

# Central Lowlands and Interior Highlands Pallid Sturgeon Spawning and Stocking Summary

1992-2017



Prepared for the Middle Basin Pallid Sturgeon Workgroup

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# Contents

Introduction.....	3
Spawning/Stocking Activities by Year Class .....	5
1992 .....	5
1997 .....	7
1998 .....	10
1999 .....	11
2000 .....	13
2001 .....	14
2002 .....	18
2003 .....	22
2004 .....	27
2005 .....	32
2006 .....	37
2007 .....	39
2008 .....	43
2009 .....	46
2010 .....	55
2011 .....	62
2012 .....	70
2013 .....	72
2014 .....	78
2015 .....	85
2016 .....	90
2017 .....	93
Acknowledgments.....	96
REFERENCES .....	97

## LIST OF TABLES

Table 1. Stockings by year class for RPMA #4. ....	100
Table 2. Year stocked by location for RPMA #4 (year denotes calendar year of stocking, not year-class of progeny). ....	115
Table 3. Hatchery reared pallid sturgeon released in RPMA #4 attributable to male broodfish. Colored PIT tags have contributed to multiple spawning years. ....	117
Table 4. Hatchery reared pallid sturgeon released in RPMA #4 attributable to female broodfish. Colored PIT tags have contributed to multiple spawning years. ....	121
Table 5. RPMA #4 Cryopreserved milt on hand. ....	123

## LIST OF FIGURES

Figure 1. Map of RPMA #4 stocking locations. ....	126
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## LIST OF APPENDICES

Appendix A. Garrison Dam NFH Diet Regiment.....	128
Appendix B. Gavins Point NFH Diet Regiment.....	129
Appendix C. Diet Regiments From Blind Pony SFH and Neosho NFH.....	130
Appendix D. Tagging and Marking of Hatchery Reared Fish Stocked by Year-Class.....	132
Appendix E. List of stocking locations and abbreviated codes (Referenced in Table 2).....	134

# Introduction

The pallid sturgeon, *Scaphirhynchus albus*, was listed as endangered in 1990 by the U.S. Fish and Wildlife Service (USFWS) due to population declines resulting from habitat loss (USFWS 2008). The loss of habitat was attributed to the construction and operation of dams on the Upper Missouri River and modification of riverine habitat by channelization of the lower Missouri and Mississippi rivers (USFWS 2008). In addition to habitat loss there is little to no data indicating substantial natural recruitment and with increasing threats from commercial harvest and entrainment losses in portions of the Missouri and Mississippi rivers, little is known about the pallid sturgeon population abundance and size. In response to these concerns the U.S. Army corps of Engineers (USACE) and the USFWS abiding by requirements of the Endangered Species Act, developed a Jeopardy Biological Opinion for pallid sturgeon in 2000. The Biological Opinion was amended in 2003 with elements comprising population assessment, propagation and augmentation, habitat creation and restoration, monitoring, and research on flows and life history (Bergman et al. 2008).

Specific to this report the goal of the propagation and augmentation program was to augment populations by establishing year-class structures to strengthen populations to avoid catastrophic extinction (Bergman et al. 2008). The objectives were to develop year-class structures that are currently absent from the population due to lack of natural reproduction and recruitment and to establish broodstock for future propagation efforts in case of catastrophic population decline. In combination with these efforts the goal of the Recovery Plan is to delineate tasks that would facilitate the recovery of the pallid sturgeon when implemented and work in compliance with the Biological Opinion. The Recovery Plan and Biological Opinions determine goals and objectives that tie into management questions and data gaps which are answered through research and management actions. Research is performed by three distinct basin workgroups to provide management actions for the recovery of pallid sturgeon as well as raise new questions in adaptive feedback for the Recovery Plan. The Upper Basin covers the Missouri River Basin from Montana to Gavins Point Dam in South Dakota. The Middle basin covers the Missouri River downstream from Gavins Point Dam to the Missouri-Mississippi River confluence and also the Mississippi River downstream to the Mississippi-Ohio River confluence. The Lower Basin stretches from the Mississippi-Ohio River confluence downstream to the Gulf of Mexico, and includes the Atchafalya (Bergman et al. 2008).

Using knowledge gained from the spawning of numerous *Scaphirhynchus* species, Blind Pony State Fish Hatchery (SFH) in Sweet Springs, Missouri successfully spawned the first pallid sturgeon *S. albus* in late April of 1992. Due to an unfamiliar life history of the pallid sturgeon, the Pallid Sturgeon Recovery Plan in 1993 (USFWS 1993), found it necessary to propagate the species ensuring that individuals remained in the wild while further research could be conducted. Since the establishment of the Recovery Plan, hypotheses have been formed that contribute loss of spawning habitat to the low numbers of pallid sturgeon in the population. The success of Blind Pony SFH was the first step of a very large measure to ensure that the species remained in the wild until actions could be taken to provide adequate spawning habitat for pallid sturgeon. Even though the first spawning in 1992 was a major step forward, lack of genetic information deferred stocking until 1994 (Krentz et al. 2005). Then in 1995 the Missouri Department of Conservation developed, "An Action Plan for Pallid Sturgeon in Missouri." Objectives were to provide a multi-year stocking plan for pallid sturgeon, ensure maximum genetic variability, outline details of mating design, stocking sites, size and number of pallid sturgeon stocked, continue to obtain wild broodstock, evaluate new diets for young pallid sturgeon, and continue to utilize two marking systems (coded wire tag and external T-bar tags) to maintain family identity through the life cycle (Graham, date unavailable). Since the first spawning at

Blind Bony SFH, a vast amount of information has been acquired regarding the genetics, genealogy, and age and growth of the fish, as well as the spawning and habitat requirements.

This report is a revised version of “Pallid Sturgeon Spawning and Stocking Summary Report 1992-2004” (Krentz et al. 2005). It also uses data from the United States Fish and Wildlife Service (USFWS) (Wilson 2009) and other sources, to update the spawning and stocking of the Recovery Priority Management Area (RPMA) #4 history through the fall of 2017. RPMA #4 has also been labeled as the Central Lowlands and Interior Highlands.

# Spawning/Stocking Activities by Year Class

## 1992

### Blind Pony State Fish Hatchery

#### Spawning

Broodstock were captured from the Mississippi River and transported to Blind Pony SFH. In April of 1992, approximately 118,000 eggs were collected from two pallid sturgeon females and one suspected pallid/shovelnose hybrid female (Krentz et al. 2005). The hybrid was later confirmed to be a pallid sturgeon after being taken to Gavins Point Dam National Fish Hatchery (NFH) for holding (B. Drecktrah, Blind Pony SFH, personal communication). The three females were crossed with four pallid sturgeon males. On April 30 an estimated 32,400 fry were hatched.

#### Stocking Results

A total of 4,182 pallid sturgeon was stocked from the 1992 spawning efforts. Ninety-nine pallid sturgeon were transported to Gavins Point NFH and reared for several years until they were stocked in the Platte River in 1998 and 1999 (Bollig 1997).

#### Two Rivers State Recreation Area, Platte River

- 4/16/1998 (6 yrs. old)
  - 84 pallid sturgeon stocked at RM 40.3 of the Platte River
    - Mean Length = 592 mm, Mean Weight = 694 g
    - All fish marked with PIT tags while 10 fish were implanted with Radio Telemetry tags
  - River temperature was 7°C and discharge was 11,500 cfs
- 3/9/1999 (7 yrs. Old)
  - 15 pallid sturgeon stocked at RM 40.3 of the Platte River
    - Mean Length = 746 mm, Mean Weight = 1893 g
    - All fish marked with PIT Tags as well as Radio Telemetry tags
  - River temperature was 17°C and discharge was 15,000 cfs

#### Hermann, MO

- 3/9/1994
  - 892 fish stocked at RM 97.6
    - Mean Weight = 101 g
    - Coded wire tag under first dorsal scute
    - Floy tag in left pectoral fin
  - River temperature was 6.1°C and discharge was 166,000 cfs
- 3/14/1994
  - 96 fish stocked at RM 97.6
    - Mean Weight = 101 g

- Coded wire tag under first dorsal scute
  - Floy tag in left pectoral fin
- River temperature was 6.1°C and discharge was 106,6000 cfs
- 9/30/1994
  - 11 fish stocked at RM 97.6
    - Mean Length = 330 mm
    - Coded wire tag under first dorsal scute
    - Floy tag in left pectoral fin
  - Discharge was 55,100 cfs

#### **Washington, MO**

- 3/9/1994
  - 607 pallid sturgeon stocked at RM 68.5
    - Mean Weight = 113 g
    - Coded wire tag under first dorsal scute
    - Floy tag in left pectoral fin
  - River temperature was 6.1°C

#### **St. Charles, MO**

- 3/9/1994
  - 837 fish stocked at RM 28.5
    - Mean Weight = 115 g
    - Coded wire tag under first dorsal scute
    - Floy tag in left pectoral fin
  - River temperature was 6.1°C

#### **Chester, IL, Mississippi River**

- 3/10/1994
  - 948 fish stocked at RM 110
    - Mean Weight = 126 g
    - Coded wire tag under first dorsal scute
    - Floy tag in left pectoral fin
  - Discharge was 744,000 cfs

#### **Cape Girardeau, MO, Mississippi River**

- 3/10/1994
  - 692 fish stocked at RM 55
    - Mean Weight = 104 g
    - Coded wire tag under first dorsal scute
    - Floy tag in left pectoral fin
  - River temperature was 6.1°C

# 1997

## **Gavins Point National Fish Hatchery**

### **Spawning**

Two females along with one male were captured in the fall 1996 from the Missouri and Yellowstone River Confluence and transported to Gavins Point NFH on January 6, 1997 from Garrison Dam NFH (Bollig 1997). Two additional males, captured in the fall 1993 and already at the hatchery were also used for spawning. Spawning occurred on June 17 and 18 with a tank temperature of approximately 64°F (Bollig 1997; Krentz et al. 2005). A total of nearly 300,000 green eggs were produced from the two females, with an 80% eye-up and a hatch rate of nearly 45%. This resulted in the first successful spawning of wild pallid sturgeon for the upper portion of the range. Five lots were produced from the spawning events, but only two of the families were stocked in RPMA #4. It should also be noted that broodstock captured in the spring 1997 were used as a backup to the main spawning attempt at Gavins Point NFH and transported to Garrison Dam NFH for spawning. No progeny were produced at Garrison Dam NFH.

### **Stocking Results**

A total of 35 pallid sturgeon was stocked in RPMA # 4 as part of a publicity event held at Ponca State Park. The remaining 1,886 fish were stocked in RPMA's #1, #2, and #3.

#### **Ponca State Park, NE**

- 4/23/2002
  - 35 fish stocked at RM 753
    - Length and weight not recorded
    - All fish marked with a PIT tag
  - River temperature was 12.5°C and discharge was 26,400 cfs
  - Crosses (Female x Male)
    - 1F4B246E04 x 7F7D291A07
      - 1. Right and left vertical orange elastomer (28)
    - 1F4A301354 x 7F7D291A07
      - 1. Right vertical yellow elastomer (7)

## **Blind Pony State Fish Hatchery**

### **Spawning**

On April 29 broodstock were received from a commercial fisherman at Caruthersville, MO, near RM 845 of the Lower Mississippi River and held in brood tanks at the hatchery (Krentz et al. 2005). Water temperature in the brood tanks was gradually warmed from 55°F to 60°F. Two of the three females ovulated. Milt was taken from the three males and motility was good. It was stored in bags on ice and mixed periodically. The female pallids were hand stripped at regular intervals through the day. On May 2, 1997, the Missouri Department of Conservation successfully spawned two females. A total of 61,250 eggs were collected in three lots. The eggs had a 42 % survival and produced 25,922 fry. The 1997 broodstock were not implanted with PIT tags but were marked with 4-digit T-bar tags (B. Drecktrah, Blind Pony SFH, personal communication).

### **Stocking Results**

As a result of the spawning efforts by Blind Pony SFH a total of 2,816 fingerling pallid sturgeon was stocked.

#### **Platte River**

- 10/15/1997
  - 402 fish stocked at RM 5 of the Platte River
    - Fingerling
    - Coded wire tag
    - Floy tag
  - River temperature was 18.3°C
  - Crosses (female x male)
    1. 7751 x 7757
    2. 7752 x 7760
    3. 7752 x 7764

#### **Cooley Lake Access Dedication Ceremony, MO**

- 9/18/1997
  - 389 fish stocked at RM 339.5
    - Fingerling
    - All fish marked with a coded wire tag
    - All fish marked with a floy tag
  - River temperature was 25.6°C and discharge was 76,300 cfs
  - Crosses (female x male)
    1. 7751 x 7757
    2. 7752 x 7760
    3. 7752 x 7764

#### **Waverly, MO**

- 7/24/1997
  - 24 fish stocked at RM 299
    - Fingerling
    - All fish marked with a PIT tag
    - All fish marked with a floy tag
  - River temperature was 31.1°C and discharge was 84,300 cfs
  - Crosses (female x male)
    1. 7751 x 7757
    2. 7752 x 7760
    3. 7752 x 7764

#### **Hermann, MO**

- 10/15/1997
  - 400 fish stocked at RM 97.6
    - Fingerling
    - All fish marked with a coded wire tag
    - All fish marked with a floy tag
  - River temperature was 18.3°C and discharge was 98,500 cfs
  - Crosses (female x male)
    1. 7751 x 7757
    2. 7752 x 7760
    3. 7752 x 7764

#### **Washington, MO**

- 10/15/1997
  - 400 fish stocked at RM 68.5
    - Fingerling

- All fish marked with a coded wire tag
- All fish marked with a floy tag
- Temperature and discharge data unavailable
- Crosses (female x male)
  1. 7751 x 7757
  2. 7752 x 7760
  3. 7752 x 7764

**St. Charles, MO**

- 10/15/1997
  - 400 fish stocked at RM 28.5
    - Fingerling
    - All fish marked with a coded wire tag
    - All fish marked with a floy tag
  - Temperature and discharge data unavailable
  - Crosses (female x male)
    1. 7751 x 7757
    2. 7752 x 7760
    3. 7752 x 7764

**St. Genevieve Access/County, MO, Mississippi River**

- 10/15/1997
  - 401 fish stocked at RM 122.4
    - Mean Length = 170 mm, Mean Weight = 28 g
    - All fish marked with a coded wire tag
    - All fish marked with a floy tag
  - Discharge was 42,800cfs
  - Crosses (female x male)
    1. 7751 x 7757
    2. 7752 x 7760
    3. 7752 x 7764

**Chester, IL, Mississippi River**

- 10/15/1997
  - 400 fish stocked at RM 110
    - Mean Length = 170 mm, Mean Weight = 28 g
    - Coded wire tag under first dorsal scute
    - Floy tag
  - Discharge was 135,000cfs
  - Crosses (female x male)
    1. 7751 x 7757
    2. 7752 x 7760
    3. 7752 x 7764

# 1998

## **Gavins Point National Fish Hatchery**

### **Spawning**

In the fall of 1997, a cooperative broodstock effort provided four females and six males collected near the confluence of the Missouri and Yellowstone Rivers taken to Garrison Dam NFH. They were acclimated to captivity until October and November when they were transported to Gavins Point. Spawning of the fish took place in early June with 284,000 green eggs produced with a 26.1% hatch rate (Bollig 1998, Krentz et al. 2005). Approximately 74,200 pallid sturgeon fry were hatched but on June 18 and 19 a heavy silt load circulated through the fry tanks and caused a catastrophic loss.

### **Stocking Results**

Due to the death of all 1998 progeny there was no stocking of the year class.

## **Garrison Dam National Fish Hatchery**

### **Spawning**

In the spring of 1998 four males and a single female were collected near the mouth of the Missouri and Yellowstone Rivers and taken to Garrison Dam NFH for spawning. Spawning took place on the evening of June 11<sup>th</sup> with 142,220 green eggs produced with a 16% hatch rate (Holm 1998). 17,450 fry from four family lots were flown to Gavins Point NFH for production.

### **Stocking Results**

Two of the four family lots survived and 298 fish were stocked as two year olds in Recovery Priority Areas 2 and 3.

# 1999

## Gavins Point National Fish Hatchery

### Spawning

In November of 1998 four females and three males were transported to Gavins Point NFH from Garrison Dam NFH (Bollig 1999). The broodstock from Garrison Dam NFH were collected near the confluence of the Yellowstone and Missouri Rivers. On June 15 three reproductive males and only one reproductive female were spawned. Approximately 145,000 green eggs were collected contributing to a hatch rate of 48.3% resulting in a total of 70,035 fry (Krentz et al 2005).

### Stocking Results

Between August and September the number of pallid sturgeon was periodically reduced to increase fish health by reducing densities and weight per tank. In September, 4,906 pallid sturgeon juveniles were held in 22 tanks (Bollig 1999). To reduce the number of fish to the final density for the over wintering period 1,760 juveniles were euthanized and buried. These fish were deemed excess for stocking, research, and public awareness needs. Of the remaining 3,146 pallids that survived in captivity 532 were stocked in RPMA #4, while the remainders were stocked in RPMA's #1, #2, and #3. Note: Due to iridovirus in shovelnose sturgeon juveniles at the hatchery, frequent monitoring, testing, and quarantine was administered to prevent the spread to the pallid sturgeon building and tanks.

#### Ponca State Park, NE

- 4/23/2002
  - 180 fish stocked at RM 753
    - Mean Length = 437 mm, Mean Weight = 323 g
    - All fish marked with a PIT tag
  - River temperature was 12.5°C and discharge was 26,400 cfs
  - Female 7F7B021573 crossed with males; 7F7D441774, 113719262A, 7F7F06583D

#### Bellevue, NE

- 11/1/2002
  - 187 fish stocked at RM 601.4
    - Mean Length = 422 mm, Mean Weight = 310 g
    - All fish marked with a PIT tag
  - River temperature was 9°C and discharge was 31,400 cfs
  - Female 7F7B021573 crossed with males; 7F7D441774, 113719262A, 7F7F06583D

#### Boonville, MO

- 4/25/2002
  - 165 pallid sturgeon stocked at RM 195.1
    - Mean Length = 437 mm, Mean Weight = 308 g
    - All fish marked with a PIT tag
  - River temperature was 14°C and discharge was 56,300 cfs

- Female 7F7B021573 crossed with males; 7F7D441774, 113719262A, 7F7F06583D

## **Garrison Dam National Fish Hatchery**

### **Spawning**

In April four male and three female broodstock collected at the confluence of the Yellowstone and Missouri Rivers were taken to Garrison Dam NFH for spawning. On June 10<sup>th</sup> two of the females were spawned with the third spawning occurring a few days later on the 15<sup>th</sup>. A total of 175,450 green eggs were taken with a 25% hatch rate resulting in 43,479 fry (Holm 1999). Cryopreservation techniques were employed on the four males by staff from the Warm Springs Fish Technology Center, GA.

### **Stocking**

Fish were grown to 6.6 inches by November when they were transferred to Valley City NFH for overwintering. In the Spring of 2000 the fish were returned to Garrison Dam NFH. Fish health sampling revealed the fish were positive for iridovirus in August and they were euthanized in October.

# **2000**

## **Gavins Point National Fish Hatchery**

### **Spawning**

Due to continuing iridovirus concerns stemming from 1999, no broodstock were delivered to Gavins Point NFH and no spawning occurred (Bollig 2000, Krentz et al. 2005)

### **Stocking Results**

There was no stocking of the 2000 year class.

## **Garrison Dam National Fish Hatchery**

### **Spawning**

In April, nine male and two female broodstock collected at the confluence of the Yellowstone and Missouri Rivers were taken to Garrison Dam NFH for spawning. An additional six males and a single female were collected from the Missouri River above Fort Peck Reservoir (RPA1) in early June. One female from each RPA was spawned on June 15<sup>th</sup> and 16<sup>th</sup>, and the following female on June 22. A total of 175,407 green eggs were produced with a 22% overall hatch. A total of 38,028 fry and 20 family lots were produced. High nitrogen and a gill amoeba were diagnosed as the cause of mortality in August on the 2000 year class pallid sturgeon. A formalin treatment (100 ppm -1 hr bath) was administered and mortality ceased. Later that month diagnostics work revealed the 2000 year class, as well as the 1999 year class were positive for the iridovirus. By the time they were euthanized in October the virus was in a latent state. Cryopreservation of milt was successful in producing progeny for the first time.

### **Stocking**

No stocking occurred as a result of the iridovirus. All fish euthanized.

# 2001

## Garrison Dam National Fish Hatchery

### Spawning

Broodstock collected near the confluence of the Missouri and Yellowstone Rivers from a cooperative broodstock effort in late April of 2001 were transported to Miles City SFH where egg extraction took place between two females and four males (Holm 2001, Krentz et al. 2005). A total of 268,187 eggs from the two females were collected and spawned with the four males. Before hatching the four family lots were split and a portion of each lot was moved to Garrison Dam NFH.

In late May the staff from Bozeman Fish Technology (FTC) Center assembled a 16 foot circular tank on the bank of the Missouri River near James Kipp Recreation Area in Montana (Holm 2001). During the first week of June, broodstock collection began with two males captured above Ft. Peck Lake. On June 11 the first and only female was captured. The 102,900 eggs from the female were crossed with the five males captured. The eggs were placed in oxygen filled bags and transported to Bozeman FTC and Garrison Dam NFH for rearing. Egg survival was 21% while hatch rates were 84%, resulting in approximately 19,000 fry.

The 2001 year-class from Garrison Dam NFH, were found to be negative for iridovirus, stocking of the 2001 year-class occurred in RPMA #2, #3, and #4.

### Stocking Results

A total of 6,456 fish was stocked in early April of 2002 as a result of successful rearing at Garrison Dam NFH. A total of 2,778 yearlings from all nine families were also transferred to Blind Pony SFH ( $n = 2,273$ ) on April 9, 2002 and Gavins Point NFH ( $n = 505$ ) for the captive broodstock program on April 21, 2002.

#### St. Helena, NE

- 4/3/2002
  - 280 fish stocked at RM 799
    - Mean Length = 220 mm
    - All fish marked with a PIT tag
  - River temperature was 4°C
  - Female 411D262C1F crossed with male 41476A0462

#### Mulberry Bend, SD

- 4/3/2002
  - 320 pallid sturgeon stocked at RM 775
    - Mean Length = 203 mm
    - All fish marked with a PIT tag
  - River temperature was 5°C
  - Female 411D262C1F crossed with male 41476A0462
- 4/11/2002

- 1,553 pallid sturgeon stocked at RM 775
  - Mean Length = 195 mm
  - All fish marked with a PIT tag
- River temperature was 8.5°C
- Crosses (Female x Male)
  1. 220E345E09 x 1F4A111C6A
  2. 220E345E09 x 1F4A27214F
  3. 411D262C1F x 17509415139
  4. 411D262C1F x 1F4A4B5973
  5. 411D262C1F x 411D0E2C5F
  6. 7F7F06672B x 115631222A
  7. 7F7F06672B x 7F7D3C5708

#### **Bellevue, NE**

- 4/3/2002
  - 466 fish stocked at RM 601.4
    - Mean Length = 201 mm, Mean Weight = 41 g
    - All fish marked with a PIT tag
  - River temperature was 6°C and discharge was 31,000 cfs
  - Female 411D262C1F crossed with male 41476A0462
- 4/11/2002
  - 1,576 fish stocked at RM 601.4
    - Mean Length = 205 mm
    - All fish marked a PIT tag
  - River temperature was 10.5°C and discharge was 29,200 cfs
  - Crosses (Female x Male)
    1. 220E345E09 x 1F4A111C6A
    2. 220E345E09 x 1F4A27214F
    3. 411D262C1F x 17509415139
    4. 411D262C1F x 1F4A4B5973
    5. 411D262C1F x 411D0E2C5F
    6. 411D262C1F x 41476A0462
    7. 7F7F06672B x 115631222A
    8. 7F7F06672B x 7F7D3C5708

#### **Boonville, MO**

- 4/3/2002
  - 466 fish stocked at RM 195.1
    - Mean Length = 201 mm
    - All fish marked with a PIT tag
  - River temperature was 14°C and discharge was 56,300 cfs
  - Female 411D262C1F crossed with male 41476A0462
- 4/11/2002
  - 1,767 fish stocked at RM 195.1
    - Mean Length = 201 mm
    - All fish marked with a PIT tag
  - River temperature was 14°C and discharge was 44,900 cfs

- Crosses (Female x Male)
  1. 220E345E09 x 1F4A111C6A
  2. 220E345E09 x 1F4A27214F
  3. 411D262C1F x 17509415139
  4. 411D262C1F x 1F4A4B5973
  5. 411D262C1F x 411D0E2C5F
  6. 411D262C1F x 41476A0462
  7. 7F7F06672B x 115631222A
  8. 7F7F06672B x 7F7D3C5708

## Neosho National Fish Hatchery

### Spawning

No fish were spawned at Neosho NFH in 2001, but on February 25, 2002 approximately 5,219 pallid sturgeon from Miles City SFH were transported to the Gavins Point NFH where they were transferred to the Neosho NFH distribution truck for delivery at Neosho NFH. These fish were the result of the spawning that was cooperatively completed by the staffs from the Valley City NFH, ND; Miles City SFH; and Gavins Point NFH, in June, 2001 ( Bollig 2002).

### Stocking Results

A total of 956 pallid sturgeon was hatched at Miles City SFH and reared at Neosho NFH. They were the first stocked pallids with an elastomer tag in RPMA #4.

#### Mulberry Bend

- 10/22/2002
  - 302 pallid sturgeon stocked at RM 775
    - Mean Length = 283 mm, Mean Weight = 41 g
    - All fish marked with a PIT tag
    - All fish marked with right vertical green elastomer
  - Discharge was 31,800 cfs
  - Crosses (Female x Male)
    1. 220E345E09 x 1F4A111C6A
    2. 7F7F06672B x 7F7D3C5708

#### Bellevue, NE

- 10/25/2002
  - 310 fish stocked at RM 601.4
    - Mean Length = 229 mm, Mean Weight = 42 g
    - All fish marked with a PIT tag
    - All fish marked with a right vertical green elastomer
  - River temperature was 10°C and discharge was 33,400 cfs
  - Crosses (Female x Male)
    1. 220E345E09 x 1F4A111C6A
    2. 220E345E09 x 432C063C4E
    3. 7F7F06672B x 7F7D3C5708

**Boonville, MO**

- 11/1/2002
  - 344 fish stocked at RM 195.1
    - Mean Length = 227 mm, Mean Weight = 41 g
    - All fish marked with a PIT tag
    - All fish marked with right vertical green elastomer
  - River temperature was 18°C and discharge was 42,000 cfs
  - Crosses (Female x Male)
    1. 220E345E09 x 1F4A111C6A
    2. 220E345E09 x 7F7D3C5708
    3. 7F7F06672B x 7F7D3C5708

# 2002

## **Garrison Dam National Fish Hatchery**

### **Spawning**

Three mature female pallid sturgeon, two immature egg females, and nine mature male pallid sturgeon collected near the confluence of the Yellowstone and Missouri Rivers from a cooperative broodstock effort between April 22 and June 4, 2002, were taken to Garrison Dam NFH (Holm 2002, Krentz et al. 2005). Eggs amounting to 80,882 were collected from the female spawned on June 19 and 20 with two broodstock males and two cryopreserved males. Along with cryopreserved milt from male 1F477B3A65 caught in 2000, fresh milt from the same fish, recaptured in 2002 was also used. Even though fresh and cryopreserved milt was used from male 1F477B3A65, no offspring from the fresh milt were produced. A second male, 1F4A27214F, cryopreserved in 2001 was also used. A second female did not ovulate. The third female produced 7,300 green eggs with an 18% hatch rate. All fertilized eggs were divided between Garrison Dam NFH, Gavins Point NFH, Bozeman FTC and Miles City SFH.

The 2002 year-class from Garrison Dam NFH, were found to be positive with iridovirus but not epizootic, and stocking of the 2002 year-class in RPMA #4 did continue.

### **Stocking Results**

Garrison Dam NFH produced 5,457 fish that were stocked as a result of the four family lots. Note: Gavins Point NFH, and Neosho NFH also stocked 1,534 and 2,259 fish respectively from other lots of the same female totaling 9,241 progeny originating at Garrison Dam NFH (Bollig 2002, Holm 2002, D. Hendrix, Neosho NFH, personal communication).

#### **Mulberry Bend**

- 7/15/2003
  - 1,946 pallid sturgeon stocked at RM 775
    - Mean Length = 282 mm, Mean Weight = 74 g
    - All fish marked with a PIT tag
  - River temperature was 26.4°C
  - Female 116224546A crossed with males; 220F107A6F, 7F7D461025, 116167123A, 1F477B3A65
- 10/5/2003
  - 133 pallid sturgeon stocked at RM 775
    - Mean Length = 264 mm
    - All fish marked with a PIT tag
  - River conditions were not recorded

- Female 116224546A crossed with males; 220F107A6F, 7F7D461025, 116167123A, 1F477B3A65

#### **Bellevue, NE**

- 7/16/2003
  - 1,938 fish stocked at RM 601.4
    - Mean Length = 278 mm, Mean Weight = 77 g
    - All fish marked with a PIT tag
  - River temperature was 28°C and discharge was 35,400 cfs
  - Female 116224546A crossed with males; 220F107A6F, 7F7D461025, 116167123A, 1F477B3A65

#### **Boonville, MO**

- 7/16/2003
  - 1,441 fish stocked at RM 195.1
    - Mean Length = 277 mm
    - All fish marked with a PIT tag
  - River temperature was 28.5°C and discharge was 61,300 cfs
  - Female 116224546A crossed with males; 220F107A6F, 7F7D461025, 116167123A, 1F477B3A65

## **Gavins Point National Fish Hatchery**

### **Spawning**

On July 16, 2002, 20,950 fry spawned on June 19 and 20 were transferred from Garrison Dam NFH to Gavins Point NFH for further rearing, transfer to other hatcheries, and stocking (Bollig 2002). These fry stemmed from four family lots resulting from one female and two males collected near the confluence of the Yellowstone and Missouri Rivers and two males that were cryopreserved in 2000 and 2001.

### **Stocking Results**

A total of 1,534 fish was stocked from spawning efforts at Garrison Dam NFH and rearing at Gavins Point NFH.

