FY 2007 to 2009 State Wildlife Grant (SWG) Program

State of Illinois - Grant No. T-58-D-1

# Final Report

2012

# Redspotted Sunfish (Lepomis miniatus) reintroduction to Illinois sites of historical distribution

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**INTRODUCTION**

The redspotted sunfish is a Threatened species in Illinois. The Illinois Wildlife Action Plan (IWAP) lists the redspotted sunfish as a Species in Greatest Need of Conservation, with a “strongly decreasing” population trend. The species is highly impacted due to multiple habitat stresses, as well as community and population stresses as defined by the IWAP (page 319). Targeted surveys over the past three years, funded largely by State Wildlife Grant T-14-P1, have confirmed the dire status of this species in the state. Based on this survey information, the redspotted sunfish was subsequently proposed and downgraded to Endangered status as results showed continued decline in recent years. In fact, only two distinct populations with significant numbers of individuals and multiple year classes present were found in the effort.

At several backwater lakes along the Ohio River in southeast Illinois, the redspotted sunfish appeared to be maintaining sizable populations as recent as the 1980's (Burr and Warren 1987). However, our most recent sampling of these lakes indicate the species and its preferred habitat of aquatic vegetation to be absent or only present in very low numbers. In fact, the Cypress Ditch population was the only population throughout southern Illinois we found to be stable.

The situation is similar in west-central Illinois, which was once the species’ stronghold in Illinois waters. The redspotted sunfish is believed to be gone from the mainstem Illinois River. The species appears to rely heavily on habitats with significant stands of aquatic vegetation, and this type of habitat has been eliminated in these waters. The distribution of the redspotted sunfish in this part of the state is now restricted to a couple of small tributaries close to the Illinois River in the Sangamon River basin. A recently-discovered population in Fish Creek was the only population found in west-central Illinois to have significant numbers of individuals across multiple year classes.

These remnant populations are undoubtedly extremely vulnerable to anthropogenic disturbances and increasing frequency of extended drought conditions. Immediate efforts to increase the distribution of the redspotted sunfish is necessary to avoid extirpation and maintain genetic viability of the species in Illinois waters. Genetic analyses of these remnant populations (T-14-P1) support propagation of the remaining individuals as a viable option. Although numbers are low, genetic variability within the populations is still substantial. Offspring produced through captive propagation of Fish Creek individuals were deemed useful to reintroduce the species and establish populations in restored backwater lakes of the Illinois River.

The Emiquon Nature Preserve near Havana, Illinois is the primary target for reintroduction efforts, as this isolated backwater lake possesses the necessary habitat of aquatic vegetation essential to successful establishment of the redspotted sunfish. Reintroduction of this species coincides well with management strategies at the site also. Emiquon is currently at 3900 acres of surface water, down from 4300 acres a year ago.

Other reintroduction sites utilized for translocation of redspotted sunfish to establish additional populations include the restored backwater lakes of Hennepin-Hopper and Spunky Bottoms along the Illinois River, in addition to water bodies with favorable habitat conditions at Banner Marsh Fish and Wildlife Area, Spring Lake State Fish and Wildlife Area, and Snakeden Hollow State Fish and Wildlife Area. The establishment of multiple self-sustaining populations of redspotted sunfish will be a step towards the ultimate goal to de-list the species.

**OBJECTIVES:**

1. Collect a minimum of five pairs per year of redspotted sunfish from Fish Creek, propagate them in rearing ponds, and monitor progress.

2. Stock redspotted sunfish, propagated from Fish Creek broodstock, into receiving waters (currently Emiquon and Mansion Pond at Allerton Park) at a rate of ten to fifty individuals per acre.

3. Monitor Fish Creek redspotted sunfish population and established populations (Emiquon and Mansion Pond) to determine survival, growth rates, and natural reproduction for evidence of sustainability.

4. Monitor redspotted sunfish genetic composition of collected broodstock, the Fish Creek population, propagated offspring, and established populations in receiving waters.

**PRE-PROJECT EXPECTED BENEFITS AND RESULTS:**

Reintroduction efforts will provide insurance against catastrophic events of extirpation of the redspotted sunfish in Illinois waters. Increasing the number of populations of this species will bring this species closer to its historic status in Illinois waters, executing Action Item No. 4 of the Streams Campaign of the Illinois Wildlife Action Plan (IWAP - p. 63). Doing so, will contribute to increased biodiversity and biotic integrity of the fisheries and lead to possible de-listing of the redspotted sunfish, the stated objective for the species (IWAP - p. 319).

Methods will provide assurance of genetic diversity of introduced populations with improved knowledge of genetic characteristics of existing populations (a level 3 threat; IWAP - p. 319). In the process of the project execution, we will also gain knowledge of various aspects of the life history of this poorly known species in Illinois. This will be achieved through rearing pond observations of spawning activities and mark-recapture analyses and observation of population structure through annual sampling.

Expected results will include an established, self-sustaining population of redspotted sunfish in the waters of the Emiquon Nature Preserve (IWAP Streams Campaign Action Item No. 4 - p. 63). A self-sustaining refuge population of redspotted sunfish will be established in Mansion Pond at Allerton Park, as well. Other prospective receiving waters will be considered and evaluated as the project progresses. These prospects will be dependent on site habitat quality, management approval, and our ability to produce adequate numbers of redspotted sunfish in the rearing ponds.

**JOB 1. Collect a minimum of five pairs per year of redspotted sunfish from Fish Creek and propagate them in rearing ponds.**

## PROCEDURES

Redspotted sunfish broodstock were collected from Fish Creek beginning in May of 2008. Broodstock were collected using an electrofishing pushboat equipped with a 3-boom array of electrodes powered by a 4000-watt 3-phased AC Multiquip generator.

An original target minimum of five pairs of redspotted sunfish per rearing pond per year was sought for production. And a target minimum of fifty pairs of adults over the course of several years was sought to comprise the broodstock for producing individuals for establishing reintroduced populations. This target was to be achieved through additional pairs, rearing ponds, or years of production as the project progressed. However, our management approach was necessarily adapted as Fish Creek was sampled at multiple sites, and redspotted sunfish were found to only be present in the 991-meter reach immediately upstream of Wolf Lake. Although the mature redspotted sunfish collected and utilized for pond propagation were returned each year to Fish Creek, the source population from this relatively short reach dwindled as aquatic vegetation was eliminated from the creek. As the density of aquatic vegetation dissipated in the creek, catch rates of redspotted sunfish quickly suffered, necessitating the decision to discontinue the removal of mature individuals from the population. Successful establishment of highly productive refuge populations further allowed this selected course of action and still meet our goals.

All adult redspotted sunfish collected from Fish Creek were implanted with passive integrated transponders (PIT tags) to identify individuals. Broodfish were transported directly to rearing ponds and stocked. Rearing ponds at
Perdueville (1 acre) and the Illinois Natural History Survey in Urbana (1/6 acre) in east-central Illinois were secured for redspotted sunfish production.

Fish Creek adults were used for only a single season of production in the rearing ponds to ensure genetic variability. Tagged individuals collected in subsequent years were recorded and returned to the stream.

**RESULTS**

In 2008, 24 mature redspotted sunfish from Fish Creek were stocked into two 1/6-acre ponds at the Illinois Natural History Survey (INHS) in Champaign on May 16th. The sex ratio was determined to be 9 males and 15 females. Sizes ranged from 100 to 130 mm, with the males being the larger individuals. All individuals were clipped from their upper or lower caudal fin for genetic samples, and their dorsal and anal spines were clipped for unique identification.

| FISH NO. | SEX | LENGTH | CLIP | | FISH NO. | SEX | LENGTH | CLIP |
|---|---|---|---|---|---|---|---|---|
| 1 | M | 125 | UC 1-1 | | 14 | F | 104 | LC 2-4 |
| 2 | F | 100 | LC 1-2 | | 15 | F | 116 | LC 2-5 |
| 3 | F | 103 | LC 1-3 | | 16 | F | 115 | LC 2-6 |
| 4 | M | 122 | UC 1-4 | | 17 | F | 94 | LC 2-7 |
| 5 | F | 108 | LC 1-5 | | 18 | M | 123 | UC 2-8 |
| 6 | M | 121 | UC 1-6 | | 19 | M | 120 | UC 2-9 |
| 7 | F | 107 | LC 1-7 | | 20 | F | 108 | LC 2-10 |
| 8 | M | 127 | UC 1-8 | | 21 | M | 130 | UC 3-1 |
| 9 | F | 109 | LC 1-9 | | 22 | M | 126 | UC 3-2 |
| 10 | F | 112 | LC 1-10 | | 23 | F | 103 | LC 3-3 |
| 11 | F | 100 | LC 2-1 | | 24 | F | 101 | LC 3-4 |
| 12 | F | 103 | LC 2-2 | | | | | |
| 13 | F | 102 | LC 2-3 | | | | | |
| | | | | | | | | |

**Table 1.** 2008 redspotted sunfish broodstock. Fish number 1 to 13 were stocked into Pond D and fish number 14 to 24 were stocked into Pond E at the Illinois Natural History Survey in Champaign, Illinois. UC=upper caudal clip. LC=lower caudal clip. The first number represents the number of the anal spine clipped, and the second number represents the number of the dorsal spine clipped.

In 2009, a total of 34 redspotted sunfish from Fish Creek were stocked into two 1/6-acre INHS ponds in Champaign. These fish were collected in three sampling events on April 17th, May 27th, and June 8th. The sex ratio was determined to be 15 males and 19 females. Sizes ranged from 92 to 151 mm. All individuals were clipped from their upper or lower caudal fin for genetic samples, and their dorsal and anal spines were clipped for unique identification.


**Figure 1.** Illinois Natural History Survey pond. **Figure 2.** Perdueville rearing pond.

| FISH NO. | SEX | LENGTH | CLIP | DATE | FISH NO. | SEX | LENGTH | CLIP | DATE |
|---|---|---|---|---|---|---|---|---|---|
| 1 | M | 136 | UC 0-1 | 4/17/2009 | 18 | F | 114 | LC 1-1 | 6/8/2009 |
| 2 | M | 126 | UC 0-2 | 4/17/2009 | 19 | F | 114 | LC 1-2 | 6/8/2009 |
| 3 | M | 120 | UC 0-3 | 4/17/2009 | 20 | M | 126 | UC 1-1,3 | 6/8/2009 |
| 4 | M | 116 | UC 0-4 | 4/17/2009 | 21 | F | 131 | LC 1-4 | 6/8/2009 |
| 5 | M | 92 | UC 0-5 | 4/17/2009 | 22 | F | 114 | LC 1-5 | 6/8/2009 |
| 6 | M | 102 | UC 0-6 | 4/17/2009 | 23 | M | 121 | UC 1-6 | 6/8/2009 |
| 7 | F | 120 | LC 0-7 | 5/27/2009 | 24 | M | 133 | UC 1-8 | 6/8/2009 |
| 8 | F | 110 | LC 0-8 | 5/27/2009 | 25 | M | 133 | UC 2-1 | 6/8/2009 |
| 9 | F | 127 | LC 0-9 | 6/8/2009 | 26 | M | 151 | UC 2-3 | 6/8/2009 |
| 10 | F | 109 | LC 0-10 | 6/8/2009 | 27 | F | 111 | LC 2-5 | 6/8/2009 |
| 11 | F | 115 | LC 1-7 | 6/8/2009 | 28 | F | 108 | LC 2-6 | 6/8/2009 |
| 12 | F | 118 | LC 1-9 | 6/8/2009 | 29 | F | 106 | LC 2-7 | 6/8/2009 |
| 13 | F | 110 | LC 1-10 | 6/8/2009 | 30 | F | 113 | LC 2-8 | 6/8/2009 |
| 14 | M | 119 | UC 2-2 | 6/8/2009 | 31 | M | 129 | UC 2-9 | 6/8/2009 |
| 15 | F | 107 | LC 2-4 | 6/8/2009 | 32 | F | 103 | LC 2-10 | 6/8/2009 |
| 16 | F | 117 | LC 3-1 | 6/8/2009 | 33 | F | 115 | LC 3-2 | 6/8/2009 |
| 17 | M | 146 | UC 3-4 | 6/8/2009 | 34 | M | 135 | UC 3-3 | 6/8/2009 |

**Table 2.** 2009 redspotted sunfish broodstock. Fish number 1 to 17 were stocked into Pond B and fish number 18 to 34 were stocked into Pond E at the Illinois Natural History Survey in Champaign, Illinois. UC=upper caudal clip. LC=lower caudal clip. The first number represents the number of the anal spine clipped, and the second number represents the number of the dorsal spine clipped.

