.

July 14 - Eggs were taken at 12:30 am, 11:00 am and 1:35 pm - in all cases egg quality looked good. This female ovulated over a 24 hour period. The last egg take produced about 100 mls. 'Ovarian' fluid for this fish was very thick.

July 15 - ~2:00 am transformer was hit by lightning. We were without power temporarily. The boiler in the old building burned out a relay and the temperature study was again compromised. The eggs from most of the takes look great - neurulation has occurred. The second and third collections using male 374A look poor - milt quality was bad.

July 16 - Transferred 150 mls each of two family lots (202B X 6357, 202B X 7677) to Miles City to replace fish a weak family lot there. Monte flew in with the remaining 41 fry from 6452 X 737A to add to our 'broodstock' lot.

July 18 - eggs from 202B X 6357 began hatching at 2:30 pm in FT-2. Eggs from the temperature trial 1B peaked hatch in the morning and from 2B was about half hatched off by 3:00 pm

July 19 - hatching finished for the majority of 202B - peak of hatch for the 'day after' eggs.

July 20- loaded up four males to take back to the confluence (1F477B4E51, 115679374A, 115529097A, 430E452777). Took 25,000 fry to Culbertson for the larval drift study:

202B X 374A - 60 mls @ 139/ml = 8,333

202B X 6357 - 83 mls @ 100/ml = 8,333

202B X 7677 - 54 mls @ 154/ml = 8,333

July 22 - Inventoried eggs on incubator 5B - temperature trial (incoming water temperature 12-15°C). Measured in a 250, 100, and 50 ml graduated cylinder (dry method)- all measurements were very close (+/- 1 ml). A total of 65 mls eggs were measured out with an egg count of 2609. Egg size was determined to be 39.5 per ml for female 202B. The same eggs were loaded in a 12

inch Von Bayer V-trough. A total of 104 eggs were counted giving an estimated size of 44,494 eggs per quart. Using the dry volume method the egg size was 37,380 per quart. The difference between the two sampling methods was 16%.

July 23 - stocked 25,000 fry from 3 families for the drift study:

202B X 7677 - 9,333  
202B X 374A - 1,000  
202B X 6357 - 14,666

July 27 - stocked 25,000 8 day old fry from 3 families for the drift study:

202B X 7677 - 119 mls @ 30.3/ml = 3,620  
202B X 374A - 107.5 mls @ 26.8/ml = 2,880  
202B X 6357 - 709 mls @ 26.1/ml = 18,500

August 4 - Switched to a #3 Biodiet Starter feed on the larger pallids. Milt repository was moved to the Valley City NFH due to inconsistent availability of liquid nitrogen at Garrison Dam NFH.

September 3 - Switched 202B fish from #2 Biodiet to #3.

September 7-9 Tagging pallids for RPA #2 and #4 - Female lots 216A

September 9 - Blind Pony SFH up to haul pallids to Booneville and Leavenworth (Table 12).

September 10 - Loaded up Gavins Point NFH truck for the Bellevue Stocking and our unit for the Wolf Point stock site.

September 11 - Loaded our unit for the Culbertson and Sidney stock sites.

September 19 - Switched all pallids from #3 Biodiet to #2 Silver Cup Salmon.

September 22 - Have a major outbreak in two tanks. Tank 71 (216A X 2777) had 500 fish. 57 died on the 22 and 287 the following day. The fish were 'flashing' or more correctly 'darting' prior to the start of mortalities. Tank 82 had a different pattern. These fish were lethargic and off feed heading up to this date. On the 23<sup>rd</sup> there were 212 dead the days preceding and after only a handful of mortalities. FT-18 (216A X 123A) also has the same issues only on a small scale - 14 mortalities but lethargic fish.

October 8 - Loaded Blind Pony SFH truck for trip to Leavenworth Kansas and Booneville MO. The water to the Booneville stock site has been shut off and the bottled oxygen was not sufficient to keep the oxygen level up. Forty percent of the fish in that died (including 51 that were picked out at the stock site). We had tagged 3713 fish from female 202B for that site. 2199 survived the incident (Table 13). An additional 2864 fish went to the Leavenworth Kansas site (Table 14). ~20 fish that didn't look like they would survive at the time of loading were kept at the hatchery. A week later all those fish are still alive and apparently unaffected.



October 10 - Lethargic fish and high mortalities noted in the 401E X MC♂ family lot tanks 50, 59, and 78. There are similar conditions in tank 10(0D60 X 1445), 73(202B X 7677), 75 (216A X 7531). The three eight foot tanks are holding tagged fish from female 202B with one of each male. So far only the green tank has shown any mortalities and those have been runt fish.

October 13 - Weighed the sample of morts from T-78. A Sample of 150 fish weighed 962 grams for a sample size of 6.4 grams/fish.

October 14 - Water temperature is 67°F. Loaded out Neosho NFH for a fingerling transfer. Three female lots - 1863 fish. The largest family lot is the female 4954 with progeny averaging 7 inched FL. The smallest was female 6452 with an average size of 5.7 inches. See Table 16.

Bozeman FHC and Jim Peterson are on site for health assessment.

October 15 - Pallids held for RPA #2 stocking are stocked at the confluence of the Milk and Missouri Rivers by boat. A total of 3482 fish were stocked (Table 15).

October 21 - Loaded out Neosho NFH for a fingerling transfer (Table 17).

October 28 - Loaded out Neosho NFH for a fingerling transfer (Table 18).

Nov 4 - Tagged 2477 pallids and transferred to the north 20 foot tank for holding. A quarantine tank is set up in N-8 as a place to put sickly fish. The idea being that the lethargic fish may be shedding virus which would impact the others. Emaciated fish were included as a potential disease threat.

Nov 19 - Tagged pallids were stocked in the Yellowstone River below the intake diversion (Table 19). Water temperature was 38°F. A sample of 100 fish were checked for CWT retention and 100% of the tags were retained. The fish also held their elastomer mark.

December 15 - 720 pallids from 23 family lots were transferred to Gavins Point NFH in our 3 compartment tank (Table 20). The fish were shipped in 6 inch perforated tubes to keep family groups separate.

December 31 - water temperature at 41°F. Stopped feeding dry diets and initiated blood worm feeding.

January 11 - Final shipment of future broodstock to Gavins Point NFH including three 2003 family lots (Table 21).

February 4 - Replaced pump bearings; water was not degassed due to lack of head pressure. Nitrogen levels increased creating gas bubbles in gill lamellae. 45 fish died as a result. After pump repairs the nitrogen levels were reduced and mortality stopped.

## Fall Capture

Crews were at the confluence on Nov 9 for the Fall capture. Water temperature at the confluence was 43°F. The target was 2 females and 3 males. The boats began fishing from the confluence just after 9:00 am. Two fish were caught near the confluence, one male #7F7B031F17, one female #115676635A. At about 2:00 the effort was shifted downstream. Four additional pallids were collected with the last fish, a female #115557165A, caught near Erickson Island at 3:50 pm. Two males 7F7D517479 and 7F7D2D273D were also loaded on the distribution truck for transport to Gavins Point after having blood taken and OTC injections. All fish were cathetered and egg samples preserved. An immature egg stage female was also collected #7F7D517479 as was the immature female that was CART tagged this Spring. The CART tagged fish was not cathetered but it was noted that she was not 'plump'.

## Discussion

Growth rates of hatchery reared pallids followed similar patterns between hatcheries. Growth within the first three months post stocking was very good with average rates between 0.5 and 0.8 mm per day - similar to hatchery growth rates (Table 27). Growth rates of pallids at large 3-12 months was down considerably (averages 0.18 and 3.0mm per day) but expected since it would likely represent winter months since most stocking is done in the Spring/Summer (Table 29). Growth was also slower after the first year at large with the growth rates of the 1-3 year old fish ranging between 0.14 and 0.23 mm per day. Average growth even at these rates still represent nearly 3 inches per year.

Data on growth rates broken out by RPA indicates that the upper RPA's are not as productive as the lower ones based on the little data that has been collected (Table 28). Days at large and size at stocking should also be considered when analyzing Table 28. Recapture data is strongest in RPA 1 and 3 with just over 2% of stocked fish being recaptured in RPA 1 and nearly 1 3/4 % recaptured in RPA 3. Unfortunately very little data was collected at stocking on fish in RPA 1 leaving growth rates in question.

Overall growth rates of pallids stocked from Garrison Dam were comparable to other facilities. Growth rates over the past three year were good indicating that the fish are effectively foraging in spite of being virus positive. Percentage of recaptures relative to numbers stocked indicate that Garrison's survival is also comparable to other facilities.

In general, where the presence of the iridovirus in a pallid tank was documented by mortality and histology in the October sampling, the iridovirus and subsequent mortality was not a problem in the months following through to stocking in April (Table 24). Similar results were seen in 2003. Six tanks were diagnosed as virus positive in October 2003. In five of the six tanks, the fish were maintained in that tank without adding fish from other tanks. The total mid-October inventory of those five tanks was 691 fish. Mid-May the total in the tanks was 682 - a 99% survival rate over seven months. Overall seven month survival rate for the 2003 progeny was 76%.

Density at levels didn't correlate well with viral incidence or mortality (Table 26). Assuming viral expression is related to stress either the densities at Garrison were not significant enough or other stressors were masking the effects. Viral epizootic and associated mortality were present at densities below 0.3 pounds per square foot as well as above 1.5 pounds per square foot (tanks 52 and 67). The opposite was also true - no virus or mortality in those ranges (tanks 54 and 76). Even mortality didn't completely correlate with virus although generally it was the rule. In most cases a level 4/5 fin score resulted in mortality rates near 15%. There were isolated cases where mortality reached near 70% but other cases where mortality was less than 1%.

Table 1. Proposed Parings - Genetic Distances

Female	Male	Location	Rogers	Nei
Garrison Dam NFH Females				
115555495A	431565767B	GAD	0.623	1.048
	430E452777	GAD	0.592	0.827
	220E5F4928	GAD	0.546	0.642
454910202B	220F0F7677	GAD	0.608	0.763
	220F0E6207	MC	0.572	0.709
	1F47606357	GAD	0.526	0.508
114476216A	7F7E55466D	GAD	0.572	0.960
	1F53312736	GAD	0.430	0.553
	430E452777	GAD	0.401	0.341
	1F4A312640	GAD	0.438	0.310
132253516A	115529097A	GAD	0.588	0.679
	7F7F066452 *	MC	0.526	0.592
	-	-	-	-
	220E5F4928	GAD	0.421	0.441
Miles City SFH Females				
115551683A	7F7D3C555D	MC	0.572	0.742
	115552116A	GAD	0.535	0.626
	114473737A	GAD	0.529	0.626
454B380D60	7F7F065834	GAD	0.617	0.886
	1F4A3E1445	GAD	0.546	0.827
	7F7D376F73	MC	0.592	0.715
1F53330401E	7F7F066A40	GAD	0.608	0.763
	1F477B4E51	GAD	0.572	0.820
	115679374A	GAD	0.572	0.763

\* Actually a female

Table 2. Pallid Broodstock Data.