#### **Mulberry Bend, SD**

- 9/4/2003
  - 500 fish stocked at RM 775
    - Mean Length = 278 mm, Mean Weight = 94 g
    - All fish marked with a PIT tag
    - All fish marked with a right vertical red elastomer
    - All fish marked with a left vertical yellow elastomer
  - River temperature was 23.5°C
  - Female 116224546A crossed with males; 220F107A6F, 7F7D461025, 1F4A27214F, 1F477B3A65

#### **Bellevue, NE**

- 9/4/2003
  - 500 fish stocked at RM 601.4
    - Mean Length = 283 mm, Mean Weight = 92 g
    - All fish marked with a PIT tag
    - All fish marked with a right vertical red elastomer
    - All fish marked with a left vertical yellow elastomer
  - River temperature was 25.5°C and discharge was 27,600 cfs
  - Female 116224546A crossed with males; 220F107A6F, 7F7D461025, 1F4A27214F, 1F477B3A65

#### **Boonville, MO**

- 9/4/2003
  - 534 pallid sturgeon stocked at RM 195.1
    - Mean Length = 291 mm, Mean Weight = 100 g
    - All fish marked with a PIT tag
    - All fish marked with a right vertical red elastomer
    - All fish marked with a left vertical yellow elastomer
  - River temperature was 14°C and discharge was 56,300 cfs
  - Female 116224546A crossed with males; 220F107A6F, 7F7D461025, 1F4A27214F, 1F477B3A65

## **Neosho National Fish Hatchery**

### **Spawning**

In December of 2002, 3,740 juveniles from three families were transferred from Gavins Point NFH to Neosho NFH for rearing, and later tagging and stocking in RPMA # 4 (Bollig 2003). These fry stemmed from three family lots resulting from one female and two males collected near the confluence of the Yellowstone and Missouri Rivers and one cryopreserved male from 2000. The fry were spawned on June 19 and 20 at Garrison Dam NFH before being transported to Gavins Point NFH in July and finally to Neosho in December.

### **Stocking Results**

A total of 2,259 total fish was stocked from spawning efforts at Garrison Dam NFH and rearing at Gavins Point NFH.

#### **Mulberry Bend**

- 10/20/2003
  - 666 pallid sturgeon stocked at RM 775
    - Mean Length = 258 mm, Mean Weight = 69 g
    - All fish marked with a PIT tag
    - All fish marked with a right vertical red elastomer
    - All fish marked with a left vertical yellow elastomer
  - River temperature was 15.7°C and discharge was 28,500
  - Female 116224546A crossed with males; 220F107A6F, 7F7D461025, 1F477B3A65

**Bellevue, NE**

- 10/22/2003
  - 717 fish stocked at RM 601.4
    - Mean Length = 267 mm, Mean Weight = 70 g
    - All fish marked with a PIT tag
    - All fish marked with a right vertical red elastomer
    - All fish marked with a left vertical yellow elastomer
  - Discharge was 29,600 cfs
  - Female 116224546A crossed with males; 220F107A6F, 7F7D461025, 1F477B3A65

**Boonville, MO**

- 10/24/2003
  - 876 fish stocked at RM 195.1
    - Mean Length = 262 mm, Mean Weight = 72 g
    - All fish marked with a PIT tag
    - All fish marked with a right vertical red elastomer
    - All fish marked with a left vertical yellow elastomer
  - Discharge was 35,500 cfs
  - Female 116224546A crossed with males; 220F107A6F, 7F7D461025, 1F477B3A65

# 2003

## **Garrison Dam National Fish Hatchery**

### **Spawning**

Broodstock were captured between April 22 and May 14, 2003, from the Missouri and Yellowstone confluence and then transported to either Garrison Dam NFH or Miles City SFH (Holm 2003, Krentz et al. 2005). Three females were spawned at Miles City SFH, while three different females were taken to Garrison Dam NFH. Note: female 44426F185B was a recapture from September of 1994 with an unreadable PIT tag (7F7B016070).

Spawning began on June 25 and ovulation proceeded throughout the day. A total of four family lots were produced from female 44426F185B (Holm 2003). A total of 157,352 eggs were collected, resulting in an estimated hatch of 30,110. The second female 7F7B026102 didn't respond well to injections and the few eggs taken were in poor quality and had no hatch results. Finally, the third female 115676694A produced 38,000 eggs of which only 254 hatched and 8 survived to the first month. Four ended up as six inch fish and were transferred to Gavins Point NFH for future broodstock.

Spawning at Miles City SFH was initiated on June 30 with the proper hormone injection. A total of 118,320 eggs was collected from female 132256586A and crossed with three males (Holm 2003). The second female 7F7F054855, (a previously spawned female with no progeny stocked in RPMA #4) produced 48,520 eggs and was also crossed with three males. The surprise female 115679394A produced a minimal number of eggs which were not ready. On July 3, eggs and milt were shipped to Garrison Dam NFH and Bozeman FTC and hatched on July 6-7.

The 2003 year-class from Garrison Dam NFH, were found to be positive with iridovirus but not epizootic, but stocking of the 2003 year-class in RPMA #4 did continue.

### **Stocking Results**

A total of 7,781 pallid sturgeon was stocked between November 2003 and July 2004 as either fingerlings or yearlings in the Missouri River. On October 6 fish for Gavins Point NFH future broodstock as well as 2003 propagation efforts were hauled at an average length of 5 inches (Holm 2003). Four family lots at 650 fish per compartment were delivered. In addition to these fish, 11 boxes were shipped to represent smaller family lots. Seven of the eleven boxes arrived with no mortality, while the other four boxes suffered 100% mortality. On October 15 an additional 1,600 six inch fish were transported to Gavins Point NFH. Tanks were loaded with 400 fish from four family lots. On October 30 Neosho NFH hauled 3,916 seven inch fish back to their hatchery. Due to oxygen problems in the center tank, a December 1 inventory indicated they lost 377 fish during the month as a result of the haul. Information on the stocking results for these fish can be found under the Neosho NHF heading.

### **Mulberry Bend**

- 11/2/2003

- 1,701 fish stocked at RM 775
  - Average length of fish was 200 mm
  - All fish marked with a coded wire tag
  - All fish marked with a right vertical pink elastomer
- River temperature was 7.3°C
- Crosses (female x male)
  1. 44426F185B x 7F7D291A07
  2. 7F7F054855 x 115675486A
  3. 132256586A x 1F47760123
  4. 44426F185B x 41475D3C5D
  5. 44426F185B x 1F521B1E56
  6. 132256586A x 132157621A
- 11/3/2003
  - 115 fish stocked at RM 775
    - Average length of fish was 200 mm
    - All fish marked with coded wire tag
    - All fish marked with a right vertical pink elastomer
  - River temperature and discharge data unavailable
  - Crosses (female x male)
    1. 132256586A x 132114552A

#### **Bellevue, NE**

- 12/2/2003
  - 1,770 fish stocked at RM 601.4
    - Average length of fish was 200 mm
    - All fish marked with coded wire tag
    - All fish marked with a right vertical pink elastomer
  - River temperature was 3.7°C and discharge was 15,300 cfs
  - Crosses (female x male)
    1. 132256586A x 132114552A
    2. 132256586A x 1F47760123
    3. 132256586A x 132157621A
    4. 44426F185B x 1F521B1E56
    5. 44426F185B x 41475D3C5D
    6. 44426F185B x 7F7D291A07
    7. 7F7F054855 x 115669540A
    8. 7F7F054855 x 115675486A
- 7/8/2004
  - 817 fish stocked at RM 601.4
    - Mean length = 222 mm, Mean weight = 45 g
    - All fish marked with a right horizontal yellow elastomer
    - 761 fish marked with a PIT tag
    - 56 fish marked with a coded wire tag
  - River temperature was 21.7°C and discharge was 37,800 cfs
  - Crosses (female x male)
    1. 132256586A x 132114552A
    2. 132256586A x 132157621A
    3. 132256586A x 1F47760123
    4. 44426F185B x 1F4A363031
    5. 44426F185B x 1F521B1E56
    6. 44426F185B x 41475D3C5D
    7. 44426F185B x 7F7D291A07

8. 7F7F054855 x 115669540A
9. 7F7F054855 x 115675486A
10. 7F7F054855 x 132313521A

**Leavenworth, KS**

- 7/8/2004
  - 825 fish stocked at RM 397
    - Mean length = 217 mm, Mean weight = 49 g
    - All fish marked with a right horizontal yellow elastomer
    - 787 fish marked with a PIT tag
    - 38 fish marked with a coded wire tag
  - River temperature was 27.5°C and discharge was 47,000 cfs
  - Crosses (female x male)
    1. 132256586A x 132114552A
    2. 132256586A x 132157621A
    3. 132256586A x 1F47760123
    4. 44426F185B x 1F4A363031
    5. 44426F185B x 1F521B1E56
    6. 44426F185B x 41475D3C5D
    7. 44426F185B x 7F7D291A07
    8. 7F7F054855 x 115669540A
    9. 7F7F054855 x 115675486A
    10. 7F7F054855 x 132313521A

**Boonville, MO**

- 12/2/2003
  - 1,778 fish stocked at RM 195.1
    - Average length of fish was eight inches
    - All fish marked with a right vertical pink elastomer
    - All fish marked with a coded wire tag
  - River temperature was 6°C and discharge was 25,500 cfs
  - Crosses (female x male)
    1. 132256586A x 132157621A
    2. 132256586A x 132114552A
    3. 132256586A x 1F47760123
    4. 44426F185B x 1F521B1E56
    5. 44426F185B x 41475D3C5D
    6. 44426F185B x 7F7D291A07
    7. 7F7F054855 x 115669540A
    8. 7F7F054855 x 115675486A
- 7/8/2004
  - 774 fish stocked at RM 195.1
    - Mean length = 223 mm, Weight = 40 g
    - All fish marked with a right horizontal yellow elastomer
    - 719 fish marked with a PIT tag
    - 55 fish marked with a coded wire tag
  - River temperature 26°C and discharge was 94,200 cfs
  - Crosses (female x male)
    1. 132256586A x 132114552A
    2. 132256586A x 132157621A
    3. 132256586A x 1F47760123
    4. 44426F185B x 1F4A363031
    5. 44426F185B x 1F521B1E56
    6. 44426F185B x 41475D3C5D

7. 44426F185B x 7F7D291A07
8. 7F7F054855 x 115669540A
9. 7F7F054855 x 115675486A

## **Gavins Point National Fish Hatchery**

### **Spawning**

No spawning of any adult pallid sturgeon took place in 2003 at Gavins Point NFH. In October, Gavins Point NFH did receive 4,319 pallid sturgeon fingerlings spawned in late June of 2003 from Garrison Dam NFH for future broodstock and stocking purposes (Holm 2003; J. Powell, Gavins Point NFH, personal communication). In April of 2004, the juveniles exhibited symptoms of iridovirus, were checked, and tested positive for a low incidence of the virus.

### **Stocking Results**

After testing positive for iridovirus in April, a total of 51 fish were stocked in August 2004, at Boyer Chute National Wildlife Refuge as part of a Lewis and Clark celebration with various dignitaries from the Corps of Engineers, U.S. Fish and Wildlife Service, American Rivers, State of Nebraska, Audubon Society, and others present (Bollig 2003). In addition, 1,009 pallid sturgeon were stocked in RPMA #3 and 3,259 were mortalities (J. Powell, Gavins Point NFH, personal communication).

#### **Boyer Chute**

- 8/2/2004
  - 51 fish were stocked at RM 637.4
    - Mean length = 262 mm, Mean weight = 70 g
    - All fish marked with a PIT tag
    - All fish marked with right vertical yellow elastomer
  - River temperature was 26.3°C and discharge was 27,500 cfs
  - Crosses (Female x Male)
    1. 44426F185B x 41475D3C5D

## **Neosho National Fish Hatchery**

### **Spawning**

Fish were spawned at Miles City SFH in June of 2003 (Holm 2004). Eggs were then delivered to and reared at Garrison NFH before being transported to Neosho NFH on October 30. More detailed information can be found above under the 2003 spawning and stocking report for Garrison Dam NFH.

### **Stocking Results**

A total of 2,054 fish was stocked in July of 2004 as yearlings in the Missouri River.

#### **Bellevue, NE**

- 8/19/2004
  - 416 fish were stocked at RM 601.4
    - Mean length = 235 mm, Mean weight = 52 g
    - All fish marked with a PIT tag
    - All fish marked with right horizontal yellow elastomer
  - Discharge was 28,700 cfs
  - Crosses (Female x Male)

1. 44426F185B x 1F4A363031
2. 44426F185B x 7F7D291A07
3. 44426F185B x 1F521B1E56
4. 44426F185B x 41475D3C5D
5. 7F7F054855 x 115669540A
6. 7F7F054855 x 115675486A

**Leavenworth, KS**

- 9/7/2004
  - 830 fish were stocked at RM 397
    - Mean length = 250 mm, Mean weight = 55 g
    - All fish marked with a PIT tag
    - All fish marked with right horizontal yellow elastomer
  - Discharge was 39,000 cfs
  - Crosses (Female x Male)
    1. 132256586A x 1F47760123
    2. 132256586A x 132114552A
    3. 132256586A x 132157621A
    4. 44426F185B x 1F4A363031
    5. 44426F185B x 7F7D291A07
    6. 44426F185B x 1F521B1E56
    7. 44426F185B x 41475D3C5D
    8. 7F7F054855 x 115669540A
    9. 7F7F054855 x 115675486A

**Boonville, MO**

- 8/27/2004
  - 808 fish were stocked at RM 195.1
    - Mean length = 246 mm, Mean weight = 53 g
    - All fish marked with a PIT tag
    - All fish marked with right horizontal yellow elastomer
  - Discharge was 99,900 cfs
  - Crosses (Female x Male)
    1. 132256586A x 1F47760123
    2. 132256586A x 132114552A
    3. 132256586A x 132157621A
    4. 44426F185B x 1F4A363031
    5. 44426F185B x 7F7D291A07
    6. 44426F185B x 1F521B1E56
    7. 44426F185B x 41475D3C5D

# 2004

## Garrison Dam National Fish Hatchery

### Spawning

Between April 20 and 29 seven reproductive female pallid sturgeon and twenty reproductive male pallid sturgeon were captured near the confluence of the Yellowstone and Missouri Rivers (Holm 2004). The reproductive fish were transported to either Miles City SFH or directly to Garrison Dam NFH. Between June 7 and June 16 numerous spawning events between four females and eleven males created thirteen families at Garrison Dam NFH. Approximately 384,000 eggs were collected during this effort.

The three female and nine male pallid sturgeon that were transported to Miles City SFH were spawned on June 29 (Holm 2004). A total of nearly 288,000 green eggs were produced from the females with an eye-up of 56.1% and a hatch of 36.1%. On June 29 nine family lots were spawned at Miles City SFH but prior to hatching 100ml of eggs from each of the families were flown to Garrison Dam NFH and arrived on July 2. On July 6 hatching from the Miles City eggs began, spawning of the remaining fish at Garrison NFH commenced, and by July 19 almost all hatching had occurred for the year class.

The 2004 year-class from Garrison Dam NFH, were found to be positive with iridovirus but not epizootic, stocking of the 2004 year class in RPMA #2 and #4 did continue.

### Stocking Results

A total of 35,629 fish was stocked as a result of spawning at Garrison Dam NFH (Holm 2004). This total does not include the nearly 105,000 fry from Garrison NFH and Miles City SFH spawning events that were stocked near Culbertson, MT for a larval drift study. Garrison produced a grand total of 22 family lots that were distributed at different ages throughout RPMA #4. Between September and December of 2004 many of the fingerlings were either stocked or transferred to Gavins Point NFH ( $n = 720$ ) for captive broodstock or Neosho NFH ( $n = 5,507$ ) to be reared.

### Sioux City, IA

- 4/22/2005
  - 2,557 pallid sturgeon stocked at RM 732.6
    - Mean Length = 207 mm, Mean Weight = 40 g
    - All fish marked with a horizontal red elastomer
    - 2,003 fish marked with PIT tag
    - 554 fish marked with coded wire tag
  - River temperature was 12.8°C and discharge was 27,200 cfs
  - Crosses (Female x Male)
    - 1) 114476216A x 1F477B3A65
    - 2) 114476216A x 1F4A27214F
    - 3) 114476216A x 1F4A312640
    - 4) 114476216A x 1F4A4B5973

- |                             |                             |
|-----------------------------|-----------------------------|
| 5) 114476216A x 220F107A6F  | 14) 454910202B x 115679374A |
| 6) 114476216A x 430E452777  | 15) 454910202B x 1F47606357 |
| 7) 114476216A x 431565767B  | 16) 454910202B x 220F0F7677 |
| 8) 114476216A x 7F7D487531  | 17) 454B380D60 x 1F4A3E1445 |
| 9) 114476216A x 7F7E55466D  | 18) 454B380D60 x 7F7D376F73 |
| 10) 115551683A x 115552116A | 19) 454B380D60 x 7F7F065834 |
| 11) 115551683A x 7F7D3C555D | 20) 7F7F066452 x 114473737A |
| 12) 11555495A x 431565767B  | 21) 7F7F066452 x 7F7F065834 |
| 13) 1F5330401E x Unknown    | 22) MIX x MIX               |

**Bellevue, NE**

- 9/10/2004
  - 6,634 fish stocked at RM 601.4
    - Mean Length = 81 mm, Mean Weight = 2 g
    - All fish marked with a coded wire tag
    - All fish marked with a right horizontal red elastomer
  - River temperature was 24.2°C and discharge was 28,900 cfs
  - Female 114476216A crossed with males; 1F4A312640, 1F4A4B5973, 430E452777, 7F7D487531, 7F7E55466D

**Leavenworth, KS**

- 9/10/2004
  - 9,170 fish stocked at RM 397
    - Mean Length = 81 mm, Mean Weight = 2 g
    - All fish marked with a coded wire tag
    - All fish marked with a right vertical red elastomer
  - River temperature was 25°C and discharge was 31,600 cfs
  - Female 114476216A crossed with males; 7F7E55466D, 7F7D487531, 430E452777, 1F4A4B5973, 1F4A312640
- 10/8/2004
  - 2,864 fish stocked at RM 397
    - Mean Length = 115 mm, Mean Weight = 6 g
    - All fish marked with a coded wire tag
    - All fish marked with a right vertical red elastomer
  - River temperature was 20°C and discharge was 33,900 cfs
  - Female 454910202B crossed with males; 220F0F7677, 1F47606357, 115679374A

**Cooley Lake, MO**

- 4/22/2005
  - 33 fish stocked at RM 342
    - Length and weight were not recorded
    - All fish marked with a PIT tag
    - All fish marked with a right horizontal red elastomer
  - River temperature was ~20°C and discharge was 51,600 cfs
  - Female 11555495A crossed with male 431565767B
- 4/25/2005

- 2,411 fish stocked at RM 342
  - Mean Length = 204 mm, Mean Weight = 32 g
  - All fish marked with a right horizontal red elastomer
- 121 fish marked with a coded wire tag
- 2,290 fish marked with a PIT tag
- River temperature was 21°C and discharge was 51,200 cfs
- Crosses (Female x Male)
 

<ol style="list-style-type: none"> <li>1. 114476216A x 1F477B3A65</li> <li>2. 114476216A x 1F4A27214F</li> <li>3. 114476216A x 1F4A312640</li> <li>4. 114476216A x 1F4A4B5973</li> <li>5. 114476216A x 220F107A6F</li> <li>6. 114476216A x 430E452777</li> <li>7. 114476216A x 431565767B</li> <li>8. 114476216A x 7F7D487531</li> <li>9. 114476216A x 7F7E55466D</li> <li>10. 115551683A x 115552116A</li> <li>11. 115551683A x 7F7D3C555D</li> </ol>	<ol style="list-style-type: none"> <li>12. 115555495A x 431565767B</li> <li>13. 1F5330401E x Unknown</li> <li>14. 454910202B x 115679374A</li> <li>15. 454910202B x 1F47606357</li> <li>16. 454910202B x 220F0F7677</li> <li>17. 454B380D60 x 1F4A3E1445</li> <li>18. 454B380D60 x 7F7D376F73</li> <li>19. 454B380D60 x 7F7F065834</li> <li>20. 7F7F066452 x 114473737A</li> <li>21. 7F7F066452 x 7F7F065834</li> <li>22. MIX x MIX</li> </ol>
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**Boonville, MO**

- 9/10/2004
  - 9,761 fish stocked at RM 195.1
    - Mean Length = 86 mm, Mean Weight = 2 g
    - All fish marked with a coded wire tag
    - All fish marked with a right vertical red elastomer
  - River temperature was 25.5°C and discharge was 48,400 cfs
  - Female 114476216A crossed with males; 1F4A312640, 1F4A4B5973, 430E452777, 7F7D487531, 7F7E55466D
- 10/8/2004
  - 2,199 fish stocked at RM 195.1
    - Mean Length = 117 mm, Mean Weight = 6 g
    - All fish marked with a coded wire tag
    - All fish marked with a right vertical red elastomer
  - River temperature was 20.5°C and discharge was 42,500 cfs
  - Female 454910202B crossed with males; 115679374A, 1F47606357, 220F0F7677

# Gavins Point National Fish Hatchery

## Spawning

On June 17, a total of 25,200 fertilized eggs from four family lots was received from Bozeman FTC (Bollig 2004). The eggs began hatching on June 18. These four families were the result of broodstock collected from above Fort Peck Reservoir.

## Stocking Results

Fifteen Energetics Study fish were stocked from the 2004 year class in 2006.

### Ponca State Park, NE

- 5/9/2006
  - 15 fish stocked at RM 753
    - Mean Length = 267 mm, Mean Weight = 61 g
    - All fish marked with a PIT tag
  - River temperature was 16.5°C and discharge was 21,700cfs
  - Female 132211792A crossed with male 132235554A

# Neosho National Fish Hatchery

## Spawning

Out of seven reproductive females and eighteen reproductive males collected near the confluence of the Yellowstone and Missouri Rivers, five of the females and seven of the males were spawned and hatched at Garrison NFH creating eight family lots (Holm 2004). These eight lots would later be transferred to Neosho NFH to be reared and later stocked. On October 13, the first of three transfers from Garrison NFH to Neosho NFH moved 1,934 fingerlings from three family lots. On October 21, 1,481 fingerlings from three families consisting of two new families were transferred to Neosho NFH to be reared. The last transfer on October 28 moved 2,092 fingerlings making up three new families resulting in a grand total of 5,507 fingerlings and eight family lots.

## Stocking Results

A total of 3,611 total fish was all stocked at Miami, MO resulting from spawning efforts at Garrison Dam NFH and rearing at Neosho NFH.

### Miami, MO

- 6/16/2005
  - 589 fish stocked at RM 262.8
    - Mean Length = 258 mm, Mean Weight = 69 g
    - All fish marked with a PIT tag
    - All fish marked with a right horizontal red elastomer
  - River temperature was 28°C discharge was 91,200 cfs
  - Female 7F7F066452 crossed with male 7F7F065834
- 6/17/2005

- 394 fish stocked at RM 262.8
  - Mean Length = 254 mm, Mean Weight = 57 g
  - All fish marked with a PIT tag
  - All fish marked with a right horizontal red elastomer
- River temperature was 27.5°C and discharge was 82,200 cfs
- Crosses (Female x Male)
  1. 114476216A x 1F4A312640
  2. 11555495A x 431565767B
  3. 454910202B x 115679374A
- 6/30/2005
  - 801 fish stocked at RM 262.8
    - Mean Length = 245 mm, Mean Weight = 51 g
    - All fish marked with a PIT tag
    - All fish marked with a right horizontal red elastomer
  - River temperature was 28.5°C and discharge was 61,200 cfs
  - Female 454B380D60 crossed with male 7F7F065834
- 9/19/2005
  - 840 fish stocked at RM 262.8
    - Mean Length = 243 mm, Mean Weight = 47 g
    - All fish marked with a PIT tag
    - All fish marked with a right horizontal red elastomer
  - River temperature was 24°C and discharge was 37,900 cfs
  - Crosses (Female x Male)
    1. 114476216A x 1F4A4B5973
    2. 454910202B x 1F47606357
- 9/22/2005
  1. 987 fish stocked at RM 262.8
    - Mean Length = 233 mm, Mean Weight = 43 g
    - All fish marked with a PIT tag
    - All fish marked with a right horizontal red elastomer
  2. River temperature was 24.5°C and discharge was 37,500 cfs
  3. Crosses (Female x Male)
    1. 114476216A x 1F4A4B5973
    2. 114476216A x 220F107A6F
    3. 454910202B x 115679374A
    4. 454B380D60 x 7F7F065834

# 2005

## **Middle Basin Pallid Sturgeon Workgroup Plan**

In late March of 2005 due to the recommendation from the Recovery Team to stock fish from locally obtained broodstock, it was agreed by the members of the Middle Basin Work Group that a concerted effort to collect local brood stock from the Missouri River as well as the Chain of Rocks area in the Middle Mississippi to produce progeny for stocking in 2006. The work group also proposed to the Recovery Team that if no fish could be obtained from the two locations that Upper Basin origin fish were available for stocking in 2006. The pallid sturgeon assessment (PSA) crews (FWS, MDC, and NGPC) were set to devote a couple of weeks of work to capturing adult pallids to fulfill this need. Efforts were to first be focused on major tributaries of the Missouri River, then fall back to fish from the Middle Mississippi. The proposed broodstock effort lead to logistics to be arranged for bringing in adult pallid sturgeon from RPMA #4 to serve as a local broodstock source. If the efforts were successful Herb Bollig would provide a step by step list of procedures for injecting pallid sturgeon with antibiotics.

The Workgroup agreed ideally the basin as a whole would like to have 3 females and 9 males. Because crews may not be able to correctly determine sex or state of gonad maturity on the river no more than 24 fish will be taken to the hatcheries (6 females and 18 males). It was determined the fish should be 37 inches or larger and an attempt should be made to collect the fish in the fall. This was thought to be the best approach to deal with stress issues associated with spawning. However, given the need to secure a source of fish for stocking in 2006 any possible broodstock collected would be brought in immediately.

The decision of propagating only local broodstock provoked many questions. It was assumed it would be very difficult if not impossible to maintain genetic diversity with a fish population as small as what was believed the pallid sturgeon population to be in RPMA #4. The pallid sturgeon that had been isolated by dams for decades were seen to have no morphological difference other than size. At the time it was assumed that spawning separation may occur. Due to many unknowns, a genetics advisory group was then selected. The Recovery Team would rely upon this group to help provide answers to these difficult questions concerning genetic issues that the Middle Basin Workgroup was faced with. As of early 2005, 62,000 Upper Basin progeny had been stocked into RPMA #4 and it was considered by the Middle Basin Workgroup to continue to use upper basin fish and spread the genetics throughout the river. It had been assumed the adult population in the Upper Basin was showing little to no signs of recruitment and distributing the genetics of these fish throughout the basin could prevent them from being lost completely from the system. The Middle Basin Workgroup recommended to the Recovery Team that the stocking of Upper Basin fish be allowed to continue in RPMA #4 until a viable source of locally obtained broodstock be secured. The Recovery Team did allow the stocking of Upper Basin fish that were to be stocked in 2005.

Due to limitations by the Recovery Plan, the Middle Basin Workgroup questioned the number of fish that could be stocked. A consensus from the Group agreed that there is not a limitation on the number of pallid sturgeon that could or should be stock given the current production capabilities. Relating to stocking, a small group of Workgroup discussed the possibility of changing stocking locations from the sites that had been used historically. The question also arose of the importance of tagging pallid sturgeon. The Upper Basin Work Group had previously established a tagging committee to address some of the issues and concerns. At the time the Upper Basin Work Group was only considering this issue downstream to Gavins Pt. Dam. The recommendation was made that the Middle Basin Work Group has a couple of people participate with the Upper Basin Work Group Tagging Committee.

Wyatt Doyle volunteered to participate and Vince Travnicek and Gerald Mestl would also provide personnel from their respective agencies who would serve on this committee

Several agencies (MDC, FWS NGPC) recognized the value to moving stocking locations based on the knowledge of how these fish are using the river. The group recognized the need to ensure that selecting new stocking locations would not interfere with any past studies and that spreading the fish too thin had implications for logistics of stocking as well as for recapture. This led to the formation of a small board that would propose changing stocking locations to the Recovery Team.

During the spring meeting of 2005 it was brought up that it made no sense to use fish from Gavins Point NFH to stock fish above Yankton. The point was made there are 800 miles of river below the dam, and only three hatcheries to stock it (Blind Pony SFH, Gavins Point NFH, and Neosho NFH), while there are only 350 miles of river upstream from Yankton that was being stocked from five hatcheries (Gavins Point NFH, Bozeman Fish Technology Center, Ft. Peck State Fish Hatchery, Miles City State Fish Hatchery, and Garrison Dam NFH). After deliberation it was agreed that Bozeman FTC and Ft. Peck SFH are not high production pallid hatcheries and Garrison NFH, Miles City SFH and Gavins Pt. NFH are the only places to supply fish to the Upper Basin. As a result cooperation would be used between the Upper and Middle Basins for the use of Gavins Point NFH. Pertaining to the use of Gavins Point NFH, a large concern about iridovirus was stressed and a point was made to the Recovery Team that further research needs to be conducted.

In the spring of 2005 Gavins Point NFH held a 1992 year class progeny, produced from a female that was collected from the middle Mississippi, which appeared to be ready to spawn. At the time the female was to be spawned with a male from the lower Missouri or middle Mississippi. The question surfaced of crossing this fish with a male from the Upper Basin if a Lower Basin fish was not collected. There was opposition from a Group member of conducting this type of cross and the Group agreed that this cross would only be performed as a last resort if no other viable males for crossing were available. The first option would be to try and collect a male from either the Middle Mississippi or the Lower Missouri and then only use the Upper Basin fish as a last resort. Genetics on any and all crosses of this nature would be checked to ensure that hybrids would not be created in the hatchery system. No records of this fish being spawned or stocked exist.

## **Gavins Point National Fish Hatchery**

### **Spawning**

Two females and three males used for the 2005 spawning activities were captured near the Missouri and Yellowstone confluence and transported to Gavins Point NFH on November 9 and 10, 2004 (Bollig 2005; Holm 2005). The fish were spawned on June 22 creating six families. Over 322,123 green eggs were produced from the females with an eye-up rate near 91% and a hatch rate of 51.4%. The females and males were hand spawned, thus no incisions or sutures were required. All females and males were returned to their capture location on November 7, 2005.

Spawning also occurred at Miles City SFH, Garrison NFH, and above Fort Peck Reservoir (Bozeman) (Bollig 2005). On July 12, 2005, a total of 34,795 eggs from eight families, crossed from four females and six males, were shipped to Gavins Point NFH for future broodstock development, stocking, and research. A portion of a single family from the Garrison NFH spawning, arriving on July 12, 2005 consisting of 4,300 eggs, eventually was stocked with the six families spawned at Gavins Point NFH. Overall, 14 families reared at Gavins Point NFH were stocked in RPMA #3 and #4, went to South Dakota State University (SDSU) for research, or remain on site for future broodstock (J. Powell, Gavins Point NFH, personal communication).

It should also be noted that on May 10, Gavins Point NFH received approximately 11,250 newly-spawned pallid sturgeon eggs from broodstock spawned at Natchitoches NFH, LA (Bollig 2005). These eggs were hatched and the fish were reared to satisfy the bioenergetic research of pallid sturgeon. The research was completed cooperatively between the U.S. Fish and Wildlife Service (Great Plains FWMAO and Gavins Point NFH) and SDSU, Brookings, SD.