Fish Creek experienced perpetual high water conditions throughout 2009, which preempted the appearance of large numbers of small grass carp in the stream. Aquatic vegetation was nearly non-existent during our surveys of fall 2009 through the spring of 2012.

In 2010, we were only able to collect four redspotted sunfish 99 to 122 mm that were kept for pond propagation. Two were collected on April 21st and two were collected on May 11th. These four fish were stocked into the Perdueville rearing pond, near Gibson City, Illinois. The fish were not sexed or fin-clipped, but they were PIT-tagged prior to returning them to Fish Creek. The redspotted sunfish were poly-cultured with state-threatened species starhead topminnows (*Fundulus dispar*) and ironcolor shiners (*Notropis chalybaeus*) in this 1/2-acre pond.

| FISH NO. | LENGTH | DATE |
|---|---|---|
| 1 | 99 | 4/21/2010 |
| 2 | 114 | 4/21/2010 |
| 3 | 108 | 5/11/2010 |
| 4 | 122 | 5/11/2010 |

**Table 3.** 2010 redspotted sunfish broodstock. These fish were stocked into the Perdueville rearing pond, near Gibson City, Illinois.

In 2011, we decided not to collect additional redspotted sunfish broodstock from Fish Creek. This decision was based on the fact that the refuge populations established with past stockings from the previous years of pond propagation continued to do very well and would likely benefit very little from additional stockings. The sharp decline in the Fish Creek population following the loss of aquatic vegetation also prompted this decision. A population survey in Fish Creek on June 13, 2011 validated this decision when only four mature redspotted sunfish were collected (3 new captures 135-149 mm and 1 recapture 153 mm).

In 2012, the Fish Creek population continued to produce low numbers with only four questionably mature individuals collected on May 23, 2012. these fish ranged from 90 to 103 mm. None were removed for continued pond propagation.

**Job 2. Stock redspotted sunfish, propagated from Fish Creek broodstock, into receiving waters (currently Emiquon and Mansion Pond at Allerton Park) at a rate of ten to fifty individuals per acre.**

**RESULTS**

2008 pond production was estimated to be over 4,000 YOY redspotted sunfish. 175 individuals were stocked into Mansion Pond at Allerton Park (a refuge pond for rare fish species of the Sangamon River basin) on October 28, 2008. Mansion Pond is just over two acres in surface area, so the target stocking rate was exceeded with the single stocking. Other fish species being maintained in the pond with redspotted sunfish are lake chubsuckers (*Erimyzon sucetta*), ironcolor shiners (*Notropis chalybaeus*), and starhead topminnows (*Fundulus dispar*).

The remainder of the 2008 fish (approximately 4,000 individuals) were stocked into 72-acre Fish Preserve Lake, a protected water body at Emiquon Nature Preserve on October 29, 2008. The target stocking rate for this refuge lake was also met in the first year (at approximately 55 per acre).

The 2009 pond harvest was estimated at about 2,600 individuals. As stocking goals for Mansion Pond were met in 2008, all of these were stocked into Fish Preserve Lake at Emiquon Nature Preserve. This brought the stocking rate to nearly 92 per acre for Fish Preserve Lake.

In 2010, pond harvest was estimated to be about 2,000 individuals. All of these were stocked into Fish Preserve Lake at Emiquon Nature Preserve, bringing the overall stocking rate to approximately 119 per acre. Other fish species added to the population of Fish Preserve Lake are starhead topminnows (*Fundulus dispar*) and ironcolor shiners (*Notropis chalybaeus*). Contaminant species discovered in the lake include common carp (*Cyprinus carpio*), gizzard shad (*Dorosoma cepedianum*), and black bullheads (*Ameiurus melas*).

Pond propagation was discontinued after the 2010 season.

**Figure 3.** Mansion Pond Aquatic Refuge at Allerton Park.

**Figure 4.** Fish Preserve Lake at Emiquon Nature Preserve.


**Figure 5.** Signage at Fish Preserve Lake at Emiquon Nature Preserve.

**Figure 6.** Jim Walker of the Illinois Department of Natural Resources, Division of Fisheries stocking redspotted sunfish at Fish Preserve Lake.

**Figure 7.** Rob Hilsabeck, Illinois Department of Natural Resources District Fisheries Biologist (left) and Tharran Hobson of The Nature Conservancy (right) stocking redspotted sunfish at Fish Preserve Lake.

**Figures 8-9.** Young-of-the-year redspotted sunfish produced in 2008 were significantly larger at the time of harvest than those from the subsequent years. This may have been due to fathead minnows (*Pimephales promelas*) also being present in the rearing pond that year.

**Job 3. Monitor Fish Creek redspotted sunfish population and established populations (Emiquon and Mansion Pond) to determine survival, growth rates, and natural reproduction for evidence of sustainability.**

## PROCEDURES

The redspotted sunfish population of Fish Creek has been monitored regularly twice per year in the spring and fall. The same 991-meter reach is surveyed during each event. The reach is bordered by culverted road crossings at the downstream and upstream limits. The reach is electrofished with a pushboat equipped with a 3-boom array of electrodes powered by a 4000-watt AC 3-phase Muliquip generator. The reach is surveyed from downstream-to-upstream and upstream- to-downstream, hugging the right bank in each direction. Although electrofishing times vary among sampling events, the same reach is covered each time. Therefore, the collection results are treated as equivalent here, expressed as total numbers rather than catch rates.

## FISH CREEK - SPRING SURVEY RESULTS

In 2008, 47 redspotted sunfish were collected in one sampling event on May 16th. 24 of these fish were considered mature and 23 immature. Sizes ranged from 20 to 130 mm, with a mean of 66.8 mm.

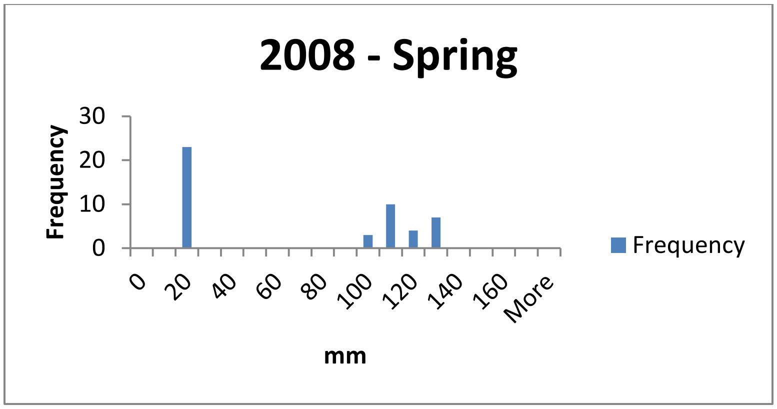


**Figure 10.** Spring 2008 Fish Creek redspotted sunfish size distribution.

In 2009, 43 redspotted sunfish were collected in three sampling events on April 17th, May 27th, and June 8th, including recaptures of three fish (137, 144, and the largest at 153 mm) returned from the rearing ponds in 2008. Though catch rates are not directly comparable, the data is useful for expressing the size distribution of the collected fish. All but seven of these fish appeared to be mature. Sizes ranged from 66 to 153 mm. Due to the large number of small individuals missing from the sample, as compared to 2008, the mean length increased dramatically to 114.4 mm.

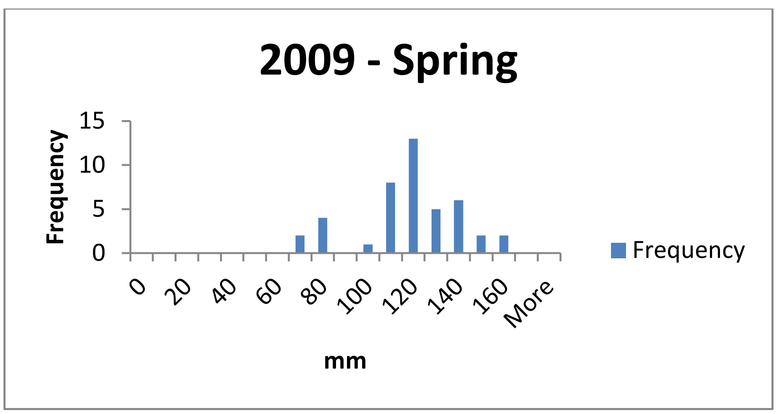


**Figure 11.** Spring 2009 Fish Creek redspotted sunfish size distribution.

In 2010, catch rates dropped significantly. Beginning in the fall of 2009, we witnessed a drastic reduction in the amount of aquatic vegetation present in Fish Creek. Perpetual high water in 2009 brought schools of small grass carp (*Ctenopharyngodon idella*) into the targeted reach of Fish Creek. Whether it was the grass carp, or the wet conditions that may have flushed herbicides from the agriculture-dominated watershed, or a combination of impacts is unknown. But the loss of aquatic vegetation in Fish Creek had a dramatic impact on the redspotted sunfish population.

In two sampling events on April 21st and May 11th, we collected 11 individuals (4 in April and 7 in May). Six of these fish were recaptures from broodstock returned to Fish Creek from previous years (1 from 2008 at 146 mm and 5 from 2009 at 132, 136, 137, 137, and 158 mm). Therefore, over half of the fish we collected in the spring of 2010 were mature individuals that we had returned to the stream. Only one immature individual at 40 mm was collected. The size range was 40 to 158 mm, with a mean length of 120.8 mm.

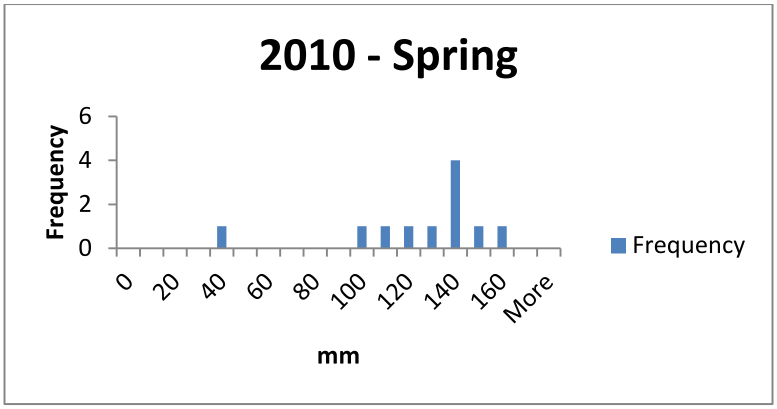


**Figure 12.** Spring 2010 Fish Creek redspotted sunfish size distribution.

In 2011, catch rates continued to decline with only four redspotted sunfish collected on June 13th. All of these were large mature fish with a size range of 135 to 153 mm and a mean length of 143 mm. The lack of smaller individuals was alarming and a likely indication that successful reproduction had not recently taken place in Fish Creek.