2004 PALLID STURGEON BROODSTOCK DATA											
Tag Number	Date	Sex	Wt lbs.	2 <sup>nd</sup> Tag Number	Other Info	Set Time	Location	RM	Spawn results		Spawn Site
									Cryo	Progeny	
7F7D376F73	4/20	U	38	1F54714656	Blood taken - last caught in 1994		MO	1582			MC
7F7D437250	4/20	U	39	7F7D3C555D	Blood taken - Cath nothing - last caught in 1995		MO	1582			MC
115525534A	4/20	M		CART #34	Blood taken - released		MO	1582	no	no	----
220F0E6207	4/20	U	43		Blood taken - Cath nothing	6:00	MO	1582			MC
115716093A	4/20	F	40	'GASKET'	Blood taken-Cath eggs-Released 5/25 pre-spawn	6:00	MO	1582			----
1F4A363031	4/20	M		CART #30	Blood taken released- tag torn out- given Nuflor		MO	1582	yes	yes	----
1F4A27214F	4/20	M		CART #2	Blood taken - released	13:00	YE	0	yes	yes	----
1F4A111C6A	4/20	M		CART #144	Blood taken - released	10:00	MO	1582	yes	yes	----
132157621A	4/20	M		CART #28	Blood taken - released-tag torn - given Nuflor	3:00	MO	1582	yes	yes	----
1F4A143350	4/20	M		CART #50	Blood taken - released	7:00	MO	1582	yes	no	----
7F7F066452	4/20	F	25		Blood taken - ID as male in 1994	10:00	MO	1582			MC
115551683A	4/20	F	50		New fish	10:00	MO	1582			MC
1F4B225A1A	4/20	U			Blood taken - 'SNAKE' - released	5:30	MO	1582			---
7F7F066A40	4/20	U	40	2204583665	Blood taken - Nuflor injection @ capture	7:00	MO	1582			GAD
220F0F7677	4/20	U	39		Blood taken	8:00	MO	1582			GAD
1F47606357	4/20	U	45	1F4A1E4336	No blood - @ GAD in 1996	8:00	MO	1582			GAD
1F4A3E1445	4/20	M	43	1F4A2F3A2E	Blood taken - milt cryo in 2002	7:00	MO	1582	yes		GAD

2004 PALLID STURGEON BROODSTOCK DATA											
Tag Number	Date	Sex	Wt lbs.	2 <sup>nd</sup> Tag Number	Other Info	Set Time	Location	RM	Spawn results		Spawn Site
									Cryo	Progeny	
1F48449755B	4/21	M	29	CART #	No blood - released	7:10	MO				----
1F477B3A65	4/21	M		CART #38	Blood taken - released	4:30	YE	0	yes	yes	----
220E5F6E26	4/21	U		CART #31	Released (possible female)				no	no	----
2202236E31	4/21	M		CART #44	Released				yes	no	----
1F4A33194B	4/21	M		CART #46	Blood taken - released				yes	no	----
1F477B4E51	4/21	U	55		Blood taken - Biopsy scar 1997	6:00	YE	6			GAD
1F4A312640	4/21	M	42		Blood taken - milt taken @ MC in 1995	6:00	YE	6			GAD
115553544A	4/21	F			Blood -Nuflor-CART transmitter implanted						----
1F53312736	4/21	M	36	1F52167900			YE	8.5			GAD
1F477B3A65	4/21	M		CART #38	Caught earlier in the day - Released		MO	1582	yes	yes	----
132253516A	4/21	F	62		Blood taken - new fish						GAD
114476216A	4/22	F	39		Blood taken - new fish		MO	1582			GAD
1F521B1E56	4/22	M		CART #27	released				yes	yes	----
115679374A	4/22	U	38		Blood taken	13:00	MO	1582			GAD
114473737A	4/22	U	41		Blood taken - new fish	8:45	MO	1582			GAD
1F4A27214F	4/22	M		CART #2	Blood taken - released	6:00	MO	1582	yes	yes	----
115529097A	4/22	U	35			6:40	YE	4			GAD
454910202B	4/22	F	33		Blood taken - new fish- cath eggs	9:30	MO	1582			GAD

2004 PALLID STURGEON BROODSTOCK DATA											
Tag Number	Date	Sex	Wt lbs.	2 <sup>nd</sup> Tag Number	Other Info	Set Time	Location	RM	Spawn results		Spawn Site
									Cryo	Progeny	
115555495A	4/22	F	65		no blood or catheter - new fish	0:55	YE	5.5			GAD
115552116A	4/22	M	31		jaw tag 0097 (from 1988)	6:00	MO	1851			GAD
220E5F4928	4/22	U	38			8:00	MO	1851			GAD
7F7E55466D	4/23	U	44	1F557B2071	Radio tagged in 1994, Cathetered	6:30	MO	1582			GAD
7F7F065834	4/23	M	35		spawned in 2002 at MCSFH		MO	1582	yes	no	GAD
431565767B	4/23	U	64		Cathetered - no eggs -	4:00	MO	1582			GAD
430E452777	4/23	U	51			3:00	MO	1582			GAD
1F4A111C6A	4/23	M	27		spawned at GAD in 2001	5:00	MO	1852	yes	yes	----
220C7D0429	4/28	U	31	2204523542	collected in 1996 and 1999				no	no	----
7F7D291A07	4/28	M			spawned in 1997 and 2003				yes	yes	----
7F7F072442	4/29	M	40						no	no	----
1F4A0B1A72	4/29	M	33		milt taken at GAD in 1996				no	no	----
1F5330401E	4/29	F	31	1F521F363A	collected in 1995				no		MC
454B380D60	4/29	F	30		new fish				no		MC

Table 3. Female # 114476216A - Spawning Results

FEMALE # 114476216A								
TIME	DATE	MALE #	MLS EGGS	# EGGS @ 37/ML green	Total egg number prehatch	fry mortality to Aug 1	Initial Survival	Inventory August 1
3:49p	6/14	Initial injection						
8:37a	6/15	Final injection						
4:30p	6/15	no eggs						
9:30p	6/15	no eggs						
12:30a	6/16	7F7E55466D	275	10175	16761	8100	38%	6435
3:45a	6/16	7F7E55466D	125	4625				
9:30a	6/16	7F7E55466D	750	27750				
3:45a	6/16	1F4A312640	920	34040				
7:30a	6/16	1F4A312640	625	23125	27676	16723	46%	12643
1:30p	6/16	1F4A312640	300	11100	12284			
5:20a	6/16	430E452777	800	29600	34780	15970	48%	16581
1:30p	6/16	430E452777	700	25900	33078			
5:20a	6/16	Cryo Trials	300	11100	13314	3584	73%	9730
9:30a	6/16	Cryo Trials	150	5550				
4:35p	6/16	Cryo Trials	96	3552				
TOTAL			5041	186517	137893	44377	51%	45389



Table 4. Female # 115555495A - Spawning Results

FEMALE # 115555495A											
TIME	DATE	MALE #	MLS EGGs	# EGGs @ 37/ML	Calc #/ml	Percent Fertilization (based on prehatch)	Egg count (Prehatch)			Progeny on September 1	% Survival from egg to 75 days
							Live	Dead	Total		
3:42p	6/14	Initial injection									
8:41a	6/15	Resolving dose									
4:30p	6/15	no eggs									
9:30p	6/15	no eggs									
12:45a	6/16	431565767B	0.5	15	0				0		
5:30a	6/16	no eggs		0	0	-	-	-	-		
7:30a	6/16	431565767B	0.2	2	0	-	-	-	-		
9:30a	6/16	431565767B	20	740	47	95%	890	43	933		
1:30p	6/16	431565767B	27	999	32	91%	799	78	877		
4:40p	6/16	431565767B	18	666	78	54%	756	647	1403		
10:00p	6/16	431565767B	38	1406	30	8%	91	1043	1134		
5:15a	6/17	431565767B	45	1665	37	0.0	0	1665	1665		
TOTAL			148.7	5493	40	42%	2536	3476	6012	1348	53%

Table 5. Female #454910202B - Spawning Results

FEMALE #454910202B													
TIME	DATE	MALE #	MLS EGGS (35 min post spawn)	# EGGS @ 37/ML green	MLS Eggs @ 39.5/ml neurulization	# Eggs @ 39.5/ml	Percent Fert (neurulized eggs)	Live eggs	Research	larval drift	transfer	9/1/05 Invent ory	% Survival eggs to 45 days
11:15a	7/12	initial injection											
8:30 a	7/13	resolving dose											
12:55 p	7/13	1F47606357	8	336	425	16788	98%						
3:00 p	7/13	1F47606357	350	14700			99%	16620	6885	41504	6000		
6:30 p	7/13	220F0F7677	350	14700	375	14813	98%	14516	4126	1252	6000		
6:30 p	7/13	115679374A	550	23100	550	21725	80%	11850	8681	12214	0		
8:15 p	7/13	220F0F7677	260	10920	290	11455	98%	21291					
8:15 p	7/13	1F47606357	**750	31500	885	34958	96%	10997	10997				
10:20 p	7/13	1F47606357	325	13650	365	14418	97%	33909					
10:20 p	7/13	220F0F7677	225	9450	265	10468	72%	10381					
10:20p	7/14	115679374A	225	9450	315	12443	9%	942					
12:30 a	7/14	1F47606357	400	16800	430	16985	85%	10576					
12:30 a	7/14	115679374A	290	12180	400	15800	3%	510					
11:00 a	7/14	1F47606357	400*	16800	450	17775	71%	11218					
1:35 p	7/14	1F47606357	100	4200	110	4345	82%	14576					
TOTAL			4233	177786	4860	191970		157384	30689	54970	12000	14904	72%

\* Eggs were spent into tank while stripping

\*\* Eggs used in the temperature trial experiment.