## **Stocking**

A total of 2,400 fish was stocked in the Missouri River at four different locations as yearlings from seven family lots.

### **St. Helena, NE**

- 9/1/2006
  - 610 fish were stocked at RM 799
    - Mean Length = 312 mm, Mean Weight = 132 g
    - All fish marked with a PIT tag
    - All fish marked with right vertical yellow elastomer
  - River temperature was 22.9°C and turbidity was 8 Formazin Nephelometric Unit (fnu)
  - Crosses (Female x Male)
    1. 115676635A x 1F40072169
    2. 115676635A x 7F7B031F17
    3. 115676635A x 7F7D2D723D
    4. 115557165A x 1F40072169
    5. 115557165A x 7F7B031F17
    6. 115557165A x 7F7D2D723D
    7. 7F7B026102 x 7F7B023253

### **Decatur, NE**

- 9/1/2006
  - 607 fish were stocked at RM 691
    - Mean length = 310 mm, Weight = 131 g
    - All fish marked with a PIT tag
    - All fish marked with right vertical yellow elastomer
  - River temperature was 23.5°C, discharge was 28,100 cfs, and turbidity was 9.6 fnu
  - Crosses (Female x Male)
    1. 115676635A x 1F40072169
    2. 115676635A x 7F7B031F17
    3. 115676635A x 7F7D2D723D
    4. 115557165A x 1F40072169
    5. 115557165A x 7F7B031F17
    6. 115557165A x 7F7D2D723D
    7. 7F7B026102 x 7F7B023253

### **Bellevue, NE**

- 8/31/2006
  - 607 fish were stocked at RM 601.4
    - Mean length = 309 mm, Mean Weight = 134 g
    - All fish marked with a PIT tag
    - All fish marked with right vertical yellow elastomer
  - River temperature was 24.5°C and discharge was 30,000 cfs
  - Crosses (Female x Male)
    1. 115676635A x 1F50072169
    2. 115676635A x 7F7B031F17
    3. 115676635A x 7F7D2D723D
    4. 115557165A x 1F40072169

5. 115557165A x 7F7B031F17
6. 115557165A x 7F7D2D723D
7. 7F7B026102 x 7F7B023253

#### **Parkville, MO**

- 8/31/2006
  - 576 fish were stocked at RM 377.5
    - Mean length = 311 mm, Mean weight = 137 g
    - All fish marked with a PIT tag
    - All fish marked with right vertical yellow elastomer
  - River temperature was 28.5°C and discharge was 48,800 cfs
  - Crosses (Female x Male)
    1. 115676635A x 1F40072169
    2. 115676635A x 7F7B031F17
    3. 115676635A x 7F7D2D723D
    4. 115557165A x 1F40072169
    5. 115557165A x 7F7B031F17
    6. 115557165A x 7F7D2D723D
    7. 7F7B026102 x 7F7B023253

## **Neosho National Fish Hatchery**

### **Spawning**

On June 27, 45,000 fertilized pallid sturgeon eggs from a June 2005, spawning effort at Gavins Point NFH were shipped to Neosho NFH (Bollig 2005). Further information about the broodstock collection, dates, and egg development can be found in the 2005 Gavins Point NFH spawning section.

### **Stocking**

Spawning at Gavins Point NFH and rearing at Neosho NFH resulted in 1,254 pallid sturgeon stocked.

#### **Bellevue, NE**

- 5/5/2006
  - 628 fish were stocked at RM 601.4
    - Mean length = 261 mm, Mean Weight = 58 g
    - All fish marked with a PIT tag
    - All fish marked with right vertical yellow elastomer
  - River temperature was 15°C and discharge was 35,700 cfs
  - Crosses (Female x Male)
    1. 115557165A x 1F50072169
    2. 115676635A x 1F50072169

#### **Rulo, NE**

- 5/9/2006
  - 357 fish were stocked at RM 497.9
    - Mean length = 259 mm, Mean Weight = 55 g
    - All fish marked with a PIT tag
    - All fish marked with a right vertical yellow elastomer
  - River temperature was 17.8°C Discharge was 39,800 cfs
  - Crosses (Female x Male)

1. 115557165A x 1F50072169
  2. 115676635A x 1F50072169
- 5/26/2006
    - 204 fish were stocked at RM 497.9
      - Mean length = 250 mm, Mean Weight = 54 g
      - All fish marked with a PIT tag
      - All fish marked with a right vertical yellow elastomer
    - River temperature was 22.2°C Discharge was 35,300 cfs
    - Crosses (Female x Male)
      1. 115557165A x 1F50072169
      2. 115676635A x 1F50072169
  - 6/28/2006
    - 65 fish were stocked at RM 497.9
      - Mean length = 219 mm, Mean Weight = 35 g
      - All fish marked with a PIT tag
      - All fish marked with a right vertical yellow elastomer
    - River temperature was 25.8°C Discharge was 34,000 cfs
    - Crosses (Female x Male)
      1. 115557165A x 1F50072169
      2. 115676635A x 1F50072169

# 2006

## Gavins Point National Fish Hatchery

### Spawning

On October 25, two female and three male pallid sturgeon were transported from the Yellowstone and Missouri Rivers confluence area to Gavins Point NFH (Bollig 2006). After arrival the fish were given a shot of antibiotics responded well. On June 20 and 21 one of the females and two of the males were spawned, resulting in two family lots.

Between November 3, 2005 and May 15, 2006, 14 potential broodstock were either flown or driven to Gavins Point NFH (Bollig 2006). These fish were captured in RPMA #4 by the Missouri Department of Conservation, Nebraska Game and Parks Commission, South Dakota Game Fish and Parks, as well as one fish from an unknown source. No eggs or sperm were collected from any of the RPMA # 4 adult pallid sturgeon that were thought to be reproductive. The lack of sexual response in captivity may have been due to the time of capture, handling, stress, and possibly moving the fish during their peak spawning time and putting them in colder temperatures at the Gavins Point NFH.

Approximately 7,200 fertilized eggs spawned at the Miles City SFH on June 13 and 14, from one male and one female captured near the confluence of the Yellowstone and Missouri Rivers, were transported to Gavins Point NFH on June 18 (Bollig 2006). Four families of fertilized eggs (n = 57,000) were shipped to Neosho NFH on June 26<sup>th</sup> 2006. An estimated 8,000 fertilized eggs spawned on June 27 from a different female and male captured near the Yellowstone and Missouri confluence, were transported by volunteers on June 30 from Miles City SFH for incubation, hatching, and rearing at Gavins Point NFH.

On August 7, the hatchery crew inventoried the 2006 year-class pallid sturgeon fingerlings, including Lower Mississippi River family lots (Bollig 2006). There were a total of 7,849 fish in the six different families that remained at Gavins Point NFH for future broodstock, stocking, and research activities. Four of these families would be used for future stocking in RPMA #4.

### Stocking Results

A total of 3,642 fish was stocked as a result of the four family lots distributed at the four locations.

#### St. Helena, NE

- 5/9/2007
  - 950 fish stocked at RM 799
    - Length and weight were not recorded
    - All fish had 3<sup>rd</sup> right scute removed
    - All fish marked with left vertical pink elastomer
  - River temperature was 18.8°C and turbidity was 12 fnu

- Crosses (Female x Male)
  1. 4064021213 x 7F7D291A07
  2. 4064021213 x 7F7D4A7758
  3. 1F497F1801 x 1F4A0B1A72
  4. 4443250A24 x 465D43745B

**Mulberry Bend, SD**

- 5/10/2007
  - 907 pallid sturgeon stocked at RM 775
    - Length and weight were not recorded
    - All fish had 3<sup>rd</sup> right scute removed
    - All fish marked with left horizontal pink elastomer
  - River temperature was 18.8°C and turbidity was 12 fnu
  - Crosses (Female x Male)
    1. 4064021213 x 7F7D291A07
    2. 4064021213 x 7F7D4A7758
    3. 1F497F1801 x 1F4A0B1A72
    4. 4443250A24 x 465D43745B

**Sloan, IA**

- 5/10/2007
  - 923 pallid sturgeon stocked at RM 708.6
    - Length and weight were not recorded
    - All fish had 3<sup>rd</sup> right scute removed
    - All fish marked with left vertical blue elastomer
  - River temperature was 20.7°C and discharge was 20,700 cfs
  - Crosses (Female x Male)
    1. 4064021213 x 7F7D291A07
    2. 4064021213 x 7F7D4A7758
    3. 1F497F1801 x 1F4A0B1A72
    4. 4443250A24 x 465D43745B

**Bellevue, NE**

- 5/9/2007
  5. 862 fish stocked at RM 601.4
    - Length and weight were not recorded
    - All fish marked with a coded wire tag
    - All fish marked with a left horizontal blue elastomer
  6. River temperature was 18.5°C and discharge was 48,500 cfs
  7. Crosses (Female x Male)
    1. 4064021213 x 7F7D291A07
    2. 4064021213 x 7F7D4A7758
    3. 1F497F1801 x 1F4A0B1A72
    4. 4443250A24 x 465D43745B

# 2007

## **Garrison National Fish Hatchery**

### **Spawning**

In the spring of 2007 broodstock were collected near the confluence of the Yellowstone and Missouri Rivers and Sundheim Park (Holm 2007). A total of seven females and 15 males were captured and 19 production lots were created (including 7 from cryopreserved milt). Additional smaller family lots resulted from cryopreservation studies conducted with five of the seven females. Of the 19 production lots, four were available at the time the request was made by Neosho NFH. On June 25, 2007, one female was spawned with three males. Cryopreservation experiments were also conducted using this female to produce additional family lots from six cryopreserved males. A total of 193,126 eggs neurulated, producing 108,107 fry at hatch with a 71% survival rate. Two days later, a second female spawned with three different males. Additional cryopreservation experiments were conducted. A total of 141,345 eggs neurulated, producing 95,812 fry at hatch with a 92% survival rate.

### **Stocking**

On July 13 Garrison Dam NFH air mailed fry to Neosho NFH on a five hour flight (Holm 2007). Fry were bagged among 4,150 – 5,900 fry sent per two gallon box, for a total of 54,357. The breakdown by family was 33,218 larvae from family 2945 X 2E34; 4,554 from 3D3A X 3031; 7740 from 3D3A X 2A6B and 8845 from 3D3A X 294A. Stocking details for the Garrison Dam NFH spawned progeny are provided in the Neosho NFH section.

## **Gavins Point National Fish Hatchery**

### **Spawning**

Two male broodstock were collected from Upper Plattsmouth Bend by the NGPC on April 18, 2007, and one female was collected near the Little Sioux River by Aaron Delonay (USGS). On May 30, 2007, spawning between one female and two males occurred (McGilvray 2007). A total of 42,300 eggs were collected between the two families. Six hundred twenty-six progeny from male 4B11 were held in the Endangered Species Building at the hatchery until they were stocked in 2008. Another 2,162 progeny from male 3E4C were kept in the broodstock building and tested positive for iridovirus. All progeny from 3E4C that did not experience mortality were euthanized.

### **Stocking**

A total of 620 fish were stocked at two different river confluences along the Missouri River from a single family lot.

#### **James River, SD**

- 5/7/2008
  - 310 fish were stocked at RM 800.1
    - Mean length = 250 mm Mean Weight = 53 g
    - All fish marked with a PIT tag
    - All fish had their 3<sup>rd</sup> left scute removed
  - River temperature was 12.6°C and turbidity was 5.9 fnu
  - Crosses (Female x Male)

1. 471A2C1013 x 412C3D4B11

### **Platte River Confluence, NE**

- 5/7/2008
  - 310 fish were stocked at RM 595
    - Mean length = 256 mm, Mean Weight = 60 g
    - All fish marked with a PIT tag
    - All fish had their 3<sup>rd</sup> left scute removed
  - River temperature was 16.3°C and discharge was 36,400 cfs
  - Crosses (Female x Male)
    1. 471A2C1013 x 412C3D4B11

## **Neosho National Fish Hatchery**

### **Spawning**

All fish reared at Neosho NFH were spawned at Garrison Dam NFH. See Garrison Dam NFH spawning section for more information.

### **Stocking**

Two thousand and one fish were stocked in 2007, 800 in 2008, and 1,094 in 2009 (M. Cheung, Neosho NFH, personal communication). A total of 3,895 fish was the result of the spawning at Garrison Dam NFH and rearing at Neosho NFH.

### **Mulberry Bend, SD**

- 10/18/2007
  - 667 fish were stocked at RM 775
    - Mean length = 78 mm, Weight = 2 g
    - All fish marked with a right vertical orange elastomer
    - All fish marked with a coded wire tag
  - River temperature was 14.3°C and turbidity was 17 fnu
  - Crosses (Female x Male)
    1. 47151A3D3A x 7F7D372A6B
    2. 47151A3D3A x 1F4A363031
    3. 47151A3D3A x 115669294A
- 6/8/2009
  - 360 fish were stocked at RM 775
    - Mean length = 356 mm, Mean weight = 179 g
    - All fish marked with a PIT tag
    - All fish had their 4<sup>th</sup> left scute removed
  - River temperature was 17.0°C
  - Crosses (Female x Male)
    1. 40636B2945 x 4443422E34
    2. 47151A3D3A x 7F7D372A6B

### **Sloan, IA**

- 10/18/2007
  - 667 fish were stocked at RM 708.6
    - Mean length = 78 mm, Weight = 2 g
    - All fish marked with a right vertical orange elastomer
    - All fish marked with a coded wire tag
  - River temperature was 14°C and discharge was 23,600 cfs

- Crosses (Female x Male)
  1. 47151A3D3A x 7F7D372A6B
  2. 47151A3D3A x 1F4A363031
  3. 47151A3D3A x 115669294A
- 6/3/2009
  - 368 fish were stocked at RM 708.6
    - Mean length = 340 mm, Mean weight = 148 g
    - All fish marked with a PIT tag
    - All fish had their 4<sup>th</sup> left scute removed
  - River temperature was 18.8°C and discharge was 30,600 cfs
  - Crosses (Female x Male)
    1. 40636B2945 x 4443422E34
    2. 47151A3D3A x 7F7D372A6B

### **Bellevue, NE**

- 10/18/2007
  - 667 fish were stocked at RM 601.4
    - Mean length = 78 mm, Weight = 2 g
    - All fish marked with a right vertical orange elastomer
    - All fish marked with a coded wire tag
  - River temperature was 14°C and discharge was 32,000 cfs
  - Crosses (Female x Male)
    1. 47151A3D3A x 7F7D372A6B
    2. 47151A3D3A x 1F4A363031
    3. 47151A3D3A x 115669294A
- 7/9/2008
  - 400 fish were stocked at RM 601.4
    - Mean length = 227 mm, Mean Weight = 40 g
    - All fish marked with a PIT tag
    - All fish had their 4<sup>th</sup> left scute removed
  - Discharge was 29,300 cfs
  - Crosses (Female x Male)
    1. 40636B2945 x 4443422E34
    2. 47151A3D3A x 1F4A363031
    3. 47151A3D3A x 7F7D372A6B
    4. 47151A3D3A x 115669294A
- 9/23/2008
  - 400 fish were stocked at RM 601.4
    - Mean length = 243 mm, Mean weight = 46 g
    - All fish marked with a PIT tag
    - All fish had their 4<sup>th</sup> left scute removed
  - Discharge was 20,100 cfs
  - Crosses (Female x Male)
    1. 40636B2945 x 4443422E34
    2. 47151A3D3A x 1F4A363031
    3. 47151A3D3A x 7F7D372A6B
    4. 47151A3D3A x 115669294A
- 6/1/2009
  - 366 fish were stocked at RM 601.4
    - Mean length = 345 mm, Mean weight = 152 g

- All fish marked with a PIT tag
- All fish had their 4<sup>th</sup> left scute removed
- Discharge was 30,500 cfs
- Crosses (Female x Male)
  1. 40636B2945 x 4443422E34
  2. 47151A3D3A x 7F7D372A6B

# 2008

## **Blind Pony State Fish Hatchery**

### **Spawning**

One female and three male pallid sturgeon captured during an intensive broodstock collection effort by the NGPC were sent to Blind Pony SFH on April 21 and 23 (B. Drecktrah, Blind Pony SFH, personal communication). The Missouri Department of Conservation (MDC) provided two males that were being held at Neosho NFH as well as a female and three other males held at Blind Pony SFH. Due to low motility and non-reproductive stages, only one male from NGPC and three males from MDC were crossed with the two females. Both females were spawned on May 8, at a water temperature of 18°C. Approximately 35,000 eggs were produced between the two females, in seven family lots, but the numbers for each male cross cannot be identified. The females' eggs were kept separate but Blind Pony pooled the gametes from the males in order to properly roll the eggs during incubation. The broodstock were held for one week and then were returned to the river and released near their capture location.

### **Stocking Results**

A total of 4,466 fish was stocked from spawning efforts at Blind Pony SFH.

#### **Big Sioux River**

- 9/11/2008
  - 1,000 fish stocked at RM 734.0
    - Length and weight were not recorded
    - All fish had 4<sup>th</sup> right scute removed
    - All fish marked with a left vertical blue elastomer
  - River temperature was 19.6°C and discharge was 24,100 cfs
  - Female 470C467335 crossed with males; 432A191F35, 432778110D, 460E112040

#### **Bellevue, NE**

- 9/11/2008
  - 1,178 fish stocked at RM 601.4
    - Length and weight were not recorded
    - All fish had 4<sup>th</sup> right scute removed
    - All fish marked with a left vertical green elastomer
  - River discharge was 26,200 cfs
  - Female 470C467335 crossed with males; 432A191F35, 432778110D, 460E112040

#### **Payne's Landing, MO**

- 9/10/2008
  - 1,188 fish stocked at RM 477.1
    - Length and weight were not recorded
    - All fish had 4<sup>th</sup> right scute removed
    - All fish marked with a left horizontal green elastomer
  - River discharge was 31,600 cfs

- Female 470C467335 crossed with males; 432A191F35, 432778110D, 460E112040

#### **Cooley Lake, MO**

- 9/10/2008
  - 1,100 fish stocked at RM 341.2
    - Length and weight were not recorded
    - All fish had 4<sup>th</sup> right scute removed
    - All fish marked with a left vertical orange elastomer
  - River discharge was 39,800 cfs
  - Female 470C467335 crossed with males; 432A191F35, 432778110D, 460E112040

## **Neosho National Fish Hatchery**

### **Spawning**

No spawning took place at Neosho NFH in 2008. After spawning at Blind Pony pallid sturgeon offspring were transported to Neosho as fingerlings on June 19 to be reared and stocked. Information about the spawning can be found in the 2008 Blind Pony NFH spawning efforts.

### **Stocking Results**

A total of 2,197 fish was stocked from spawning efforts at Blind Pony SFH and rearing at Neosho NFH (M. Cheung, Neosho NFH, personal communication).

#### **James River Confluence**

- 6/17/2009
  - 558 fish stocked at RM 798
    - Mean Length = 302 mm, Mean Weight = 82 g
    - All fish had 4<sup>th</sup> right scute removed
    - All fish marked with a PIT tag
  - River temperature was 22.4°C and turbidity was 9.8 fnu
  - Female 423373582F crossed with males; 432A191F35, 432778110D, 460E112040, 435F60206E

#### **Platte River Confluence, NE**

- 6/15/2009
  - 558 fish stocked by boat at the Platte River confluence RM 595.0
    - Mean Length = 335 mm, Mean Weight = 113 g
    - All fish had 4<sup>th</sup> right scute removed
    - All fish marked with a PIT tag
  - Missouri River discharge was 30,500 cfs
  - Female 423373582F crossed with males; 432A191F35, 432778110D, 460E112040, 435F60206E

#### **Kansas River Confluence, KS**

- 6/10/2009
  - 557 fish stocked by boat at the Kansas River confluence RM 367.5
    - Mean Length = 297 mm, Mean Weight = 81 g

- All fish had 4<sup>th</sup> right scute removed
- All fish marked with a PIT tag
- Missouri River discharge was 93,400 cfs
- Female 423373582F crossed with males; 432A191F35, 432778110D, 460E112040, 435F60206E

**Grand River Confluence, MO**

- 6/12/2009
  - 524 fish stocked at RM 250
    - Mean Length = 293 mm, Mean Weight = 77 g
    - All fish had 4<sup>th</sup> right scute removed
    - All fish marked with a PIT tag
  - River temperature was 21.2°C and discharge was 15,100 cfs
  - Female 423373582F crossed with males; 432A191F35, 432778110D, 460E112040, 435F60206E

# 2009

## **Gavins Point National Fish Hatchery**

### **Spawning**

One female and three male reproductive broodstock were collected by NGPC in either the fall of 2008 or spring of 2009 (J. Powell, Gavins Point NFH, personal communication). These fish were spawned in early May to produce 36,363 eggs from three families. Seven thousand eggs were shipped to Neosho NFH to be hatched and reared. Another 14,000 eyed eggs from one family cross was received from Blind Pony SFH for hatching and rearing. Neosho NFH also transferred 6,300 eyed eggs from a cross captured in the Mississippi River to be hatched, reared, and then returned for overwintering in the fall of 2009.

### **Stocking Results**

A total of 313 fish were stocked from spawning and/or rearing efforts at Gavins Point NFH.

#### **James River Confluence**

- 10/7/2009
  - 156 fish stocked by boat at RM 798
    - Mean Length= 233 mm Mean Weight = 45 g
    - All fish had 5<sup>th</sup> left scute removed
    - All fish marked with a PIT tag
  - River temperature was 11.7°C and discharge was 32,700 cfs
  - Crosses (Female x Male)
    1. 434A00324C x 44235B7567
    2. 434A00324C x 470C493F38
    3. 434A00324C x 4703584B1B
    4. 412C20001A x 43152D6A6F

#### **Mulberry Bend, SD**

- 10/7/2009
  - 157 fish stocked at ramp at RM 775
    - Mean Length= 238 mm Mean Weight = 48 g
    - All fish had 5<sup>th</sup> left scute removed
    - All fish marked with a PIT tag
  - River temperature was 11.7°C and discharge was 32,700 cfs
  - Crosses (Female x Male)
    1. 434A00324C x 44235B7567
    2. 434A00324C x 470C493F38
    3. 434A00324C x 4703584B1B
    4. 412C20001A x 43152D6A6F

# Blind Pony State Fish Hatchery

## Spawning

Between April 1 and April 15, NGPC captured and transported three reproductive females and seven reproductive males to Blind Pony SFH. MDC also provided two reproductive males to the hatchery to create nine family lots. All lots were spawned on April 30. Eyed eggs from six of the nine families were transferred to Neosho NFH and one of the nine families was transferred to Gavins Point Dam NFH.

## Stocking Results

Over the summer three family lots had increased mortality rates. Samples from each lot were sent to Bozeman FTC where they were confirmed to have Ranavirus. This led to the fish being euthanized. The remaining six families were divided into thirds and one third of each family was stocked at six locations. A second transfer of 7,982 fish for overwintering occurred on November 18 to Neosho NFH. This made up the remaining two thirds of the fish from Blind Pony SFH. Even with the loss of three families, 3,668 six month old pallids were stocked in the fall of 2009 as a result of spawning and rearing at Blind Pony SFH.

### Sloan, IA

- 11/18/2009
  - 591 fish stocked at RM 708.6
    - Mean Length = 180 mm, Mean Weight = 21 g
    - All fish had 5<sup>th</sup> right scute removed
    - All fish marked with a left vertical blue elastomer
  - River temperature was 7.5°C and discharge was 24,500 cfs
  - Crosses (Female x Male)
    1. 434D30680D x 4706232202
    2. 434D30680D x 486762580F
    3. 434D30680D x 4618545D4F
    4. 412C20001A x 47054C3B54
    5. 4704265B0C x 4868637401
    6. 412C20001A x 486762580F

### Wilson Island State Rec. Area, IA

- 11/18/2009
  - 609 fish stocked at RM 641
    - Mean Length = 185 mm, Mean Weight = 21 g
    - All fish had 5<sup>th</sup> right scute removed
    - All fish marked with a left horizontal blue elastomer
  - Discharge was 28,700 cfs
  - Crosses (Female x Male)
    1. 434D30680D x 4706232202
    2. 434D30680D x 486762580F
    3. 434D30680D x 4618545D4F
    4. 412C20001A x 47054C3B54

- 5. 4704265B0C x 4868637401
- 6. 412C20001A x 486762580F

**Upper Hamburg Chute**

- 11/19/2009
  - 607 fish stocked at RM 554.9
    - Mean Length = 170 mm, Mean Weight = 21 g
    - All fish had 5<sup>th</sup> right scute removed
    - All fish marked with a left vertical green elastomer
  - Discharge was 36,300 cfs
  - Crosses (Female x Male)
    1. 434D30680D x 4706232202
    2. 434D30680D x 486762580F
    3. 434D30680D x 4618545D4F
    4. 412C20001A x 47054C3B54
    5. 4704265B0C x 4868637401
    6. 412C20001A x 486762580F

**Kenmoor Bend, MO**

- 11/19/2009
  - 630 fish stocked at RM 438.1
    - Mean Length = 172 mm, Mean Weight = 20 g
    - All fish had 5<sup>th</sup> right scute removed
    - All fish marked with a left horizontal green elastomer
  - Discharge was 42,200 cfs
  - Crosses (Female x Male)
    1. 434D30680D x 4706232202
    2. 434D30680D x 486762580F
    3. 434D30680D x 4618545D4F
    4. 412C20001A x 47054C3B54
    5. 4704265B0C x 4868637401
    6. 412C20001A x 486762580F

**Camden Bend, MO**

- 11/19/2009
  - 590 fish stocked at RM 327
    - Mean Length = 183 mm, Mean Weight = 22 g
    - All fish had 5<sup>th</sup> right scute removed
    - All fish marked with a left vertical orange elastomer
  - Discharge was 64,900 cfs
  - Crosses (Female x Male)
    1. 434D30680D x 4706232202
    2. 434D30680D x 486762580F
    3. 434D30680D x 4618545D4F
    4. 412C20001A x 47054C3B54
    5. 4704265B0C x 4868637401
    6. 412C20001A x 486762580F

**Cranberry Bend, MO**

- 11/19/2009
  - 641 fish stocked at RM 283.5
    - Mean Length = 170 mm, Mean Weight = 20 g
    - All fish had 5<sup>th</sup> right scute removed
    - All fish marked with a left horizontal orange elastomer
  - Discharge was 68,400 cfs
  - Crosses (Female x Male)
    1. 434D30680D x 4706232202
    2. 434D30680D x 486762580F
    3. 434D30680D x 4618545D4F
    4. 412C20001A x 47054C3B54
    5. 4704265B0C x 4868637401
    6. 412C20001A x 486762580F

## Neosho National Fish Hatchery

### Spawning

Seven family lots were spawned from four females and six males resulting in 3,713 YOY pallid sturgeon (B. Drecktrah, Blind Pony SFH, personal communication; D. Hendrix, Neosho NFH, personal communication). Neosho also received 7,982 fish spawned at Blind Pony SFH from six family lots on November 18. Overall a total of 11,695 pallid sturgeon were being held at the hatchery. In December 2009, lot 001A x 3B54 experienced mortalities and Becky Lasee at the Lacrosse Fish Health Center presumptively identified the fish to have *Aeromonas hydrophila* and ran PCR to confirm (D. Hendrix, Neosho NFH, personal communication).

### Stocking Results

It was determined by the middle basin sub-committee that the fish from the 2009 year class be held overwinter to allow for increased growth and potentially higher survival rates, while also being monitored for Ranavirus. Tagging efforts began on February 17, 2010 at Neosho NFH in their old building. Crews from NGPC and MDC PIT tagged and removed the fifth scute of one third of the pallids to make room for incoming broodstock in the spring. These fish were stocked out in April and May. Tagging efforts continued August 2-3 on fish being held in the new building. They had their fifth scute removed, were PIT tagged, weighed, and measured before being stocked. A small portion was held until October before being stocked. A total of 10,613 fish were stocked from spawning and rearing efforts at Neosho NFH.