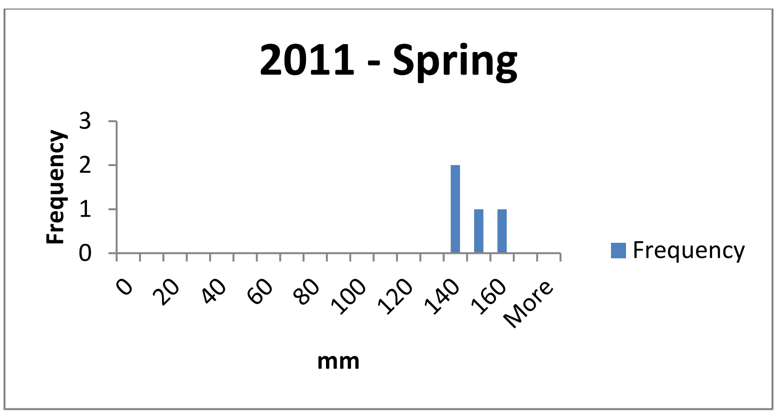


**Figure 13.** Spring 2011 Fish Creek redspotted sunfish size distribution.

In 2012, catch rates were again very low with five redspotted sunfish collected on May 23rd. Interestingly, the large individuals were now missing from our collection and smaller individuals were now present. The sizes ranged from 53 to 103 mm, with a mean length of 79.6 mm. The size range indicates that successful reproduction likely did occur in 2011, albeit minimal.

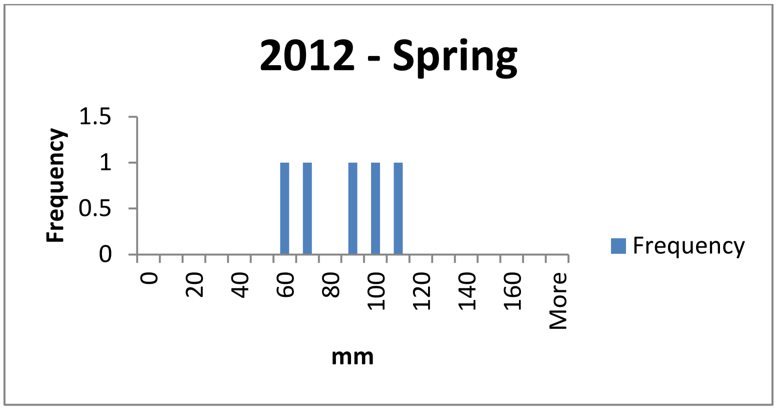


**Figure 14.** Spring 2012 Fish Creek redspotted sunfish size distribution.

**FISH CREEK - SPRING SURVEY DISCUSSION**

The four years (2008-2012) of spring surveys of Fish Creek indicate a vulnerable and unstable redspotted sunfish population. Highest catch rates of immature individuals occurred in 2008, showing relatively good reproduction success. The presence of these small individuals in the spring sample probably represent a late spawning event in 2007.

The 2009 spring survey results produced a wide size range of individuals. Although the very small fish were not present, this collection was most representative of a healthy functioning population.

2010 was the first indication of a struggling population, impacted strongly by the loss of aquatic vegetation. The collection of low numbers has persisted through 2011-2012, with aquatic vegetation still sparse in the target reach of Fish Creek.

The presence of smaller individuals in the 2012 spring sample offer a glimmer of hope that a low rate of successful reproduction is still taking place in the continued absence of aquatic vegetation. Field observations tell us that the redspotted sunfish may be finding refuge among woody growth from terrestrial vegetation. The apparent loss of large individuals from the 2012 collection is perplexing, though.

Future samples in the coming years will be interesting. 2012 produced drought conditions that reduced the target reach of Fish Creek to almost nothing. There may be positive effects from the drought that may allow vegetation to rebound when stable water levels return. On the other hand, the drought may have been the final impact to an already struggling population, damaging enough to cause an extirpation event.

**Figures 15-16.** Two photos of Fish Creek showing the abundance of aquatic vegetation up until 2009 (left) and the dramatic reduction of aquatic vegetation following 2009 (right).

**FISH CREEK - FALL SURVEY RESULTS**

To monitor the redspotted sunfish population in Fish Creek, we initiated a standardized fall survey of the targeted 991-meter reach. The reach is bordered by culverted road crossings at the downstream and upstream limits. The reach is electrofished with a pushboat equipped with a 3-boom array of electrodes powered by a 4000-watt AC 3-phase Muliquip generator. The reach is surveyed from downstream-to-upstream and upstream-to-downstream, hugging the right bank in each direction. Although electrofishing times vary among sampling events, the same reach is covered each time. Therefore, the collection results are treated as equivalent here, expressed as total numbers rather than catch rates.

The 2008 survey on October 24th, prior to the return of broodstock to Fish Creek, produced 25 individuals. The size range was 49 to 128 mm, with a mean length of 89.9 mm.

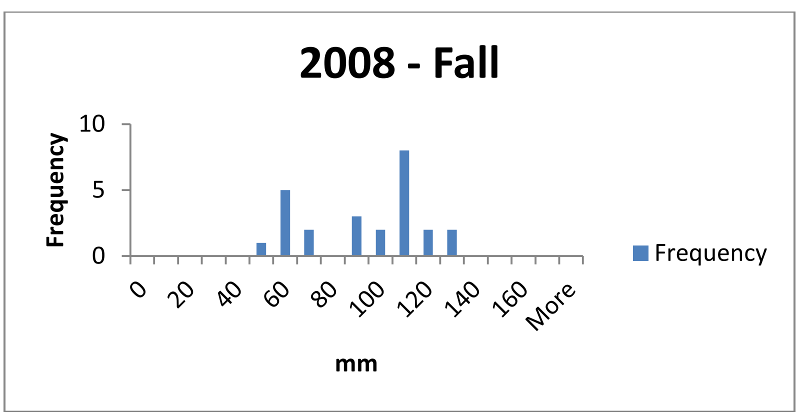


**Figure 17.** Fall 2008 Fish Creek redspotted sunfish size distribution.

The 2009 survey on October 1st, prior to the return of broodstock to Fish Creek, reflected the initial impacts of the loss of vegetation. As discussed earlier, perpetual high water conditions throughout 2009 brought schools of grass carp and probably an influx of agricultural herbicides to the target reach of Fish Creek. This resulted in a nearly complete elimination of aquatic vegetation that has had severe and continued impact to the vulnerable redspotted sunfish population of Fish Creek. The results of the 2009 survey were 6 redspotted sunfish with a size range of 52 to 123 mm and a mean length of 98.2 mm. A wide range of sizes was represented, but overall numbers were significantly reduced to 24% of the 2008 totals.

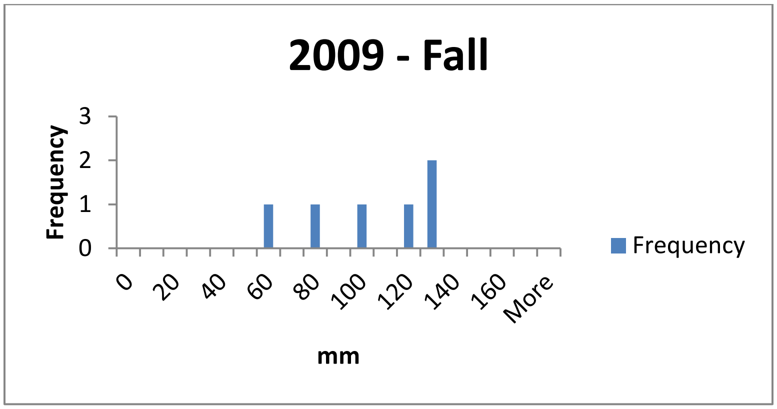


**Figure 18.** Fall 2009 Fish Creek redspotted sunfish size distribution.

The 2010 fall survey was conducted on October 20th. The number of individuals collected rebounded somewhat, due to what appeared to be a successful spawn. However, the number of mature fish was low. Since only four mature individuals were removed for pond propagation efforts in 2010, this low number could not be explained, except for the observation that the sparse vegetation is no longer effectively holding a substantial number of mature fish. We do not know if the mature individuals moved from the area and sought refuge elsewhere, or if they succumbed to increased predation and/or competition with other sunfish species better adapted to these new conditions. 20 individuals were collected with a size range of 42 to 135 mm and a mean length of 59.4 mm. Only three of these fish were mature at 104, 107, and 135 mm.

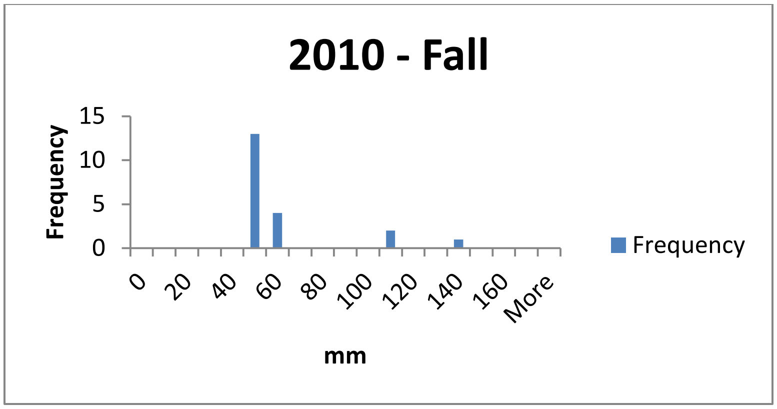


**Figure 19.** Fall 2010 Fish Creek redspotted sunfish size distribution.

The 2011 fall survey of Fish Creek was conducted on October 13th. The results of the survey were extremely disheartening with only a single immature redspotted sunfish at 44 mm collected. Fortunately six individuals were collected in the spring of 2012, so this was not the end of the Fish Creek population.

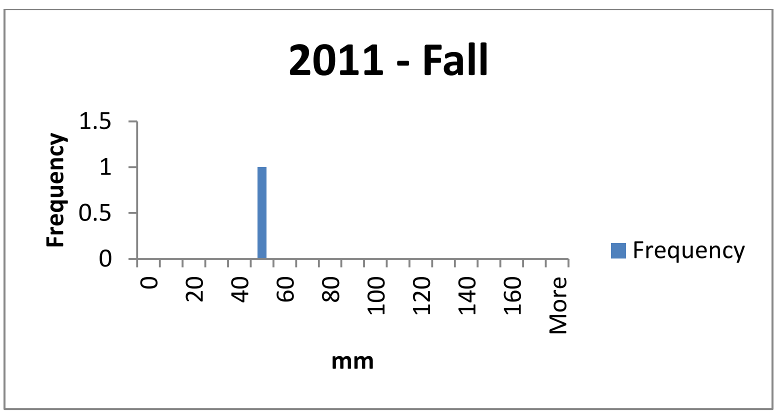


**Figure 20.** Fall 2011 Fish Creek redspotted sunfish size distribution.

The Fish Creek population was not surveyed in the fall of 2012, due to drought conditions that left Fish Creek nearly desiccated. Future surveys in the coming years will tell us if the redspotted sunfish population of Fish Creek will be able to rebound from this bout.