Table 6. 2004 Progeny

Spawning Results											
Female #	Male #	Eggs (OZS)	# Eggs @37-40ml	Prehatch Eggs Retained on Station	Eggs/Fry used in Research	Larval Drift Fry Stocked	Fingerling Inventory Sept 1	Fingerling stocking RPA #2	Fingerling stocking RPA #4	Hatchery Transfer Neosho	November Inventory
114476216A	7F7E55466D	1150	40250		2581	18333	9568	3745	4727		361
114476216A	1F4A312640	1845	64575		6712	18333	10876	1805	7830	599	565
114476216A	430E452777	1500	52500		7588	18333	14404	4867	8672		523
CRYO '01	1F4A27214F	546	20202				111				91
CRYO '04	431565767B						143	38			105
CRYO '02	220F107A6F						483			417	90
CRYO '02	1F477B3A65						461	311			105
CRYO PECK	7F7D487531						4340	459	3508		99
CRYO PECK	1F4A4B5973						2208	450	828	758	117
CRYO '02	116167123A						119				56
Female Total				177527		16881	54999	42713	11675	25565	1774
115555495A	431565767B	149	5960	2536			1348			844	403
454910202B	1F47606357	2665	105268	6000 to MC	6885	41504	7098	1770	2768	917	470
454910202B	220F0F7677	930	36735	6000 to MC	5950	21280	4126	1252	1459	0	918
454910202B	115679374A	1265	49968		8681	12214	3680	1489	836	650	372
Female Total			191970		21516	74998	14904	4511	5063	1567	1760

Spawning Results											
Female #	Male #	Eggs (OZS)	# Eggs @37-40ml	Prehatch Eggs Retained on Station	Eggs/Fry used in Research	Larval Drift Fry Stocked	Fingerling Inventory Sept 1	Fingerling stocking RPA #2	Fingerling stocking RPA #4	Hatchery Transfer Neosho	November Inventory
GAD total		10050	375457	14536	76794	259994	116582	32372	61256	7526	8147
115551683A	7F7D3C555D	35	36227	3500			524	106			329
MC	115552116A	38	39332	3500			145				145
	114473737A	41	42437	3500			3				0
454B380D60	7F7F065834	30	31052	3500			1439	288		651	389
MC	1F4A3E1445	20	20701	3500			468				230
	7F7D376F73	16	16561	3500			489	82			215
7F7F066452	114473737A	21	21736	3500			123				94
MC	1F4A3E1445	35	36227	3500			111				74
	7F7F065834	29	30017	3500			1282	116		600	378
1F5330401E	7F7F066A40	5	5175	6200 FRY@ 62/ml			3150				905
MC	1F477B4E51	2	2070								
	115679374A	6	6210								
Miles City TOTAL		243	287745		0	0	7734	592	0	1251	2759
Grand Total		10293	663202	14536	76794	259994	124316	32964	61256	8777	10906

\* CRYO lots have female # 114476216A

Table 7. Temperature trial #1 - Female #216A

Temperature °C	12			16			18			20			24		
Incubator	5B			4B			3B			2B			1B		
mls of fertilized eggs*	190			180			160			180			210		
Time of First Cleavage 6/16	10:10 am			7:40 am			7:00 am			~7:00 am			6:30 am		
% fertilization				88.3%			88.4%			87.6%			-		
Time of second cleavage 6/16	12:00pm			8:00 am			7:55 am			7:50			~6:45		
Time of Neurulation	<7:00am			5:30 pm			3:00 pm			4:00 am			9:00 am		
Date of Neurulation	6/20			6/19			6/19			6/18			6/17		
Start of Hatch				<7:00am			1:30 pm			7:00 am			7:00 am		
Date of Hatch				6/27			6/21			6/20			6/19		
Finished Hatch				>2:00 pm			<7:00am			10:00am			12:00am		
Date Hatch Finished				6/23			6/23			6/22			6/20		
Replicate	E	M	W	E	M	W	E	M	W	E	M	W	E	M	W
Egg inventory 6/18 1:00pm mL	56	84	84	70	64	72	70	70	68	70	62	88	60	62	60
dead egg count 6/17													1224	1318	774
dead egg count 6/18										396	308	52	701	628	409
dead egg count 6/19 am										0	0	0	552	658	617
dead egg count 6/19 pm				13	32	7	11	7	136	383	228	75	877	538	271
dead egg count 6/20							9	5	151	18	62	23	153	274	251
dead egg count 6/21	1	10	13	8	13	6	113	41	125						
dead egg count 6/22	1	0	33							1176					
dead egg count 6/23	7	14	9	812			1141			2618			6258		
dead egg count 6/24	14	14	39												
dead egg count 6/25	44	56	58												
dead egg count 6/26	0	0	0												
Totals by replicate	67	94	152	21	45	13	133	53	412	797	598	150	3507	3416	2322
Totals by treatment group	313			891			1739			5339			15503		

Table 8. Temperature Trial #2 - Female 202B

Temperature °C	12			16			18			20			24		
Incubator	5B			4B			3B			2B			1B		
mls of fertilized eggs*	150			150			150			150			150		
Time of First Cleavage	1:00 am 7/14			12:15 am 7/14			11:15pm7/13								
Time of second cleavage				1:00 am 7/14			12:15am 7/14			11:30 pm 7/13			11:15 pm 7/13		
Start of Hatch				am			am			am			pm		
Date of Hatch				7/21			7/19			7/18			7/17		
Finished Hatch				am			pm			am			pm		
Date Hatch Finished				7/22			7/20			7/20			7/19		
Volume of eggs (mL)	177			~177			~177			~177			~177		
number of eggs @ 39.5/mL	6992			6992			6992			6992			6992		
Replicate	E	M	W	E	M	W	E	M	W	E	M	W	E	M	W
Egg inventory	65	60	52	-	-	-	-	-	-	-	-	-	-	-	-
dead egg count 7/16	0	0	0	0	1	0	8	3	7	6	12	13	11	13	17
dead egg count 7/17	5	0	0	9	8	9	11	9	12	-	-	-	-	-	-
dead egg count 7/18	2	2	2	10	7	5	39	55	27	22	37	58	-	-	-
dead egg count 7/19	0	0	0	0	0	0	20	36	35	22	67	73	324		
dead egg count 7/20	23	19	13	10	12	11	51	41	32						
dead egg count 7/21	25	53	30	31	20	19	3	7	8						
dead egg count 7/22	21	33	11	22	25	47									
Totals by replicate	141	167	108	82	73	91	132	151	121	50	116	144	335	13	17
Totals by treatment group	416			246			404			310			689		
5 day post hatch mortality	1671 *														

\* More to be counted (preserved)

Table 9. Milt Collections 2004

Milt Collections								
Pit Tag #	Amount Taken (mls)	Inj Date	Inject Time	Take Date	Time	Motility	Characteristics	Milt Cryo
1F4A3E1445	150	6/9	10:45a	6/10	11:00a	95%	2% milk	N
1F4A312640	150	6/9	10:45a	6/10	11:00a	95%	2% milk	N
7F7E55466D	130	6/14	3:15p	6/15				
1F4A312640	130	6/14	3:18p	6/15				
431565767B	150	6/14	3:21p	6/15				
1F53312736	-	6/14	3:27p	-	-	-	NO SPERM	N
430E452777	60	6/14	3:35p	6/15			bloody	
220E5F4928	150	6/14	3:42p					
430E452777	180	6/14	3:35p		3:50p			
1F53312736	-	6/14	3:27p		3:50p		NO SPERM	N
7F7F066A40	420	6/23	10:30a	6/25	10:30 a			N
220F0F7677	420	6/23	10:30a	6/25	10:30 a			Y
1F47606357	420	6/23	10:30a	6/25	10:30 a			N
1F4A3E1445	270	6/23	10:30a	6/25	10:30 a			Y
1F477B4E51	420	6/23	10:30a	6/25	10:30 a			N
115529097A	2	6/23	10:30a	6/25	10:30 a			N
115552116A	420	6/23	10:30a	6/25	10:30a			Y
7F7F066A40	220	6/23	10:30a	6/25	3:00p			Y
1F47606357	240	6/23	10:30a	6/25	3:00p			Y
1F477B4E51	240	6/23	10:30a	6/25	3:00p			Y
115529097A	90	6/23	10:30a	6/25	3:00p		bloody	Y

Table 10. Milt Repository at Valley City NFH

Pit Tag	Year	Source	Straw Size		Dewar #	Cane Location #	Motility (fresh)	Motility (pre freeze)	Motility (post freeze)	Represented by progeny in RPA
			(ml)	~ #						
7F7F054773	2000	GAD	0.5	4	1	4	90%			
2202236E31	2000	CMR	0.5	4	1	4	95%	5%		
115712453A	2000	GAD	0.5	4	1	4	85%			
1F4A004552	2000	GAD	0.5	4	1	4	90%			
1F4A33194B	2000	GAD	0.5	4	1	4	95%			
1F4A143350	2000	GAD	0.5	5	1	4	90%			
1F4A27214F	2001	MC	0.5	25	1	1				2,3,4
	2001	MC	5	3	1	2				2,3,4
1F4A111C6A	2001	MC	0.5	20	1	1				2,3,4
	2001	MC	5	4	1	2				2,3,4
115631222A	2001	MC	0.5	20	1	1				3,4
	2001	MC	5	3	1	2				3,4
7F7D3C5708	2001	MC	0.5	20	1	1				3,4
	2001	MC	5	4	1	2				3,4
411D0B4E09 (2265)	2001	CMR	5	1	1	4				1,2
	2001	CMR	0.5	10	1	4				1,2
17509415139	2001	CMR	0.5	10	1	4				1,2,3,4
41476A0462	2001	CMR	0.5	20	1	4				1,2,3,4
	2001	CMR	5	1	1	4				1,2,3,4
411D0E2C5F	2001	CMR	0.5	20	1	4				1,2,3,4
	2001	CMR	5	1	1	4				1,2,3,4
1F4A4B5973	2001	CMR	0.5	5	1	4				1,2,3,4
7F7D434B54	2002	GAD	0.5	40	1	5	40%			brood
1F477B3A65	2002	GAD	0.5	10	1	5	90%			2,3,4
	2002	GAD	0.5	70	1	7	90%			2,3,4
7F7D461025	2002	CMR	0.5	40	1	6				brood
7F7F065834	2002	GAD	0.5	40	1	6				
115556461A	2002	GAD	0.5	40	1	7				
1F4772396F	2002	GAD	0.5	40	1	8	35%			



Pit Tag	Year	Source	Straw Size		Dewar #	Cane Location #	Motility (fresh)	Motility (pre freeze)	Motility (post freeze)	Represented by progeny in RPA
			(ml)	~ #						
220F107A6F	2002	GAD	0.5	40	1	8	85%			2,3,4
116167123A	2002	GAD	0.5	40	1	9	75%			2,3,4
1F4A3E1445	2002	GAD	0.5	40	1	9	80%			
115544332A	2002	GAD	0.5	40	1	10	90%			
452738076E	2003	CMR	0.5	130	2	1	90%		5%	
	2003	CMR	5	6	2	3	90%			
411D0E2C5F	2003	CMR	0.5	100	2	5	90%		5+%	
	2003	CMR	5	5	2	5	90%			
452A4E1F15	2003	CMR	5	5	2	4				
	2003	CMR	0.5	80	2	10	60%	30%	<1%	
	2003	CMR	0.5	100	2	6		80%	40%	
	2003	CMR	0.5	100	2	2			5%	
132157621A	2003	GAD	0.5	70	2	4	95%		1-5%	1,2,3,4
7F7D372A6B	2003	GAD	0.5	50	2	8	70%	30-80%	20%	
132313521A	2003	GAD	0.5	70	2	8	70%	1-25%	5%	4
1F521B1E56	2003	GAD	0.5	80	2	6	80%	0-80%	1 - 5%	3,4
	2003	GAD	0.5	70	2	1			<1%	3,4
1F4A13592B	2003	GAD	0.5	70	2	9	85%	50-85%	35%	
7F7D291A07	2003	GAD	0.5	80	2	7	80%	1-20%	20%	3,4
1F4A363031	2003	GAD	0.5	80	2	7	50%	0-5%	50%	1,4
115675486A	2003	GAD	0.5	70	2	10	60%	30-70%	50%	1,2,3,4
1F47760123	2003	MC	0.5	70	2	3	65%	65%	1-2%	1,3,4
115669540A	2003	MC	0.5	60	2	2	50%	55%	<1- 2%	1,2,3,4
132114552A	2003	MC	0.5	80	2	9	40%	40%	1%	2,3,4
220E5F4928	2004	GAD	0.5	100	1	9	80%			
1F4A312640	2004	GAD	0.5	100	1	8	85%			1,4
431565767B	2004	GAD	0.5	99	1	7	95%			2,4
430E452777	2004	GAD	0.5	100	1	7	95%			2,4
7F7E55466D	2004	GAD	0.5	100	1	5	90%			4