### Ponca State Park, NE

- 5/5/2010
  - 511 fish stocked at boat ramp at RM 753.0
    - Mean Length = 285 mm, Mean Weight = 70 g
    - All fish had 5<sup>th</sup> left scute removed
    - All fish marked with a PIT tag
  - River temperature was 15.2°C and discharge was 36,000 cfs
  - Crosses (Female x Male)
    1. 412C20001A x 47054C3B54

- 2. 412C20001A x 43152D6A6F
- 3. 412C20001A x 486762580F
- 4. 434D30680D x 4618545D4F
- 5. 434D30680D x 486762580F
- 6. 434D30680D x 4706232202
- 8/9/2010
  - 1,279 fish stocked at boat ramp at RM 753.0
    - Mean Length = 306 mm, Mean Weight = 89 g
    - All fish had 5<sup>th</sup> left scute removed
    - All fish marked with a PIT tag
  - River temperature was 25.8°C
  - Crosses (Female x Male)
    1. 412C20001A x 47054C3B54
    2. 412C20001A x 486762580F
    3. 434D30680D x 4618545D4F
    4. 434D30680D x 486762580F
    5. 434D30680D x 4706232202
    6. 4704265B0C x 4868637401
- 10/27/2010
  - 552 fish stocked at RM 753.0
    - Mean Length = 265 mm, Mean Weight = 59g
    - All fish had 5<sup>th</sup> left scute removed
    - All fish marked with a PIT tag
    - Age at stocking 17 months
  - River temperature was 12.1 and discharge was 58,400 cfs
  - Crosses (Female x Male)
    1. 412C20001A x 47054C3B54
    2. 412C20001A x 486762580F
    3. 434D30680D x 4618545D4F
    4. 434D30680D x 486762580F
    5. 434D30680D x 4706232202
    6. 4704265B0C x 4868637401

**Lake Manawa, IA**

- 8/11/2010
  - 1,325 fish stocked at boat ramp at RM 607.1 instead of at the Nebraska City boat ramp due to flooding
    - Mean Length = 310 mm, Mean Weight = 91 g
    - All fish had 5<sup>th</sup> left scute removed
    - All fish marked with a PIT tag
  - Discharge was 85,000 cfs
  - Crosses (Female x Male)
    1. 412C20001A x 47054C3B54
    2. 412C20001A x 486762580F
    3. 434D30680D x 4618545D4F
    4. 434D30680D x 486762580F

5. 434D30680D x 4706232202
6. 4704265B0C x 4868637401

**Nebraska City, NE**

- 5/5/2010
  - 508 fish stocked at boat ramp at RM 563.0
    - Mean Length = 276 mm, Mean Weight = 75 g
    - All fish had 5<sup>th</sup> left scute removed
    - All fish marked with a PIT tag
  - Discharge was 51,000 cfs
  - Crosses (Female x Male)
    1. 412C20001A x 47054C3B54
    2. 412C20001A x 43152D6A6F
    3. 412C20001A x 486762580F
    4. 434D30680D x 4618545D4F
    5. 434D30680D x 486762580F
    6. 434D30680D x 4706232202
- 10/27/2010
  - 547 fish stocked at RM 563.0
    - Mean Length = 275 mm, Mean Weight = 64 g
    - All fish had 5<sup>th</sup> left scute removed
    - All fish marked with a PIT tag
    - Age at stocking 17 months
  - Discharge was 69,000 cfs
  - Crosses (Female x Male)
    1. 412C20001A x 47054C3B54
    2. 412C20001A x 486762580F
    3. 434D30680D x 4618545D4F
    4. 434D30680D x 486762580F
    5. 434D30680D x 4706232202
    6. 4704265B0C x 4868637401

**Atchison Bend**

- 4/8/2010
  - 509 fish stocked by boat at RM 421.9
    - Mean Length = 279 mm, Mean Weight = 73 g
    - All fish had 5<sup>th</sup> left scute removed
    - All fish marked with a PIT tag
  - River temperature was 13.8°C, discharge was 79,900 cfs, and turbidity was 230 ntu
  - Crosses (Female x Male)
    1. 412C20001A x 47054C3B54
    2. 412C20001A x 43152D6A6F
    3. 434D30680D x 4618545D4F
    4. 434D30680D x 486762580F
    5. 434D30680D x 4706232202
- 8/20/2010
  - 1,468 fish stocked by boat at RM 421.9

- Mean Length = 305 mm, Mean Weight = 88 g
  - All fish had 5<sup>th</sup> left scute removed
  - All fish marked with a PIT tag
- River temperature was 26.2°C, turbidity was 182 ntu, and discharge was 80,000 cfs
- Crosses (Female x Male)
  1. 412C20001A x 47054C3B54
  2. 412C20001A x 486762580F
  3. 434D30680D x 4618545D4F
  4. 434D30680D x 486762580F
  5. 434D30680D x 4706232202
  6. 4704265B0C x 4868637401
- 10/26/2010
  - 549 fish stocked at RM 421.9
    - Mean Length = 280 mm, Mean Weight = 64 g
    - All fish had 5<sup>th</sup> left scute removed
    - All fish marked with a PIT tag
    - Age at stocking 17 months
  - River temperature was 15.5°C, discharge was 71,200 cfs, and turbidity was 32 ntu
  - Crosses (Female x Male)
    1. 412C20001A x 47054C3B54
    2. 412C20001A x 486762580F
    3. 434D30680D x 4618545D4F
    4. 434D30680D x 486762580F
    5. 434D30680D x 4706232202
    6. 4704265B0C x 4868637401

### **Sheep Nose Bend/Lexington**

- 4/8/2010
  - 511 fish stocked by boat at RM 312.2
    - Mean Length = 278 mm, Mean Weight = 73 g
    - All fish had 5<sup>th</sup> left scute removed
    - All fish marked with a PIT tag
  - River temperature was 14.9°C, discharge was 112,000 cfs, and turbidity was 315 ntu
  - Crosses (Female x Male)
    1. 412C20001A x 47054C3B54
    2. 412C20001A x 43152D6A6F
    3. 434D30680D x 4618545D4F
    4. 434D30680D x 486762580F
    5. 434D30680D x 4706232202
- 8/19/2010
  - 1,258 fish stocked by boat at RM 312.2
    - Mean Length = 305 mm, Mean Weight = 87 g
    - All fish had 5<sup>th</sup> left scute removed
    - All fish marked with a PIT tag
  - River temperature was 28.0°C, turbidity was 171 ntu, and discharge was 117,000 cfs
  - Crosses (Female x Male)

1. 412C20001A x 47054C3B54
  2. 412C20001A x 486762580F
  3. 434D30680D x 4618545D4F
  4. 434D30680D x 486762580F
  5. 434D30680D x 4706232202
  6. 4704265B0C x 4868637401
- 10/26/2010
    - 550 fish stocked at RM 312.2
      - Mean Length = 274 mm, Mean Weight = 61 g
      - All fish had 5<sup>th</sup> left scute removed
      - All fish marked with a PIT tag
      - Age at stocking 17 months
    - River temperature was 15.8°C and discharge was 73,900 cfs
    - Crosses (Female x Male)
      1. 412C20001A x 47054C3B54
      2. 412C20001A x 486762580F
      3. 434D30680D x 4618545D4F
      4. 434D30680D x 486762580F
      5. 434D30680D x 4706232202
      6. 4704265B0C x 4868637401

#### **Portland, MO**

- 4/2/2010
  - 349 fish stocked by boat at RM 114.2
    - Mean Length = 332 mm, Mean Weight = 128 g
    - All fish had 5<sup>th</sup> left scute removed
    - All fish marked with PIT tag
    - Half of fish stocked on channel sand bar
    - Half of fish stocked in side channel
  - Discharge was 177,000 cfs
  - Crosses (Female x Male)
    1. 145261670A x 145317672A

#### **Hermann, MO**

- 4/2/2010
  - 347 fish stocked by boat at RM 97.6
    - Mean Length = 350 mm, Mean Weight = 135 g
    - All fish had 5<sup>th</sup> left scute removed
    - All fish marked with PIT tag
    - Half of fish stocked on channel sand bar
    - Half of fish stocked in side channel
  - River temperature was 17.9°C and discharge was 144,000 cfs
  - Crosses (Female x Male)
    1. 145261670A x 145317672A

#### **Weldon Springs, MO**

- 4/6/2010
  - 349 fish stocked by boat at RM 41.0

- Mean Length = 295 mm, Mean Weight = 88 g
- All fish had 5<sup>th</sup> left scute removed
- All fish marked with a PIT tag
- Half of fish stocked on channel sand bar
- Half of fish stocked in side channel
- River conditions were not available
- Crosses (Female x Male)
  1. 145261670A x 145317672A

# 2010

## **Gavins Point National Fish Hatchery**

### **Spawning**

On Thursday, April 28 and 29, eight family lots were spawned at Blind Pony SFH. April 30, five families were divided equally and sent to Gavins Point NFH along with eggs from two other families totaling seven families consisting of 45,175 eggs (K. Steffensen, NGPC, personal communication). After experiencing heavy fungus infections on the eggs during incubation, an average hatch rate of 21% for the seven family lots resulted in 9,900 estimated fry on hand May 5 after losing two family lots totally. Between May 7 and May 20 another family lot was a total loss leaving four lots at Gavins Point NFH. Gavins Point NFH utilized heated well water (62-63°F) for rearing all families due to lake water temperatures in the mid 50's. Feeding of the remaining four families also began on May 5 (K. Schilling, personal communication).

On May 17 an estimated 5,800 fry were on hand. In order to maximize survival among families 1,600 fry were transferred back to Blind Pony SFH. These fish were split from the two family lots that were only at Gavins Point NFH leaving them with 4,200 fish. As of July 31, 2010 a total of 2,963 fish are currently on hand.

After the early mortality due to fungus Gavins Point NFH began working on an experimental de-gassing system for the water supply to individual 6ft. tanks, suspecting that nitrogen gas was a causative factor. Jeff Powell developed a system injecting liquid oxygen into packed columns suspended above the tanks, and it appeared that the extra oxygen reduced the nitrogen percentage but total gas percentage did not drop. Overall early survival appeared to be better but total gas was suspected to be the limiting factor.

### **Stocking Results**

Fish that were reared at Gavins Point NFH in 2010 were either stocked in September or held overwinter and stocked in April of 2011. 2,669 fish were stocked among two sites. An additional 98 fish at Gavins Point NFH were used as part of tag retention study and were stocked at Mulberry Bend on October 4<sup>th</sup> 2011 the crosses were mixed.

#### **James River Confluence**

- 9/29/2010
  - 349 fish stocked by boat at RM 798
    - All fish had 5<sup>th</sup> right scute removed
    - Fish were marked with either a PIT tag or pink elastomeres on both sides
  - 1. Crosses (Female x Male)
    1. 486866124D x 460D506D20
    2. 486866124D x 47054C3B54

- 3. 434C38070F x 462614693D
- 4/13/2011
  - 1,019 fish stocked by boat at RM 798
  - 1. All fish had 5<sup>th</sup> right scute removed
  - 2. All fish were marked with a PIT tag
  - 3. Crosses (Female x Male)
    - 1. 412C240973 x 470C493F38
    - 2. 486866124D x 460D506D20
    - 3. 486866124D x 47054C3B54
    - 4. 434C38070F x 462614693D

### **Mulberry Bend, SD**

- 9/29/2010
  - 350 fish stocked at RM 775
    - All fish had 5<sup>th</sup> right scute removed
    - Fish were marked with either a PIT tag or pink elastomeres on both sides
  - Crosses (Female x Male)
    - 1. 486866124D x 460D506D20
    - 2. 486866124D x 47054C3B54
    - 3. 434C38070F x 462614693D
- 4/13/2011
  - 951 fish stocked at RM 775
    - All fish had 5<sup>th</sup> right scute removed
    - All fish were marked with a PIT tag
  - Crosses (Female x Male)
    - 1. 412C240973 x 470C493F38
    - 2. 486866124D x 460D506D20
    - 3. 486866124D x 47054C3B54
    - 4. 434C38070F x 462614693D
- 10/04/2011
  - 1. 98 fish were stocked at RM 775
    - All fish had 5<sup>th</sup> right scute removed
    - All fish were marked with a PIT tag
    - Mean length 358.6 mm, mean weight = 142.1 g
    - River temperature was 16.2°C, discharge was 43,000 cfs
    - Crosses Female x Male were mixed

## **Blind Pony State Fish Hatchery**

### **Spawning**

A total of eight family lots and 81,170 eggs were spawned at Blind Pony SFH between April 28 and 29. These families resulted from four females and eight males collected by Nebraska Game and Parks Commission and one male that was spawned in 2009, re-caught by Marty Hamel of the University of Nebraska, and reused in 2010. All fish were caught in early April 2010 with the exception of two females which were caught in March 2010 and October 2009 and held at Gavins Point NFH until transferred for spawning at Blind Pony SFH.

Immediately after spawning, hatchery staff expressed concerns with the quality of eggs of one female (B. Drecktrah, Blind Pony SFH, personal communication). Speculation was correct when fertilization occurred in none of the eggs. This reduced the family lots to six at Blind Pony SFH. Between April and May, Blind Pony SFH lost three more families entirely. Speculation of gas levels had been mentioned from other hatcheries but tests revealed mortality from gases to be unlikely. These progeny died before hatch and never developed. On May 17, Blind Pony SFH received two families totaling 1,600 fry from Gavins Point NFH. These lots were not represented at Blind Pony SFH and received as a precautionary measure to prevent catastrophic loss. Fish were tagged on September 28, 2010, except for the fish that were shipped to Neosho NFH to be over-wintered.

## Stocking Results

A total of 2,974 fish were stocked from spawning efforts at Blind Pony SFH in 2010. An additional 4,724 fish were transported to Neosho to be held overwinter.

### Big Sioux River Confluence, NE

- 9/22/2010
  - 525 fish stocked at RM 735.0
    - Mean Length = 154.4 mm, Mean Weight = 13 g
    - All fish had 5<sup>th</sup> right scute removed
    - All fish marked with vertical left blue
    - Fish stocked by boat at Long. -096.45388, Lat. 42.49198
  - River temperature was 16.2°C
  - Crosses (Female x Male)
    1. 486866124D x 47054C3B54
    2. 412C240973 x 470C493F38

### Decatur, NE

- 9/22/2010
  - 499 fish stocked at RM 691.0
    - Mean Length = 154.8 mm, Mean Weight = 13 g
    - All fish had 5<sup>th</sup> right scute removed
    - All fish marked with horizontal left blue
    - Fish stocked at boat ramp
  - River temperature was 16.2°C
  - Crosses (Female x Male)
    1. 486866124D x 47054C3B54
    2. 412C240973 x 470C493F38

### Upper Hamburg Chute

- 9/22/2010
  - 490 fish stocked at RM 554.0
    - Mean Length = 154.8 mm, Mean Weight = 13 g
    - All fish had 5<sup>th</sup> right scute removed
    - All fish marked with vertical left green
    - Fish stocked by boat at Long. -095.76293, Lat. 40.61185
  - River temperature was 17.7°C
  - Crosses (Female x Male)

1. 486866124D x 47054C3B54
2. 412C240973 x 470C493F38

#### **Worthwine Chute**

- 9/22/2010
  - 487 fish stocked at RM 458.5
    - Mean Length = 154.8 mm, Mean Weight = 13 g
    - All fish had 5<sup>th</sup> right scute removed
    - All fish marked with horizontal left green
    - Fish stocked by boat at Long. -094.93729, Lat. 39.86189
  - River temperature was 18.4°C, discharge was 88,900 cfs, and turbidity was 150 ntu
  - Crosses (Female x Male)
    1. 486866124D x 47054C3B54
    2. 412C240973 x 470C493F38

#### **Liberty**

- 9/22/2010
  - 493 fish stocked at RM 351.2
    - Mean Length = 154.8 mm, Mean Weight = 13 g
    - All fish had 5<sup>th</sup> right scute removed
    - All fish marked with vertical left orange
    - Fish stocked by boat at Long. -094.36845, Lat. 39.16917
  - River temperature was 19.0°C, discharge was 104,000 cfs, and turbidity was 230 ntu
  - Crosses (Female x Male)
    1. 486866124D x 47054C3B54
    2. 412C240973 x 470C493F38

#### **Waverly**

- 9/22/2010
  - 480 fish stocked at RM 296.2
    - Mean Length = 154.8 mm, Mean Weight = 13 g
    - All fish had 5<sup>th</sup> right scute removed
    - All fish marked with horizontal left orange
    - Fish stocked by boat at Long. -093.56313, Lat. 39.22337
  - River temperature was 19.8°C, discharge was 107,000 cfs, and turbidity was 232 ntu
  - Crosses (Female x Male)
    1. 486866124D x 47054C3B54
    2. 412C240973 x 470C493F38

## **Neosho National Fish Hatchery**

### **Spawning**

Two family lots consisting of 19,422 eggs were spawned at Neosho NFH on April 30, 2010. One female collected by MDC and two males present at Blind Pony SFH were transferred to Neosho and made up the crosses. One other female collected by NGPC in 2009 that was held overwinter never released eggs even after two hormone injections. This female was tagged by Aaron Delonay of USGS for tracking studies. Diana Papoulias and Mandy Annis, from the Columbia Environmental

Research Center were present at the time of spawning and noticed development in one cross but not in the other. Even though little or no development occurred all eggs continued to be incubated (D. Hendrix, Neosho NFH, personal communication). The Interior Highlands Management Unit had no males to cross with the one reproductive female, so eggs from the pure pallid and two hybrids collected were used for Diana's captive maturation study. The fish were spawned on May 7, 2010 for this study.

Unfortunately, on day 21 after hatch (May 31) Neosho NFH experienced a severe mortality. All fry died within a six hour period and no fish remain from the 2010 year class. A preliminary microscopic examination was done at the hatchery and revealed no obvious reasons for the deaths. Samples were also sent to the Fish Health Lab in La Crosse, WI, for an extensive examination. These results also revealed no reasons for the deaths. Additionally, a sample of spring water was analyzed for contaminants by a lab in Springfield, MO. Results revealed that there were no contaminants.

## Stocking Results

Fish that spawned at Blind Pony SFH and held overwinter at Neosho were stocked in the fall of 2011. Prior to stocking, all fish were tagged in August 2011 with a PIT tag and the 5<sup>th</sup> right scute was removed. 3,843 fish from Neosho NFH were stocked among six sites.

### Ponca State Park, NE

- 9/21/2011
  - 640 fish stocked at RM 753.5
    - Mean length = 311.42 mm, mean weight = 95.91 g
    - All fish had 5<sup>th</sup> right scute removed
    - All fish were marked with PIT tag
  - Crosses (Female x Male)
    1. 434C38070F x 462614693D
    2. 486866124D x 47054C3B54
    3. 412C240973 x 470C493F38
    4. 486866124D x 460D506D20
    5. 48665E2D76 x 434A011475

### Decatur, NE

- 9/21/2011
  - 642 fish stocked at RM 691.0
    - Mean Length = 313.62 mm, Mean weight = 114.89 g
    - All fish had 5<sup>th</sup> right scute removed
    - Fish stocked GPS location at Long. -094.93698, Lat. 39.86392
  - River temperature was 18° C
  - Crosses (Female x Male)
    1. 434C38070F x 462614693D
    2. 486866124D x 47054C3B54
    3. 412C240973 x 470C493F38
    4. 486866124D x 460D506D20
    5. 48665E2D76 x 434A011475

### Nebraska City, NE

- 9/21/2011
  - 640 fish stocked at RM 563.4
    - Mean Length = 296.48 mm, Mean weight = 84.74 g
    - All fish had 5<sup>th</sup> right scute removed
    - Fish stocked GPS location at Long. -095.84614, Lat. 40.69366
  - River temperature was 19.2°C
  - Crosses (Female x Male)
    1. 434C38070F x 462614693D
    2. 486866124D x 47054C3B54
    3. 412C240973 x 470C493F38
    4. 486866124D x 460D506D20
    5. 48665E2D76 x 434A011475

### Worthwine Chute

- 9/21/2011
  - 641 fish stocked at RM 458.5
    - Mean Length = 298.1 mm, Mean weight = 86.24 g
    - All fish had 5<sup>th</sup> right scute removed
    - Fish stocked GPS location at Long. -094.93698, Lat. 39.86392
  - River temperature was 18°C, discharge was 109,000 cfs, and turbidity was 88 ntu
  - Crosses (Female x Male)
    1. 434C38070F x 462614693D
    2. 486866124D x 47054C3B54
    3. 412C240973 x 470C493F38
    4. 486866124D x 460D506D20
    5. 48665E2D76 x 434A011475

### Liberty

- 9/21/2011
  - 639 fish stocked at RM 351.3
    - Mean Length = 319.93 mm, Mean weight = 106.86 g
    - All fish had 5<sup>th</sup> right scute removed
    - Fish stocked GPS location at Long. -094.36846, Lat. 39.16995
  - River temperature was 16.8°C
  - Crosses (Female x Male)
    1. 434C38070F x 462614693D
    2. 486866124D x 47054C3B54
    3. 412C240973 x 470C493F38
    4. 486866124D x 460D506D20
    5. 48665E2D76 x 434A011475

### Waverly

- 9/21/2011
  - 636 fish stocked at RM 296.2
    - Mean Length = 303.65 mm, Mean weight = 90.35 g
    - All fish had 5<sup>th</sup> right scute removed
    - Fish stocked GPS location at Long. -093.56207, Lat. 39.22206
  - River temperature was 16.8°C

- Crosses (Female x Male)
  1. 434C38070F x 462614693D
  2. 486866124D x 47054C3B54
  3. 412C240973 x 470C493F38
  4. 486866124D x 460D506D20
  5. 48665E2D76 x 434A011475

## Garrison National Fish Hatchery

### Stocking

A juvenile telemetry study was conducted in 2014 between Nebraska Game and Parks Commission and the U.S. Geological Survey. As part of this study, two separate trials were run, where acoustic telemetry tags were inserted into juvenile pallid sturgeon. The first trial was conducted using 37 tagged fish stocked on July 23<sup>rd</sup> in a secondary channel located on Tobacco Bend (RM 589). These 37 fish were progeny from six family lots that spawned in 2010 from Garrison National Fish Hatchery (Holm 2014). See 2013 year class section for data about the second trial that was conducted.

Family cross (Female x Male)	# Progeny Stocked
• 1F5569653E X 1F4A33194B	6
• 1F5569653E X 7F7D24754C	6
• 43105F0C7E X 1F4A143350	4
• 43105F0C7E X 44436E2975	6
• 43105F0C7E X 4704550E5B	6
• 6C00024873 X 116165646A	9

### Tobacco Bend

- 7/23/2014
  - 37 fish Stocked by boat at RM 589.1
    - Mean Length = 485 mm, Mean Weight = 355 g
    - All fish marked with PIT tag
    - All fish had acoustic telemetry tag inserted
    - 50% of Fish stocked at GPS location: Lat. 40.98327, Lon.-95.85090
    - 50% of Fish stocked at GPS location: Lat. 40.96995, Lon.-95.84917
  - River temperature was 26.3°C and discharge was 42,600 cfs
  - Crosses (Female x Male)
    1. 1F5569653E x 1F4A33194B
    2. 1F5569653E x 7F7D24754C
    3. 43105F0C7E x 1F4A143350
    4. 43105F0C7E x 44436E2975
    5. 43105F0C7E x 4704550E5B
    6. 6C00024873 x 116165646A

# 2011

## Gavins Point National Fish Hatchery

### Spawning

Spawning efforts took place at Blind Pony SFH on April 26<sup>th</sup> 2011, after spawning, 32,806 fertilized eggs were transported to Gavins Point NFH to be reared and stocked at a later date.

### Stocking Results

A total of 4,384 fish were stocked from spawning efforts that occurred at Blind Pony SFH, then later, were transported, reared, and stocked from Gavins Point SFH in 2011. An additional 1,627 fish of the following crosses (female x male) were held overwinter at Gavins Point SFH. In spring 2012, 1,488 fish reared at Gavins Point SFH were stocked among four locations.

1. 4627111945 x 412C727B25
2. 4626553E42 x 460E275D2B
3. 4868364835 x 412C5D2741
4. 4868364835 x 470C547B78
5. 4626553E42 x 412C2A094F
6. 4627111945 x 460E647803

### James River Confluence

- 10/3/2011
  - 1,097 fish stocked at RM 798
    - Mean length = 226.4 mm, mean weight = 40.1 g
    - All fish had 6<sup>th</sup> left scute removed
    - All fish marked with a PIT tag
  - River temperature was 16°C, discharge was 40,000 cfs
  - Crosses (Female x Male):
    1. 4627111945 x 412C727B25
    2. 4626553E42 x 460E275D2B
    3. 4868364835 x 412C5D2741
    4. 4868364835 x 470C547B78
    5. 4626553E42 x 412C2A094F
- 3/26/2012
  - 376 fish stocked at RM 799
    - Mean length = 248.6 mm, mean weight = 45.1 g
    - All fish had 6<sup>th</sup> left scute removed
    - All fish marked with a PIT tag
  - River temperature was 13.9°C, discharge was 31,500 cfs
  - Crosses (Female x Male)

1. 4627111945 x 412C727B25
2. 4626553E42 x 460E275D2B
3. 4868364835 x 412C5D2741
4. 4868364835 x 470C547B78
5. 4626553E42 x 412C2A094F
6. 4627111945 x 460E647803

### **Mulberry Bend**

- 10/4/2011
  - 1,082 fish stocked at RM 775.0
    - Mean length = 228.2 mm, mean weight = 38.8 g
    - All fish had 6<sup>th</sup> left scute removed
    - All fish marked with a PIT tag
  - River temperature was 16.2°C, discharge was 43,000 cfs
  - Crosses (Female x Male):
    1. 4627111945 x 412C727B25
    2. 4626553E42 x 460E275D2B
    3. 4868364835 x 412C5D2741
    4. 4868364835 x 470C547B78
    5. 4626553E42 x 412C2A094F
- 3/27/2012
  - 375 fish stocked at RM 775.0
    1. Mean length = 236.5 mm, mean weight = 39.5 g
    2. All fish had 6<sup>th</sup> left scute removed
    3. All fish marked with a PIT tag
  - River temperature was 13.9°C, discharge was 31,500 cfs
  - Crosses (Female x Male)
    1. 4627111945 x 412C727B25
    2. 4626553E42 x 460E275D2B
    3. 4868364835 x 412C5D2741
    4. 4868364835 x 470C547B78
    5. 4626553E42 x 412C2A094F
    6. 4627111945 x 460E647803

### **Ponca State Park**

- 10/4/2011
  - 1,104 fish stocked at RM 753.5
    - Mean length = 230.4 mm, mean weight = 41.0 g
    - All fish had 6<sup>th</sup> left scute removed
    - All fish marked with a PIT tag
  - River temperature was 16.2°C, discharge was 43,000 cfs
  - Crosses (Female x Male):
    1. 4627111945 x 412C727B25
    2. 4626553E42 x 460E275D2B
    3. 4868364835 x 412C5D2741
    4. 4868364835 x 470C547B78
    5. 4626553E42 x 412C2A094F

- 3/27/2012
  - 361 fish stocked at RM 753.5
    - Mean length = 230.9 mm, mean weight = 38.5 g
    - All fish had 6<sup>th</sup> left scute removed
    - All fish marked with a PIT tag
  - River temperature was 13.9°C, discharge was 31,500 cfs
  - Crosses (Female x Male)
    1. 4627111945 x 412C727B25
    2. 4626553E42 x 460E275D2B
    3. 4868364835 x 412C5D2741
    4. 4868364835 x 470C547B78
    5. 4626553E42 x 412C2A094F
    6. 4627111945 x 460E647803

**Decatur, NE**

- 10/4/2011
  - 1,101 fish stocked at RM 691.0
    - Mean length = 232.8 mm, mean weight = 41.8 g
    - All fish had 6<sup>th</sup> left scute removed
    - All fish marked with a PIT tag
  - River temperature was 17°C, discharge was 46,700 cfs
  - Crosses (Female x Male):
    1. 4627111945 x 412C727B25
    2. 4626553E42 x 460E275D2B
    3. 4868364835 x 412C5D2741
    4. 4868364835 x 470C547B78
    5. 4626553E42 x 412C2A094F
- 3/26/2012
  - 260 fish stocked at RM 691.0
    - Mean length = 248.1 mm, mean weight = 43.3g
    - All fish had 6<sup>th</sup> left scute removed
    - All fish marked with a PIT tag
  - Crosses (Female x Male)
    1. 4627111945 x 412C727B25
    2. 4626553E42 x 460E275D2B
    3. 4868364835 x 412C5D2741
    4. 4868364835 x 470C547B78
    5. 4626553E42 x 412C2A094F
    6. 4627111945 x 460E647803
  - 116 fish stocked at RM 691.0
    - Mean length = 204.8 mm, mean weight = 24.7g
    - All fish had 6<sup>th</sup> left scute removed
    - All fish were Elastomered Black/Right and Blue/Left
  - River temperature was 13.9°C, discharge was 31,500 cfs
  - Crosses (Female x Male)

1. 4627111945 x 412C727B25
2. 4626553E42 x 460E275D2B
3. 4868364835 x 470C547B78
4. 4626553E42 x 412C2A094F

## Blind Pony State Fish Hatchery

### Spawning

Broodstock collection efforts in late 2010 and early 2011 resulted in 89 pallid sturgeons that were sent to hatcheries for further assessment. Of those 89 fish, 27 were reproductive ready; 9 females and 18 males. As a result, seven family lots successfully spawned 66,500 eggs at Blind Pony SFH on April 26<sup>th</sup> 2011. These families resulted from four females and eight males collected by Nebraska Game and Parks Commission and two of which were males collected from Missouri Department of Conservation crews. All fish were caught in early April 2011 except for two that were caught on March 21, 2011.

After spawning, half of the fertilized eggs were shipped to Gavin's Point NFH to be hatched and reared. In May of 2011, 4,802 fry were shipped Neosho NFH to be reared. Then again in September 2011, additional fingerlings were shipped to Neosho for overwintering.

### Stocking Results

From spawning and rearing efforts at Blind Pony SFH, 3,222 fish were stocked from the 2011 year-class.

#### Bon Ton Bend (St. Joe)

- 9/28/2011
  - 774 fish stocked at RM 451.6
    - Mean length = 185.42 mm, mean weight = 21.57 g
    - All fish had 6<sup>th</sup> left scute removed
    - All fish marked with horizontal green elastomer
    - Fish stocked at GPS location Long. -094.87961, Lat. 39.79206
  - River temperature was 18°C, discharge was 99,000 cfs, and turbidity was 119 ntu
  - Crosses (Female x Male):
    1. 4868364835 x 412C5D2741
    2. 4627111945 x 460E647803
    3. 4626553E42 x 412C2A094F
    4. 4627111945 x 412C727B25
    5. 4868364835 x 470C547B78
- 10/6/2011
  - 311 fish stocked at RM 451.6

- Mean length = 177.8 mm, mean weight = 20.4 g
- All fish had 6<sup>th</sup> left scute removed
- All fish marked with horizontal green elastomer
- Fish stocked at GPS location -94.87961, 39.79206
- River temperature was 19°C, discharge was 67,400 cfs, and turbidity was 128 ntu
- Crosses (Female x Male):
  1. 4626553E42 x 460E275D2B

### **Kansas City Riverfront**

- 9/28/2011
  - 786 fish stocked at RM 363.0
    - Mean length = 182.88 mm, mean weight = 21.12 g
    - All fish had 6<sup>th</sup> left scute removed
    - All fish marked with vertical orange elastomer
    - Fish stocked at GPS location -94.55074, 39.13193
  - River temperature was 19.4°C, discharge was 119,000, and turbidity was 104 ntu
  - Crosses (Female x Male):
    1. 4868364835 x 412C5D2741
    2. 4627111945 x 460E647803
    3. 4626553E42 x 412C2A094F
    4. 4627111945 x 412C727B25
    5. 4868364835 x 470C547B78
- 10/06/2011
  - 305 fish stocked at RM 363.5
    - Mean length = 177.8 mm, mean weight = 20.4 g
    - All fish had 6<sup>th</sup> left scute removed
    - All fish marked with vertical orange elastomer
    - Fish stocked at GPS location; Long. -094.55074, Lat. 39.13193
  - River temperature was 19.5°C, discharge was 92,000 cfs, and turbidity was 142 ntu
  - Crosses (Female x Male):
    1. 4626553E42 x 460E275D2B

### **Grand River**

- 9/28/2011
  - 757 fish stocked at RM 250.0
    - Mean length = 193.04 mm, mean weight = 22.05
    - All fish had 6<sup>th</sup> left scute removed
    - All fish marked with horizontal orange elastomer
    - Fish stocked at GPS location; Long. -094.55074, Lat. 39.13193
  - River temperature was 19.5°C, discharge was 118,000 cfs, and turbidity was 122 ntu
  - Crosses (Female x Male):
    1. 4868364835 x 412C5D2741
    2. 4627111945 x 460E647803
    3. 4626553E42 x 412C2A094F
    4. 4627111945 x 412C727B25
    5. 4868364835 x 470C547B78

- 10/05/2011
  - 289 fish stocked at RM 263.5
    - Mean length = 177.8 mm, mean weight = 20.4 g
    - All fish had 6<sup>th</sup> left scute removed
    - All fish marked with horizontal orange elastomer
    - Fish stocked at GPS location; Long. -093.12173, Lat. 39.38047
  - River temperature was 19.5°C, discharge was 92,200 cfs, and turbidity was 95 ntu
  - Crosses (Female x Male):
    1. 4626553E42 x 460E275D2B

## Neosho National Hatchery

### Spawning

Spawning efforts took place at Blind Pony SFH on April 26<sup>th</sup> 2011. In May of 2011, 9,475 fry were shipped Neosho NFH to be reared. Then, again in September 2011, an additional 20,300 fingerlings were shipped to Neosho for overwintering.