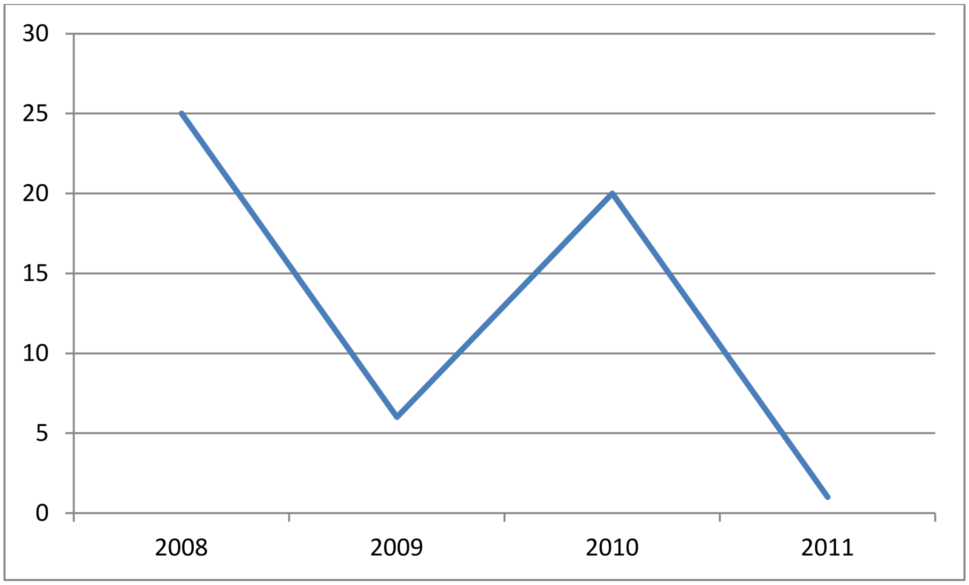


**Figure 21.** Declining catch rates from the fall surveys of Fish Creek.

## FISH CREEK HABITAT MITIGATION

Following the loss of aquatic vegetation during 2009, it became clear that the redspotted sunfish population was strongly dependent on the availability of habitat. From our observations in Fish Preserve Lake and the affinity of redspotted sunfish for a beaver hut in the lake, we attempted to create woody habitat in Fish Creek. The hope was to provide a sufficient amount of woody habitat to sustain redspotted sunfish numbers in the stream until aquatic vegetation had a chance to recover.

Six woody habitat structures were placed into Fish Creek on June 13, 2011. The structures were placed adjacent to the woody cover of button bush present along the stream banks, as this was the habitat where the few numbers of redspotted sunfish were being collected.

Unfortunately, the dry conditions that have persisted since this time have left these structures above the waterline most of the time. The structures' true utility as redspotted sunfish habitat will not be realized until normal flow conditions return to Fish Creek.

**Figures 22-23.** Woody habitat structures placed in Fish Creek to mitigate the loss of aquatic vegetation.

## MANSION POND AQUATIC REFUGE

Mansion Pond Aquatic Refuge is a two-acre pond at Allerton Park in Monticello, Illinois (Figure 3). This pond was rehabilitated for the establishment of a refuge for rare and declining fish species of the Sangamon River basin. Populations of lake chubsuckers (*Erimyzon sucetta*), ironcolor shiners (*Notropis chalybaeus*), and starhead topminnows (*Fundulus dispar*) had been previously established in the pond when 175 redspotted sunfish were stocked on October 26, 2008 from the first year of propagation efforts.

## MONITORING PROCEDURES

The Mansion Pond population of fishes is sampled with two mini-fyke nets set for 24 hours in the late fall. These nets appear to be very efficient in the sampling of redspotted sunfish and the other species, except starhead topminnows.

## RESULTS

Mansion Pond was first surveyed on November 3, 2009. We quickly learned that the redspotted sunfish spawned in the pond as age-1 fish. 491 redspotted sunfish were collected in the two nets. The 2009 redspotted sunfish population was dominated by 20 to 60 mm young-of-the-year, with the highest numbers in the 20-mm range (46.8%). The fish stocked in 2008 were now in the 120 to 143-mm range and represented about 5.3% of the redspotted sunfish population in the pond. In addition to the redspotted sunfish, 239 lake chubsuckers (30-182 mm) and 327 ironcolor shiners (30-60 mm) were also collected.

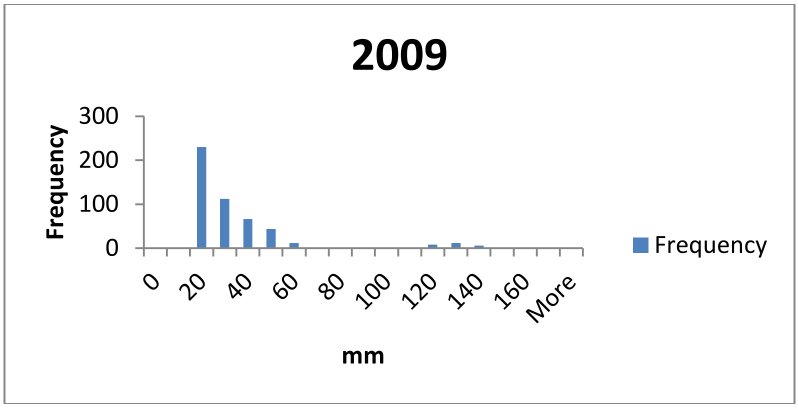


**Figure 24.** 2009 Mansion Pond redspotted sunfish size distribution.

The second survey of Mansion Pond was conducted on November 23, 2010. 951 redspotted sunfish were collected. Sizes ranged from 20 to an impressive 170 mm, with highest numbers in the 60-mm range (19.3%). In addition to the redspotted sunfish, 75 lake chubsuckers (38-208 mm) and 3 ironcolor shiners (50-52 mm) were also collected. It appears that the redspotted sunfish have quickly become the most dominant species in the pond, causing profound reductions in the numbers of the other fish species present (a 69% reduction in lake chubsuckers and a 99% reduction in ironcolor shiners).

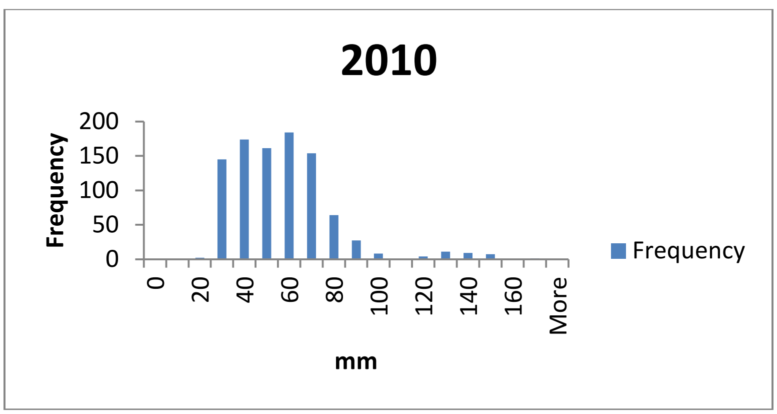


**Figure 25.** 2010 Mansion Pond redspotted sunfish size distribution.

The third survey of Mansion Pond was conducted on October 21, 2011. 384 redspotted sunfish were collected, which was about 40% of the numbers collected the previous year. The apparent reduction in the redspotted sunfish population is unexplained. Sizes ranged from 38 to 155 mm, with highest numbers in the 50-mm range (35.4%). In addition to the redspotted sunfish, 22 lake chubsuckers (62-109 mm) and 14 ironcolor shiners (54-64 mm) were also collected. It may be possible that the nets did not sample well during the 2011 survey, though there is no indication as to why this would be the case.

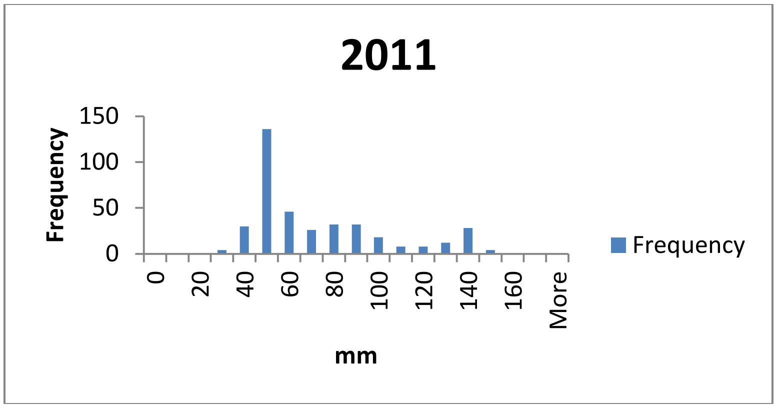


**Figure 26.** 2011 Mansion Pond redspotted sunfish size distribution.

The fourth survey of Mansion Pond was conducted on October 23, 2012. Numbers for all species rebounded significantly. 2536 redspotted sunfish were collected, which more than doubled the highest catch rate to date. Sizes ranged from 36 to 163 mm, with highest numbers in the 60-mm range (46.3%). In addition to the redspotted sunfish, 150 lake chubsuckers (70-196 mm) and 42 ironcolor shiners were also collected.

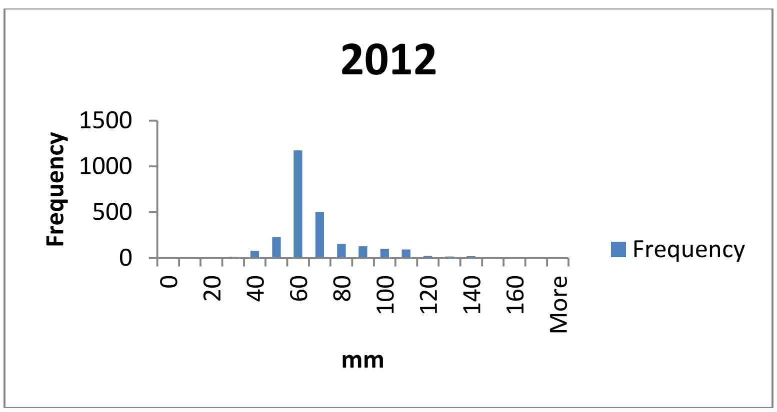


**Figure 27.** 2012 Mansion Pond redspotted sunfish size distribution.

Redspotted sunfish have responded well to life in Mansion Pond. They spawned successfully at age-1 and have proven to be prolific spawners in all years. The redspotted sunfish have induced reductions in the numbers of the other fish species in the pond (i.e., lake chubsuckers and ironcolor shiners). The starhead topminnows are effectively sampled with the mini-fyke nets, but they have likely responded similarly to the introduction of redspotted sunfish. Another interesting effect of the redspotted sunfish was the impact on the crayfish population. Prior to the stocking of the redspotted sunfish, the crayfish population was flourishing in the pond without the presence of an effective predatory species. The crayfish had overwhelmed the pond and decimated the aquatic vegetation. The redspotted sunfish began to have a noticeable impact on the crayfish within a year of their introduction to the pond. By 2011, the only crayfish present in the nets were large adults. And in 2012, no crayfish were collected in the nets. As the crayfish population was reduced, aquatic vegetation returned to the pond to the point that it needed to be treated with targeted herbicides to keep it in check aesthetically.