Pit Tag	Year	Source	Straw Size		Dewar #	Cane Location #	Motility (fresh)	Motility (pre freeze)	Motility (post freeze)	Represented by progeny in RPA
			(ml)	~ #						
1F4A4B5973	2004	CMR	0.5	100	1	3	90%			1,2,3,4
7F7D487531	2004	CMR	0.5	100	1	3				4
7F7E42795C	2004	CMR	0.5	100	1	5	95%			
220F0E6207	2004	MC	0.5	100	2	5				
7F7E55466D	2004	GAD	0.5	100	1	5*	90%			4
430E452777	2004	GAD	0.5	100	1	7*	95%			2,4
7F7E42795C	2004	CMR	0.5	55	1	5*	95%			
220F0F7677	2004	GAD	0.5	100	1	10	90%			2,4
1F4A3E1445	2004	GAD	0.5	100	1	10	95%			1,4
115552116A	2004	GAD	0.5	50	1	8	90%			4
115552116A	2004	GAD	0.5	50	1	9	90%			4
115529097A	2004	GAD	0.5	50	1	6	90%			
115529097A	2004	GAD	0.5	50	1	3	90%			
7F7F066A40	2004	GAD	0.5	100	2	3	85%			
1F47606357	2004	GAD	0.5	100	2	1	80%			2,4
1F477B4E51	2004	GAD	0.5	100	2	8	40%			
220F0E6207	2004	MC	0.5	100	2	6*	45%			
7F7F065834	2004	GAD	0.5	100	2	7	85%			2,4
7F7D437250	2004	MC	0.5	100	2	9	95%			2,4
115679374A	2004	GAD	0.5	70	2	2	95%			2,4
114473737A	2004	GAD	0.5	70	2	3	85%			
7F7D376F73	2004	GAD	0.5	70	2	10	85%			4
Total Straws (including 5 ml)				4372						

Dewar Capacity: 2000 ½ ml straws (10 straws/cane - 20 canes/canister - 10 canisters/dewar)

Fifty-eight males are represented in the repository as of 2004. Twenty-seven are not represented through progeny in the Missouri River.

Table 11. 2003 Pallid Sturgeon Progeny - July 8, 2004 Stocking

Female	Male	Bellevue, NE	Leavenworth, KS	Booneville, MO	Total
44426F185B	7F7D291A07	48	48	45	141
(7B7B016070)	1F521B1E56	78	68	67	213
	41475D3C5D	220	218	220	658
	1F4A363031	41	42	35	118
TOTAL		387	376	367	1130
7F7F054855	115669540A	40	31	40	111
	115675486A	70	66	70	206
	132313521A	39	65	0	104
TOTAL		149	162	110	421
132256586A	132114552A	99	108	99	306
	132157621A	122	114	125	361
	1F47760123	71	66	71	208
TOTAL		292	288	295	875
GRAND TOTAL		828	826	772	2426
WEIGHT (LBS)		80.5	73.6	71	225
NUMBER/POUND		10.3	11.2	10.9	10.8
LENGTH (IN)		8.9	8.6	8.7	8.7

Table 12. 2004 Pallid Sturgeon Progeny, September 9-11, 2004 Stocking

Family	Booneville, MO	Leavenworth, KS	Bellevue, NE	Culbertson, MT	Wolf Point, MT	Sidney, MT	Total
216A X 7531	1144	1143	1221	75	309	75	3967
216A X 5973	276	276	276	150	150	150	1278
216A X 446D	1595	1566	1566	1213	1150	1382	8472
216A X 2640	3368	3582	880	681	681	443	9635
216A X 2777	3378	2603	2691	1700	1750	941	13063
Length (in)	3.4	3.2	3.2	3.3	3.3	3.4	3.3
Weight (lbs)	51.8	42.8	31.0	18.4	19.4	16.5	179.9
#/lb	188.4	214.3	214	207.6	208	181.3	202.3
Total	9761	9170	6634	3819	4040	2991	36415
Red elastomer tag	left parallel	right parallel	across	left parallel	left parallel	left parallel	

\* all fish were CWT and red elastomer tagged

Table 13. October 8, 2004 - RPA #4 Stocking.

Tank #	♀	♂	July	Aug	Sept	Current Inventory OCT 1	Monthly % Mortality	RPA #2	Booneville MO Number	Weight (lbs)	Corrected Number	Corrected Weight	Leavenworth KS Number	Weight
FT-2	202B	6357	977	77	2	199	1.0%	69		0.0	0	0.0	0	0.0
FT-8	202B	6357	122	83	2	297	0.7%	0	297	4.0	176	2.3	0	0.0
FT-16	202B	6357	2779	428	4	290	1.4%	160		0.0	0	0.0	0	0.0
T-54	202B	6357	-	-	-	700	0.0%	150		0.0	0	0.0	0	0.0
T-57	202B	6357	-	0	73	1165	5.9%	147		0.0	0	0.0	892	11.0
T-63	202B	6357	82	191	0	569	0.0%			0.0	0	0.0	19	0.2
T-77	202B	6357	194	358	8	706	1.1%	674		0.0	0	0.0	37	0.5
S-8	202B	6357	-	-	1	3084	0.0%		1928	25.7	1142	15.2	502	6.2
FRY	202B	6357	1012	-	-	0	0.0%			0.0	0	0.0	0	0.0
LOT TOTAL			5166	1137	90	7010	1.3%	1200	2225	29.7	1318	17.6	1450	17.9
Total to RPA #4									2768					
FT-3	202B	7677	201	94	1	150	0.7%	150		0.0	0	0.0	0	0.0
FT-12	202B	7677	18	46	2	150	1.3%	150		0.0	0	0.0	0	0.0
T-60	202B	7677	-	-	4	951	0.4%	951		0.0	0	0.0	0	0.0
T-61	202B	7677	-	-	2	998	0.2%	399		0.0	0	0.0	287	3.5
T-73	202B	7677	17	366	1	949	0.1%	360		0.0	0	0.0	0	0.0
G-8	202B	7677	-	-	0	1769	0.0%		1024	13.7	606	8.1	566	7.0

Tank #	♀	♂	July	Aug	Sept	Current Inventory OCT 1	Monthly % Mortality	RPA #2	Booneville MO Number	Weight (lbs)	Corrected Number	Corrected Weight	Leavenworth KS Number	Weight		
T-76	202B	7677	118	-	0	0	0.0%			0.0	0	0.0	0	0.0		
LOT TOTAL			354	506	10	4967	0.2%	2010	1024	13.7	606	8.1	853	10.5		
Total to RPA #4									1459							
FT-6	202B	374A	230	63	2	150	1.3%			0.0	0	0.0	20	0.2		
FT-13	202B	374A	46	84	0	150	0.0%			0.0	0	0.0	20	0.2		
T-56	202B	374A	-	-	0	700	0.0%			0.0	0	0.0	150	1.9		
T-69	202B	374A	36	351	5	298	1.7%			0.0	0	0.0	308	3.8		
T-74	202B	374A	-	-	1	699	0.1%		81	1.1	48	0.6	63	0.8		
N-8	202B	374A	-	-	0	1675	0.0%	1200	383	5.1	227	3.0	0	0.0		
T-64	202B	374A	95	-	-	0	0.0%			0.0	0	0.0	0	0.0		
LOT TOTAL			407	498	8	3672	0.2%	1200	464	6.2	275	3.7	561	6.9		
Total to RPA #4									836							
									Subtotal		3713	49.5	2199	29.3	2864	35.3
									Number/pound		75.0		75.0		81.1	
									Total Number		5063					

Table 14. Garrison Dam NFH 2004 Pallid Sturgeon - October 8, 2004 Stocking

Female	Male	Leavenworth, KS			Booneville, MO		
		Number	Lbs	Length	Number	Lbs	Length
454910202B	1F47606357	1450	17.9	4.5	1318	17.6	4.6
	220F0F7677	853	10.5	4.4	606	8.1	4.6
	115679374A	561	6.9	4.4	275	3.7	4.6
GRAND TOTAL		2864	35.3	4.4	2199	29.4	4.6
NUMBER/POUND		81.1			74.8		

Table 15. Garrison Dam NFH 2004 Pallid Sturgeon - October 15, 2004 Stocking

Female	Male	Missouri / Milk River Confluence, MT			
		Number	Lbs	#/lb	size(in)
454910202B	1F47606357	1200	20.9	57	5.0
	220F0F7677	1082	19.4	56	5.0
	115679374A	1200	22.2	54	5.1
GRAND TOTAL		3482	62.5	56	5.0

Table 16. Neosho NFH Transfers from Garrison Dam NFH - October 13, 2004

Tank	Female	Male	Number	Weight (lbs)	Length (in)	#/lb	Grams per fish
T-61	495A	767B	164	8.6	7.2	19.1	23.8
T-67	495A	767B	241	12.0	7.1	20.1	22.6
T-76	495A	767B	203	10.0	7.1	20.3	22.4
Lot Total			608	30.6	7.1	19.9	22.8
FT-6	202B	374A	40	1.4	6.3	28.6	15.9
FT-13	202B	374A	40	1.4	6.3	28.6	15.9
T-56	202B	374A	285	7.6	5.8	37.5	12.1
T-74	202B	374A	285	7.6	5.8	37.5	12.1
Lot Total			650	18.0	5.8	36.1	12.6
FT-24	6452	5834	36	1.2	6.2	30.0	15.1
FT-25	6452	5834	96	2.0	5.3	48.0	9.5
T-52	6452	5834	173	3.8	5.4	45.5	10.0
T-58	6452	5834	371	9.1	5.6	40.8	11.1
Lot Total			676	16.1	5.5	42.0	10.8
TOTAL			1934	64.7	6.2	29.9	15.2