### Stocking

Fish that spawned at Blind Pony SFH and held overwinter at Neosho NFH were stocked in the spring/summer/fall 2012. Prior to stocking, all fish were tagged in May 2012 with a PIT tag and the 6<sup>th</sup> left scute was removed. 12,642 fish reared at Neosho NFH were stocked among four sites in 2012.

#### Platte River Confluence, NE

- 6/13/2012
  - 3,264 fish stocked at RM 595
    - Mean length = 282.5 mm, mean weight = 71.3 g
    - All fish had 6<sup>th</sup> left scute removed
    - All fish were tagged with a PIT tag
    - Fish stocked at GPS location: Latitude 41.05529, Longitude -95.88229
  - River temperature was 22.8°C, discharge was 39,000cfs
  - Crosses (Female x Male)
    1. 4868364835 x 412C5D2741
    2. 4627111945 x 460E647803
    3. 4626553E42 x 412C2A094F
    4. 4627111945 x 412C727B25
    5. 4868364835 x 470C547B78
    6. 4626553E42 x 460E275D2B
    7. 412C275E0A x 462600695D

#### Bon Ton Bend (St. Joseph)

- 6/5/2012
  - 3,237 fish stocked at RM 451.6
    - Mean length = 270.4 mm, mean weight = 61.7 g
    - All fish had 6<sup>th</sup> left scute removed

- All fish were tagged with a PIT tag
- All fish stocked at GPS location: Latitude 39.80742, Longitude -94.87817
- River temperature was 22.2° C, discharge was 56,400 cfs
- Crosses (Female x Male)
  1. 4868364835 x 412C5D2741
  2. 4627111945 x 460E647803
  3. 4626553E42 x 412C2A094F
  4. 4627111945 x 412C727B25
  5. 4868364835 x 470C547B78
  6. 4626553E42 x 460E275D2B

### **Kansas City, MO**

- 5/31/2012
  - 3,240 fish stocked at RM 363.0
    - Mean length = 269.4 mm, mean weight = 59.8 g
    - All fish had 6<sup>th</sup> left scute removed
    - All fish were tagged with a PIT tag
    - All fish stocked at GPS location: Latitude 39.13230, Longitude -94.55022
  - River temperature was 24.0° C, discharge was 58,000 cfs, turbidity was 289 ntu
  - Crosses (Female x Male)
    1. 4868364835 x 412C5D2741
    2. 4627111945 x 460E647803
    3. 4626553E42 x 412C2A094F
    4. 4627111945 x 412C727B25
    5. 4868364835 x 470C547B78
    6. 4626553E42 x 460E275D2B

### **Grand River**

- 6/7/2012
  - 2,368 fish stocked at RM 250.0
    - Mean length = 272.0 mm, mean weight = 61.7 g
    - All fish had 6<sup>th</sup> left scute removed
    - All fish were tagged with a PIT tag
    - All fish stocked at GPS location: Latitude 39.38044, Longitude -93.11266
  - River temperature was 24.2° C, discharge was 59,100 cfs, turbidity was 400 ntu
  - Crosses (Female x Male)
    1. 4868364835 x 412C5D2741
    2. 4627111945 x 460E647803
    3. 4626553E42 x 412C2A094F
    4. 4627111945 x 412C727B25
    5. 4868364835 x 470C547B78
    6. 4626553E42 x 460E275D2B
- 10/10/2012
  - 533 fish stocked at RM 250.0
    - Mean length = 299.9 mm, mean weight = 84.5 g
    - All fish had 6<sup>th</sup> left scute removed
    - All fish were tagged with a PIT tag

- All fish stocked at GPS location: Latitude 39.38014, Longitude -93.11285
- River temperature was 15.9° C, discharge was 44,280 cfs, turbidity was 58.4 ntu
- Crosses (Female x Male)
  1. 4868364835 x 412C5D2741
  2. 4627111945 x 460E647803
  3. 4626553E42 x 412C2A094F
  4. 4627111945 x 412C727B25
  5. 4868364835 x 470C547B78
  6. 4626553E42 x 460E275D2B

# 2012

## **Gavins Point National Fish Hatchery**

### **Spawning**

Broodstock collection and spawning were hampered in the spring of 2012 because of warm water temperatures. Broodstock collection ended with two reproductive males at Gavins Point NFH and two reproductive females at Neosho NFH. On May 8, 2012, the two reproductive males at Gavins Point NFH did not release milt; therefore, only cryopreserved sperm was available for spawning (K. Winders, MDC, personal communication).

### **Stocking Results**

No stocking of any fish from Gavins Point National Fish Hatchery took place in 2012.

## **Blind Pony State Fish Hatchery**

### **Spawning**

Due to concerns about warm water temperatures at Blind Pony State Fish Hatchery, no spawning efforts took place and all broodstock fish were transported to either Gavins Point NFH or Neosho NFH.

### **Stocking Results**

No stocking of any fish from Blind Pony State Fish Hatchery took place in 2012.

## **Neosho National Fish Hatchery**

### **Spawning**

On May 9, 2012 spawning efforts took place at Neosho NFH with the help and support from Bruce Drecktrah, Jake Colehour (Blind Pony SFH) and Kyle Winders (MDC). Since fresh milt was unavailable, only cryopreserved milt was used. Two reproductive females were used for spawning efforts. One female (4A472A1652) tested negative for iridovirus but did not release eggs, the other female (4A493D1454) tested positive for iridovirus and released eggs. A total of 15,080 eggs were produced from the female 4A493D1454 (iridovirus positive) and crossed with two cryopreserved males 48643A7120 and 47154C4C7B (D. Hendrix, Neosho NFH, personal communication, and K. Winders, MDC, personal communications). As a result, 865 fry were produced from the two crosses;

- 4A493D1454 Female x 48643A7120 Male = 800 Fry
- 4A493D1454 Female x 47154C4C7B Male = 65 Fry

Four females will be held over at the Neosho NFH until next year and all were tested negative for iridovirus.

1. 4866727804

2. 4311424979
3. 460E52494D
4. 462704502D

## Stocking Results

The progeny from female 4A493D1454 (irridovirus positive) was tested for irridovirus in fall 2013 and results were negative. Therefore, two parent crosses totaling 99 fish were stocked on May 27 2014 at the Grand River.

### Grand River

- 5/27/2014
  - 99 fish stocked at RM 250.0
    - Mean length Cross (1454 x 7120) = 408.7 mm, mean weight = 237.3 g
    - Mean length Cross (1454 x 4C7B) = 364 mm, mean weight = 164.5 g
    - All fish had 6<sup>th</sup> right scute removed
    - All fish were tagged with a PIT tag
    - All fish stocked at GPS location: Latitude 39.38014, Longitude -93.11285
  - River temperature was 22.2° C, discharge was 44,400 cfs, turbidity was 82 ntu
  - Crosses (Female x Male)
    1. 4A493D1454 x 48643A7120
    2. 4A493D1454 x 47154C4C7B

# 2013

## **Gavins Point National Fish Hatchery**

### **Spawning**

On June 25, 2013 spawning efforts took place at Gavins Point NFH. Three females (412C34470E, 434C38070F, 412C576B54) successfully released a combined 59,280 eggs. However, only one male (4627061C6F) released milt. Therefore, the one good male was paired up with each female to produce three families.

### **Stocking Results**

On May 12<sup>th</sup> and 13<sup>th</sup> 2014, 890 fish were stocked among two sites from two parent crosses from spawning and rearing efforts at Gavins Point NFH.

### **James River Confluence**

- 5/12/2014
  - 427 fish stocked at RM 798
    - Mean length = 231 mm, mean weight 36.2 g
    - All fish had 7<sup>th</sup> left scute removed
    - All fish were marked with a PIT tag
  - River temperature was 12.7° C
  - Crosses (Female x Male):
    1. 412C576B54 x 4627061C6F

### **Mulberry Bend**

- 5/13/2014
  - 463 fish stocked at RM 775
    - Mean length Cross (6B54 x 1C6F) = 199 mm, mean weight = 34 g
    - Mean length Cross (470E x 1C6F) = 229 mm, mean weight = 35.4 g
    - All fish had 7<sup>th</sup> left scute removed
    - Fish were marked with either a PIT tag or left vertical pink elastomer
  - River temperature was 11.8° C
  - Crosses (Female x Male):
    1. 412C576B54 x 4627061C6F
    2. 412C34470E x 4627061C6F

## **Blind Pony State Fish Hatchery**

### **Spawning**

No successful spawning took place at Blind Pony SFH in 2013. Three females were injected, however none released viable eggs. Egg samples were pulled for evaluation from the females on May

6<sup>th</sup> and results showed signs of atresia. Milt was collected on April 24<sup>th</sup> from seven males and again on April 30<sup>th</sup> from an additional eight males. Milt from the fish was transferred to Gavins Point NFH to be used for spawning in June. Milt was also shipped to Warm Springs Fish Technology Center for cryopreservation (B. Drecktrah Blind Pony SFH, personal communications 2013). Ten thousand one hundred and eleven fertilized eggs were transferred in May from Neosho NFH to Blind Pony SFH and where they were successfully hatched.

## **Stocking Results**

1,533 fish from one parent cross that spawned at Neosho NFH in May 2013 and reared at Blind Pony SFH were stocked in fall 2013. Fish were stocked among four sites representing one site per river segment. Note: The progeny from the second family (460E52494D x 486833490E) that spawned at Neosho NFH and reared at Blind Pony SFH were not stocked due to testing positive to Ranavirus (J. Colehour, Blind Pony SFH 2014).

### **Mulberry Bend**

- 9/18/2013
  - 403 fish stocked at RM 775
    - Mean length = 162 mm, mean weight 15.7 g
    - All fish had 7<sup>th</sup> left scute removed
    - All fish were marked with a left horizontal pink elastomer
    - Fish stocked at GPS location; Lat. 42.71468, Lon. -096.9434
  - River temperature was 21.6 °C, discharge was 33,300 cfs, turbidity was 16 ntu
  - Crosses (Female x Male):
    1. 460E52494D x 43497E1577

### **Sloan, IA**

- 9/18/2013
  - 387 fish stocked at RM 708.6
    - Mean length = 162 mm, mean weight 15.7g
    - All fish had 7<sup>th</sup> left scute removed
    - All fish were marked with a left vertical blue elastomer
    - Fish stocked at GPS location; Lat. 42.21015, Lon. -096.35837
  - River temperature was 21 °C, discharge was 34,500 cfs, turbidity was 22 ntu
  - Crosses (Female x Male):
    1. 460E52494D x 43497E1577

### **Platte River Confluence**

- 9/18/2013
  - 384 fish stocked at RM 595
    - Mean length = 162 mm, mean weight 15.7 g
    - All fish had 7<sup>th</sup> left scute removed
    - All fish were marked with a left vertical green elastomer
    - Fish stocked at GPS location; Lat. 41.05532, Lon. -095.88224
  - River temperature was 21.1 °C, discharge was 37,800 cfs, turbidity was 35 ntu
  - Crosses (Female x Male):

1. 460E52494D x 43497E1577

## **Napoleon**

- 9/18/2013
  - 359 fish stocked at RM 331.2
    - Mean length = 162 mm, mean weight 15.7 g
    - All fish had 7<sup>th</sup> left scute removed
    - All fish were marked with a left vertical orange elastomer
    - Fish stocked at GPS location; Lat. 39.14582, Lon. -094.10656
  - River temperature was 22.3 °C, discharge was 41,900 cfs, turbidity was 31 ntu
  - Crosses (Female x Male):
    1. 460E52494D x 43497E1577

## **Neosho National Fish Hatchery**

### **Spawning**

On May 8<sup>th</sup>, a total of 22,000 fertilized eggs were produced from one female (460E52494D) and two males (486833490E and 43497E1577) at Neosho NFH. The female that successfully spawned, was a fish held overwinter from 2012. Both males used were collected in 2013. Half of the fertilized eggs were transferred to Blind Pony SFH (D. Hendrix, Neosho NFH, personal communication, and K. Winders, MDC, personal communications 2013). A second reproductive ready female (4311424979) was unsuccessful at releasing any eggs.

### **Stocking Results**

In late May and early June 2014, 2,198 fish from two parent crosses held over winter at Neosho NFH were stocked among six sites. In addition one thousand two hundred and eight fish that spawned and reared at Neosho were stocked in September 2014. Two family lots were stocked among six sites along the Missouri River.

### **Sloan, IA**

- 5/29/2014
  - 410 fish stocked at RM 708.6
    - Mean length cross (494D x 490E) = 271 mm, mean weight 64.7 g
    - Mean length cross (494D x 1577) = 265 mm, mean weight 60.2 g
    - All fish had 7<sup>th</sup> left scute removed
    - All fish were marked with a PIT tag
    - Fish stocked at GPS location; Lat. 42.21102, Lon. -096.35835
  - River temperature was 22.4 °C, discharge was 32,000 cfs,
  - Crosses (Female x Male):
    1. 460E52494D x 486833490E
    2. 460E52494D x 43497E1577
- 9/25/2014
  - 215 fish stocked at RM 708.6

- Mean length = 270 mm, mean weight 64.77g
- All fish had 7<sup>th</sup> left scute removed
- All fish were marked with a PIT tag
- Fish stocked at GPS location; Lat. 42.21015, Lon. -096.35837
- River temperature was 19.6 °C, discharge was 48,600 cfs,
- Crosses (Female x Male):
  1. 460E52494D x 43497E1577

### Lake Manawa, IA

- 5/29/2014
  - 412 fish stocked at RM 607.1
    - Mean length cross (494D x 490E) = 267 mm, mean weight 62.6 g
    - Mean length cross (494D x 1577) = 258 mm, mean weight 57.5 g
    - All fish had 7<sup>th</sup> left scute removed
    - All fish were marked with a PIT tag
    - Fish stocked at GPS location; Lat. 41.18903, Lon. -095.86413
  - River temperature was 22 °C, discharge was 37,100 cfs
  - Crosses (Female x Male):
    1. 460E52494D x 486833490E
    2. 460E52494D x 43497E1577
- 9/23/2014
  - 202 fish stocked at RM 607.1
    - Mean length = 268 mm, mean weight 62.74 g
    - All fish had 7<sup>th</sup> left scute removed
    - All fish were marked with a PIT tag
    - Fish stocked at GPS location; Lat. 41.18903, Lon. -095.86413
  - River temperature was 21.0 °C, discharge was 53,300 cfs
  - Crosses (Female x Male):
    1. 460E52494D x 43497E1577

### Platte River Confluence

- 5/29/2014
  - 413 fish stocked at RM 595
    - Mean length cross (494D x 490E) = 279 mm, mean weight 71.8 g
    - Mean length cross (494D x 1577) = 254 mm, mean weight 56.3g
    - All fish had 7<sup>th</sup> left scute removed
    - All fish were marked with a PIT tag
    - Fish stocked at GPS location; Lat. 42.05726, Lon. -095.88504
  - River temperature was 22 °C, discharge was 43,700 cfs
  - Crosses (Female x Male):
    1. 460E52494D x 486833490E
    2. 460E52494D x 43497E1577
- 9/23/2014
  - 202 fish stocked at RM 595
    - Mean length = 263 mm, mean weight 58.36 g
    - All fish had 7<sup>th</sup> left scute removed

- All fish were marked with a PIT tag
- Fish stocked at GPS location; Lat. 41.05532, Lon. -095.88224
- River temperature was 20.0 °C, discharge was 60,400 cfs, turbidity was 92 ntu
- Crosses (Female x Male):
  1. 460E52494D x 43497E1577

### **Payne's Landing, MO**

- 5/29/2014
  - 413 fish stocked at RM 508.5
    - Mean length = 273 mm, mean weight 70 g
    - All fish had 7<sup>th</sup> left scute removed
    - All fish were marked with a PIT tag
    - Fish stocked at GPS location; Lat. 40.16896, Lon. -095.45736
  - River temperature was 24.1 °C, discharge was 40,200 cfs,
  - Crosses (Female x Male):
    1. 460E52494D x 486833490E
    2. 460E52494D x 43497E1577
- 9/23/2014
  - 203 fish stocked at RM 508.5
    - Mean length = 266mm, mean weight 61.91 g
    - All fish had 7<sup>th</sup> left scute removed
    - All fish were marked with a PIT tag
  - Fish stocked at GPS location; Lat. 40.16896, Lon. -095.45736
  - River temperature was 20.2 °C, discharge was 68,800 cfs, turbidity was 147,
  - Crosses (Female x Male):
    1. 460E52494D x 43497E1577

### **Napoleon**

- 5/27/2014
  - 411 fish stocked at RM 331.2
    - Mean length = 260 mm, mean weight 57.3 g
    - All fish had 7<sup>th</sup> left scute removed
    - All fish were marked with a PIT tag
    - Fish stocked at GPS location; Lat. 39.14582, Lon. -094.10656
  - River temperature was 21 °C, discharge was 43,200 cfs, turbidity was 57 NTU
  - Crosses (Female x Male):
    1. 460E52494D x 486833490E
    2. 460E52494D x 43497E1577
- 9/23/2014
  - 203 fish stocked at RM 328.6
    - Mean length = 283 mm, mean weight 66.99 g
    - All fish had 7<sup>th</sup> left scute removed
    - All fish were marked with a PIT tag
    - Fish stocked at GPS location; Lat. 39.133191, Lon. -094.063408
  - River temperature was 20.7 °C, discharge was 74,800 cfs, turbidity was 110 ntu

- Crosses (Female x Male):
  1. 460E52494D x 43497E1577

## Miami

- 5/27/2014
  - 142 fish stocked at RM 263
    - Mean length = 268 mm, mean weight 62 g
    - All fish had 7<sup>th</sup> left scute removed
    - All fish were marked with a PIT tag
    - Fish stocked at GPS location; Lat. 39.3284, Lon. -093.23134
  - River temperature was 22.1 °C, discharge was 44,400 CFS, turbidity was 74 NTU
  - Crosses (Female x Male):
    1. 460E52494D x 43497E1577
- 9/18/2014
  - 386 fish stocked at RM 262.8
    - Mean length = 291 mm, mean weight 81.66 g
    - All fish had 7<sup>th</sup> left scute removed
    - All fish were marked with a PIT tag
    - Fish stocked at GPS location; Lat. 39.326002, Lon. -092.228788
  - River temperature was 20 °C, discharge was 79,700 cfs, turbidity was 96 ntu
  - Crosses (Female x Male):
    1. 460E52494D x 43497E1577
    2. 460E52494D x 486833490E

## Garrison National Fish Hatchery

### Stocking

A juvenile telemetry study was conducted in 2014 between Nebraska Game and Parks Commission and the U.S. Geological Survey. As part of this study, two separate trials were run, where acoustic telemetry tags were inserted into juvenile pallid sturgeon. The second trial was conducted using 21 tagged fish stocked on September 17<sup>th</sup> in a secondary channel located on Tobacco Bend (RM 589). These 21 fish were progeny from one family lot that were spawned in 2013 from Garrison National Fish Hatchery (Holm 2014). See 2010 year class section for data about the first trial that was conducted.

### Tobacco Bend

- 9/17/2014
  - 21 fish Stocked by boat at RM 589.1
    - Mean Length = 374 mm, Mean Weight = 222 g
    - All fish marked with PIT tag
    - All fish had acoustic telemetry tag inserted
    - 50% of Fish stocked at GPS location: Lat. 40.98327, Lon.-95.85090
    - 50% of Fish stocked at GPS location: Lat. 40.96995, Lon.-95.84917
  - River temperature was 18.1°C and discharge was 60,400 cfs
  - Crosses (Female x Male)
    1. 462C7B2F49 x 1F4B225A1A

# 2014

## **Gavins Point National Fish Hatchery**

### **Spawning**

No Spawning occurred at Gavins Point NFH. Males at the hatchery did produce milt in 2014, however the milt was of such poor quality none were cryopreserved.

### **Stocking Results**

No stocking of any fish from Gavins Point NFH took place in 2014

## **Blind Pony State Fish Hatchery**

### **Spawning**

The successful spawn of six family lots produced 62,853 eggs on April 30<sup>th</sup> at Blind Pony SFH (J. Colehour, Blind Pony, personal communication 2014). Two out of the five females held in the hatchery for broodstock, successfully released eggs (Females 4718743427, 4705136A55). Six out of the 17 males were successfully crossed with females. Sixteen males released milt and were cryopreserved. One male (470B02615D) did not release milt. On May 6<sup>th</sup>, 19,303 fry among four family groups were shipped to Neosho NFH. On June 2<sup>nd</sup>, an additional 12,501 fish from five family lots were shipped to Neosho NFH.

### **Stocking Results**

A total of 19,582 fish among six family lots were stocked in late September of 2014 across 10 stocking sites.

### **Mulberry Bend**

- 9/25/2014
  - 296 fish stocked at RM 775
    - Mean length = 144 mm, mean weight 9.79 g
    - All fish had 7<sup>th</sup> right scute removed
    - All fish were marked with a left horizontal pink elastomer
    - Fish stocked at GPS location; Lat. 42.71468, Lon. -096.9434
  - River temperature was 20.0 °C
  - Crosses (Female x Male):
    1. 4705136A55 x 471641107C
    2. 4718743427 x 4315643D47
    3. 4718743427 x 4714687E4D

## **Sloan, IA**

- 9/25/2014
  - 613 fish stocked at RM 708.6
    - Mean length = 144 mm, mean weight 9.79g
    - All fish had 7<sup>th</sup> right scute removed
    - All fish were marked with a left vertical blue elastomer
    - Fish stocked at GPS location; Lat. 42.21015, Lon. -096.35837
  - River temperature was 19.6 °C, discharge was 49,000 cfs
  - Crosses (Female x Male):
    1. 4705136A55 x 471641107C
    2. 4705136A55 x 486845622D
    3. 4718743427 x 4315643D47
    4. 4718743427 x 4714687E4D

## **Nebraska City, NE**

- 9/23/2014
  - 455 fish stocked at RM 563.4
    - Mean Length = 144 mm, Mean weight = 9.79 g
    - All fish had 7<sup>th</sup> right scute removed
    - All fish were marked with a left vertical green elastomer
    - Fish stocked GPS location; Lat. 40.69366, Long. -095.84614
  - River temperature was 20.8°C, discharge was 60,400 cfs, and turbidity was 92 NTU
  - Crosses (Female x Male)
    1. 4718743427 x 4315643D47
    2. 4718743427 x 4714687E4D

## **Payne's Landing, MO**

- 9/22/2014
  - 507 fish stocked at RM 478.2
    - Mean Length = 144 mm, Mean weight = 9.79 g
    - All fish had 7<sup>th</sup> right scute removed
    - All fish were marked with a left horizontal green elastomer
    - Fish stocked GPS location; Lat. 39.901050, Long. -095.17928,
  - River temperature was 20.7°C, discharge was 68,800 cfs, and turbidity was 143 NTU
  - Crosses (Female x Male)
    1. 4718743427 x 4315643D47
    2. 4718743427 x 4714687E4D

## **Waverly**

- 9/15/2014
  - 779 fish stocked at RM 292.8
    - Mean Length = 144 mm, Mean weight = 9.79 g
    - All fish had 7<sup>th</sup> right scute removed
    - All fish were marked with a left vertical orange elastomer
    - Fish stocked GPS location; Lat. 39.21825, Long. -093.50553
  - River temperature was 18.9°C, discharge was 102,000 cfs, and turbidity was 644 NTU

- Crosses (Female x Male)
  1. 4705136A55 x 471641107C
  2. 4705136A55 x 486845622D
  3. 4718743427 x 4315643D47
  4. 4718743427 x 4714687E4D

### **Miami**

- 9/18/2014
  - 455 fish stocked at RM 262.8
    - Mean Length = 144 mm, Mean weight = 9.79 g
    - All fish had 7<sup>th</sup> right scute removed
    - All fish were marked with a left horizontal green elastomer
    - Fish stocked GPS location; Lat. 39.326002, Long. -093.228788
  - River temperature was 20.0°C, discharge was 79,700 cfs, and turbidity was 110 NTU
  - Crosses (Female x Male)
    1. 4718743427 x 4315643D47
    2. 4718743427 x 4714687E4D

### **Glasgow**

- 9/18/2014
  - 825 fish stocked at RM 226
    - Mean Length = 144 mm, Mean weight = 9.79 g
    - All fish had 7<sup>th</sup> right scute removed
    - All fish were marked with a left vertical red elastomer
    - Fish stocked GPS location; Lat. 39.219897, Long. -092.849247
  - River temperature was 20.3°C, discharge was 110,000 cfs
  - Crosses (Female x Male)
    1. 4705136A55 x 470956612B
    2. 4705136A55 x 471641107C
    3. 4705136A55 x 486845622D
    4. 4718743427 x 4315643D47
    5. 4718743427 x 4714687E4D

### **Hartsburg**

- 9/18/2014
  - 2,024 fish stocked at RM 160
    - Mean Length = 144 mm, Mean weight = 9.79 g
    - All fish had 7<sup>th</sup> right scute removed
    - All fish were marked with a left horizontal red elastomer
    - Fish stocked GPS location; Lat. 38.707211, Long. -092.340414
  - River temperature was 18.6°C, discharge was 121,000 cfs
  - Crosses (Female x Male)
    1. 4705136A55 x 470956612B
    2. 4705136A55 x 471641107C
    3. 4705136A55 x 486845622D
    4. 4718743427 x 47152F234F

5. 4718743427 x 4315643D47
6. 4718743427 x 4714687E4D

### Hermann

- 9/18/2014
  - 2,047 fish stocked at RM 97.6
    - Mean Length = 144 mm, Mean weight = 9.79 g
    - All fish had 7<sup>th</sup> right scute removed
    - All fish were marked with a left vertical purple elastomer
    - Fish stocked GPS location; Lat. 38.708444, Long. -091.434630
  - River temperature was 18.9°C, discharge was 139,000 cfs
  - Crosses (Female x Male)
    1. 4705136A55 x 470956612B
    2. 4705136A55 x 471641107C
    3. 4705136A55 x 486845622D
    4. 4718743427 x 47152F234F
    5. 4718743427 x 4315643D47
    6. 4718743427 x 4714687E4D

### Klondike Park

- 9/18/2014
  - 2,100 fish stocked at RM 56.3
    - Mean Length = 144 mm, Mean weight = 9.79 g
    - All fish had 7<sup>th</sup> right scute removed
    - All fish were marked with a left horizontal purple elastomer
    - Fish stocked GPS location; Lat. 38.583794, Long. -090.819397
  - River temperature was 19.7°C, discharge was 162,000 cfs
  - Crosses (Female x Male)
    1. 4705136A55 x 470956612B
    2. 4705136A55 x 471641107C
    3. 4705136A55 x 486845622D
    4. 4718743427 x 47152F234F
    5. 4718743427 x 4315643D47
    6. 4718743427 x 4714687E4D

## Neosho National Fish Hatchery

### Spawning

No spawning occurred at Neosho NFH in 2014. Fry were received from Blind Pony SFH to Neosho NFH in May ( $n = 19,303$ ) and June ( $n = 12,501$ ) 2014 for rearing. See Blind Pony spawning section for numbers of fry shipped to Neosho. In the fall 2014, an additional estimated 3,600 fish (i.e. 6 family lots) were transferred to Neosho NFH from Blind Pony SFH for overwintering.

Note:

In June 2015, health concerns were recognized while tagging the overwintered fish prior to their stocking. The fish had developed pronounced fin curl and lesions on their bellies, and concerns for their survival were discussed among members of the Middle Basin Pallid Sturgeon Workgroup (J. Colehour, Blind Pony SFH, personal communication 2015). After further investigation a decision was made to not stock them in the Missouri River and thus euthanizing the remaining stock.

## Stocking Results

A total of 9,481 fish from 5 family lots that spawned at Blind Pony SFH and reared at Neosho NFH were stocked in late September 2014 across eight stocking sites.

### Mulberry Bend

- 9/25/2014
  - 1,596 fish stocked at RM 775
    - Mean length = 110 mm, mean weight 10.39 g
    - All fish had 7<sup>th</sup> right scute removed
    - All fish were marked with a left horizontal pink elastomer
    - Fish stocked at GPS location; Lat. 42.71468, Lon. -096.9434
  - River temperature was 20.0 °C
  - Crosses (Female x Male):
    1. 4705136A55 x 470956612B
    2. 4705136A55 x 486845622D
    3. 4718743427 x 47152F234F
    4. 4718743427 x 4315643D47
    5. 4718743427 x 4714687E4D

### Sloan, IA

- 9/25/2014
  - 1,356 fish stocked at RM 708.6
    - Mean length = 104 mm, mean weight 10.39g
    - All fish had 7<sup>th</sup> right scute removed
    - All fish were marked with a left vertical blue elastomer
    - Fish stocked at GPS location; Lat. 42.21015, Lon. -096.35837
  - River temperature was 19.6 °C, discharge was 49,000 cfs
  - Crosses (Female x Male):
    1. 4705136A55 x 470956612B
    2. 4705136A55 x 471641107C
    3. 4718743427 x 47152F234F
    4. 4718743427 x 4315643D47

### Nebraska City, NE

- 9/23/2014
  - 1,664 fish stocked at RM 563.4
    - Mean Length = 110 mm, Mean weight = 10.39 g
    - All fish had 7<sup>th</sup> right scute removed

- All fish were marked with a left vertical green elastomer
- Fish stocked GPS location; Lat. 40.69366, Long. -095.84614
- River temperature was 20.8°C, discharge was 60,400 cfs, and turbidity was 92 NTU
- Crosses (Female x Male)
  1. 4705136A55 x 470956612B
  2. 4705136A55 x 471641107C
  3. 4705136A55 x 486845622D
  4. 4718743427 x 47152F234F

### Payne's Landing, MO

- 9/22/2014
  - 1,271 fish stocked at RM 478.2
    - Mean Length = 110 mm, Mean weight = 10.39 g
    - All fish had 7<sup>th</sup> right scute removed
    - All fish were marked with a left horizontal green elastomer
    - Fish stocked GPS location; Lat. 39.901050, Long. -095.17928,
  - River temperature was 20.7°C, discharge was 68,800 cfs, and turbidity was 143 NTU
  - Crosses (Female x Male)
    1. 4705136A55 x 470956612B
    2. 4705136A55 x 471641107C
    3. 4718743427 x 47152F234F

### Waverly

- 9/15/2014
  - 1,143 fish stocked at RM 292.8
    - Mean Length = 110 mm, Mean weight = 10.39 g
    - All fish had 7<sup>th</sup> right scute removed
    - All fish were marked with a left vertical orange elastomer
    - Fish stocked GPS location; Lat. 39.21825, Long. -093.50553
  - River temperature was 18.9°C, discharge was 102,000 cfs, and turbidity was 644 NTU
  - Crosses (Female x Male)
    1. 4705136A55 x 470956612B
    2. 4718743427 x 47152F234F

### Miami

- 9/18/2014
  - 1,347 fish stocked at RM 262.8
    - Mean Length = 110 mm, Mean weight = 10.39 g
    - All fish had 7<sup>th</sup> right scute removed
    - All fish were marked with a left horizontal green elastomer
    - Fish stocked GPS location; Lat. 39.326002, Long. -093.228788,
  - River temperature was 20.0°C, discharge was 79,700 cfs, and turbidity was 110 NTU
  - Crosses (Female x Male)
    1. 4705136A55 x 470956612B
    2. 4705136A55 x 471641107C
    3. 4705136A55 x 486845622D

4. 4718743427 x 47152F234F

### **Glasgow**

- 9/18/2014
  - 1,041 fish stocked at RM 226
    - Mean Length = 144 mm, Mean weight = 9.79 g
    - All fish had 7<sup>th</sup> right scute removed
    - All fish were marked with a left vertical red elastomer
    - Fish stocked GPS location; Lat. 39.219897, Long. -092.849247
  - River temperature was 20.3°C, discharge was 110,000 cfs
  - Crosses (Female x Male)
    1. 4705136A55 x 470956612B
    2. 4718743427 x 47152F234F

### **Hartsburg**

- 9/18/2014
  - 63 fish stocked at RM 160
    - Mean Length = 101 mm, Mean weight = 10.39 g
    - All fish had 7<sup>th</sup> right scute removed
    - All fish were marked with a left horizontal red elastomer
    - Fish stocked GPS location; Lat. 38.707211, Long. -092.340414
  - River temperature was 18.6°C, discharge was 121,000 cfs
  - Crosses (Female x Male)
    1. 4718743427 x 47152F234F

# 2015

## **Gavins Point National Fish Hatchery**

### **Spawning**

Six reproductive fish were successfully spawned in 2015 at Gavins Point NFH. The first spawning event occurred on April 22<sup>nd</sup> and involved female 46274D3910 and two males (6C00096039 and 4626756119) which resulted in 27,270 eggs (J. Powell, Gavins Point NFH, personal communication). Female 3910 was collected by the Nebraska Game and Parks crew 11 days prior to spawning. The second spawning event occurred on May 13<sup>th</sup> which resulted in two family lots with female 4718485A15 crossed with two males (4626111802 and 4718491B5B) to produce 21,600. Female 5A15 was collected in November 2015 and was overwintered at Gavins Point NFH.