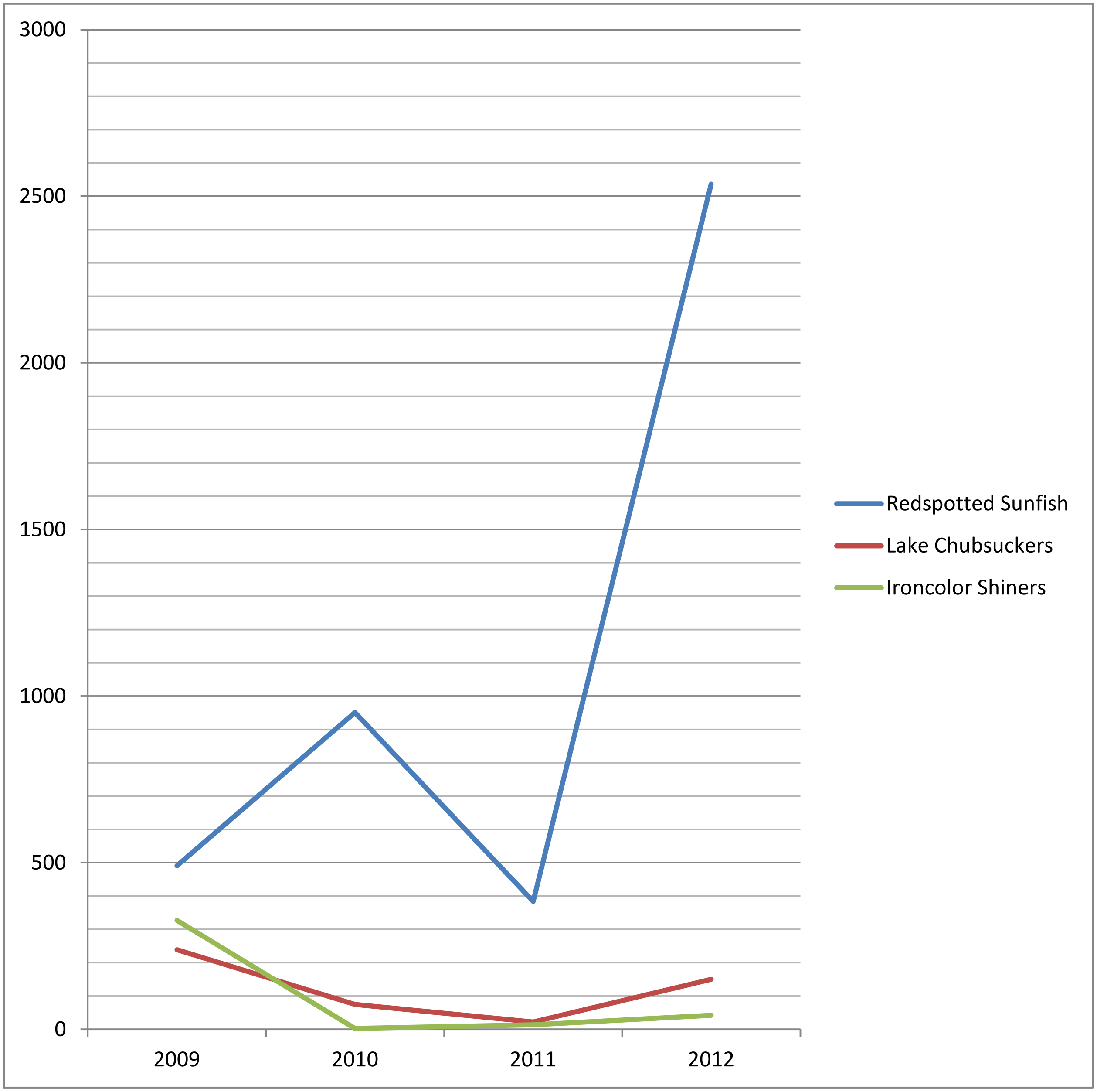


**Figure 28.** Comparative survey results for three fish species of Mansion Pond Aquatic Refuge.

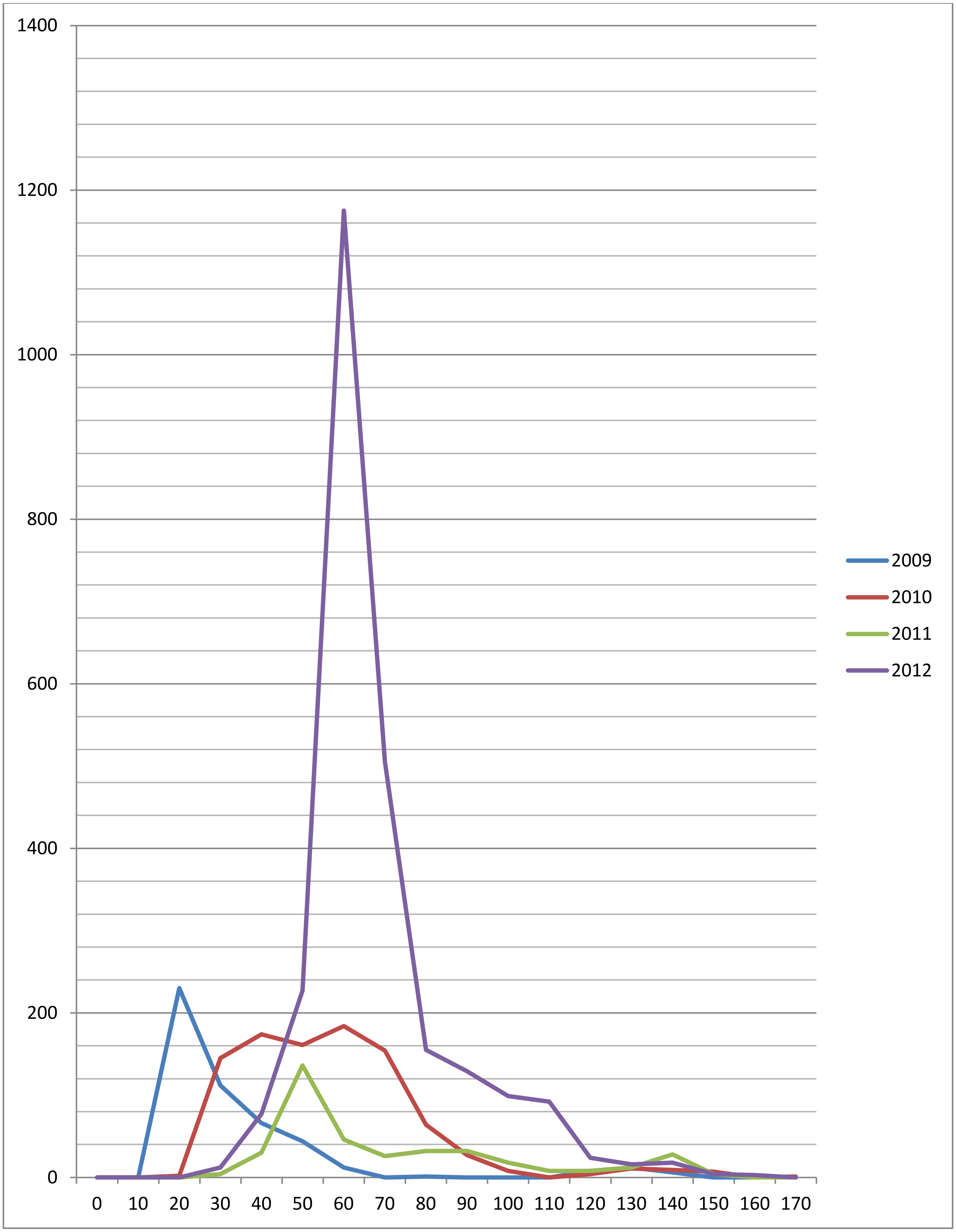


**Figure 29.** Size distribution in millimeters of redspotted sunfish in Mansion Pond over their first 4-year period in the pond.

## FISH PRESERVE LAKE

Fish Preserve Lake at Emiquon Nature Preserve near Havana, Illinois is a 72-acre lake that was rehabilitated to serve as a refuge for rare fish species. The lake is owned by The Nature Conservancy.

Fish Preserve Lake received stockings of redspotted sunfish from our pond propagation efforts in 2008, 2009, and 2010. Stockings were estimated at over 4,000 in 2008, 2,600 in 2009, and 2,000 in 2010. All of these were offspring of broodfish from nearby Fish Creek.

Other rare fish species stocked into Fish Preserve Lake are starhead topminnows (*Fundulus dispar*) and ironcolor shiners (*Notropis chalybaeus*). Both of these species appear to be doing well in the lake.

In addition to the stocked fish species, common carp (*Cyprinus carpio*), gizzard shad (*Dorosoma cepedianum*), and black bullheads (*Ameiurus melas*) have shown up in the lake as contaminants. The populations of these species appear to be increasing rapidly in the lake.

## PROCEDURES

Fish Preserve Lake has been surveyed multiple times by DC boat electrofishing. The surveys have not been standardized, as we have typically electrofished until we collect a representative sample. The majority of the redspotted sunfish in the lake are usually encountered along grassed banks, woody debris, and a particularly productive beaver hut.

**Figures 30-31.** The beaver hut in Fish Preserve Lake and the abundant redspotted sunfish that are typically electrofished from it.

## RESULTS

Fish Preserve Lake was first surveyed on September 1, 2009. As the lake was first stocked in 2008, this survey clearly showed that the redspotted sunfish had spawned as age-1 fish. 446

redspotted sunfish were collected in 30.5 minutes of electrofishing (CPUE=875 per hour). Sizes ranged from 19 to 146 mm. Highest numbers were in the 30-mm range with 40.8% of the total. 51 starhead topminnows and 1 ironcolor shiner were also collected.

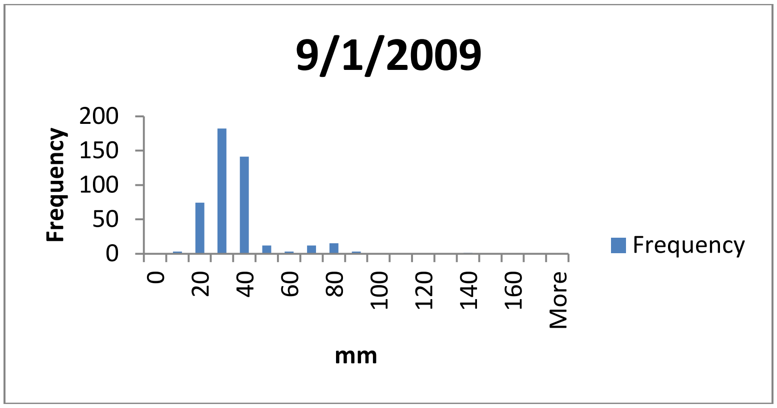


**Figure 32.** September 1, 2009 Fish Preserve Lake redspotted sunfish size distribution.

**Figure 33.** Young-of-the-year redspotted sunfish collected from Fish Preserve Lake in 2009.

A survey of Fish Preserve Lake for translocation purposes on May 6, 2010 produced 634 redspotted sunfish 42 to 123 mm in 13.1 minutes of electrofishing (CPUE=2882 per hour).

On September 27, 2010, Fish Preserve Lake was electrofished for 11.5 minutes and produced 1,700 redspotted sunfish 20 to 151 mm (CPUE=8947 per hour). This effort also produced approximately 500 ironcolor shiners, 50 starhead topminnows, 500 gizzard shad, 9 common carp, and 1 black bullhead.

On October 24, 2011, Fish Preserve Lake was electrofished for 16.7 minutes and produced 463 redspotted sunfish 27 to 169 mm (CPUE=1654 per hour), with highest numbers in the 80-mm range (23.3%). This survey also produced 4 ironcolor shiners, 20 common carp, 6 gizzard shad, and 5 black bullheads.