Table 17. Neosho NFH Transfers from Garrison Dam NFH - October 21, 2004

Tank	Female	Male	Number	Weight (lbs)	Length (in)	#/lb	Grams per fish
T-61	495A	767B	104	6.4	7.6	16.3	27.9
T-67	495A	767B	42	2.6	7.6	16.2	28.1
T-76	495A	767B	85	6.6	8.2	12.9	35.3
Lot Total			231	15.6	7.8	14.8	30.7
T-81	216A	2640	361	15.9	6.8	22.7	20.0
FT-22	216A	2640	99	0.9	4.0	110.0	4.1
FT-23	216A	2640	139	1.6	4.3	86.9	5.2
Lot Total			599	18.4	6.0	32.6	13.9
FT-28	0D60	5834	96	5.0	7.2	19.2	23.6
FT-29	0D60	5834	118	4.0	6.2	29.5	15.4
FT- 27	0D60	5834	168	5.8	6.3	29.0	15.7
T-72	0D60	5834	269	9.6	6.3	28.0	16.2
Lot Total			651	24.4	6.4	26.7	17.0
TOTAL			1481	58.4	6.6	25.4	17.9

Table 18. Neosho NFH Transfers from Garrison Dam NFH - October 28, 2004

Tank	Female	Male	Number	Weight (lbs)	#/lb	Grams per fish	Length (in)
T-54	202B	6357	348	11.4	30.5	14.9	6.2
T-63	202B	6357	372	20.0	18.6	24.4	7.3
FT-16	202B	6357	97	2.8	34.6	13.1	5.9
FT-2	202B	6357	100	3.0	33.3	13.6	6.0
Lot Total	202B	6357	917	37.2	24.7	18.4	6.6
T-80	216A	7A6F	211	11.4	18.5	24.5	7.3
FT-26	216A	7A6F	115	1.2	95.8	4.7	4.2
FT-27	216A	7A6F	91	1.2	75.8	6.0	4.6
Lot Total			417	13.8	30.2	15.0	6.2
T-66	216A	5973	377	19.2	19.6	23.1	7.1
T-55	216A	5973	381	11.4	33.4	13.6	6.0
Lot Total			758	30.6	24.8	18.3	6.2
TOTAL			2092	81.6	25.6	17.7	6.5

Table 19. November 19 2004, Intake Stockings, Yellowstone River, MT.

Tank	♀	♂	Tagged #	Weight (lbs)	Length (in)	#/lb	Stock Number
<b>CRYOPRESERVATION LOTS</b>							
T-79	216A	3A65	100	6.2	7.6	16.1	99
FT-22	216A	3A65	119	1.8	4.8	66.1	117
FT-23	216A	3A65	96	1.2	4.5	80.0	95
T-55	216A	767B	38	2.4	7.7	15.8	38
LOT TOTAL			353	11.6	6.2	30.4	348
<b>FEMALE 216A</b>							
T-53	216A	2777	134	7.6	7.4	17.6	132
T-64	216A	2777	141	8.8	7.6	16.0	139
LOT TOTAL			482	16.4	6.2	29.4	476
<b>FEMALE 202B</b>							
FT-1	202B	6357	155	1.8	4.4	86.1	153
FT-8	202B	6357	172	2.4	4.6	71.7	170
FT-11	202B	6357	250	3.2	4.5	78.1	247
LOT TOTAL			577	7.4	4.5	78.0	570
FT-12	202B	7677	24	0.8	6.2	30.0	24
N-8	202B	7677	148	5.2	6.3	28.5	146
LOT TOTAL			172	6.0	6.3	28.7	170
FT-6	202B	374A	85	4.0	7.0	21.3	84
FT-13	202B	374A	52	2.0	6.5	26.0	51
FT-15	202B	374A	119	1.4	4.4	85.0	117
T-74	202B	374A	37	1.6	6.8	23.1	37

Tank	♀	♂	Tagged #	Weight (lbs)	Length (in)	#/lb	Stock Number
LOT TOTAL			293	9.0	6.0	32.6	289
FEMALE 0D60							
FT-29	0D60	5834	30	1.6	7.2	18.8	30
T-51	0D60	5834	262	10.8	6.7	24.3	259
LOT TOTAL			292	12.4	6.7	23.5	288
T-77	0D60	6F73	83	3.2	6.5	25.9	82
LOT TOTAL			83	3.2	6.5	25.9	82
FEMALE 6452							
FT-24	6452	5834	118	4.0	6.2	29.5	116
LOT TOTAL			118	4.0	6.2	29.5	116
FEMALE 683A							
FT-7	683A	555D	32	2.0	7.6	16.0	32
FT-17	683A	555D	75	4.6	7.6	16.3	74
LOT TOTAL			107	6.6	7.6	16.2	106
GRAND TOTAL			4043	125.0	6.0	32.3	3991

Fish for the Intake stocking on the Yellowstone River were tempered 5 days prior to stocking from 65°F to 48°F prior to hauling. At the site they were tempered another 5° F to 43. The water temperature in the river was 38°F. The fish hauled well. While tempering at the site, 100 fish were selected for a CWT retention check. All 100 fish held a tag two weeks post tagging. The fish also had red elastomer marks consistent with the year class (parallel, left).

Table 20. December 25, 2004 Future Broodstock for Gavins Point from Garrison (2004 Progeny - Seven females - 23 family lots)

TANK	FEMALE	MALE	SHIP #	WEIGHT (g)	#/lb	LENGTH (in)	SHIP DATE
T-79	216A	3A65	30	1236	11.0	8.7	12/15/2004
T-68	216A	214F	30	406	33.5	6.0	12/15/2004
FT-18	216A	123A	30	768	17.7	7.4	12/15/2004
T-80	216A	7A6F	30	1580	8.6	9.4	12/15/2004
T-71	216A	7531	30	892	15.3	7.8	12/15/2004
T-66	216A	5973	30	746	18.3	7.3	12/15/2004
T-55	216A	767B	30	1095	12.4	8.3	12/15/2004
T-70	216A	466D	30	1198	11.4	8.6	12/15/2004
T-65	216A	2640	30	1595	8.5	9.4	12/15/2004
FT-20	216A	2777	30	433	31.5	6.1	12/15/2004
T-76	495A	767B	30	1466	9.3	9.2	12/15/2004
T-63	202B	6357	30	1017	13.4	8.1	12/15/2004
FT-3	202B	7677	30	729	18.7	7.3	12/15/2004
T-74	202B	374A	30	754	18.1	7.3	12/15/2004
T-51	0D60	5834	30	895	15.2	7.8	12/15/2004
T-75	0D60	1445	30	750	18.2	7.3	12/15/2004
T-77	0D60	6F73	30	961	14.2	8.0	12/15/2004
FT-19	6452	737A	30	565	24.1	6.7	12/15/2004
FT-28	6452	1445	30	759	17.9	7.4	12/15/2004
T-52	6452	5834	30	468	29.1	6.3	12/15/2004
FT-7	683A	555D	30	1509	9.0	9.3	12/15/2004
T-81	683A	116A	30	952	14.3	7.9	12/15/2004
T-78	401E	MIX	60	1051	25.9	6.5	12/15/2004
Total Number			720	21825	15.0	7.8	12/15/2004

Table 21. January 11, 2005 Future Broodstock for Gavins Point from Garrison (2004 Progeny - Seven females - 23 family lots ; 2003 Progeny - Two females - 3 family lots)

TANK	FEMALE	MALE	SHIP #	WEIGHT (kg)	WEIGHT (lbs)	#/lb	LENGTH (in)	SHIP DATE
T-79	216A	3A65	30	1.48	3.26	9.2	9.2	1/11/2005
T-68	216A	214F	30	0.64	1.41	21.3	7.0	1/11/2005
FT-18	216A	123A	30	0.74	1.63	18.4	7.3	1/11/2005
T-80	216A	7A6F	30	1.52	3.35	9.0	9.3	1/11/2005
T-71	216A	7531	30	0.84	1.85	16.2	7.6	1/11/2005
T-66	216A	5973	30	0.88	1.94	15.5	7.7	1/11/2005
T-55	216A	767B	30	1.24	2.73	11.0	8.7	1/11/2005
FT-4	216A	466D	30	0.46	1.01	29.6	6.2	1/11/2005
S-8	216A	2640	30	1.38	3.04	9.9	9.0	1/11/2005
FT-20	216A	2777	30	0.56	1.23	24.3	6.6	1/11/2005
T-76	495A	767B	30	1.72	3.79	7.9	9.7	1/11/2005
T-16	202B	6357	29	0.70	1.54	18.8	7.2	1/11/2005
FT-73	202B	7677	45	0.82	1.81	24.9	6.6	1/11/2005
T-13	202B	374A	30	0.72	1.59	18.9	7.2	1/11/2005
T-51	0D60	5834	30	0.90	1.98	15.1	7.8	1/11/2005
T-10	0D60	1445	30	0.46	1.01	29.6	6.2	1/11/2005
T-77	0D60	6F73	30	0.90	1.98	15.1	7.8	1/11/2005
FT-26	6452	737A	23	0.54	1.19	19.3	7.2	1/11/2005
FT-9	6452	1445	23	0.64	1.41	16.3	7.6	1/11/2005
T-25	6452	5834	30	0.62	1.37	21.9	6.9	1/11/2005
FT-6	683A	555D	30	1.42	3.13	9.6	9.1	1/11/2005
T-81	683A	116A	30	0.98	2.16	13.9	8.0	1/11/2005
T-78	401E	MIX	60	1.20	2.64	22.7	6.8	1/11/2005
Total Number			720	21.36	47.05	15.3	7.8	1/11/2005
2003 Progeny								
S-20	4855	521A	69	9.60	21.15	3.3	13.0	1 cross mark
S-20	6070	3031	74	10.50	23.13	3.2	13.1	no elasomer
S-20	6070	592B	6	1.16	2.56	2.3	14.5	1 parallel mark
Total Number			149	21.26	46.83	3.2	13.1	

Table 22. April 21 &amp; 25, 2005 Stocking - 2004 Progeny

Family	Tank #	Sioux City, IA	Kansas City, MO	Total
216A X 446D	4,G8	135	123	258
216A X 2640	65,66,S8,80	226	324	550
216A X 2777	53,64	119	235	354
216A X 214F	1	11	6	17
216A X 3A65	79	42	4	46
216A X 7A6F	3,5	18	10	28
216A X 7531	10	11	8	19
216A X 5973	70	25	31	56
216A X 767B	6,7	18	17	35
495A X 767B	59,61,67,68,76	340	33	373
202B X 6357	2,54,56,63	225	124	349
202B X 7677	9,57,60,73,71	294	264	558
202B X 374A	74	70	157	227
0D60 X 5834	72 & 51	91	182	273
0D60 X 1445	75	70	51	121
0D60 X 6F73	77	116	43	159
6452 X 737A	11	9	8	17
6452 X 5834	58,69	103	47	150
683A X 555D	52,55,62	220	89	309
683A X 116A	81	82	37	119
401E X MCM	8 ,50,78,82,83	174	417	591
MIX X MIX	N8	151	139	290
Weight (lbs)		180	140	320
Length (in)		8.0	7.6	7.8
TOTAL		2546	2349	4895