On April 27<sup>th</sup>, fertilized eggs ( $n = 13,974$ ) from the first two family lots were transferred to Blind Pony SFH for further rearing. Then on May 18<sup>th</sup> a total of 10,620 fertilized eggs from the second group of family lots were transferred to Blind Pony SFH. Milt from six reproductive males was cryopreserved and stored at Gavins Point NFH in 2015 (C. Hooley, Gavins Point NFH, personal communication).

### **Stocking Results**

A total of 12,513 fish among four family lots were stocked in late August 2015 across eight sites. An additional 500 fish were stocked at two locations on June 14, 2016 after being reared at Gavins Point NFH.

#### **St. Helena, NE**

- 6/14/2016
  - 250 fish stocked at RM 799.0
    - Mean length = 330 mm, mean weight 116 g
    - All fish had 8<sup>th</sup> left scute removed
    - All fish marked with a PIT tag
    - Fish stocked at GPS location; Lat. 42.85057, Lon. -097.26967
  - River temperature was 25.4 °C, river discharge at Sioux City, IA was 31,400 cfs
  - Crosses (Female x Male):
    1. 46274D3910 6C00096039
    2. 46274D3910 4626756119

#### **Deer Island**

- 8/24/2015
  - 1,029 fish stocked at RM 672.8
    - Mean length = 206 mm, mean weight 29 g
    - All fish had 8<sup>th</sup> left scute removed
    - All fish were marked with a left vertical blue elastomer

- Fish stocked at GPS location; Lat. 41.83152, Lon. -096.10932
- River temperature was 26.2 °C, river discharge at Decatur, NE was 32,700 cfs
- Crosses (Female x Male):
  1. 46274D3910 6C00096039
  2. 46274D3910 4626756119
  3. 4718485A15 4626111802
  4. 4718485A15 4718491B5B
- 6/14/2016
  - 250 fish stocked at RM 672.8
    - Mean length = 330 mm, mean weight 129 g
    - All fish had 8<sup>th</sup> left scute removed
    - All fish were marked with a PIT tag
    - Fish stocked at GPS location; Lat. 41.83152, Lon. -096.10932
  - River temperature was 21.6 °C, river discharge at Decatur, NE was 31,000 cfs
  - Crosses (Female x Male):
    1. 46274D3910 6C00096039
    2. 46274D3910 4626756119
    3. 4718485A15 4626111802
    4. 4718485A15 4718491B5B

### **Thurnau**

- 8/24/2015
  - 1,028 fish stocked at RM 508.5
    - Mean length = 206 mm, mean weight 29 g
    - All fish had 8<sup>th</sup> left scute removed
    - All fish were marked with a left vertical green elastomer
    - Fish stocked at GPS location; Lat. 40.16874, Lon. -095.45744
  - River temperature was 23.0 °C, river discharge at Rulo, NE was 56,100 cfs
  - Crosses (Female x Male):
    1. 46274D3910 6C00096039
    2. 46274D3910 4626756119
    3. 4718485A15 4626111802
    4. 4718485A15 4718491B5B

### **Sibley, MO**

- 8/25/2015
  - 1,118 fish stocked at RM 335.8
    - Mean length = 206 mm, mean weight 29 g
    - All fish had 8<sup>th</sup> left scute removed
    - All fish were marked with a left vertical orange elastomer
    - Fish stocked at GPS location; Lat. 39.17858, Lon. -094.17285
  - River temperature was 24.5 °C, discharge at KC gage was 57,100 cfs and turbidity was 229 ntu
  - Crosses (Female x Male):
    1. 46274D3910 6C00096039

2. 46274D3910 4626756119
3. 4718485A15 4626111802
4. 4718485A15 4718491B5B

### Waverly, MO

- 8/25/2015
  - 1,029 fish stocked at RM 293
    - Mean length = 206 mm, mean weight 29 g
    - All fish had 8<sup>th</sup> left scute removed
    - All fish were marked with a left horizontal orange elastomer
    - Fish stocked at GPS location; Lat. 39.21918, Lon. -093.50122
  - River temperature was 24.8 °C, discharge at Waverly gage was 62,900 cfs and turbidity was 295 ntu
  - Crosses (Female x Male):
    1. 46274D3910 6C00096039
    2. 46274D3910 4626756119
    3. 4718485A15 4626111802
    4. 4718485A15 4718491B5B

### Boonville, MO

- 8/26/2015
  - 2,049 fish stocked at RM 195.2
    - Mean length = 203 mm, mean weight 29 g
    - All fish had 8<sup>th</sup> left scute removed
    - All fish were marked with a left vertical red elastomer
    - Fish stocked at GPS location; Lat. 38.985599, Lon. -092.719543
  - River temperature was 24.0 °C, discharge was 68,000 cfs and turbidity was ≈400 ntu
  - Crosses (Female x Male):
    1. 46274D3910 6C00096039
    2. 46274D3910 4626756119
    3. 4718485A15 4626111802
    4. 4718485A15 4718491B5B

### Noren Access

- 8/26/2015
  - 2,087 fish stocked at RM 144
    - Mean length = 203 mm, mean weight 29 g
    - All fish had 8<sup>th</sup> left scute removed
    - All fish were marked with a left horizontal red elastomer
    - Fish stocked at GPS location; Lat. 38.588960, Lon. -092.179119
  - River temperature was 24°C, discharge was 72,000 cfs and turbidity was ≈400 ntu
  - Crosses (Female x Male):
    1. 46274D3910 6C00096039
    2. 46274D3910 4626756119
    3. 4718485A15 4626111802
    4. 4718485A15 4718491B5B

## Hermann, MO

- 8/26/2015
  - 2,087 fish stocked at RM 97.7
    - Mean length = 203 mm, mean weight 29 g
    - All fish had 8<sup>th</sup> left scute removed
    - All fish were marked with a left vertical purple elastomer
    - Fish stocked at GPS location; Lat. 38.708444, Lon. -091.434630
  - River temperature was 21.6 °C, discharge was 75,400 cfs and turbidity was ≈400 ntu
  - Crosses (Female x Male):
    1. 46274D3910 6C00096039
    2. 46274D3910 4626756119
    3. 4718485A15 4626111802
    4. 4718485A15 4718491B5B

## St. Charles, MO

- 8/26/2015
  - 2,086 fish stocked at RM 27.5
    - Mean length = 203 mm, mean weight 29 g
    - All fish had 8<sup>th</sup> left scute removed
    - All fish were marked with a left horizontal purple elastomer
    - Fish stocked at GPS location; Lat. 41.83152, Lon. -096.10932
  - River temperature was 21.6 °C, discharge was 95,400 cfs and turbidity was ≈400 ntu
  - Crosses (Female x Male):
    1. 46274D3910 6C00096039
    2. 46274D3910 4626756119
    3. 4718485A15 4626111802
    4. 4718485A15 4718491B5B

# Blind Pony State Fish Hatchery

## Spawning

Blind Pony SFH attempted to spawn one mature female pallid sturgeon on May 6<sup>th</sup> and another mature female on May 13<sup>th</sup>. Both females (460E52494D and 4626711111) were captured on April 13<sup>th</sup> (Nebraska Game and Parks Commission); however, neither female released eggs. Thus, milt from seven reproductive males were cryopreserved (C. Landstad, Blind Pony SFH, personal communication). Blind Pony SFH received fertilized eggs from Gavins Point on April 27<sup>th</sup> and May 18<sup>th</sup> for a total 24,594 eggs from four family lots. During late June and into July, ranavirus cases were discovered in all family lots being reared at the hatchery. After further investigation and high mortalities among family lots, the Middle Basin Workgroup made the decision to euthanize all remaining fish, which would potentially test positive for ranavirus. It was discovered later that the water from Blind Pony Lake; the sole water source for the hatchery, also tested positive for ranavirus. Blind Pony SFH is currently investigating alternatives and is considering facility modifications for prevention of any future outbreaks and before any propagation rearing would continue. At this time,

Blind Pony SFH will no longer hold, spawn or rear, pallid sturgeon until further investigation and treatment for ranavirus occurs.

### Stocking Results

No stocking of any fish from Blind Pony SFH took place in 2015.

## Neosho National Fish Hatchery

### Spawning

No spawning events took place at Neosho National Fish Hatchery in 2015 as female 48684E0F0C went atretic before being injected to induce spawning. This female was overwintered for two years at Neosho NFH after being captured by the Missouri Department of Conservation on October 21, 2013. Two males and eighteen females were held overwinter for potential broodstock in 2016.

In 2015, at Neosho NFH problems with fin curl and blisters in reared fish were investigated with progeny from Gavins Point NFH captive broodstock program. Testing was conducted by using both water sources (i.e. well and spring water), and the changing of material in the linings of the tanks to assess a response to captive fish; provided by Gavins Point NFH, being reared at Neosho NFH. Results from this study will help determine how future techniques will be conducted at the hatchery.

The following is a list of fish being over-wintered at Neosho NFH as of January 26<sup>th</sup> 2016:

1.	4311424979	Female	12.	4627683B2B	Female
2.	430E492944	Female	13.	4704107D31	Female
3.	43132C6947	Female	14.	470426226D	Female
4.	431548146D	Male	15.	470451174C	Female
5.	46273F4F47	Male	16.	47046A5E0F	Female ( <i>Alt.</i>
6.	460D3D0632	Female		<i>PIT Tag # 432D7F5176</i> )	
7.	4618591F4D	Female	17.	470B110F50	Female
8.	461D7D217B	Female	18.	4714615372	Female
9.	46261E1761	Female	19.	486A5F142C	Female
10.	4627313A46	Female	20.	4875255C5A	Female
11.	46273D071F	Female			

### Stocking Results

No stocking of any fish from Neosho NFH took place in 2015.

# 2016

## Gavins Point National Fish Hatchery

### Spawning

The first successful spawn was with female 46263A6E1B crossed with two males (462646292E and 486A163E43) on April 28<sup>th</sup> which produced 25,345 eggs. The female (6E1B) was collected in spring 2015 and was held in the hatchery over-summer and over-winter. After spawning, genetic analysis determined that male (3E43) was not a pure pallid. All offspring from that male cross were later euthanized (Jeff Powell, Gavins Point NFH, personal communication 2016). The second spawn occurred on May 12<sup>th</sup> 2016 with female (4627201358) crossed with two males (4627652E23 and 4704510611) and later produced 13,531 eggs. Female (1358) was taken to hatchery in October 2015 and held over-winter and determined reproductive early in 2016. Cryopreserved milt from male (6011) was used in 2016 spawning efforts, the milt was collected from the fish in 2015 (C. Hooley, Gavins Point NFH, personal communication). Male (2E23) had been collected in spring 2015 as non-reproductive and held over-summered and over-wintered.

In May 2016, Blind Pony SFH received 9,712 fertilized eggs from captive spawned at Gavins Point NFH to be used for experimentation with ranavirus conditions within the facility. See further details under the Blind Pony SFH section.

The following is a list of fish being over-wintered at Gavins Point NFH as of December 2016:

Note: Some genders are undetermined until ultra-sound is conducted in winter 2017.

1)	4714667A6B	M	17)	4C3B763336	M	33)	4627136354	U
2)	47163E0030	F	18)	4625391A65	U	34)	462457120D	M
3)	4627545945	F	19)	48685B616A	F	35)	4704056D3B	U
4)	46263A6E1B	F	20)	471A2F6D1B	F?	36)	48683A3B7D	U
5)	4627693763	F	21)	462711443D	U	37)	4627023208	F?
6)	46280F5C1C	F	22)	4626513A54	M	38)	4715591B05	U
7)	462753226F	M	23)	46277B6F29	F	39)	47160E450B	F
8)	4626641923	F	24)	4627201358	F	40)	46267D5F5B	F
9)	4715682923	M	25)	4625761D21	M	41)	46276D476B	F
10)	4627273956	M	26)	46271B725E	M	42)	46266E1076	U
11)	4627144425	M	27)	4348434520	U	43)	47032D1576	U
12)	4626157206	M	28)	4627322E51	F?	44)	46273E0255	U
13)	46267D2971	F	29)	6C00112132	F?	45)	47072B041C	U
14)	47041F697D	F?	30)	46272F5630	U	46)	462654620D	M
15)	4625485A12	M	31)	4626564564	U	47)	46262E7F26	M?
16)	46270E6C3C	F	32)	462704502D	F	48)	462538724D	F?

## Stocking Results

A total of 608 fish from three family lots were stocked on April 18, 2017. All pallid sturgeon were stocked at Cranberry Bend at river mile 281.3.

### Cranberry Bend

- 4/18/2017
  - 608 fish stocked at RM 281.3
    - Mean length = 297.9 mm, Mean weight = 93 g
    - All fish had 8<sup>th</sup> right scute removed
    - All fish were marked with PIT tag
  - River temperature was 19.°C
  - River Discharge was 85,300 cfs
  - Turbidity was 283 ntu
  - Crosses (Female x Male)
    1. 4627201358 x 4627652E23
    2. 4627201358 x 4704510611
    3. 46263A6E1B x 462646292E

## Blind Pony State Fish Hatchery

### Spawning

Fertilized eggs ( $n \approx 9,712$ ) from captive spawn were received from Gavins Point NFH on May 23<sup>rd</sup> for the purpose of testing reared fish at the facility to determine if they can replicate ranavirus issues. As of July 20<sup>th</sup> 2016, no fish had expressed any indication of ranavirus conditions. Reared fish were split among chilled water and ambient water temperature tanks. Brine shrimp were fed three times a day and commercial feed was also used. On June 26<sup>th</sup>, all were converted to commercial feed. Fish reared from this investigation will not be stocked in the Missouri River, but will euthanized at the end of the experiment. Blind Pony SFH is working with the state budget process to purchase a UV filter system within the hatchery to combat ranavirus issues.

### Stocking Results

No stocking of any fish from Blind Pony SFH took place in 2016.

## Neosho National Fish Hatchery

### Spawning

Three reproductive females (460D3D0632, 4875255C5A, and 430E492944) were induced on February 29<sup>th</sup> 2016, after PI values showed that fish ready to spawn. After multiple attempts to spawn, all results ended with females unsuccessful at releasing eggs. After committee decision, all three fish were implanted with acoustic telemetry tags (courtesy of USGS-CERC) and were returned to the river at Cooley Lake Access in the spring 2016. Two of the three females had been held-over

since 2014 and 2013. On May 4<sup>th</sup>, milt from two reproductive males (6C00112754 and 6C00112812) from 2016 were cryopreserved and later sent to Warm Springs Fish Technology Center (J. Pacheco personal communication 2016). The facility continued to investigate fin curl issues by testing larval fish in both spring water and well water. A total of 48,935 fertilized eggs from captive spawn were shipped from Gavins Point NFH in May 2016 and were reared in both water conditions.

The following is a list of fish being over-wintered at Neosho NFH as of December 2016:

1.	4311424979	Female	16.	486A5F142C	Female
2.	43132C6947	Female	17.	470C323740	Male
3.	431548146D	Male	18.	4626377E2A	Female
4.	46273F4F47	Male	19.	4626697247	Male
5.	461D7D217B	Female	20.	4707635C6B	Male
6.	46261E1761	Female	21.	46273A463A	Male
7.	4627313A46	Female	22.	47040F7A78	Female
8.	46273D071F	Female	23.	470A6E642D	Female
9.	4627683B2B	Female	24.	47043F7B20	Female
10.	4704107D31	Female	25.	412C255708	Male
11.	470426226D	Female	26.	4313587E22	Male
12.	470451174C	Female	27.	4628232D7B	Male
13.	47046A5E0F	Female	28.	47095E4565	Female
	( <i>Alt. PIT Tag # 432D7F5176</i> )		29.	46277C247E	Male
14.	470B110F50	Female	30.	4705740E3C	Unknown
15.	4714615372	Female			

## Stocking Results

No stocking of any fish from Neosho NFH took place in 2016.

# 2017

## Gavins Point National Fish Hatchery

### Spawning

Several spawning events occurred at Gavins Point National Fish Hatchery in 2017. On April 19<sup>th</sup> a female (47163E0030) that was held in hatchery for two years, was paired with two cryo-preserved males (4626513A54 and 4627144425). They produced 42,750 fertilized eggs at 38 eggs / ml. Spawning efforts took 41 hours to completely ovulate and temperatures ranged from 55 to 58° F (J. Powell, Gavins NFH, personal communication 2017).

The second spawning event took place during April 26<sup>th</sup> -28<sup>th</sup>, and resulted in successful spawn of 8 family lots. Four females produced eggs -- 4627463568 (28,000), 46280F5C1C (33,440), 4627545945 (27,675) and 46274F3A60 (20,425) and eight males were used. Female 4627463568 and 46274F3A60 were captured in the spring of 2017. Female 46280F5C1C and 4627545945 were both hold over pallid sturgeon from previous years. Female 46280F5C1C is a special case; in 2015 it spawned and produced 5 ml of sperm while 5% active, but was not viable enough for cryo-preservation. This fish was held-over at the hatchery to monitor its progression. Then in 2016, the fish had white eggs present after an ultrasound was conducted, then later it had developed and produced black eggs in 2017.

A third spawning event took place on May 4<sup>th</sup> with two females and four cryo-preserved males (J. Powell, Gavins NFH, personal communication 2017). Both females produced viable eggs. Female 47160E450B was captured in the fall of 2016 and produced 26,865 eggs. Female 462764734F was caught in the spring of 2017 and produced 6,570 eggs in 2017.

A fourth spawning event took place on June 6<sup>th</sup> with one female and two cryo-preserved males. Female 46271E7B23 was captured in the spring of 2017 and produced 19,930 viable eggs thus creating two family groups.

Another note, four females (4627463568, 46274F3A60, 462764734F, 46271E7B23 ) that all successfully spawned were observed to have the species *Polypodium hydriforme*; a parasite known for attacking fish eggs in sturgeon and paddlefish species.

In addition, 11 of the 12 males that were spawned were also cryo-preserved. Males not cryo-preserved were kept at the facility and will be spawned in a future year and entered into the cryo-repository. Six of the eight female lots experienced early life stage mortality and therefore these six females will be held at the hatchery and spawned again when viable eggs are produced.

The following is a list of fish being over-wintered at Gavins Point NFH as of October 2017:

Note: Some genders are undetermined until ultra-sound is conducted in spring of 2018

1.4714667A6B M	11. 46270E6C3C F	21. 47160E450BF
2.4627545945 F	12. 4627322E51 M	22. 471A2F6D1B F
3.46263A6E1B F	13. 4626564564 F	23. 46273E0255 M?
4.4627693763 F	14. 462704502D F	24. 46277B6F29 F
5.46280F5C1C F	15. 462457120D M	25. 462711443D M
6. 4626641923 F	16. 4C3B763336 M	26. 4704214268 F
7. 4627201358 F	17. 48683A3B7D M	27. 6C00112742 F
8. 4625761D21 M	18. 4715591B05 M	28.46274F3A60 F
9. 46267D2971 F	19. 46276D476B M	29. 4627017870 F
10. 47041F697D M	20. 47032D1576 M?	30. 4627463568 F

31. 462764734F F  
32. 4627156C74 M  
33. 4626773563 M  
34. 412C37665D M?

35. 470A676363 M  
36. 47187B4132 M  
37. 4713167929 F  
38. 4715674971 F

39. 4626711111 F  
40. 462668685F F  
41. 46256A25D U

### **Stocking Results**

No stocking of any fish from Gavins Point NFH took place in 2017.

## **Blind Pony State Fish Hatchery**

### **Spawning**

No spawning events took place at Blind Pony State Fish Hatchery in 2017. Currently no Pallid Sturgeon were housed at the facility, while further investigation of ranavirus on site is conducted (C. Landstad, Blind Pony SFH, personal communications 2017). Paddlefish production has continued in 2017 at the hatchery while no ranavirus was detected. The facility staff has continued to work with their state agency about budgeting to purchase a UV filter system within the hatchery to prevent potential ranavirus issues.

### **Stocking Results**

No stocking of any fish from Blind Pony SFH took place in 2017.

## **Neosho National Fish Hatchery**

### **Spawning**

No successful spawning events took place at Neosho NFH in 2017. Pallid Sturgeon eggs or milt were not viable from any reproductive fish held at hatchery this year. The results were likely affected by the lack of fish exposure to cold water due to large fluctuations in well water temperatures within holding tanks that were beyond the control of the facility prior to spawning efforts. In 2017, many improvement projects were underway at the hatchery, which included; a new chiller system for tanks, degassing columns to control nitrogen levels, UV filtration system, and windows installed in the broodstock building to emulate a natural photo period (R. May, Neosho NFH, personal communication 2017). These projects were recommended by a Hatchery Review Team and were expected to be completed by the fall of 2017.

The following is a list of fish being over-wintered at Neosho NFH as of December 2017:

- |               |        |                |                                      |
|---------------|--------|----------------|--------------------------------------|
| 1. 4311424979 | Female | 7. 470426226D  | Female                               |
| 2. 431548146D | Male   | 8. 470451174C  | Female                               |
| 3. 46273F4F47 | Male   | 9. 47046A5E0F  | Female                               |
| 4. 461D7D217B | Female |                | ( <i>Alt. PIT Tag # 432D7F5176</i> ) |
| 5. 4627313A46 | Female | 10. 470C323740 | Male                                 |
| 6. 46273D071F | Female | 11. 4626377E2A | Female                               |

12. 4626697247	Male	18. 471534482C	Female
13. 46273A463A	Male	19. 43103C043D	Unknown
14. 412C255708	Male	20. 6C00112804	Unknown
15. 4705740E3C	Unknown		
16. 4626110B6B	Unknown		
17. 470404644A	Unknown		

### **Stocking Results**

No stocking of any fish from Neosho NFH took place in 2017.

# **Acknowledgments**

This document was prepared in collaboration with personnel from Garrison Dam National Fish hatchery, Gavins Point National Fish Hatchery, Blind Pony State Fish Hatchery, and Neosho National Fish Hatchery. In addition, data and stocking information were provided by multiple agencies including personnel from South Dakota Game, Fish and Park Department, Nebraska Game and Parks Commission, Missouri Department of Conservation, and United States Fish and Wildlife Service. Funding for the Pallid Sturgeon Propagation Program was provided by the United States Army Corps of Engineers.

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**Table 1. Stockings by year class for RPMA #4.**

Pallid Sturgeon Stockings in RPMA # 4						
Year Class	Hatchery	Stocking Site	Female	Male	Number Stocked Per Site	Total Stocked
1992	Blind Pony SFH	Two Rivers State Recreation Area, Platte River	7F7D380727 7F7D353F2C	7F7D434651 7F7F065570 7F7F065244	99	4,182
		Hermann			999	
		Washington			607	
		St. Charles			837	
		Chester			948	
		Cape Girardeau			692	
1997	Gavins Point NFH	Ponca State Park	1F4B246E04	7F7D291A07	28	35
			1F4A301354	7F7D291A07	7	
	Blind Pony SFH	Platte River Buckner/Cooley Lake Access Waverly Hermann Washington St. Charles St. Genevieve Access Chester	T-Bar tags 7751, 7752	T-Bar tags 7757, 7760, 7764	402	2,816
					389	
					24	
					400	
					400	
					400	
					401	
400						
1999	Gavins Point NFH	Ponca State Park	7F7B021573	113719262A	70	532
			7F7B021573	7F7D441774	70	
			7F7B021573	7F7F06583D	40	
		Bellevue	7F7B021573	113719262A	70	
			7F7B021573	7F7D441774	75	
			7F7B021573	7F7F06583D	42	
		Boonville	7F7B021573	113719262A	60	
			7F7B021573	7F7D441774	57	
			7F7B021573	7F7F06583D	48	
2001	Garrison Dam NFH	St. Helena	411D262C1F	41476A0462	280	6,428
		Mulberry Bend	411D262C1F	41476A0462	320	
			220E345E09	1F4A111C6A	339	
			220E345E09	1F4A27214F	256	
			411D262C1F	17509415139	67	
			411D262C1F	1F4A4B5973	28	
			411D262C1F	411D0E2C5F	557	
			7F7F06672B	115631222A	133	
		7F7F06672B	7F7D3C5708	173		
		Bellevue	411D262C1F	41476A0462	576	
			220E345E09	1F4A111C6A	334	
			220E345E09	1F4A27214F	232	
			411D262C1F	17509415139	51	
			411D262C1F	1F4A4B5973	21	
			411D262C1F	411D0E2C5F	512	
			7F7F06672B	115631222A	117	
			7F7F06672B	7F7D3C5708	199	

Pallid Sturgeon Stockings in RPMA # 4						
Year Class	Hatchery	Stocking Site	Female	Male	Number Stocked Per Site	Total Stocked
2001	Garrison Dam NFH	Boonville	411D262C1F	41476A0462	560	6,428 cont.
			220E345E09	1F4A111C6A	410	
			220E345E09	1F4A27214F	256	
			411D262C1F	17509415139	51	
			411D262C1F	1F4A4B5973	20	
			411D262C1F	411D0E2C5F	558	
			7F7F06672B	115631222A	180	
	7F7F06672B	7F7D3C5708	198	956		
	Neosho NFH	Mulberry Bend	220E345E09		1F4A111C6A	210
			7F7F06672B		7F7D3C5708	92
		Bellevue	220E345E09		1F4A111C6A	217
			220E345E09		432C063C4E	12
		Boonville	7F7F06672B		7F7D3C5708	81
			220E345E09		1F4A111C6A	219
220E345E09	7F7D3C5708	9				
7F7F06672B	7F7D3C5708	116				
2002	Garrison Dam NFH	Mulberry Bend	116224546A	220F107A6F	556	5,448
			116224546A	7F7D461025	380	
			116224546A	116167123A	500	
			116224546A	1F477B3A65	500	
			116224546A	220F107A6F	19	
			116224546A	7F7D461025	16	
			116224546A	116167123A	20	
		Bellevue	116224546A	1F477B3A65	78	
			116224546A	220F107A6F	556	
			116224546A	7F7D461025	382	
		Boonville	116224546A	116167123A	500	
			116224546A	1F477B3A65	500	
			116224546A	220F107A6F	470	
			116224546A	1F477B3A65	245	
	Gavins Point NFH	Mulberry Bend	116224546A	116167123A	399	1,534
			116224546A	7F7D461025	327	
			116224546A	220F107A6F	175	
			116224546A	7F7D461025	85	
		Bellevue	116224546A	1F4A27214F	115	
			116224546A	1F477B3A65	125	
			116224546A	220F107A6F	175	
	Boonville	Bellevue	116224546A	7F7D461025	85	
			116224546A	1F4A27214F	115	
		Boonville	116224546A	1F477B3A65	125	
116224546A			1F477B3A65	125		
116224546A	220F107A6F	179				
116224546A	7F7D461025	92				
116224546A	1F4A27214F	130				
116224546A	1F477B3A65	133				

Pallid Sturgeon Stockings in RPMA # 4						
Year Class	Hatchery	Stocking Site	Female	Male	Number Stocked Per Site	Total Stocked
2002	Neosho NFH	Mulberry Bend	116224546A	220F107A6F	294	2,259
			116224546A	7F7D461025	199	
			116224546A	1F477B3A65	173	
		Bellevue	116224546A	220F107A6F	213	
			116224546A	7F7D461025	216	
			116224546A	1F477B3A65	288	
		Boonville	116224546A	220F107A6F	231	
			116224546A	7F7D461025	313	
			116224546A	1F477B3A65	332	
2003	Garrison Dam NFH	Mulberry Bend	44426F185B	7F7D291A07	588	7,781
			7F7F054855	115675486A	86	
			132256586A	1F47760123	282	
			44426F185B	41475D3C5D	184	
			44426F185B	1F521B1E56	435	
			132256586A	132157621A	126	
			132256586A	132114552A	115	
		Bellevue	132256586A	132114552A	151	
			132256586A	1F47760123	344	
			132256586A	132157621A	207	
			44426F185B	1F521B1E56	484	
			44426F185B	41475D3C5D	402	
			44426F185B	7F7D291A07	645	
			7F7F054855	115669540A	101	
			7F7F054855	115675486A	178	
			44426F185B	1F4A363031	37	
			7F7F054855	132313521A	39	
		Leavenworth	132256586A	132114552A	108	
			132256586A	132157621A	115	
			132256586A	1F47760123	66	
			44426F185B	1F4A363031	37	
			44426F185B	1F521B1E56	67	
			44426F185B	41475D3C5D	220	
			44426F185B	7F7D291A07	48	
			7F7F054855	115669540A	33	
			7F7F054855	115675486A	66	
			7F7F054855	132313521A	65	
		Boonville	132256586A	132157621A	212	
			132256586A	132114552A	150	
			132256586A	1F47760123	342	
			44426F185B	1F521B1E56	482	
			44426F185B	41475D3C5D	401	
			44426F185B	7F7D291A07	631	
7F7F054855	115669540A		120			
7F7F054855	115675486A		178			
44426F185B	1F4A363031	36				