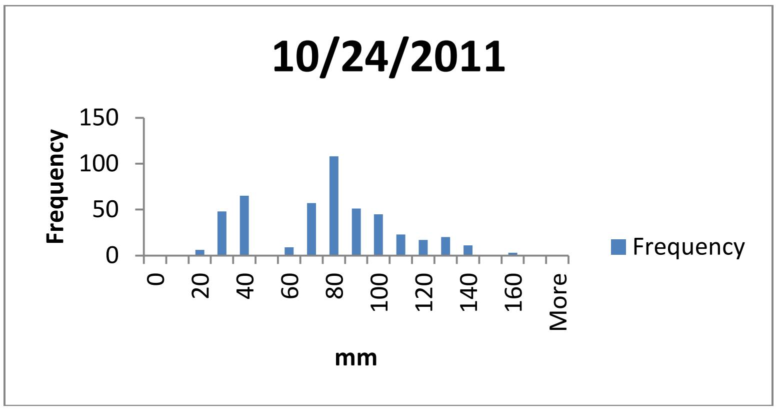


**Figure 34.** October 24, 2011 Fish Preserve Lake redspotted sunfish size distribution.

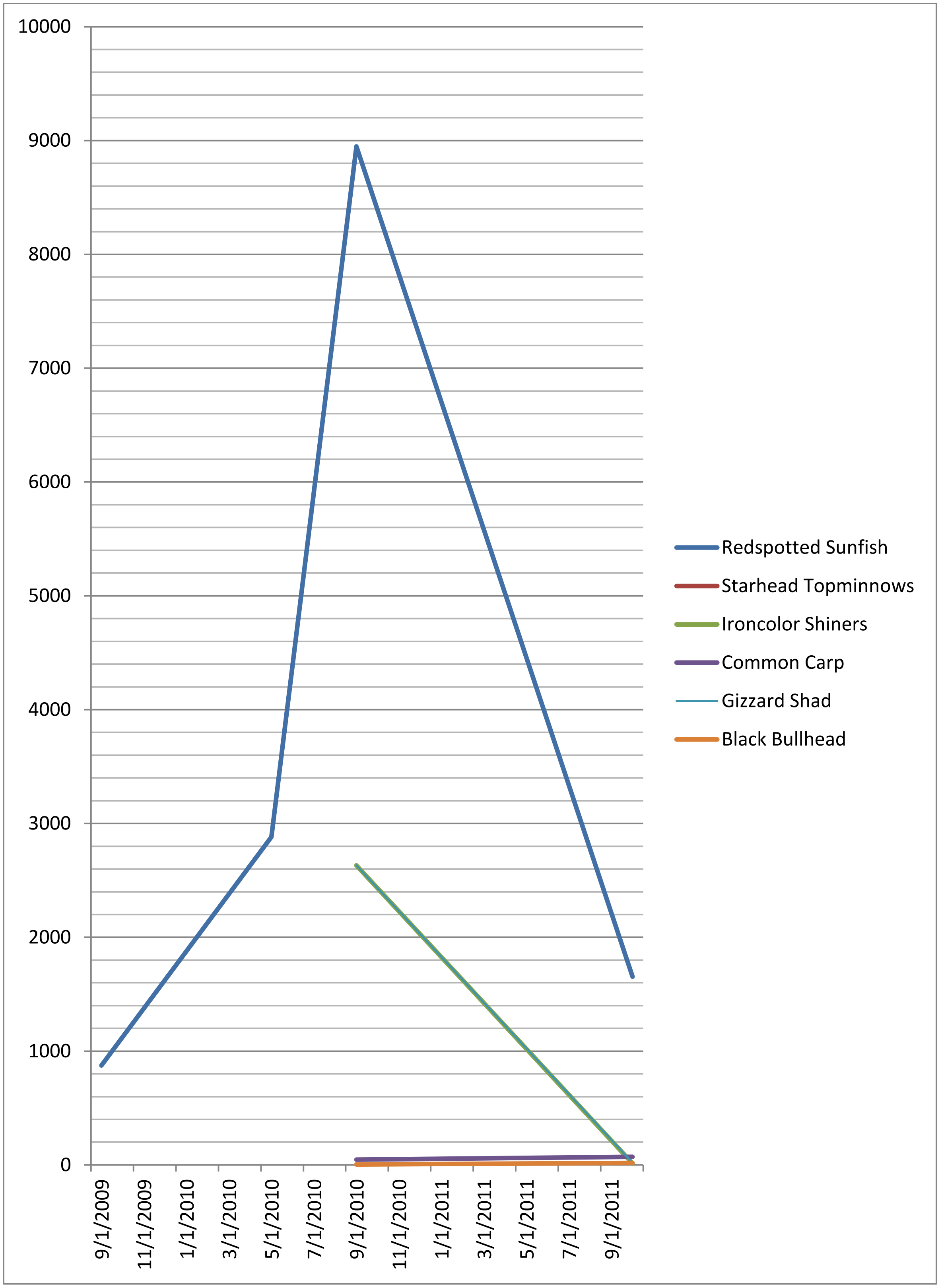


**Figure 35.** Catch rates (catch per hour) over time of the fish species currently collected from Fish Preserve Lake.

# TRANSLOCATION

Due to the successful establishment of redspotted sunfish in Fish Preserve Lake and their subsequent population explosion, translocation efforts were initiated in 2010. The goal is to move redspotted sunfish from Fish Preserve Lake to several other water bodies along the Illinois River that possess suitable habitat of abundant aquatic vegetation and/or woody debris.

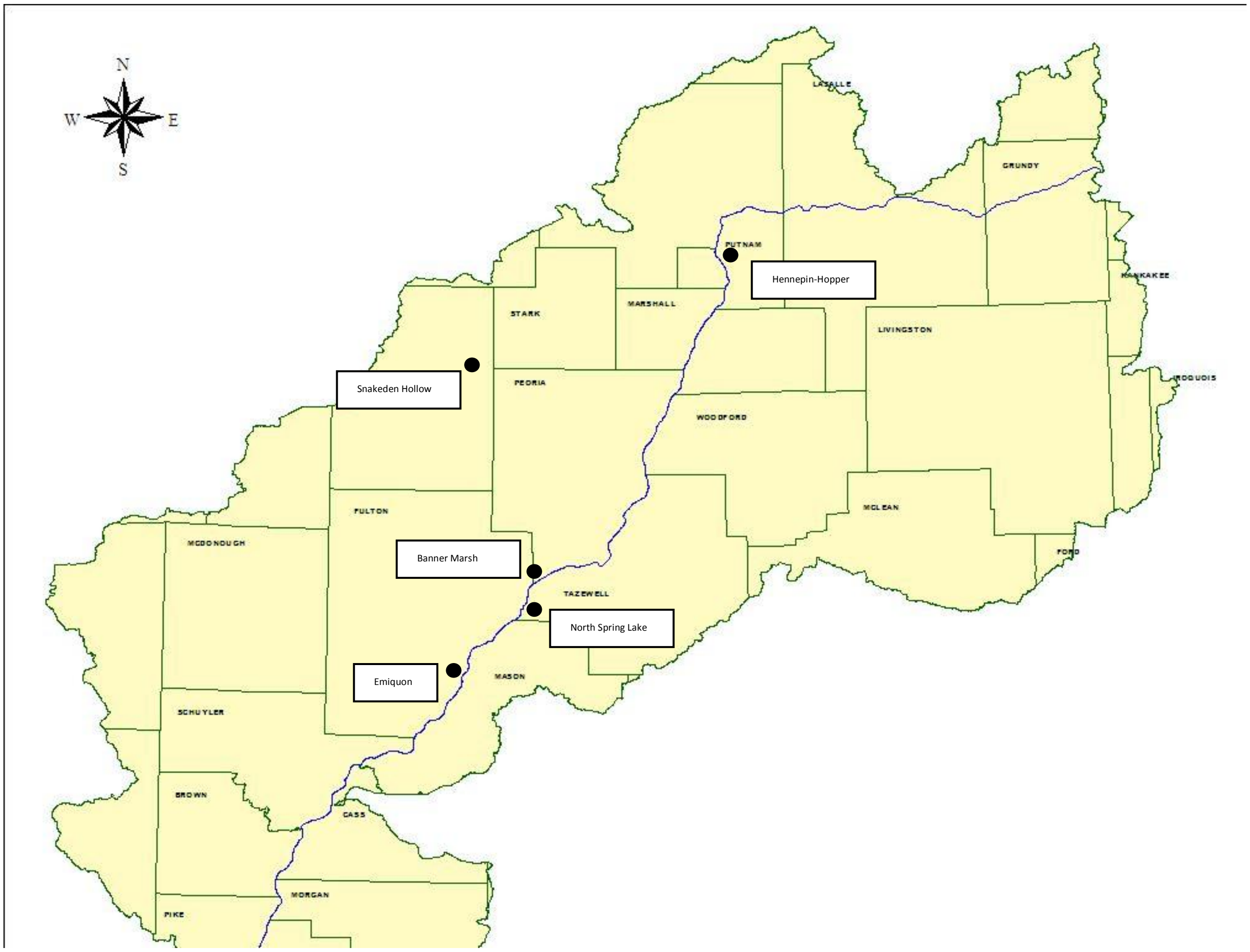


**Figure 36.** Redspotted sunfish translocation map.

## Emiquon Nature Preserve (Thompson Lake and Flag Lake)

Thompson Lake and Flag Lake at Emiquon Nature Preserve are owned by The Nature Conservancy. These two lakes are currently at about 3,900 acres. These recently rehabilitated lakes contain a diverse fish population and abundant aquatic vegetation. A total of 6,907 redspotted sunfish have been stocked into Thompson Lake and Flag Lake.

On April 8, 2010, 146 redspotted sunfish 78 to 151 mm were stocked into the lakes at the southwest ramp.

On April 9, 2010, 63 redspotted sunfish 86 to 164 mm were stocked into Pecan Grove.

On April 16, 2010, 63 redspotted sunfish were stocked south of Clark's Farm.

On September 27, 2010, 1575 redspotted sunfish 20 to 90 mm were stocked into Thompson Lake and 125 redspotted sunfish 100 to 151 mm were stocked into the Office Pond.

On October 19, 2010, approximately 5,000 redspotted sunfish 50 to 150 mm were stocked into Thompson Lake.

On June 15, 2011, 60 redspotted sunfish 52 to 162 mm were stocked into Thompson Lake.

**Dixon Waterfowl Refuge (Hennepin-Hopper Lakes)**

Hennepin-Hopper Lakes (Dixon Waterfowl Refuge) are owned by The Wetlands Initiative. The surface acreage of this wetland complex is about 2,700 acres. These lakes were also rehabilitated recently to remove invasive species and restore the native fish population. A total of 224 redspotted sunfish have been stocked at Hennepin-Hopper Lakes.

On April 14, 2010, 25 redspotted sunfish 46 to 165 mm were stocked into Farmhouse Pond.

On April 15, 2010, 199 redspotted sunfish 60 to 163 mm were stocked into Hennepin-Hopper. 27 were stocked at Side Seep Pond, 37 at Soggy Bottom Pond #1, 35 at Soggy Bottom Pond #2, 70 at Oak Ridge Pond, and 30 at Northeast Holding Pond.

The fall fish population survey in 2011 at Hennepin-Hopper Lakes produced a catch rate of 6 redspotted sunfish per hour of DC boat electrofishing. Sizes ranged from 26 to 105 mm.

**Banner Marsh State Fish and Wildlife Area**

Banner Marsh is a 4,363-acre marsh with more than 200 water bodies along the Illinois River. The area is managed by the Illinois Department of Natural Resources. The various water bodies contain aquatic vegetation and woody debris along the banks. A total of 2,367 redspotted sunfish have been stocked at Banner Marsh.

On May 7, 2010, 567 redspotted sunfish were stocked into Banner Marsh. About 100 were stocked at Shovel Lake, 100 at Pumphouse, 30 at Dragonfly Feeder, 30 at Starhead Pond, and over 300 at Johnson Lake.

On October 28, 2010, 1,800 redspotted sunfish were stocked into Banner Marsh. About 200 at Dragonfly Lake, 850 at Wheel Lake, and 750 at Johnson Lake.

**Figures 37-42.** Rob Hilsabeck, Illinois Department of Natural Resources District Fisheries Biologist, stocking redspotted sunfish into several water bodies at Banner Marsh.