Table 23. Stocking/Production Summary

<b>Garrison Dam NFH 2004 Stocking/Production Summary</b>			
<b>Stock Location</b>	<b>Size (inches)</b>	<b>Date</b>	<b>Number</b>
Culbertson, MT	fry	June/July	130000
Fingerling stock RPA #4	3.3	Sept 9-10, 2004	25565
Fingerling stock RPA #2	3.3	Sept 10-11, 2004	10850
Fingerling stock RPA #4	4.5	Oct 8, 2004	5063
Neosho NFH	6.3	Oct 13, 2004	1863
RPA #2 - Milk River Conf	5.4	Oct 15, 2004	3482
Neosho NFH	6.6	Oct 21, 2004	1481
Neosho NFH	6.5	Oct 28, 2004	2092
RPA #2 - Intake Stocking	6.1	Nov 18, 2004	2445
Gavins Point Transfers	7.8	Dec 15, 2004	720
Gavins Point Transfers	7.7	Jan 11, 2005	729
Gavins Point Transfers (2003 progeny)	13.1	Jan 11, 2005	149
RPA #4 - Sioux City, IA	8.0	April 21, 2005	2546
RPA #4 - Kansas City, KS	7.6	April 25, 2005	2349
<b>TOTAL</b>			<b>189334</b>



Table 24. Hatchery Production Summary - 2004 Progeny

♀	♂	Tanks	Inventory April 20-22	Initial Inventory feeding fry	Larval stockings and research	Fingerling stockings	Hatchery Transfer	Garrison Dam NFH Mortality Records											% Survival from feeding fry (not including fry stock)
								Jun	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb *	Mar	Apr	
216A	466D	4,G8	258	38642	20914	8472	60	3594	4506	151	267	261	157	2	0	1	1	0	50%
216A	2640	65,66,S8,80	550	52806	25045	9635	659	12998	3725	193	0	1	0	0	6	9	0	0	39%
216A	2777	53,64	354	58750	25921	13539	60	5590	10350	2416	372	39	104	5	0	14	0	0	43%
216A	214F	1	17	212	0	0	60	-	106	8	9	7	4	1	0	1	1	1	36%
216A	3A65	79	46	609	0	315	60	-	101	31	3	53	0	0	0	1	0	0	69%
216A	123A		0	157	0	0	60	-	38	2	33	18	0	6	0	0	0	0	38%
216A	7A6F	3,5	28	643	0	0	477	-	112	20	1	5	0	0	0	1	0	0	79%
216A	7531	10	19	6550	0	3967	60	756	1452	35	1	259	1	0	0	4	0	1	62%
216A	5973	70	56	3175	0	1278	818	339	601	37	0	36	10	0	0	0	0	0	68%
216A	767B	6,7	35	216	0	38	60	-	79	2	0	0	1	1	0	3	0	0	62%
495A	767B	59,61,67,68,76	373	2231	0	0	904	653	236	43	0	15	7	0	0	5	0	0	57%
202B	6357	2,54,56,63	349	60685	48389	4538	976	-	5166	1137	90	35	0	5	18	34	0	1	48%
202B	7677	9,57,60,73,71	558	31834	27230	2711	75	-	357	509	10	343	23	18	16	28	22	12	73%
202B	374A	74	227	25152	20895	2325	710	-	407	504	8	13	62	1	1	0	0	0	77%

♀	♂	Tanks	Inventory April 20-22	Initial Inventory feeding fry	Larval stockings and research	Fingerling stockings	Hatchery Transfer	Garrison Dam NFH Mortality Records											% Survival from feeding fry (not including fry stock)
								Jun	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb *	Mar	Apr	
0D60	5834	51,72	273	3323	0	292	701	-	1753	87	11	196	10	0	5	4	1	0	38%
0D60	1445	75	121	1361	0	0	60	-	987	45	18	122	7	1	0	1	0	5	13%
0D60	6F73	77	159	2481	0	83	60	-	2081	93	5	0	0	0	0	1	0	0	12%
6452	737A	11	17	329	0	0	53	-	219	12	0	0	14	14	1	9	0	0	21%
6452	1445		0	715	0	0	53	-	598	15	0	18	5	26	0	0	0	0	7%
6452	5834	12,58,69	150	1913	0	118	660	-	750	55	15	74	29	62	17	7	1	0	49%
683A	555D	52,55,62	309	1362	0	107	60		803	41	5	33	4	0	0	1	0	0	35%
683A	116A	81	119	469	0	0	60	-	256	31	1	2	0	0	0	0	0	1	38%
683A	737A		0	9	0	0	0	-		6	0	3	0	0	0	0	0	0	0%
401E	MIX	8,50,78,82,83	591	4074	0	0	120	-	1121	57	2	2053	128	2	5	6	3	4	17%
MIX	MIX	N8	290	687	0	0	0	-	-	-	-	-	348	49	22	15	14	13	42%
Totals			4899	298380	168394	47418	6866	23930	35804	5525	851	3586	914	193	91	145	43	38	46%

\* February nitrogen saturation resulted in higher than normal mortality over a 4 day period.

Table 25. Pallid Density Index and Mortality Table

Tank	Female ♀	Male ♂	# of Fish	Length (in)	Weight (lbs)	April 13 Density	7 Months Mortality							% Mort Last 3 Months	Viral status (Oct)	
							Aug	Sep	Oct	Nov	Dec	Jan	Feb			Mar
1	216A	214F	17	6.5	0.65	0.13	-	-	-	-	-	0	1	1	11%	
2	202B	6357	16	7.8	1.05	0.21	77	2	1	0	2	9	8	0	52%	
3	216A	7A6F	14	9.5	1.66	0.34	-	-	-	-	-	0	0	0	0%	
4	216A	446D	18	6.4	0.65	0.13	1	2	1	41	1	0	1	1	10%	
5	216A	7A6F	14	9.0	1.45	0.30	-	-	-	-	0	0	1	0	7%	
6	216A	767B	18	8.8	1.70	0.35	-	-	-	-	0	0	3	0	14%	
7	216A	767B	17	8.5	1.45	0.30	-	-	-	-	-	0	0	0	0%	
8	401E	MIX	8	9.3	0.90	0.18	-	-	-	-	0	0	0	1	11%	
9	202B	7677	34	5.3	0.70	0.14	-	-	-	-	1	12	21	22	62%	
10	216A	7531	19	7.1	0.95	0.19	-	-	-	-	0	0	4	0	17%	
11	6452	737A	17	6.3	0.60	0.12	-	-	-	-	2	1	9	0	37%	
12	6452	5834	0	0.0	0.00	0.00	-	-	-	-	0	0	2	0	100%	
50	401E	MIX	166	6.6	6.60	0.34	-	1	608	12	1	0	0	0	0%	+ 4/5
51	0D60	5834	137	7.3	7.50	0.38	-	6	14	0	0	4	2	0	4%	NEG
52	683A	555D	92	8.3	7.40	0.38	-	-	-	-	0	0	0	0	0%	
53	216A	2777	165	7.3	9.10	0.46	-	0	0	2	2	0	3	0	2%	+ 1 /2
54	202B	6357	116	6.8	5.20	0.27	-	0	1	0	0	1	16	0	13%	NEG

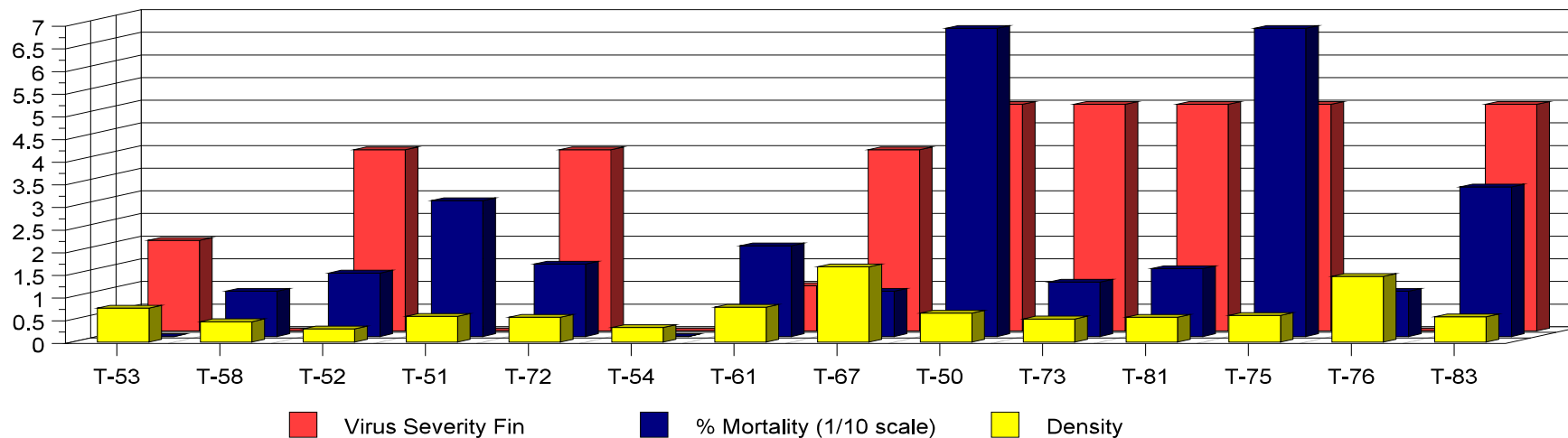
Tank	Female ♀	Male ♂	# of Fish	Length (in)	Weight (lbs)	April 13 Density	7 Months Mortality							% Mort Last 3 Months	Viral status (Oct)	
							Aug	Sep	Oct	Nov	Dec	Jan	Feb			Mar
55	683A	555D	95	8.0	6.80	0.35	-	-	-	-	1	0	0	0	0%	
56	202B	6357	113	7.5	6.65	0.34	-	-	-	-	0	6	8	0	11%	
57	202B	7677	157	6.5	6.10	0.31	-	-	-	-	2	3	3	3	5%	
58	6452	5834	112	7.4	6.44	0.33	3	11	4	0	62	17	2	1	15%	NEG
59	495A	767B	83	9.1	8.75	0.45	-	-	-	-	-	0	0	0	0%	
60	202B	7677	195	6.8	8.45	0.43	-	4	119	6	1	1	1*	1	2%	
61	495A	767B	74	8.9	7.30	0.37	-	-	10	7	0	0	4*	0	5%	+ 0/1
62	683A	555D	122	8.2	9.30	0.47	-	2	32	4	0	0	1*	0	1%	+ 4/5
63	202B	6357	104	7.8	6.90	0.35	191	0	0	0	1	2	2*	0	4%	
64	216A	2777	189	8.0	13.64	0.70	3	2	1	2	0	0	11*	0	6%	
65	216A	2640	128	9.0	13.25	0.68	7	0	1	0	0	0	5*	0	4%	
66	216A	2640	99	9.1	10.60	0.54	-	-	-	-	0	0	2*	0	2%	
67	495A	767B	49	9.2	5.30	0.42	-	0	2	0	0	0	1*	0	2%	+2/4
68	495A	767B	50	8.8	4.70	0.37	-	-	-	-	1	0	0*	0	0%	
69	6452	5834	38	5.9	1.10	0.09	-	-	-	-	1	0	3*	0	7%	
70	216A	5973	56	7.6	3.50	0.28	-	-	-	-	1	0	0*	0	0%	
71	202B	7677	67	6.8	2.95	0.23	-	-	-	-	0	0	1*	1	3%	
72	0D60	5834	136	7.0	6.45	0.33	-	4	85	7	1	1	2*	1	3%	+ 3/4
73	202B	7677	105	6.6	4.30	0.22	366	1	113	8	0	0	2*	0	2%	+ 5