Pallid Sturgeon Stockings in RPMA # 4						
Year Class	Hatchery	Stocking Site	Female	Male	Number Stocked Per Site	Total Stocked
2003	Gavins Point NFH	Boyer Chute	44426F185B	41475D3C5D	51	51
	Neosho NFH	Bellevue	44426F185B	1F4A363031	174	
				7F7D291A07		
				1F521B1E56		
				41475D3C5D		
		7F7F054855	115669540A	242		
			115675486A			
		132256586A	1F47760123	341		
			132114552A			
			132157621A			
		44426F185B	1F4A363031	363		
			7F7D291A07			
			1F521B1E56			
			41475D3C5D			
		7F7F054855	115669540A	240		
			115675486A			
132256586A	1F47760123	570				
	132114552A					
	132157621A					
44426F185B	1F4A363031	346				
	7F7D291A07					
	1F521B1E56					
	41475D3C5D					
2004	Garrison Dam NFH	Sioux City	114476216A	1F477B3A65	42	35,526
			114476216A	1F4A27214F	11	
			114476216A	1F4A312640	196	
			114476216A	1F4A4B5973	25	
			114476216A	220F107A6F	24	
			114476216A	430E452777	119	
			114476216A	431565767B	19	
			114476216A	7F7D487531	11	
			114476216A	7F7E55466D	135	
			115551683A	115552116A	82	
			115551683A	7F7D3C555D	220	
			115555495A	431565767B	340	
			1F5330401E	Unknown	174	
			454910202B	115679374A	70	
			454910202B	1F47606357	224	
			454910202B	220F0F7677	294	
			454B380D60	1F4A3E1445	70	
			454B380D60	7F7D376F73	117	
			454B380D60	7F7F065834	91	
			7F7F066452	114473737A	9	
7F7F066452	7F7F065834	103				
Mix	Mix	151				

Pallid Sturgeon Stockings in RPMA # 4							
Year Class	Hatchery	Stocking Site	Female	Male	Number Stocked Per Site	Total Stocked	
2004	Garrison Dam NFH	Bellevue	114476216A	1F4A312640	880	35,526 cont.	
			114476216A	1F4A4B5973	276		
			114476216A	430E452777	2691		
			114476216A	7F7D487531	1221		
			114476216A	7F7E55466D	1566		
		Leavenworth	114476216A	7F7E55466D	1566		
			114476216A	7F7D487531	1143		
			114476216A	430E452777	2603		
			114476216A	1F4A4B5973	276		
			114476216A	1F4A312640	3582		
			454910202B	220F0F7677	853		
			454910202B	1F47606357	1450		
			454910202B	115679374A	561		
			Cooley Lake, MO	115555495A	431565767B		33
		114476216A		1F477B3A65	4		
		114476216A		1F4A27214F	6		
		114476216A		1F4A312640	323		
		114476216A		1F4A4B5973	31		
		114476216A		220F107A6F	10		
		114476216A		430E452777	235		
		114476216A		431565767B	17		
		114476216A		7F7D487531	6		
		114476216A		7F7E55466D	122		
		115551683A		115552116A	37		
		115551683A		7F7D3C555D	86		
		1F5330401E		Unknown	416		
		454910202B		115679374A	157		
		454910202B		1F47606357	148		
		454910202B		220F0F7677	264		
		454B380D60		1F4A3E1445	51		
		454B380D60		220F0F7677	79		
		454B380D60		7F7D376F73	42		
		454B380D60		7F7F065834	182		
		7F7F066452		114473737A	7		
		7F7F066452		7F7F065834	47		
		Mix		Mix	139		
		Boonville	114476216A	1F4A312640	3368		
			114476216A	1F4A4B5973	276		
			114476216A	430E452777	3378		
			114476216A	7F7D487531	1144		
			114476216A	7F7E55466D	1595		
			454910202B	115679374A	275		
			454910202B	1F47606357	1318		
	454910202B		220F0F7677	606			
	Gavins Point NFH	Ponca State Park	132211792A	132235554A	15		15

Pallid Sturgeon Stockings in RPMA # 4							
Year Class	Hatchery	Stocking Site	Female	Male	Number Stocked Per Site	Total Stocked	
2004	Neosho NFH	Miami	7F7F066452	7F7F065834	264	3,610	
			114476216A	1F4A312640	390		
			115555495A	431565767B	421		
			454910202B	115679374A	790		
			454B380D60	7F7F065834	417		
			114476216A	1F4A4B5973	487		
			454910202B	1F47606357	353		
			114476216A	220F107A6F	488		
2005	Gavins Point NFH	St. Helena	115676635A	1F50072169	165	2,400	
			115676635A	7F7B031F17	102		
			115676635A	7F7D2D723D	41		
			115557165A	1F50072169	26		
			115557165A	7F7B031F17	74		
			115557165A	7F7D2D723D	85		
			7F7B026102	7F7B023253	117		
			115676635A	1F50072169	164		
		Decatur	115676635A	7F7B031F17	103		
			115676635A	7F7D2D723D	41		
			115557165A	1F50072169	25		
			115557165A	7F7B031F17	73		
			115557165A	7F7D2D723D	84		
			7F7B026102	7F7B023253	117		
			Bellevue	115676635A	1F50072169		165
				115676635A	7F7B031F17		102
		115676635A		7F7D2D723D	41		
		115557165A		1F50072169	26		
		115557165A		7F7B031F17	73		
		115557165A		7F7D2D723D	84		
		7F7B026102		7F7B023253	116		
		Parkville		115676635A	1F50072169		149
			115676635A	7F7B031F17	98		
			115676635A	7F7D2D723D	33		
			115557165A	1F50072169	26		
			115557165A	7F7B031F17	70		
			115557165A	7F7D2D723D	78		
			7F7B026102	7F7B023253	122		
	Neosho NFH		Bellevue	115557165A	1F50072169		449
		115676635A		1F50072169	179		
		Rulo	115557165A	1F50072169	448		
			115676635A	1F50072169	178		

Pallid Sturgeon Stockings in RPMA # 4						
Year Class	Hatchery	Stocking Site	Female	Male	Number Stocked Per Site	Total Stocked
2006	Gavins Point NFH	St. Helena	4064021213	7F7D291A07	52	3,642
			4064021213	7F7D4A7758	245	
			1F497F1801	1F4A0B1A72	439	
			4443250A24	465D43745B	214	
		Mulberry Bend	4064021213	7F7D291A07	52	
			4064021213	7F7D4A7758	241	
			1F497F1801	1F4A0B1A72	401	
			4443250A24	465D43745B	213	
		Sloan	4064021213	7F7D291A07	51	
			4064021213	7F7D4A7758	240	
			1F497F1801	1F4A0B1A72	419	
			4443250A24	465D43745B	213	
		Bellevue	4064021213	7F7D291A07	37	
			4064021213	7F7D4A7758	231	
			1F497F1801	1F4A0B1A72	390	
			4443250A24	465D43745B	204	
2007	Gavins Point NFH	James River Confluence	471A2C1013	412C3D4B11	310	620
		Platte River Confluence	471A2C1013	412C3D4B11	310	
	Neosho NFH	Mulberry Bend	47151A3D3A	7F7D372A6B	503	3,810
			47151A3D3A	1F4A363031	333	
			47151A3D3A	115669294A	x <sup>a</sup>	
			40636B2945	4443422E34	442	
			47151A3D3A	Mix	241	
		Sloan	47151A3D3A	7F7D372A6B	x <sup>a</sup>	
			47151A3D3A	1F4A363031	333	
			47151A3D3A	115669294A	x <sup>a</sup>	
			40636B2945	4443422E34	532	
		Bellevue	47151A3D3A	Unknown <sup>a</sup>	169	
			47151A3D3A	7F7D372A6B	x <sup>a</sup>	
			47151A3D3A	1F4A363031	333	
			47151A3D3A	115669294A	x <sup>a</sup>	
			40636B2945	4443422E34	532	
47151A3D3A	Unknown <sup>a</sup>	191				
2008	Blind Pony SFH	Big Sioux Confluence	470C467335	432A191F35 432778110D 460E112040	1000	4,466
		Bellevue	470C467335	432A191F35 432778110D 460E112040	1178	
		Payne's Landing	470C467335	432A191F35 432778110D 460E112040	1188	
		Cooley Lake	470C467335	432A191F35 432778110D 460E112040	1100	

<sup>a</sup> Data could not be recovered as consistent and accurate information about parental fish and number stocked at the site.

Pallid Sturgeon Stockings in RPMA # 4							
Year Class	Hatchery	Stocking Site	Female	Male	Number Stocked Per Site	Total Stocked	
2008	Neosho NFH	James River Confluence	423373582F	432A191F35 432778110D 460E112040 435F60206E	558	2,197	
		Platte River Confluence	423373582F	432A191F35 432778110D 460E112040 435F60206E	558		
		Kansas River Confluence	423373582F	432A191F35 432778110D 460E112040 435F60206E	557		
		Grand River Confluence	423373582F	432A191F35 432778110D 460E112040 435F60206E	524		
2009	Gavins Point NFH	James River Confluence	434A00324C	44235B7567	72	313	
			434A00324C	470C493F38	40		
			434A00324C	4703584B1B	5		
			412C20001A	43152D6A6F	39		
		Mulberry	434A00324C	44235B7567	85		
			434A00324C	470C493F38	33		
			434A00324C	4703584B1B	4		
			412C20001A	43152D6A6F	35		
	Blind Pony SFH	Sloan		434D30680D	4706232202	102	3,668
				434D30680D	486762580F	98	
				434D30680D	4618545D4F	100	
				412C20001A	47054C3B54	85	
				412C20001A	486762580F	114	
				4704265B0C	4868637401	92	
		Wilson Island		434D30680D	4706232202	104	
				434D30680D	486762580F	101	
				434D30680D	4618545D4F	103	
				412C20001A	47054C3B54	89	
				412C20001A	486762580F	117	
				4704265B0C	4868637401	95	
		Upper Hamburg Chute		434D30680D	4706232202	104	
				434D30680D	486762580F	100	
				434D30680D	4618545D4F	102	
				412C20001A	47054C3B54	89	
4704265B0C				4868637401	95		
412C20001A				486762580F	117		
Kenmoor Bend			434D30680D	4706232202	108		
			434D30680D	486762580F	104		
	434D30680D		4618545D4F	106			
	412C20001A		47054C3B54	92			
	4704265B0C		4868637401	98			
	412C20001A		486762580F	122			

Pallid Sturgeon Stockings in RPMA # 4									
Year Class	Hatchery	Stocking Site	Female	Male	Number Stocked Per Site	Total Stocked			
2009	Blind Pony SFH	Camden	434D30680D	4706232202	101	3,668 cont'd			
			434D30680D	486762580F	98				
			434D30680D	4618545D4F	99				
			412C20001A	47054C3B54	86				
			4704265B0C	4868637401	92				
			412C20001A	486762580F	114				
		Cranberry	434D30680D	4706232202	143				
			434D30680D	486762580F	99				
			434D30680D	4618545D4F	101				
			412C20001A	47054C3B54	88				
			4704265B0C	4868637401	94				
			412C20001A	486762580F	116				
			Neosho NFH	Ponca State Park	412C20001A		486762580F	352	10,613
					412C20001A		43152D6A6F	4	
	412C20001A	47054C3B54			244				
	434D30680D	4618545D4F			327				
	434D30680D	4706232202			772				
	434D30680D	486762580F			334				
	4704265B0C	4868637401			309				
	Lake Manawa State Park	412C20001A		486762580F	279				
		412C20001A		47054C3B54	72				
		434D30680D		4618545D4F	248				
		434D30680D		4706232202	202				
		434D30680D		486762580F	268				
		4704265B0C		4868637401	256				
		Nebraska City		434D30680D	4706232202	566			
	412C20001A		486762580F	110					
	412C20001A		43152D6A6F	5					
	434D30680D		4618545D4F	91					
	434D30680D		486762580F	61					
	412C20001A		47054C3B54	162					
	4704265B0C		4868637401	60					
	Atchison Bend	412C20001A	43152D6A6F	4					
		412C20001A	47054C3B54	225					
		412C20001A	486762580F	359					
		434D30680D	4618545D4F	340					
		434D30680D	486762580F	361					
		434D30680D	4706232202	920					
		4704265B0C	4868637401	317					
		Sheepnose Bend	434D30680D	4706232202	808				
	434D30680D		486762580F	323					
	434D30680D		4618545D4F	341					
412C20001A	47054C3B54		233						
412C20001A	486762580F		291						
412C20001A	43152D6A6F		4						
4704265B0C	4868637401		319						
Portland	145261670A	145317672A	349						
Hermann	145261670A	145317672A	347						
Weldon Spring	145261670A	145317672A	350						

Pallid Sturgeon Stockings in RPMA # 4						
Year Class	Hatchery	Stocking Site	Female	Male	Number Stocked Per Site	Total Stocked
2010	Garrison NFH	Tobacco Bend	1F5569653E	1F4A33194B	6	37
				7F7D24754C	6	
			43105F0C7E	1F4A143350	4	
				44436E2975	6	
				4704550E5B	6	
	6C00024873	116165646A	9			
	Gavins Point NFH	James River Confluence	412C240973	470C493F38	91	2,767
			434C38070F	462614693D	323	
			486866124D	460D506D20	684	
			486866124D	47054C3B54	270	
		Mulberry Bend	412C240973	470C493F38	88	
			434C38070F	462614693D	363	
			486866124D	460D506D20	581	
			486866124D	47054C3B54	269	
			Mix	Mix	98	
	Blind Pony SFH	Confluence Big Sioux River	486866124D	47054C3B54	510	2,974
			412C240973	470C493F38	15	
		Decatur	486866124D	47054C3B54	466	
			412C240973	470C493F38	33	
		Upper Hamburg Chute	486866124D	47054C3B54	457	
			412C240973	470C493F38	33	
		Worthwine Chute	486866124D	47054C3B54	454	
			412C240973	470C493F38	33	
		Liberty	486866124D	47054C3B54	460	
			412C240973	470C493F38	33	
		Waverly	486866124D	47054C3B54	447	
			412C240973	470C493F38	33	
	Neosho NFH	Ponca State Park	434C38070F	462614693D	72	3,838
			486866124D	47054C3B54	160	
			412C240973	470C493F38	213	
			486866124D	460D506D20	102	
			48665E2D76	434A011475	93	
		Decatur	434C38070F	462614693D	73	
			486866124D	47054C3B54	159	
			412C240973	470C493F38	212	
			486866124D	460D506D20	104	
			48665E2D76	434A011475	94	
		Nebraska City	434C38070F	462614693D	72	
			486866124D	47054C3B54	160	
			412C240973	470C493F38	211	
			486866124D	460D506D20	103	
			48665E2D76	434A011475	94	
		Worthwine Chute	434C38070F	462614693D	72	
			486866124D	47054C3B54	160	
			412C240973	470C493F38	212	
			486866124D	460D506D20	103	
			48665E2D76	434A011475	94	
Liberty		434C38070F	462614693D	73		
	486866124D	47054C3B54	159			

Pallid Sturgeon Stockings in RPMA # 4								
Year Class	Hatchery	Stocking Site	Female	Male	Number Stocked Per Site	Total Stocked		
2010	Neosho NFH	Liberty	412C240973	470C493F38	212	3,838 Cont.		
			486866124D	460D506D20	102			
			48665E2D76	434A011475	93			
		Waverly	434C38070F	462614693D	69			
			486866124D	47054C3B54	159			
			412C240973	470C493F38	212			
			486866124D	460D506D20	103			
48665E2D76	434A011475	93						
2011	Gavins Point NFH	James River Confluence	4627111945	412C727B25	323	5,872		
			4626553E42	460E275D2B	222			
			4868364835	412C5D2741	257			
			4868364835	470C547B78	271			
			4626553E42	412C2A094F	352			
			4627111945	460E647803	48			
		Mulberry Bend	4627111945	412C727B25	318			
			4626553E42	460E275D2B	213			
			4868364835	412C5D2741	246			
			4868364835	470C547B78	256			
			4627111945	460E647803	65			
			4626553E42	412C2A094F	359			
		Ponca State Park	4627111945	460E647803	45			
			4627111945	412C727B25	319			
			4626553E42	460E275D2B	222			
			4868364835	412C5D2741	252			
			4868364835	470C547B78	270			
			4626553E42	412C2A094F	357			
		Decatur	4627111945	412C727B25	318			
			4626553E42	460E275D2B	233			
			4868364835	412C5D2741	262			
			4868364835	470C547B78	268			
			4626553E42	412C2A094F	356			
			4627111945	460E647803	40			
		Blind Pony SFH	Bon Ton Bend (St. Joseph)	4868364835	412C5D2741		83	3,222
				4627111945	460E647803		299	
				4626553E42	412C2A094F		152	
				4627111945	412C727B25		102	
				4868364835	470C547B78		138	
				4626553E42	460E275D2B		311	
			Kansas City, MO	4868364835	412C5D2741		87	
				4627111945	460E647803		302	
				4626553E42	412C2A094F		154	
4627111945	412C727B25			102				
4868364835	470C547B78			141				
4626553E42	460E275D2B			305				
Grand River	4868364835		412C5D2741	80				
	4627111945		460E647803	296				
	4626553E42		412C2A094F	148				
	4627111945		412C727B25	99				
	4868364835		470C547B78	134				
	4626553E42		460E275D2B	289				

Pallid Sturgeon Stockings in RPMA # 4							
Year Class	Hatchery	Stocking Site	Female	Male	Number Stocked Per Site	Total Stocked	
2011	Neosho	Platte River Conf.	4627111945	412C727B25	543	12,642	
			4868364835	470C547B78	515		
			4626553E42	412C2A094F	644		
			4868364835	412C5D2741	382		
			4627111945	460E647803	390		
			4626553E42	460E275D2B	766		
		412C275E0A	462600695D	24			
		Bon Ton Bend (St. Joseph)	4627111945	412C727B25	543		
			4868364835	470C547B78	516		
			4626553E42	412C2A094F	642		
			4868364835	412C5D2741	384		
			4627111945	460E647803	388		
			4626553E42	460E275D2B	764		
		Kansas City Riverfront	4627111945	412C727B25	546		
			4868364835	470C547B78	516		
			4626553E42	412C2A094F	643		
			4868364835	412C5D2741	381		
			4627111945	460E647803	389		
			4626553E42	460E275D2B	765		
		Grand River	4627111945	412C727B25	538		
			4868364835	470C547B78	447		
			4626553E42	412C2A094F	615		
			4868364835	412C5D2741	361		
			4627111945	460E647803	394		
4626553E42	460E275D2B		546				
2012	Neosho	Grand River	4A493D1454	48643A7120	97	99	
				47154C4C7B	2		
2013	Garrison NFH	Tobacco Bend	462C7B2F49	1F4B225A1A	21	21	
	Gavins Point NFH	James River Conf.	412C576B54	4627061C6F	427	890	
		Mulberry	412C34470E	4627061C6F	5		
	Blind Pony			460E52494D	43497E1577	403	1,533
					43497E1577	387	
					43497E1577	384	
					43497E1577	359	
	Neosho			460E52494D	43497E1577	576	3,612
					486833490E	49	
					43497E1577	564	
					486833490E	50	
					43497E1577	532	
					486833490E	83	
					43497E1577	567	
					486833490E	49	
43497E1577					565		
486833490E					49		
43497E1577	462						
486833490E	66						
2014	Blind Pony	Mulberry	4705136A55	471641107C	70	10,101	
			4718743427	4315643D47	44		
				4714687E4D	182		

Pallid Sturgeon Stockings in RPMA # 4						
Year Class	Hatchery	Stocking Site	Female	Male	Number Stocked Per Site	Total Stocked
2014	Blind Pony	Sloan	4705136A55	471641107C	37	10,101 cont'd
				486845622D	300	
		4718743427	4315643D47	65		
			4714687E4D	211		
		Nebraska City	4718743427	4315643D47	244	
				4714687E4D	211	
		Payne's Landing	4718743427	4315643D47	229	
				4714687E4D	278	
		Waverly	4705136A55	471641107C	75	
				486845622D	338	
			4718743427	4315643D47	253	
		4718743427	4714687E4D	113		
			Miami	4718743427	4315643D47	
				4714687E4D	211	
		Glasgow	4705136A55	470956612B	97	
				471641107C	75	
			4718743427	486845622D	286	
				4315643D47	254	
		4718743427	4714687E4D	113		
			Hartsburg	4705136A55	470956612B	
		471641107C			69	
		4718743427		486845622D	386	
				47152F234F	737	
		Hermann	4705136A55	4315643D47	257	
	4714687E4D			113		
	4718743427		470956612B	463		
			471641107C	77		
	Klondike Park	4705136A55	486845622D	386		
			47152F234F	751		
		4718743427	4315643D47	257		
			4714687E4D	113		
	Neosho	Mulberry	4705136A55	470956612B	470	
471641107C				78		
4718743427			486845622D	392		
			47152F234F	784		
Sloan		4705136A55	4315643D47	261		
			4714687E4D	115		
9,481	4718743427	470956612B	354			
		471641107C	304			
	4718743427	47152F234F	701			
		4315643D47	204			
	Sloan	4705136A55	4714687E4D	33		
			470956612B	375		
Nebraska City	4718743427	471641107C	58			
		47152F234F	723			
	4705136A55	4315643D47	200			
		470956612B	429			
4718743427	471641107C	89				
	486845622D	420				
4718743427	47152F234F	726				

Pallid Sturgeon Stockings in RPMA # 4						
Year Class	Hatchery	Stocking Site	Female	Male	Number Stocked Per Site	Total Stocked
2014	Neosho	Payne's Landing	4705136A55	470956612B	475	9,481 cont'd
			4718743427	471641107C	100	
		Waverly	4718743427	47152F234F	696	
			4705136A55	470956612B	457	
		Miami	4718743427	47152F234F	686	
			4705136A55	470956612B	307	
			471641107C	471641107C	60	
		Glasgow	486845622D	486845622D	284	
			4718743427	47152F234F	696	
		Hartsburg	4705136A55	470956612B	310	
			4718743427	47152F234F	731	
		2015	Gavins Point NFH	St. Helena	4718743427	
46274D3910	6C00096039				26	
46274D3910	4626756119				118	
Deer Island	4718485A15			4626111802	58	
	46274D3910			4718491B5B	48	
	46274D3910			6C00096039	410	
Thurnau	4718485A15			4626756119	196	
	46274D3910			4626111802	317	
	46274D3910			4718491B5B	356	
Sibley	4718485A15			6C00096039	384	
	46274D3910			4626756119	78	
	46274D3910			4626111802	259	
Waverly	4718485A15			4718491B5B	307	
	46274D3910			6C00096039	384	
	46274D3910			4626756119	79	
Boonville	4718485A15			4626111802	258	
	46274D3910			4718491B5B	397	
	46274D3910			6C00096039	383	
Noren Access	4718485A15			4626756119	78	
	46274D3910			4626111802	260	
	46274D3910			4718491B5B	308	
Hermann	46274D3910			6C00096039	780	
	4718485A15			4626756119	158	
	46274D3910			4626111802	527	
St. Charles	4718485A15	4718491B5B	584			
	46274D3910	6C00096039	779			
	46274D3910	4626756119	158			
13,013		St. Charles	4718485A15	4626111802	527	
			46274D3910	4718491B5B	623	
		Hermann	46274D3910	6C00096039	777	
			4718485A15	4626756119	159	
		St. Charles	4718485A15	4626111802	527	
			46274D3910	4718491B5B	624	

Pallid Sturgeon Stockings in RPMA # 4						
Year Class	Hatchery	Stocking Site	Female	Male	Number Stocked Per Site	Total Stocked
2016	Gavins Point NFH	Cranberry Bend	4627201358	4627652E23	48	608
				4704510611	280	
			46263A6E1B	462646292E	280	

**Table 2. Year stocked by location for RPMA #4 (year denotes calendar year of stocking, not year-class of progeny). See Appendix E for stocking location code list.**

Stocking Location Abbreviated	River Mile	1994 - 1999	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
STHE	799		280				610	950									250		2,090
JRCF	798								310	714	1,368	1,097	376		427				4,292
MLBY	775		2,176	5,061				1,574		517	350	2,481	375	403	2,355				15,292
PCSP	753		215				15				2,342	1,744	361						4,677
BSRC	734								1,000		525								1,525
SXCY	733					2,557													2,557
SLON	709							1,590		959				387	2,594				5,530
DETR	691						607				499	1,743	376						3,225
DRIL	662															1,029	250		1,279
WISL	641									609									609
BYCT	637				51														51
LMSP	607										1,325				614				1,939
BELL	601		2,352	4,925	7,867		1,235	1,529	1,978	366									20,252
PRVC	595								310	558			3,264	384	615				5,131
PLRV	PRM, 5	402																	402
PRTR	PRM, 40.3	99																	99
TBCT	589														58				58
NECY	563										1,055	640			2,119				3,814
UHCT	555									607	490								1,097
THNU	509														616	1,028			1,644
RULO	498						626												626
PYLD	477								1,188						2,394				3,582
WWCT	459										487	641							1,128
BTBD	452											1,085	3,237						4,322
KMBD	438									630									630
ATBD	422										2,526								2,526
LVWT	397				13,689														13,689
PKVL	378						576												576
KRCN	368									557									557
KNCY	363											1,091	3,240						4,331

Stocking Location Abbreviated	River Mile	1994 - 1999	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
LBTY	351										493	639							1,132
COLK	340	389				2,444			1,100										3,933
SBLV	336															1,118			1,118
NPBD	331													359	614				973
CDBD	327								590										590
SNLX	311										2,319								2,319
WVLY	299	24									480	636			1,922	1,029			4,091
CNBY	284								641									608	1,249
MAMI	263					3,611									2,330				5,941
GRCF	250								524		1,046	2,901			99				4,570
GLGW	226														1,866				1,866
BOVL	195		2,742	4,629	13,542											2,049			22,962
HTBG	160														2,087				2,087
NRAS	144															2,087			2,087
PTLD	114										349								349
HRMN	98	1,399									347				2,047	2,087			5,880
WSTN	69	1,007																	1,007
KDPK	56														2,100				2,100
WDSG	41										349								349
STCH	29	1,237														2,086			3,323
STGV	MISS, 122.4	401																	401
CHTR	MISS, 110	1,348																	1,348
CPGR	MISS, 55	692																	692
<b>Total</b>		6,998	7,765	14,615	35,149	8,612	3,669	5,643	5,886	7,272	15,304	12,843	14,130	1,533	24,857	12,513	500	608	
Grand Total																		177,897	

**Table 3. Hatchery reared pallid sturgeon released in RPMA #4 attributable to male broodfish. Colored PIT tags have contributed to multiple spawning years.**

Year Class	Male	Age at Stocking	# of Progeny Stocked
1992	7F7D434651, 7F7F065570, 7F7F065244	2 yr Old	4,083
		6 yr Old	84
		7 yr Old	15
1997	7757, 7760, 7764 7F7D291A07	Fingerling	2,816
		5 yr Old	35
1999	113719262A 7F7D441774 7F7F06583D	3 yr Old	200
		3 yr Old	202
		3 yr Old	130
2001	115631222A 17509415139 1F4A111C6A 1F4A27214F 1F4A4B5973 411D0E2C5F 41476A0462 432C063C4E 7F7D3C5708	Yearling	430
		Yearling	170
		Yearling	1,732
		Yearling	762
		Yearling	69
		Yearling	1,670
		Yearling	1,740
		Yearling	12
2002	116167123A 1F477B3A65 1F4A27214F 220F107A6F 7F7D461025	Yearling	1,419
		Yearling	2,499
		Yearling	360
		Yearling	2,868
		Yearling	2,095
2003	Unknown Neosho Crosses 115669540A  115675486A  132114552A  132157621A  132313521A 1F47760123  1F4A363031 1F521B1E56  41475D3C5D 41475D3C5D	Yearling	2,297
		Fingerling	142
		Yearling	112
		Fingerling	302
		Yearling	206
		Fingerling	216
		Yearling	308
		Fingerling	298
		Yearling	362
		Yearling	104
		Fingerling	826
		Yearling	208
		Yearling	110
		Fingerling	1,265
		Yearling	203
Fingerling	544		
Yearling	714		

Year Class	Male	Age at Stocking	# of Progeny Stocked
2003 cont'd	7F7D291A07	Fingerling	1,771
		Yearling	141
2004	Unknown	Yearling	592
	114473737A	Yearling	16
	115552116A	Yearling	119
	115679374A	Fingerling	836
		Yearling	1,017
	132235554A	2 yr Old	15
	1F47606357	Fingerling	2,768
		Yearling	725
	1F477B3A65	Yearling	46
	1F4A27214F	Yearling	17
	1F4A312640	Fingerling	7,830
		Yearling	939
	1F4A3E1445	Yearling	121
	1F4A4B5973	Fingerling	828
		Yearling	543
	220F0F7677	Fingerling	1,459
		Yearling	637
	220F107A6F	Yearling	522
	430E452777	Fingerling	8,672
		Yearling	354
	431565767B	Yearling	831
	7F7D376F73	Yearling	159
	7F7D3C555D	Yearling	306
	7F7D487531	Fingerling	3,508
		Yearling	17
	7F7E55466D	Fingerling	4,727
		Yearling	257
7F7F065834	Yearling	1,104	
	MIX	Yearling	290
2005	1F40072169	Yearling	2,000
	7F7B023253	Yearling	472
	7F7B031F17	Yearling	695
	7F7D2D723D	Yearling	487
2006	1F4A0B1A72	Yearling	1,649
	465D43745B	Yearling	844
	7F7D291A07	Yearling	192
	7F7D4A7758	Yearling	957
2007	Unknown	Yearling	633
	Unknown	2 yr Old	1,094
	Unknown	Yearling	168

Year Class	Male	Age at Stocking	# of Progeny Stocked
2007 cont'd	1F4A363031	Fingerling	1,000
	412C3D4B11	Yearling	620
	444342246	Fingerling	1,000
2008	432A191F35	Fingerling	6,663
	432778110D		
	435F60206E		
	460E112040		
2009	4706232202	Fingerling	662
		Yearling	3,268
	4618545D4F	Fingerling	611
		Yearling	1,347
	47054C3B54	Fingerling	529
		Yearling	936
	486762580F	Fingerling	1,300
		Yearling	2,738
	4868637401	Fingerling	566
		Yearling	1,261
	44235B7567	Fingerling	157
	470C493F38	Fingerling	73
	4703584B1B	Fingerling	9
	43152D6A6F	Fingerling	74
	Yearling	17	
145317672A	Yearling	1,046	
2010	47054C3B54	Fingerling	2,794
		Yearling	957
	434A011475	Yearling	561
	462614693D	Yearling	431
	470C493F38	Fingerling	180
		Yearling	1,272
	460D506D20	Yearling	617
	1F4A33194B	4 year old	6
	7F7D24754C	4 year old	6
	1F4A143350	4 year old	4
	44436E2975	4 year old	6
	4704550E5B	4 year old	6
116165646A	4 year old	9	
2011	412C5D2741	Fingerling	1,267
		Yearling	1,508
	460E647803	Fingerling	1,095
		Yearling	1,561
	412C2A094F	Fingerling	1,878
		Yearling	2,544