**Snakeden Hollow State Fish and Wildlife Area**

Snakeden Hollow is a former surface mining site. The area is managed by the Illinois Department of Natural Resources. The site contains 125 water bodies totaling 400 acres. A total of 110 redspotted sunfish have been stocked at Snakeden Hollow.

On April 16, 2010, 80 redspotted sunfish 60 to 160 mm were stocked at Snakeden Hollow.

On May 6, 2010, 30 redspotted sunfish 97 to 170 mm were stocked at Snakeden Hollow.

**Spring Lake State Fish and Wildlife Area**

Spring Lake is a former meander of the Illinois River. It is divided into North Spring Lake and South Spring Lake. The two lakes total 1,285 acres and have abundant aquatic vegetation. The area is managed by the Illinois Department of Natural Resources. A total of 3,134 redspotted sunfish have been stocked at North Spring Lake.

On May 6, 2010, 634 redspotted sunfish 42 to 123 mm were stocked into North Spring Lake.

On October 20, 2010, approximately 2,500 redspotted sunfish 50 to 150 mm were stocked into North Spring Lake.

The fall fish population survey in 2011 at North Spring Lake produced a catch rate of 15.6 redspotted sunfish per hour of DC boat electrofishing. Sizes ranged from 90 to 148 mm.

**JOB 4. Monitor redspotted sunfish genetic composition of collected broodstock, the Fish Creek population, propagated offspring, and established populations in receiving waters.**

We monitored the genetic composition of redspotted sunfish populations throughout the region by genotyping a total of n = 1114 individual redspotted sunfish at a nine polymorphic microsatellite loci (see Appendix for a complete list of the loci assayed) identified from the existing literature (Table 1). Our analyses focused on five Groups: a) redspotted sunfish collected from across the range in Illinois and neighboring states; b) the populations as a whole from Fish Creek, IL as a local brood source; c) those individuals from Fish Creek, IL specifically used as brood; d) random samples offspring produced in production ponds; and, e) random samples from ex situ refuge populations created with the offspring.

***Rangewide diversity (Group "a")*** – to assess rangewide diversity, we examined tissue specimens collected throughout Illinois, Indiana, and Missouri from a total of 14 locations (Fig. 1). Here, we pooled samples for a total of seven populations because some locations were in close proximity to each other and presumably within the same watershed and the number of samples were limited at some locations. Range wide, allelic diversity varied across populations including the mean number of alleles, and the observed and expected heterozygosity (Table 1). Missouri populations were the most diverse with the most number of alleles and the highest levels of heterozygosity and the most private (unique) alleles. The Illinois and Indiana Wabash Regions were intermediate in their genetic diversity and Fish Creek had the lowest overall allelic diversity (Fig 2.) of all the areas sampled.

***Fish Creek (IL) diversity (Group "b")*** – to assess diversity within the primary local extant population, we assayed tissue specimens from an intensive sampling across all age groups throughout Fish Creek, IL. This group also represented the largest sample size of individuals across the species' Midwest range.

***Fish Creek adult diversity (Group "c")*** – to assess the extensiveness of capturing allelic diversity within broodstock stocked in experimental ponds at the University of Illinois for propagation, adult brood were specifically targeted for diversity assessment.

***Propagated progeny diversity (Group "d")*** – diversity of the progeny were assessed from tissues of the progeny produced in the experimental ponds to assess diversity among the young.

***Diversity within established refuge population (Group "e")*** – to assess diversity of an established population, we included tissues sampled from the introduced population, a result of this captive breeding effort, in Fish Preserve Lake at Emiquon National Wildlife Refuge.

**Genetic composition and differentiation among populations**

To determine whether populations range wide showed genetic differentiation, in terms of variation in allele frequencies, we took two approaches. The first was to measure $F_{st}$ which is based on the variance of allele frequencies between populations and varies between zero and one. Zero indicates no divergence between populations and one indicates complete isolation. Overall, based on an analysis of molecular variance we found that the majority (61%) of allelic diversity is among populations rather than within populations ($\phi_{pt}$ = 0.389, df = 6, $p$ = 0.01). The level of differentiation varies and is generally associated with geography. For example, Fish Creek increases in differentiation with the Illinois Wabash region being the lowest and the Missouri, Eleven Point River population being the highest (Table 2).

In order to test the prediction that populations closer together are less isolated than those farther apart we conducted a mantel test. A mantel test compares two matrices, a geographic and genetic distance matrix, and assumes isolation-by-distance model such that geographic distance predicts genetic distance. We found that redspotted sunfish populations do follow an isolation-by-distance model ($p$ = 0.01) (Fig. 3) which suggests that genetic differentiation is significant across the range of this species and sources for broodstock and propagation programs should be taken from the nearest location whenever possible.

**Genetic consequences of captive propagation of redspotted sunfish**

We collected a total of 57 adults from Fish Creek in 2008 and 2009 combined to serve as our broodstock for four captive breeding populations. We determined the parentage of the progeny produced in the experimental ponds at the University of Illinois from the broodstock collected at Fish Creek. Each pond received 4-8 males and 7-10 females in the early spring. We sub-sampled ~300 young of the year from each pond in the fall, presumably after the latest spawners had finished breeding. In 2008, the two ponds were partially drained and refilled, which resulted in an additional spring sample of the progeny that had overwintered. In 2009, the ponds were drained completely in the fall so there was no spring sample for these two ponds. We used CERVUS (Kalinowski et al. 2007), a well-used, genetics program to determine parentage of our pond progeny. CERVUS uses a maximum-likelihood approach to assign parents to offspring, which allows for the incorporation of genotyping errors into the analyses. The exact confidence of a particular assignment can be determined based on simulations of offspring produced by the parent population. We reported the parentage assignments for offspring that showed at confidence level of 80% or 95%. Allelic diversity was relatively low in the Fish Creek population, which ultimately hindered our ability to assign 100% of the offspring. Overall, we were able to assign at least one parent (80% confidence or greater) to 91% of the progeny (n = 780, range = 81 to 99%) (Tables 3 through 6).

Overall, the broodstock, progeny and Emiquon population had similar measures of allelic diversity to the Fish Creek (source) population; however, there is a slight decline in the mean number of alleles, the expected heterozygosity, and the number of private alleles as we move from source population to propagation to introduced population (Fig. 4). The frequencies of alleles, however, did significantly differ among each of these populations, with exception of the broodstock and their progeny ($p = 0.08$), which tended to be different (Table 7). When the broodstock and progeny were tested for these allele frequency differences for each separate pond they showed no such difference ( $p > 0.1$ for all pond/progeny comparisons), which suggests that the broodstock for each pond mated randomly enough to not alter the allele frequencies of the progeny relative to the parents. Although allelic diversity was similar among all of the propagated populations and Fish creek, the differences in allele frequencies arose, most likely, from a bottleneck from the relatively small number of broodstock used to found each pond and the uneven representation of progeny from the each parent pair.

**Implications for conservation and management**

Our efforts to propagate redspotted sunfish in closed experimental ponds worked well to capture the genetic diversity of the source population, Fish Creek. Based on our results, it is clear, that redspotted sunfish show significant population structure along an isolation-by-distance model that warrants the use of the nearest populations for propagation measures in the future. Although the Fish Creek population shows reduced allelic diversity in comparison to other parts of this species range, it shows no obvious signs of inbreeding depression in the form or function of individuals in Fish Creek. The established population in Fish Lake Preserve in Emiquon National Wildlife Refuge is a good representation of the allelic diversity that is present and our propagation efforts captured 94% of the mean number of alleles present in the Fish Creek population. Although shifts in the frequencies of alleles were detected in the transition from Fish Creek to the Emiquon population via propagation, it is unclear whether these changes will have any long-term effects on the newly established population in Emiquon. Future monitoring efforts may be needed to determine whether genetic diversity is maintained in the Emiquon population over time.

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## TABLES JOB 4

*Table 1. Number of alleles, genotypes, observed heterozygosity ($H_o$), expected heterozygosity ($H_e$), chi-square test for Hardy-Weinberg* equilibrium (*H-W p*), and fixation index (FI) for nine microsatellite loci in seven natural populations and three populations created during pond propagation of redspotted sunfish.