Tank	Female ♀	Male ♂	# of Fish	Length (in)	Weight (lbs)	April 13 Density	7 Months Mortality							% Mort Last 3 Months	Viral status (Oct)		
							Aug	Sep	Oct	Nov	Dec	Jan	Feb			Mar	
74	202B	374A	227	7.0	10.90	0.56	-	1	0	32	0	1	0*	0	0%		
75	0D60	1445	121	6.3	4.25	0.22	-	-	-	2	0	0	1*	0	1%		
76	495A	767B	117	9.1	12.20	0.62	27	0	3	0	0	0	0*	0	0%	NEG	
77	0D60	6F73	159	7.5	9.25	0.47	-	-	-	0	0	0	1*	0	1%		
78	401E	MIX	164	6.7	6.95	0.35	57	1	276	25	0	3	1*	2	4%		
79	216A	3A65	46	8.6	4.10	0.33	31	4	49	0	0	0	1*	0	2%		
80	216A	2640	60	9.0	6.20	0.49	-	-	-	0	0	0	0*	0	0%		
81	683A	116A	119	8.0	8.50	0.67	-	-	-	0	0	0	0*	0	0%		
82	401E	MIX	118	7.0	5.70	0.45	-	-	-	11	0	0	3*	0	2%		
83	401E	MIX	135	7.0	6.35	0.50	-	-	162	32	2	2	2*	0	3%	+ 4/5	
S8	216A	2640	263	9.0	26.60	0.53	-	-	-	0	0	6	2	0	3%		
N8	Nurse	Tank	290	6.7	12.20	0.24	-	-	-	-	49	22	15	14	15%		
G8	216A	446D	240	8.2	18.56	0.37	-	-	-	116	0	0	0	0	0%		
Totals / Averages			5637	7.6	311.8	0.35			760	18	1468	307	131	91	100		
									% Monthly Mortality		9%	0%	20%	5%	2%	3%	2%

Shaded mortality blocks indicate tanks that were sampled for iridovirus on October 14, 2004. The viral score represents the fin score and has a range from 0 to 5 with a level 5 being severe.

\* February nitrogen saturation resulted in higher than normal mortality over a 4 day period.

Table 26. Density, Iridovirus and Mortality (October 2004)



Tank Number	T-53	T-58	T-52	T-51	T-72	T-54	T-61	T-67	T-50	T-73	T-81	T-75	T-76	T-83
Female	216A	6452	6452	0D60	0D60	202B	495A	495A	401E	202B	216A	216A	495A	401E
Male	2777	5834	5834	5834	5834	6357	767B	767B	MCX	7677	2640	7531	767B	MCX
# of fish	300	571	366	555	521	700	451	395	899	949	478	372	640	499
Length (in)	7.0	4.8	4.8	5.2	5.3	4.0	6.2	7.2	4.6	4.2	4.7	6.0	5.4	4.6
Grams/fish	22	7	7	9	9.3	4	15	23.7	6.3	4.7	6.5	14	20	6.3
Pounds	14.5	8.8	5.6	11.0	10.7	6.2	14.9	20.6	12.5	9.8	6.8	11.5	28.2	6.9
Density (pounds/ft <sup>2</sup> )	0.75	0.45	0.29	0.57	0.55	0.32	0.77	1.66	0.64	0.51	0.55	0.59	1.45	0.56
virus barb *	2	0	18	0	13	0	1	1	17	19	28	12	0	13
virus fin *	2	0	4	0	4	0	1	4	5	5	5	5	0	5
% mortality	0.0%	0.7%	13.9%	2.5%	16.3%	0.1%	2.2%	0.5%	67.6%	11.9%	15.1%	67.7%	0.5%	32.5%
Actual Mort	0	4	51	14	85	1	10	2	608	113	72	252	3	162

\* Fin scores range from 0-5 ; Used highest score taken from fish health assessment, October 14, 2004

Table 27. Growth Rates of Recaptured Hatchery Stocked Fish

Hatchery	Num Stkd	% of Total Stocked	Months at Large	Num Recap	% of Recaps in Date Range	Days at Large	Ave Growth at Large(mm)	Growth Rate (mm)	Stock Length (mm)	Recap Length (mm)
Bozeman NFH	5455	5%	<3	11	3%	30	-	-	-	354
			3-12	0	0%	-	-	-	-	-
			12-36	3	1%	393	-	-	-	344
Miles City SFH	5918	6%	<3	33	9%	45	32	0.72	254	265
			3-12	16	5%	339	59	0.18	268	316
			12-36	15	4%	428	70	0.17	269	325
Garrison Dam NFH	68933	65%	<3	14	4%	46	35	0.84	221	247
			3-12	13	4%	288	83	0.30	266	314
			12-36	33	9%	644	136	0.23	246	379
Gavins Point NFH	13688	13%	<3	15	4%	29	27	0.57	352	360
			3-12	18	5%	294	54	0.20	348	397
			12-36	37	11%	702	84	0.14	412	487
			>36	131	38%	1778	106	0.09*	535*	541
Neosho	5491	5%	<3	3	1%	61	32	0.54	282	314
			3-12	2	1%	519	154	0.29	259	413
			>12	5	1%	211	58	0.27	264	322
Blind Pony SFH	5967	6%	<3		0%					
			3-12		0%					
			>12		0%					
TOTAL	105452	100%		349	100%					

\*represents a group of 23 six year old fish stocked at Verdel, NE in 2000

Table 28. Growth Rates broken out by RPA

Hatchery	RPA	Num Stkd*	% of Total Stocked	Num Recap	Days at Large	Ave Growth at Large (mm)	Growth/day (mm)	Stock Length (mm)	Standard Deviation (mm)	Recap Length (mm)	Standard Deviation (mm)
Bozeman NFH	1	5297	88%	14	108	6	0.06	425	138	351	89
	2	158	1%	0	393	-	-	-	-	-	-
Miles City SFH	2	5918	53%	70	253	44	0.17	267	31	309	38
Garrison Dam NFH	2	1626	15%	35	471	72	0.15	257	37	326	51
	3	841	31%	7	613	196	0.32	210	18	406	35
	4	19061	56%	19	270	124	0.46	230	45	312	134
Gavins Point NFH	1	690	12%	115	1724	-	-	-	-	507	67
	2	3410	31%	39	668	52	0.08	339	88	405	109
	3	1863	69%	40	987	93	0.09	495	91	588	97
	4	5107	15%	13	431	72	0.17	391	107	484	121
	5	2618	29%	2	16	-	-	-	-	-	-
Neosho	4	5491	16%	10	228	69	0.30	268	30	338	52
Blind Pony SFH	4	4436	13%								
	5	6368	71%								
TOTAL		62884		364							

\*2004 Stockings not included



Table 29. Growth rate as a function of stocking date

Stocking Period	Growth Rate (mm/day)	Growth SDEV	Average Days at Large	Average Size at Stocking	Average Size at Recapture	Recaptures per RPA				Number of Fish Sampled *
						1	2	3	4	
March-May	.365	.206	457	303	423	0	1	14	12	25
June-Aug	.363	.426	967	318	425	126	134	27	12	134
Sept-Dec	.216	.209	516	398	444	3	9	6	18	28
Sample Size	187	187	358	196	354	129	144	47	42	362

\* Only 187 of the 362 recaptures have growth data (primarily no length data at stocking)

Table 30. Recapture rates as a function of RPA.

RPA	Number of Recap	Total Stocked	% Recaptured of Available	River Miles	Average age	Stock Length	Recap Length	Growth Rate (mm)	Days at Large	Weight grams
1	129	5987	2.15%	180	5	-	491	-	1549	437
2	144	27889	0.52%	300	2	283	338	0.385	417	149
3	47	2704	1.74%	70	5	453	561	0.142	952	585
4	42	62719	0.07%	811	2	291	369	0.446	311	268
5	2	6153	0.03%	1154	-	-	-	-	16	-
Total/Ave	364	105452	0.35%	2515	4	329	427	0.322	877	335

Table 31. Hatchery Stocking Summary to May 2005 (fry not included)

Hatchery	RPA 1 Stock Number	RPA 2 Stock Number	RPA 3 Stock Number	RPA 4 Stock Number	RPA 5 Stock Number	Total Stock Number
Bozeman NFH	5297	158				5455
Miles City SFH		5918				5918
Garrison Dam NFH		18403	841	54584		73828
Gavins Point NFH	690	3410	1863	5107	2618	13688
Blind Pony SFH				4436	6368	10804
Neosho NFH				5491		5491
TOTAL	5987	27889	2704	69618	8986	115184

Table 32. Hatchery Recaptures 2004

PIT TAG	ELASTOMER CWT PIT	YEAR CLASS	STOCKING DATA					RECAPTURE DATA				GROWTH	
			LENGTH (mm)	WEIGHT (g)	STOCK SITE	HATCHERY	DATE	LENGTH (mm)	WEIGHT (g)	RECAP SITE	DATE	LENGTH (mm)	WEIGHT (g)
13-0779	E, P	2002	309	113	BOO	NEO		315	101	SEG 13	2003-4	6	-12
13-1045	C, P							634	940	SEG 13	2003-4	0	940
13-1083	P	2002	297		BOO	GAR		392		SEG 13	2003-4	95	0
13-1114	E, P	2002	307	100	BOO	GAV		347		SEG 13	2003-4	40	0
13-1414	E, P		208	41				298		SEG 13	2003-4	90	0
13-1415	E, P	2002	302	120	BOO	GAV		391	160	SEG 13	2003-4	89	40
13-1426	E, P	2002	290	93	BOO	NEO		322	104	SEG 13	2003-4	32	11
13-1428	E, P	2002	322	121	BOO	GAV		439		SEG 13	2003-4	117	0
13-1470	E, P	2002	306	103	BOO	NEO		393	204	SEG 13	2003-4	87	101
13-1501	PINK - R	2003			BOO	GAR		306	80	SEG 13	2003-4	0	80
13-1535	P	2002	254		BOO	NEO		455		SEG 13	2003-4	201	0
13-1571	E, P	2004	221	51	BOO	GAR		250		SEG 13	2003-4	29	0
13-1640	E, P	2002	245	45	BOO	NEO		299		SEG 13	2003-4	54	0
13-1879	P	2001	220		BOO	GAR		529	500	SEG 13	2003-4	309	500
13-1940	E, P	2004	257	63	BOO	GAV		378	161	SEG 13	2003-4	121	98
13-1940	RED - L	2002			BOO	GAR		133		SEG 13	2003-4	0	0
13-1985	P	2002	259		BOO			427	266	SEG 13	2003-4	168	266