<b>Year Class</b>	<b>Male</b>	<b>Age at Stocking</b>	<b># of Progeny Stocked</b>
<b>2011 cont'd</b>	<b>412C727B25</b>	Fingerling	1,581
		Yearling	2,170
	<b>470C547B78</b>	Fingerling	1,478
		Yearling	1,994
	<b>460E275D2B</b>	Fingerling	1,795
	Yearling	2,841	
	<b>462600695D</b>	Yearling	24
<b>2012</b>	<b>47154C4C7B</b>	2 year old	2
	<b>48643A7120</b>	2 year old	97
<b>2013</b>	<b>43497E1577</b>	Fingerling	1,533
		Yearling	3,266
	<b>4627061C6F</b>	Yearling	890
	<b>486833490E</b>	Yearling	346
	<b>1F4B225A1A</b>	Yearling	21
<b>2014</b>	<b>471641107C</b>	Fingerling	788
	<b>4315643D47</b>	Fingerling	2,512
	<b>4714687E4D</b>	Fingerling	1,693
	<b>470956612B</b>	Fingerling	4,199
	<b>486845622D</b>	Fingerling	3,096
	<b>47152F234F</b>	Fingerling	7,294
<b>2015</b>	<b>6C00096039</b>	Fingerling	4,754
	<b>4626756119</b>	Fingerling	1,418
	<b>4626111802</b>	Fingerling	3,376
	<b>4718491B5B</b>	Fingerling	3,965
<b>2016</b>	<b>4627652E23</b>	Yearling	48
	<b>4704510611</b>	Yearling	280
	<b>462646292E</b>	Yearling	280

**Table 4. Hatchery reared pallid sturgeon released in RPMA #4 attributable to female broodfish. Colored PIT tags have contributed to multiple spawning years.**

Year Class	Female	Age at Stocking	# of Progeny Stocked
1992	7F7D380727, 7F7D353F2C	2 yr Old	4,083
		6 yr Old	84
		7 yr Old	15
1997	7751, 7752, 7753	Fingerling	2,816
	1F4A301354	5 yr Old	7
	1F4B246E04	5 yr Old	28
1999	7F7B021573	3 yr Old	532
2001	220E345E09	Yearling	1,827
	411D262C1F	Yearling	3,601
	7F7F06672B	Yearling	1,000
2002	116224546A	Yearling	9,241
2003	Unknown Neosho Crosses	Yearling	2,297
	132256586A	Fingerling	1,340
		Yearling	878
	44426F185B	Fingerling	3,580
		Yearling	1,168
	7F7F054855	Fingerling	444
		Yearling	422
2004	114476216A	Fingerling	25,565
		Yearling	2,731
	115551683A	Yearling	425
	115555495A	Yearling	795
	132211792A	2 yr Old	15
	1F5330401E	Yearling	592
	454910202B	Fingerling	5,063
		Yearling	2,300
	454B380D60	Yearling	1,049
	7F7F066452	Yearling	430
MIX	Yearling	290	
2005	115557165A	Yearling	1,621
	115676635A	Yearling	1,561
	7F7B026102	Yearling	472
2006	1F497F1801	Yearling	1,649
	4064021213	Yearling	1,149
	4443250A24	Yearling	844

Year Class	Female	Age at Stocking	# of Progeny Stocked
2007	40636B2945	Fingerling	1,000
		2 years old	958
	47151A3D3A	Fingerling	1,000
	47151A3D3A	Yearling	769
	471A2C1013	Yearling	620
	Unknown	Yearling	168
2008	470C467335	Fingerling	4,466
	423373582F	Yearling	2,197
2009	434A00324C	Fingerling	239
	412C20001A	Fingerling	1,303
		Yearling	2,344
	434D30680D	Fingerling	1,873
		Yearling	5,962
	4704265B0C	Fingerling	566
		Yearling	1,261
	145261670A	Yearling	1,046
2010	486866124D	Fingerling	2,794
		Yearling	1,574
	48665E2D76	Yearling	561
	434C38070F	Yearling	431
	412C240973	Fingerling	180
		Yearling	1,272
	1F5569653E	4 year old	12
	43105F0C7E	4 year old	16
	6C00024873	4 year old	9
2011	4868364835	Fingerling	2,265
		Yearling	3,983
	4627111945	Fingerling	2,676
		Yearling	3,731
	4626553E42	Fingerling	3,673
		Yearling	5,385
	412C275E0A	Yearling	24
2012	4A493D1454	2 year old	99
2013	460E52494D	Fingerling	1,533
		Yearling	3,612
	412C576B54	Yearling	885
	412C34470E	Yearling	5
	462C7B2F49	Yearling	21
2014	4705136A55	Fingerling	8,083
	4718743427	Fingerling	11,499
2015	46274D3910	Fingerling	5,884
	4718485A15	Fingerling	7,129
2016	4627201358	Fingerling	328
	46263A6E1B	Fingerling	280

**Table 5. RPMA #4 Cryopreserved milt on hand. Colored PIT Tag denotes same individual fish. \*Denotes milt was split among three locations Warm Springs Fish Technology Center, Gavin Point National Fish Hatchery, and USDA in Fort Collins, CO.**

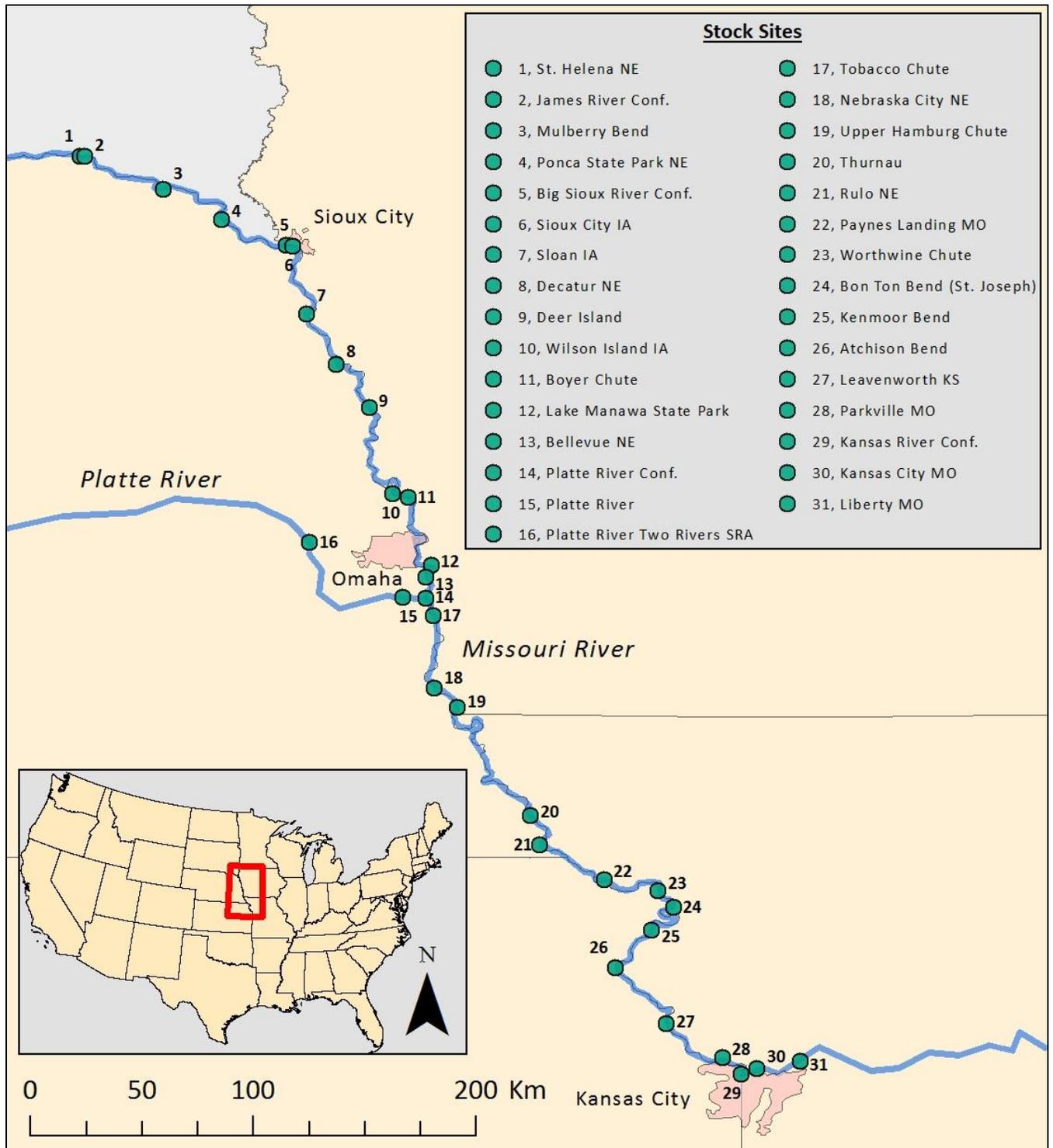
RPMA #4 Cryopreserved Male Pallid Sturgeon							
Location	Year	PIT Tag	Initial Motility	5 ml straws	0.5 ml straws	Year Spawned	Progeny Stocked
Gavins Point National Fish Hatchery	2008	470501194D	80%	0	100	2017	Pending
Warm Springs Fish Technology Center	2008	470501194D		0	30	2017	Pending
Gavins Point National Fish Hatchery	2008	4625544F62	85%	0	60	2017	Pending
Warm Springs Fish Technology Center	2008	4625544F62		0	20	2017	Pending
Warm Springs Fish Technology Center	2008	432A191F35	95%	0	100	2008	6,663
Warm Springs Fish Technology Center	2008	432778110D	90%	0	95	2008	
Warm Springs Fish Technology Center	2008	460E112040	95%	0	60	2008	
Warm Springs Fish Technology Center	2008	435F60206E	95%	0	100	2008	
Warm Springs Fish Technology Center	2010	470C493F38	50%	12	100	(2009&10)	1,525
Warm Springs Fish Technology Center	2010	462614693D	40%	20	100	2010	431
Warm Springs Fish Technology Center	2010	434A372C5E	70%	0	100		
Warm Springs Fish Technology Center	2010	4627061C6F	85%	0	100	2013	890
Warm Springs Fish Technology Center	2010	4868475D7C	70%	6	100	2017	Pending
Warm Springs Fish Technology Center	2010	470501194D	85%	20	100	2017	Pending
Warm Springs Fish Technology Center	2010	434A011475	75%	16	100	2010	561
Warm Springs Fish Technology Center	2010	460D506D20	35%	20	100	2010	617
Warm Springs Fish Technology Center	2011	4704012031	50%	20	100		
Warm Springs Fish Technology Center	2011	462600695D	80%	20	100	2011	24
Warm Springs Fish Technology Center	2011	470C547B78	70%	20	100	2011	3,472
Warm Springs Fish Technology Center	2011	412C5D2741	50%	20	100	2011	2,775
Warm Springs Fish Technology Center	2011	412C727B25	60%	20	100	2011	3,751
Warm Springs Fish Technology Center	2011	460E647803	80%	20	100	2011	2,656
Warm Springs Fish Technology Center	2011	412C2A094F	65%	20	100	2011	4,422
Warm Springs Fish Technology Center	2011	460E275D2B	60%	20	100	2011	4,636
Warm Springs Fish Technology Center	2011	412C3F5754	85%	20	100	2017	Pending
Warm Springs Fish Technology Center	2011	412C2A286F	65%	20	100	2017	Pending
Warm Springs Fish Technology Center	2011	48643A7120	75%	20	100	2012	97
Warm Springs Fish Technology Center	2011	48685E0F60	90%	20	100		
Warm Springs Fish Technology Center	2011	48685D1608	75%	20	100		
Warm Springs Fish Technology Center	2011	46262F791C	80%	20	100	2017	Pending
Warm Springs Fish Technology Center	2011	47154C4C7B	75%	20	100	2012	2
Warm Springs Fish Technology Center	2013	486833490E	75%	20	100	2013	346
Warm Springs Fish Technology Center	2013	412C5D2741	85%	20	100	2011	2,775
Warm Springs Fish Technology Center	2013	43497E1577	95%	20	99	2013	4,799

RPMA #4 Cryopreserved Male Pallid Sturgeon							
Location	Year	PIT Tag	Initial Motility	5 ml straws	0.5 ml straws	Year Spawned	Progeny Stocked
Warm Springs Fish Technology Center	2013	470434575B	90%	20	100		
Warm Springs Fish Technology Center	2014	4348434520	90%	20	100	2017	Pending
Warm Springs Fish Technology Center	2014	4618321812	80%	20	100		
Warm Springs Fish Technology Center	2014	4704012031	75%	20	100		
Warm Springs Fish Technology Center	2014	4716133136	90%	20	100		
Warm Springs Fish Technology Center	2014	116216091A	90%	20	100		
Warm Springs Fish Technology Center	2014	4315643D47	80%	20	100	2014	2,512
Warm Springs Fish Technology Center	2014	470956612B	90%	20	100	2014	4,199
Warm Springs Fish Technology Center	2014	4714687E4D	75%	20	100	2014	1,693
Warm Springs Fish Technology Center	2014	47152F234F	60%	6	100	2014	7,294
Warm Springs Fish Technology Center	2014	4715671F2B	90%	20	100		
Warm Springs Fish Technology Center	2014	471641107C	60%	20	100	2014	788
Warm Springs Fish Technology Center	2014	47177D6E54	90%	20	100		
Warm Springs Fish Technology Center	2014	471A373C04	75%	20	100		
Warm Springs Fish Technology Center	2014	486845622D	95%	20	100	2014	3,096
Warm Springs Fish Technology Center	2014	4875534A7B	95%	20	100		
Warm Springs Fish Technology Center	2014	487661653C	95%	20	100		
Warm Springs Fish Technology Center*	2015	470A7D4C77	90%	20	100		
Warm Springs Fish Technology Center*	2015	4C3B4D2000	95%	20	100		
Warm Springs Fish Technology Center*	2015	467C1D4717	70%	13	100		
Warm Springs Fish Technology Center*	2015	4627713B04	90%	0	98		
Warm Springs Fish Technology Center*	2015	4626182F31	80%	0	100		
Warm Springs Fish Technology Center*	2015	434A582F17	80%	20	100		
Warm Springs Fish Technology Center*	2015	4627751D25	60%	10	100		
Warm Springs Fish Technology Center*	2015	4718491B5B	95%	6	100	2015	3,965
Warm Springs Fish Technology Center*	2015	4626756119	80%	20	100	2015	1,418
Warm Springs Fish Technology Center*	2015	4715565005	80%	3	100		
Warm Springs Fish Technology Center*	2015	4704510611	95%	12	100	2016	280
Warm Springs Fish Technology Center*	2015	486A183E43	90%	15	100		
Warm Springs Fish Technology Center*	2015	47041F1B4D	80%	5	100		
Warm Springs Fish Technology Center	2016	6C00112754	85%	4	100		
Warm Springs Fish Technology Center	2016	6C00112812	70%	3	100		
Warm Springs Fish Technology Center	2016	4627652E23	75%	5	100	2016	48
Warm Springs Fish Technology Center	2016	462646292E	75%	15	100	2016, 2017	280, Pending
Warm Springs Fish Technology Center	2017	4625485A12	95%	5	90	2017	Pending
Warm Springs Fish Technology Center	2017	6C00112858	90%	1	100	2017	Pending
Warm Springs Fish Technology Center	2017	4715682923	90%	3	100	2017	Pending

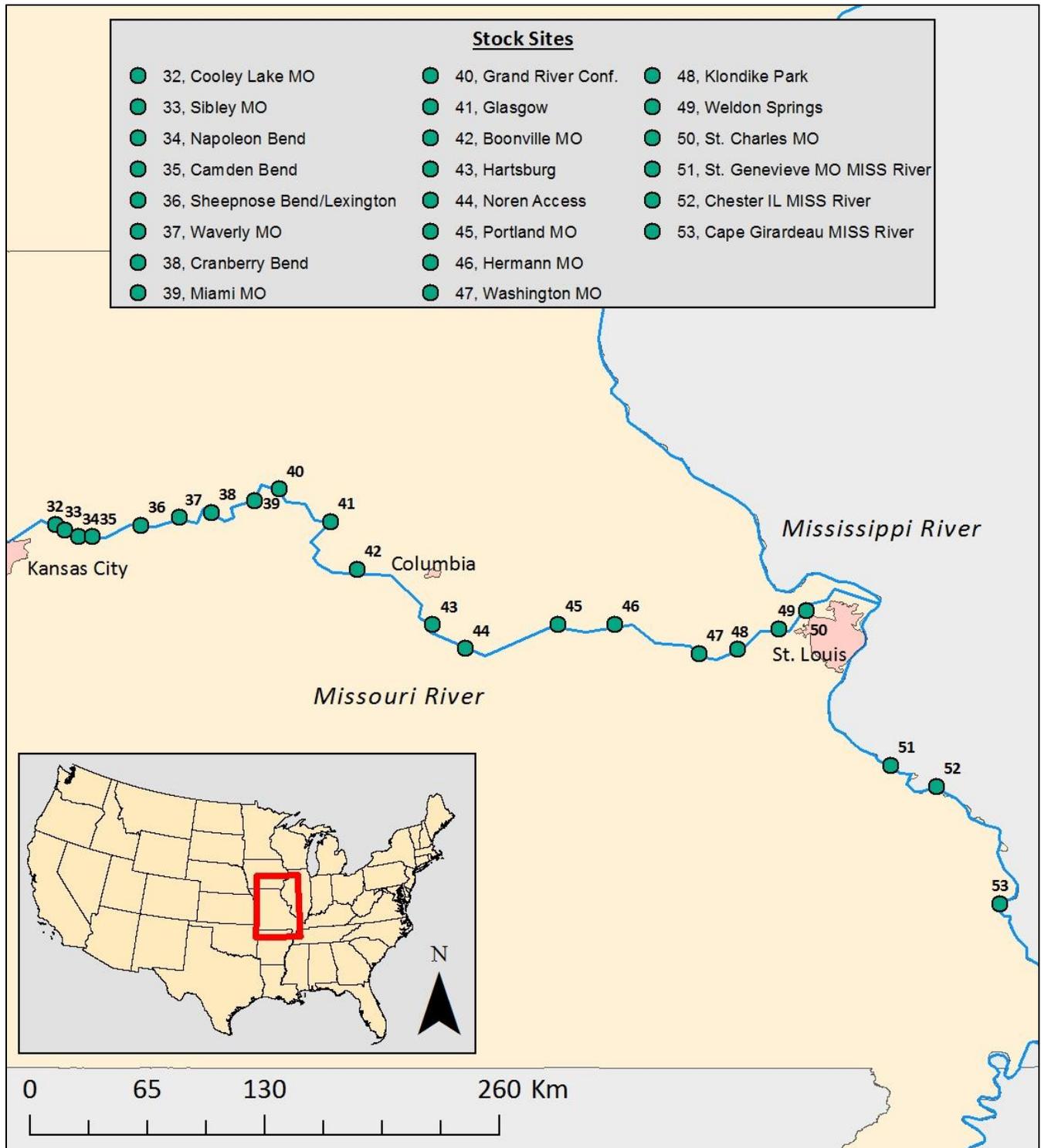
**RPMA #4 Cryopreserved Male Pallid Sturgeon**

<b>Location</b>	<b>Year</b>	<b>PIT Tag</b>	<b>Initial Motility</b>	<b>5 ml straws</b>	<b>0.5 ml straws</b>	<b>Year Spawned</b>	<b>Progeny Stocked</b>
Warm Springs Fish Technology Center	2017	46271B725E	80%	0	93	2017	Pending
Warm Springs Fish Technology Center	2017	462654620D	90%	6	98	2017	Pending
Warm Springs Fish Technology Center	2017	46272D1F4B	95%	0	25	2017	Pending
Warm Springs Fish Technology Center	2017	4626157206	60%	0	85	2017	Pending
Warm Springs Fish Technology Center	2017	4627144425	90%	20	100	2017	Pending
Warm Springs Fish Technology Center	2017	4626513A54	80%	1	100	2017	Pending
Warm Springs Fish Technology Center	2017	4627273956	95%	20	100		
Warm Springs Fish Technology Center	2017	47037B0932	95%	11	100		

Figure 1. Map of RPMA #4 stocking locations.



**Figure 2. Map of RPMA #4 stocking locations Continued.**



## Appendix A. Garrison Dam NFH Diet Regiment

Amount and food type fed at certain length classes varies between tanks in a given year. Prior to 2003 record show feed rates were based on waste in tank to minimize handling. The change from the BioDiet starter to BioDiet Grower usually took place around the end of July to beginning of August. Changeover to Silvercup usually took place at the end of August to early September. Each year it was different.

2001: BioDiet 1mm Grower  
BioDiet 1.3 mm Grower

2002: BioDiet Starter #1 and #3  
BioDiet 1.5mm Grower  
Silvercup #3 Fine Trout Crumbles  
Silvercup 1mm Ext Salmon Sinking

2003: Bloodworms  
Brine Shrimp  
BioDiet Starter #1, #2 and #3.  
BioDiet Grower #3  
Silver Cup Salmon #2  
Silver Cup #3 Fine Trout Crumbles

2004: BioDiet Starter #1, #2 and #3.  
Bloodworms  
BioDiet Grower #3  
Silver Cup Salmon #2

## Appendix B. Gavins Point NFH Diet Regiment

Diets for 2015 and 2016

The starter diet is Otihome B2 plus 20% freeze dried cyclopeeze.

Transition is slowly made off freeze dried cyclopeeze (45 days post hatch) as well as increase particle size Otihome C-1 and C-2.

Diets then transition to a mixture of Otihome and Silver Cup and end up being 100% Silver Cup #2 before stocking.

Feed rates are changed daily to weekly depending on the situation.

Feed to satiation (always have a little wasted feed in each tank).

Don't use a percent body weight to feed the fish. Estimation for percent body weight would be close to this: 12-14% body weight for starter diets then a slow transition to 4-6% body weight by the time stocked.

## Appendix C. Diet Regiments From Blind Pony SFH and Neosho NFH

### Blind Pony SFH Diet Regiment

In 1997 a commercial diet was tried. It didn't work as well as the current process.

From 1998 - 2009, Five days post hatch zooplankton and brine shrimp nauplii are fed. Brine shrimp nauplii are fed at a rate determined by the fish. The fish are fed as much as they will remove from tank in 20 minutes. Zooplankton has been pumped for 2 hours from a pond through a filter bag where it is collected. Zooplankton is evenly distributed throughout all tanks (no way to quantify). As the fish grow graded frozen brine shrimp are added and zooplankton and brine shrimp nauplii are reduced until the fish are eating only frozen brine shrimp. Fish are fed 4-times a day 8 am, 1 pm, 4 pm & 9 pm. As the fish reach about 2 inches they are converted completely to frozen brine shrimp. At this time the fish are moved from the hatchery building (aluminum start tanks) to the sturgeon building (concrete raceways). The number of feedings is reduced from 4 times a day to twice a day 8 am and 4 pm. This continues until the fish are stocked out in late September. Blind Pony Hatchery will continue to use this production process for pallid sturgeon for the foreseeable future.

**2009 Table 1: Feed from fry to 2 inches**

Type	Amount (lbs)	# of Fish
Brine Shrimp Nauplii	23	32,173
Zooplankton	NA	32,173
Frozen Brine Shrimp	97.25	32,173

**2009 Table 2: Feed from 2 inches to stocking**

Type	Amount (lbs)	# of Fish
Brine Shrimp Nauplii	7	11,706
Zooplankton	NA	11,706
Frozen Brine Shrimp	11,215.25	11,706

**2009 Table 3: Total**

Type	Amount (lbs)	# of Fish
Brine Shrimp Nauplii	30	24,690
Zooplankton	NA	24,690
Frozen Brine Shrimp	11312.5	24,690

## **Neosho NFH Diet Regiment**

Pallid sturgeon at Neosho NFH starter diet is brine shrimp nauplii. Fish are fed based on feed association and fed no more than 3 times a day. Fish will continue on this diet until two inches in length, at that point in time the fish will be transition to frozen adult brine.

Feeding regiment for fish greater than two inches is 2X a day; feed association is utilized to determine the amount of food to be fed.

The fish food brands most used at our station are as follow:

### Brine shrimp nauplii

- Argent
- Sanders

### Adult frozen

- San Francisco Bay
- Brine Shrimp Direct.

In years past bloodworms were fed to the 2 inch fish but some of the fish have not transitioned to the new fish food. Frozen brine shrimp conversions have worked very well.

**Appendix D. Tagging and Marking of Hatchery Reared Fish Stocked by Year-Class**

Year Class	Rearing Hatchery	Age at Stocking	Coded Wire Tags	Floy Tag	PIT	Elastomere		Scute # Removed		Notes or Other Markings
						Fish Left Side	Fish Right Side	Fish Left Side	Fish Right Side	
1992	Blind Pony	>Age 1	X	X	X <sup>a</sup>					
1997	Blind Pony	Age 0	X <sup>a</sup>	X	X <sup>a</sup>					Markings varied by site
	Gavins	>Age 1			X	V Orange <sup>b</sup>	V Orange <sup>b</sup>			
1999	Gavins	>Age 1			X		V Yellow <sup>b</sup>			
2001	Garrison	Age 1			X					
	Neosho				X		V Green			
2002	Garrison	Age 1			X					
	Gavins				X	V Yellow	V Red			
	Neosho				X	V Yellow	V Red			
2003	Garrison	Age 0	X				V Pink			
		Age 1	X		X		H Yellow			
	Gavins	Age 1			X		V Yellow			
	Neosho	Age 1			X		H Yellow			
2004	Garrison	Age 1	X		X		H + V Red			Markings varied by site
		Age 0	X		X		H Red			
	Gavins	Age 1			X					
	Neosho	Age 1			X		H Red			
2005	Gavins	Age 1			X		V Yellow			
	Neosho									
2006	Gavins	Age 0	X			H + V Pink	H + V Blue		3rd	Markings varied by site
2007	Gavins	Age 1			X				3rd	
	Neosho	Age 0	X				V Orange			
		≥Age 1			X				4th	
2008	Blind Pony	Age 0				X <sup>c</sup>	X <sup>c</sup>			4th
	Neosho	Age 1			X					4th
2009	Gavins	Age 0			X				5th	
	Blind Pony	Age 0				X <sup>c</sup>	X <sup>c</sup>			5th <sup>d</sup>
	Neosho	Age 1			X				5th	
2010	Garrison	≥Age 1			X					Telemetry tags (Scar on belly)
	Gavins	Age 1			X				5th	Fish part of tag retention study
	Blind Pony	Age 0				X <sup>c</sup>				5th
	Neosho	Age 1			X					5th
2011	Gavins	Age 0			X				6th	
		Age 1			X				6th	
	Blind Pony	Age 0				X <sup>c</sup>			6th	

Year Class	Rearing Hatchery	Age at Stocking	Coded Wire Tags	Floy Tag	PIT	Elastomere		Scute # Removed		Notes or Other Markings
						Fish Left Side	Fish Right Side	Fish Left Side	Fish Right Side	
2011	Neosho	Age 1			X			6th		
2012	Neosho	≥Age 1			X				6th	
2013	Garrison	Age 1			X					Telemetry tags (Scar on belly)
	Gavins	Age 1			X			7th		
	Blind Pony	Age 0				X <sup>c</sup>		7th		
	Neosho	Age 1			X			7th		
2014	Blind Pony	Age 0				X <sup>c</sup>			7th	
	Neosho	Age 0				X <sup>c</sup>			7th	
2015	Gavins	Age 0				X <sup>c</sup>		8th		
		Age 1			X			8th		
2016	Gavins	Age 1			X				8th	

<sup>a</sup> Not all stocked fish were marked with tag, varied among stock sites

<sup>b</sup> Different parental crosses received different elastomeres

<sup>c</sup> Multiple elastomer colors and combinations were varied among stocking sites

<sup>d</sup> Fish scute were removed from the wrong side for the year

**Appendix E. List of stocking locations and abbreviated codes (Referenced in Table 2).**

Stocking Location	Abbreviation	River Mile	PSA Segment
St. Helena, NE	STHE	799	7
James River Confluence	JRCF	798	7
Mulberry Bend	MLBY	775	7
Ponca State Park, NE	PCSP	753	8
Big Sioux River Confluence	BSRC	734	8
Sioux City, IA	SXCY	732.6	8
Sloan, IA	SLON	708.6	8
Decatur, NE	DETR	691	8
Deer Island	DRIL	662.3	8
Wilson Island, IA	WISL	641	8
Boyer Chute	BYCT	637.4	8
Lake Manawa State Park	LMSP	607.1	8
Bellevue, NE	BELL	601.4	8
Platte River Confluence	PRVC	595	9
Platte River	PLRV	PRM, 5	
Platte River, Two Rivers SRA	PRTR	PRM, 40.3	
Tobacco Chute	TBCT	589.1	9
Nebraska City, NE	NECY	563	9
Upper Hamburg Chute	UHCT	554.9	9
Thurnau	THNU	508.5	9
Rulo, NE	RULO	497.9	9
Paynes Landing, MO	PYLD	477.1	9
Worthwine Chute	WWCT	458.5	9
Bon Ton Bend (St. Joseph)	BTBD	451.6	9
Kenmoor Bend	KMBD	438.1	9
Atchison Bend	ATBD	421.9	9
Leavenworth, KS	LVWT	397	9

Stocking Location	Abbreviation	River Mile	PSA Segment
Parkville, MO	PKVL	377.5	9
Kansas River Confluence	KRCN	367.5	9
Kansas City, MO	KNCY	363	10
Liberty, MO	LBTY	351.2	10
Cooley Lake, MO	COLK	339.5	10
Sibley, MO	SBLY	335.8	10
Napoleon Bend	NPBD	331.2	10
Camden Bend	CDBD	327	10
Sheepnose Bend/Lexington	SNLX	311	10
Waverly, MO	WVLY	299	10
Cranberry Bend	CNBY	283.5	10
Miami, MO	MAMI	262.8	10
Grand River Confluence	GRCF	250	13
Glasgow	GLGW	226	13
Boonville, MO	BOVL	195.1	13
Hartsburg	HTBG	160	13
Noren Access (Jefferson City)	NRAS	144	13
Portland, MO	PTLD	114.2	14
Hermann, MO	HRMN	97.6	14
Washington, MO	WSTN	68.5	14
Klondike Park	KDPK	56.3	14
Weldon Springs	WDSG	41	14
St. Charles, MO	STCH	28.5	14
St. Genevieve, MO	STGV	MISS, 122.4	
Chester, IL	CHTR	MISS, 110	
Cape Girardeau, MO	CPGR	MISS, 55	