PIT TAG	ELASTOMER CWT PIT	YEAR CLASS	STOCKING DATA					RECAPTURE DATA				GROWTH	
			LENGTH (mm)	WEIGHT (g)	STOCK SITE	HATCHERY	DATE	LENGTH (mm)	WEIGHT (g)	RECAP SITE	DATE	LENGTH (mm)	WEIGHT (g)
424D2C0648		1999	488	406	BEL	GAV		562	428	SEG 9	2004	74	22
8	PINK -RV	2003			BOO	GAR		248	32	SEG 9	2004	0	32
431B302371		2001	210		VER	GAR		409	194	SEG 9	2004	199	194
4349036D60	YELLOW-RH	2003	258	50	LEA	NEO		310	36	SEG 9	2004	52	-14
11	RED - LH	2004			BOO	GAR		111		SEG 9	2004	0	0
406E5F130F	GREEN	1997	545	715	VER	GAV		670	900	SEG 5/6	2004	125	185
411A694D40	BLUE	1997	545	605	VER	GAV		680	1074	SEG 5/6	2004	135	469
424E680D67		1999	519	697	SUN	GAV		581	612	SEG 5/6	2004	62	-85
423C127A3F		1999	523	625	SUN	GAV		555	522	SEG 5/6	2004	32	-103
424F181402		1999	463	523	SUN	GAV		533	422	SEG 5/6	2004	70	-101
4250041B1D		1999	515	671	SUN	GAV		593	584	SEG 5/6	2004	78	-87
								665	1000	SEG 5/6	2004	0	1000
								560	620	SEG 5/6	2004	0	620
								578	607	SEG 5/6	2004	0	607
								760	1253	SEG 5/6	2004	0	1253
411B5A5E45		1998	487	491	VER	GAV		546	420	SEG 5/6	2004	59	-71
424D2B1821		1999	488	472	SUN	GAV		538	458	SEG 5/6	2004	50	-14
411B0F732C		1997	530	635	VER	GAV		627	712	SEG 5/6	2004	97	77

PIT TAG	ELASTOMER CWT PIT	YEAR CLASS	STOCKING DATA					RECAPTURE DATA				GROWTH	
			LENGTH (mm)	WEIGHT (g)	STOCK SITE	HATCHERY	DATE	LENGTH (mm)	WEIGHT (g)	RECAP SITE	DATE	LENGTH (mm)	WEIGHT (g)
4323482363		2001	220		VER	GAR		385	142	SEG 5/6	2004	165	142
424B35301F		1999	356	123	SUN	GAV		439	268	SEG 5/6	2004	83	145
4442674279		2002	210	33	SUN	GAV		324	105	SEG 5/6	2004	114	72
411B724227		1997	566	709	VER	GAV		617	435	SEG 5/6	2004	51	-274
411B4C467A		1997	567	900	VER	GAV		664	881	SEG 5/6	2004	97	-19
435E347D73								571	532	SEG 5/6	2004	0	532
41102D3C77	ORANGE	1997	551	564	VER	GAV		648	908	SEG 5/6	2004	97	344
411B6C795B	GREEN	1997	600	1000	VER	GAV		706	1152	SEG 5/6	2004	106	152
431C3B023A		2001	210		VER	GAR		362	145	SEG 5/6	2004	152	145
406E612022	ORANGE	1997	528	512	VER	GAV		635	794	SEG 5/6	2004	107	282
424F0B6C5F		1998	586	909	VER	GAV		686	1010	SEG 5/6	2004	100	101
435F15582E								494	391	SEG 5/6	2004	0	391
431C7A291D		2001	210		VER	GAR		458	326	SEG 5/6	2004	248	326
42573D4C60		2002	246	61	SUN	GAV		368	160	SEG 5/6	2004	122	99
4255792565		2002	247	61	SUN	GAV		359	134	SEG 5/6	2004	112	73
		1997				GAV		553	573	1897 RPA1	6/24/04	0	0
132126586A	BLUE	1997				GAV		475	330	1918 RPA1	5/1/04	0	0
132129383A	ORANGE	1997				GAV		489	378	1911 RPA1	8/5/04	0	0

PIT TAG	ELASTOMER CWT PIT	YEAR CLASS	STOCKING DATA					RECAPTURE DATA				GROWTH	
			LENGTH (mm)	WEIGHT (g)	STOCK SITE	HATCHERY	DATE	LENGTH (mm)	WEIGHT (g)	RECAP SITE	DATE	LENGTH (mm)	WEIGHT (g)
132133555A	GREEN	1997				GAV		476	367	1914 RPA1	5/21/04	0	0
132156240A	ORANGE	1997				GAV		525	455	1911 RPA1	9/1/04	0	0
132161665A	YELLOW	1997				GAV		556	588	1894 RPA1	7/27/04	0	0
132179611A	YELLOW	1997				GAV		472	317	1918 RPA1	5/5/04	0	0
132222105A	GREEN	1997				GAV		458	367	1900 RPA1	10/15/04	0	0
132252257A	GREEN	1997				GAV		546	480	1987 RPA1	5/26/04	0	0
132255346A	ORANGE	1997				GAV		657	928	1925 RPA1	9/21/04	0	0
132262326A	BLUE	1997				GAV		526	430	1901 RPA1	4/14/04	0	0
132276383A	ORANGE	1997				GAV		518	429	1907 RPA1	4/21/04	0	0
132311450A	GREEN	1997				GAV		492	415	1919 RPA1	5/5/04	0	0
132313570A	GREEN	1997				GAV		470	323	1918 RPA1	5/1/04	0	0
132335326A	ORANGE	1997				GAV		566	598	1894 RPA1	4/15/04	0	0
132335370A	YELLOW	1997				GAV		510	404	1920 RPA1	4/15/04	0	0
132335370A	YELLOW	1997				GAV		503	399	1918 RPA1	4/5/04	0	0
132335691A	ORANGE	1997				GAV		568	624	1917 RPA1	9/21/04	0	0
17610815796	GREEN	1997				GAV		497	403	1987 RPA1	6/30/04	0	0
17611258756	ORANGE	1997				GAV		520	470	1920 RPA1	6/9/04	0	0
17611374869	YELLOW	1997				GAV		546	518	1918 RPA1	6/10/04	0	0

PIT TAG	ELASTOMER CWT PIT	YEAR CLASS	STOCKING DATA					RECAPTURE DATA				GROWTH	
			LENGTH (mm)	WEIGHT (g)	STOCK SITE	HATCHERY	DATE	LENGTH (mm)	WEIGHT (g)	RECAP SITE	DATE	LENGTH (mm)	WEIGHT (g)
410870674F	GREEN	1997				GAV		563	557	1900 RPA1	10/15/04	0	0
41093A4D0B	YELLOW	1997				GAV		520	452	1888 RPA1	4/14/04	0	0
410945166F	YELLOW	1997				GAV		589	624	1888 RPA1	4/14/04	0	0
41094F4F3D	YELLOW	1997				GAV		563	540	1898 RPA1	4/13/04		
410956305D	BLUE	1997				GAV		522	473	1893 RPA1	6/16/04		
4109586D19	YELLOW	1997				GAV		502	425	1918 RPA1	6/6/04		
414D431A5D	GREEN	1997				GAV		483	353	1918 RPA1	5/4/04		
414D44475A	ORANGE	1997				GAV		488	338	1918 RPA1	5/8/04		
414D447D55	ORANGE	1997				GAV		498	364	1918 RPA1	5/1/04		
414D460667	GREEN	1997				GAV		520	404	1901 RPA1	4/1/04		
414D471439	BLUE	1997				GAV		503	408	1901 RPA1	4/15/04		
414D496D64	ORANGE	1997				GAV		526	445	1901 RPA1	3/31/04		
414D4D2D11	RED	1997				GAV		495	361	1909 RPA1	3/31/04		
414D507C16	RED	1997				GAV		587	607	1918 RPA1	5/4/04		
414D547923	RED	1997				GAV		495	320	1918 RPA1	5/3/04		
414D547A34	BLUE	1997				GAV		560	558	1896 RPA1	6/23/04		
414D547B17	GREEN	1997				GAV		561	567	1920 RPA1	9/20/04		
414D556218	ORANGE	1997				GAV		584	572	1916 RPA1	4/28/04		

PIT TAG	ELASTOMER CWT PIT	YEAR CLASS	STOCKING DATA					RECAPTURE DATA				GROWTH	
			LENGTH (mm)	WEIGHT (g)	STOCK SITE	HATCHERY	DATE	LENGTH (mm)	WEIGHT (g)	RECAP SITE	DATE	LENGTH (mm)	WEIGHT (g)
414D574F03	YELLOW	1997				GAV		615	755	1925 RPA1	4/23/04		
414D5C252F	GREEN	1997				GAV		508	508	1918 RPA1	5/1/04		
414D5E4E63	GREEN	1997				GAV		541	536	1909 RPA1	6/24/04		
414D5F2146	ORANGE	1997				GAV		515	430	1994 RPA1	4/13/04		
4141D5F2146	ORANGE	1997				GAV		522	458	1907 RPA1	9/1/04		
414D60616C	BLUE	1997				GAV		518	435	1987 RPA1	5/26/04		
414D606661	ORANGE	1997				GAV		561	562	1922 RPA1	9/20/04		
414D610D5E	RED/RED	1997				GAV		533	463	1888 RPA1	4/14/04		
414D614B09	BLUE	1997				GAV		502	365	1907 RPA1	4/21/04		
414D622051	YELLOW	1997				GAV		523	465	1910 RPA1	4/14/04		
414D63303B	BLUE	1997				GAV		492	357	1905 RPA1	4/14/04		
414D661A52	RED	1997				GAV		492	351	1918 RPA1	6/4/04		
435D6A1054	PINK/BLUE	2001						552	481	1916 RPA1	9/21/04		
435D755069		2001						604	658	1918 RPA1	9/21/04		
44427B2A72	RED/GREEN	2003						322	90	2034 RPA1	9/9/04		
4443046601	RED/YELLOW	2003						393		1916 RPA1	9/21/04		
444362342F	RED/YELLOW	2003								1914 RPA1			
4527066B0F	ORANGE	1997				GAV		539	531	1901 RPA1	3/31/04		



PIT TAG	ELASTOMER CWT PIT	YEAR CLASS	STOCKING DATA					RECAPTURE DATA				GROWTH	
			LENGTH (mm)	WEIGHT (g)	STOCK SITE	HATCHERY	DATE	LENGTH (mm)	WEIGHT (g)	RECAP SITE	DATE	LENGTH (mm)	WEIGHT (g)
45272B3964	GREEN	1997				GAV		505	408	1905 RPA1	3/23/04		
45294F7023	YELLOW	1997				GAV		558	527	1913 RPA1	9/22/04		
452A3D6110	GREEN	1997				GAV		585	646	1916 RPA1	4/28/04		
452A646C21	YELLOW	1997				GAV		711	1225	1925 RPA1	9/21/04		

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