| Population (n) | | Locus | | | | | | | | | Mean ± s.e. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | RB-7[a] | RB-20[a] | LMAR-10[b] | LMAR-9[b] | LMAR-18[b] | LMA-120[c] | LMA-21[c] | LMA-116[c] | LMA-121[c] | |
| **Fish Creek (37) Includes Fish Creek and Crane Creek** | Alleles | 4 | 10 | 6 | 3 | 2 | 1 | 2 | 3 | 1 | 3.4 ± 1.1 |
| | $H_o$ | 0.73 | 0.86 | 0.57 | 0.35 | 0.03 | 0.00 | 0.19 | 0.30 | 0.000 | 0.34 ± 0.11 |
| | $H_e$ | 0.65 | 0.84 | 0.62 | 0.36 | 0.03 | 0.00 | 0.21 | 0.41 | 0.000 | 0.35 ± 0.10 |
| | *H-W p* | 0.90 | 0.54 | 0.97 | 0.67 | 0.93 | ND | 0.49 | <0.001 | ND | FI: -0.62 |
| **Broodstock (57)** | Alleles | 3 | 11 | 5 | 3 | 1 | 1 | 2 | 4 | 1 | 3.6 ± 1.0 |
| | $H_o$ | 0.68 | 0.86 | 0.61 | 0.37 | 0.00 | 0.00 | 0.11 | 0.21 | 0.00 | 0.32 ± 0.11 |
| | $H_e$ | 0.62 | 0.85 | 0.62 | 0.45 | 0.00 | 0.00 | 0.10 | 0.22 | 0.00 | 0.32 ± 0.11 |
| | *H-W p* | 0.70 | 0.009 | 0.55 | 0.20 | ND | ND | 0.68 | 0.70 | ND | FI: 0 |
| **Pond Progeny (745)** | Alleles | 3 | 11 | 5 | 3 | 1 | 1 | 2 | 4 | 1 | 3.4 ± 1.1 |
| | $H_o$ | 0.64 | 0.89 | 0.59 | 0.50 | 0.00 | 0.00 | 0.11 | 0.26 | 0.00 | 0.33 ± 0.11 |
| | $H_e$ | 0.63 | 0.86 | 0.63 | 0.52 | 0.00 | 0.00 | 0.11 | 0.25 | 0.00 | 0.32 ± 0.11 |
| | *H-W p* | 0.52 | 0.003 | 0.003 | 0.88 | ND | ND | 0.11 | 0.96 | ND | FI: -0.71 |
| **Emiquon (109)** | Alleles | 3 | 9 | 5 | 3 | 1 | 1 | 2 | 4 | 1 | 3.2 ± 0.9 |
| | $H_o$ | 0.59 | 0.82 | 0.71 | 0.47 | 0.00 | 0.00 | 0.04 | 0.31 | 0.00 | 0.33 ± 0.11 |
| | $H_e$ | 0.56 | 0.85 | 0.64 | 0.45 | 0.00 | 0.00 | 0.04 | 0.32 | 0.00 | 0.32 ± 0.11 |
| | *H-W p* | 0.83 | 0.87 | 0.50 | 0.31 | ND | ND | 0.85 | 0.47 | ND | FI: -0.71 |
| **Illinois Wabash Region (14) Includes Beaver Pond, Fish Lake, Cypress Ditch, and AB Lake** | Alleles | 9 | 11 | 7 | 6 | 3 | 6 | 1 | 6 | 2 | 5.7 ± 1.1 |
| | $H_o$ | 0.79 | 0.79 | 0.86 | 0.86 | 0.36 | 0.50 | 0.00 | 0.79 | 0.07 | 0.56 ± 0.11 |
| | $H_e$ | 0.84 | 0.89 | 0.81 | 0.77 | 0.31 | 0.68 | 0.00 | 0.65 | 0.07 | 0.56 ± 0.11 |
| | *H-W p* | 0.40 | 0.51 | 0.82 | 0.67 | 0.88 | 0.90 | ND | 0.99 | 0.89 | FI: 0 |
| **Indiana Wabash River Region (24)** | Alleles | 8 | 13 | 8 | 7 | 3 | 5 | 1 | 6 | 2 | 5.9 ± 1.2 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Includes Barren Ditch and River Deshee** | $H_o$ | 0.29 | 0.71 | 0.75 | 0.67 | 0.17 | 0.38 | 0.00 | 0.58 | 0.21 | 0.42 ± 0.09 |
| | $H_e$ | 0.48 | 0.82 | 0.80 | 0.70 | 0.28 | 0.70 | 0.00 | 0.55 | 0.25 | 0.51 ± 0.09 |
| | *H-W p* | 0.001 | 0.016 | 0.67 | 0.93 | 0.11 | 0.002 | ND | 0.93 | 0.42 | FI: -0.31 |
| **Missouri, Current River (9)** | Alleles | 8 | 9 | 7 | 5 | 4 | 5 | 3 | 7 | 2 | 5.6 ± 0.8 |
| **Includes Current River, Tenmile Creek, and Little Black River** | $H_o$ | 0.78 | 0.89 | 0.78 | 0.67 | 0.78 | 0.78 | 0.33 | 0.67 | 0.56 | 0.69 ± 0.06 |
| | $H_e$ | 0.75 | 0.85 | 0.82 | 0.52 | 0.66 | 0.75 | 0.54 | 0.60 | 0.40 | 0.65 ± 0.05 |
| | *H-W p* | 0.91 | 0.43 | 0.77 | 0.99 | 0.75 | 0.19 | 0.03 | 0.53 | 0.25 | FI: -0.41 |
| **Missouri, Jack's Fork River (23)** | Alleles | 9 | 12 | 9 | 4 | 2 | 3 | 3 | 5 | 3 | 5.6 ± 1.2 |
| | $H_o$ | 0.74 | 0.87 | 0.83 | 0.61 | 0.26 | 0.61 | 0.35 | 0.61 | 0.13 | 0.56 ± 0.09 |
| | $H_e$ | 0.76 | 0.84 | 0.81 | 0.53 | 0.39 | 0.60 | 0.29 | 0.69 | 0.16 | 0.56 ± 0.08 |
| | *H-W p* | 0.008 | 0.23 | 0.97 | 0.82 | 0.12 | 0.96 | 0.80 | 0.71 | 0.002 | 0 |
| **Missouri, Eleven Point River (26)** | Alleles | 12 | 19 | 7 | 4 | 7 | 4 | 3 | 10 | 2 | 7.6 ± 1.8 |
| | $H_o$ | 0.85 | 0.92 | 0.69 | 0.50 | 0.65 | 0.54 | 0.58 | 0.73 | 0.12 | 0.62 ± 0.08 |
| | $H_e$ | 0.86 | 0.93 | 0.76 | 0.42 | 0.77 | 0.54 | 0.52 | 0.82 | 0.11 | 0.64 ± 0.09 |
| | *H-W p* | 0.67 | 0.78 | 0.64 | 0.82 | 0.09 | 0.02 | 0.73 | 0.13 | 0.76 | FI: -0.36 |
| **Missouri, Duck Creek (20)** | Alleles | 10 | 14 | 7 | 6 | 4 | 7 | 3 | 5 | 2 | 6.4 ± 1.2 |
| | $H_o$ | 0.85 | 0.95 | 0.90 | 0.55 | 0.50 | 0.85 | 0.75 | 0.80 | 0.35 | 0.72 ± 0.07 |
| | $H_e$ | 0.81 | 0.90 | 0.77 | 0.81 | 0.48 | 0.77 | 0.51 | 0.78 | 0.29 | 0.68 ± 0.07 |
| | *H-W p* | 0.73 | 0.70 | 0.37 | 0.006 | 0.75 | 0.87 | 0.07 | 0.54 | 0.34 | FI: -0.38 |

[a]DeWoody et al. 1998, [b]Schable et al. 2002, [c]Neff et al. 1999

Table 2. Pairwise comparisons of $F_{st}$ values for each subpopulation throughout the sampled range of redspotted sunfish. $F_{st}$ provides a measure of the genetic differentiation between subpopulations

| Fish Creek | Illinois Wabash Region | Indiana Wabash Region | Missouri, Current River | Missouri, Duck Creek | Missouri, Jack's Fork | Missouri, Eleven Point River | |
|---|---|---|---|---|---|---|---|
| 0.000 | | | | | | | Fish Creek |
| 0.098 | 0.000 | | | | | | Illinois Wabash Region |
| 0.158 | 0.046 | 0.000 | | | | | Indiana Wabash Region |
| 0.165 | 0.088 | 0.116 | 0.000 | | | | Missouri, Current River |
| 0.153 | 0.067 | 0.087 | 0.058 | 0.000 | | | Missouri, Duck Creek |
| 0.166 | 0.073 | 0.103 | 0.046 | 0.063 | 0.000 | | Missouri, Jack's Fork |
| 0.207 | 0.103 | 0.119 | 0.086 | 0.064 | 0.089 | 0.000 | Missouri, Eleven Point River |

Table 3. Parentage for fall, young of the year, and spring, overwintered, redspotted sunfish progeny from pond D in 2008. First number indicates offspring that were assigned to parents with 95% confidence. Parentheses indicate those offspring assigned to parents at 80% confidence. Numbers for mothers and fathers correspond to genotypes in appendix A.

**FALL '08 POND D**

| | | MOTHERS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **2** | **3** | **5** | **7** | **9** | **10** | **11** | **12** | **13** | **unknown** | **TOTAL** |
| **FATHERS** | **1** | | 0/(1) | | 3 | | 11/(9) | | 0/(1) | | 5 | **19/(11)** |
| | **4** | 1 | 0/(1) | | | | | 0/(7) | 0/(1) | 0/(4) | 15 | **16/(13)** |
| | **6** | | | 1 | 1 | | 6/(3) | | | | 1 | **9/(3)** |
| | **8** | | | 4 | | 10 | 0/(2) | | | | 6 | **20/(2)** |
| | **unknown** | 2 | | | | | | | | | 1 | **3** |
| | **TOTAL** | **3** | **2** | **5** | **4** | **10** | **17/(14)** | **0/(7)** | **0/(2)** | **0/(4)** | **28** | **96** |

**SPRING '08 POND D**
**(overwintered)**

| | | MOTHERS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **2** | **3** | **5** | **7** | **9** | **10** | **11** | **12** | **13** | **unknown** | **TOTAL** |
| **FATHERS** | **1** | | | 2 | 3 | | 11 | | | 2 | | **18** |
| | **4** | 3/(1) | 0/(1) | 0/(1) | | 0/(1) | | 6/(5) | | 0/(11) | 0/(3) | **9/(23)** |
| | **6** | | | | 3 | | 5/(1) | | | | 1 | **8/(2)** |
| | **8** | | | 6 | | 23 (1) | 1 | (1) | | | 1 | **31/(2)** |
| | **unknown** | | | | | | | | | | 3 | **3** |
| | **TOTAL** | **3/(1)** | **0/(1)** | **8/(1)** | **6** | **23/(2)** | **17/(1)** | **6/(6)** | **0** | **2/(11)** | **5/(3)** | **96** |

Table 4. Parentage for fall, young of the year, and spring, overwintered, redspotted sunfish progeny from pond E in 2008. First number indicates offspring that were assigned to parents with 95% confidence. Parentheses indicate those offspring assigned to parents at 80% confidence. Numbers for mothers and fathers correspond to genotypes in appendix A.

**FALL ’08 POND E**

| | | MOTHERS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **14** | **15** | **16** | **17** | **20** | **23** | **24** | **unknown** | **TOTAL** |
| | **18** | 0 (1) | | 2 (1) | | 5 | 1 (4) | | | **8 (6)** |
| **FATHERS** | **19** | 3 (2) | 1 (9) | (1) | | 0 (1) | | 0 (3) | 1 (1) | **5 (17)** |
| | **21** | 7 (1) | 8 | | | 2 | | | 6 | **23 (1)** |
| | **22** | 1 | 0 (1) | | | 5 | 6 (9) | 2 (5) | 1 (1) | **15 (16)** |
| | **unknown** | | | | | | 1 | | 4 | **5** |
| | **TOTAL** | **11 (4)** | **9 (10)** | **2 (2)** | | **12 (1)** | **8 (13)** | **2 (8)** | **12 (2)** | **96** |

**SPRING '08 POND E (overwintered)**

| | | MOTHERS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **14** | **15** | **16** | **17** | **20** | **23** | **24** | **unknown** | **TOTAL** |
| | **18** | | | 11 (5) | | 8 | 2 (2) | | | **21 (7)** |
| **FATHERS** | **19** | 3 (4) | 0 (4) | 0 (2) | | 0 (1) | 1 (1) | 0 (1) | 0 (4) | **4 (17)** |
| | **21** | 4 (2) | 4 | 1 | | | | | 6 | **15 (2)** |
| | **22** | 0 (1) | 0 (2) | | 0 (1) | 2 | 3 (10) | 4 | 1(2) | **10 (16)** |
| | **unknown** | | | | | | 1 | | 3 | **4** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **TOTAL** | **7 (7)** | **4 (6)** | **12 (7)** | **(1)** | **10 (1)** | **7 (13)** | **4 (1)** | **10 (6)** | **96** |

Table 5. Parentage for fall, young of the year, redspotted sunfish progeny from pond B in 2009. First number indicates offspring that were assigned to parents with 95% confidence. Parentheses indicate those offspring assigned to parents at 80% confidence. Numbers for mothers and fathers correspond to genotypes in appendix A.

| **FALL '09 POND B** | **MOTHERS** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **FATHERS** | **1** | **2** | **3** | **4** | **11** | **13** | **14** | **18** | **25** | **unknown** | **TOTAL** |
| **1A** | 16 (9) | 1 | 2 | 1 | 1 | | 1 | 0 (4) | | 0 (1) | **22 (14)** |
| **2A** | 0 (10) | 0 (5) | | | | | | | | | **0 (15)** |
| **3A** | | | 0 (1) | | | | | | (1) | | **0 (2)** |
| **4A** | 1 | 6 | | | | | | | 2 | (2) | **9 (2)** |
| **5A** | | | 1 | | | | | | | (3) | **1 (3)** |
| **6A** | 0 (1) | | 14 | | | | | | | (4) | **14 (5)** |
| **16** | | 1 | | 5 | 2 | | 1 (2) | | | 2 | **11 (2)** |
| **28** | (1) | | | | 2 | | | | 2 | (4) | **4 (5)** |
| **unknown** | 5 (4) | 1 (10) | 11 (7) | | | 0 (3) | 1 | | 4 (2) | 39 | **61 (26)** |
| **TOTAL** | **22 (25)** | **9 (15)** | **28 (8)** | **6** | **5** | **0 (3)** | **3 (2)** | **0 (4)** | **8 (3)** | **41 (14)** | **196** |

Table 6. Parentage for fall, young of the year, redspotted sunfish progeny from pond E in 2009. First number indicates offspring that were assigned to parents with 95% confidence. Parentheses indicate those offspring assigned to parents at 80% confidence. Numbers for mothers and fathers correspond to genotypes in appendix A.

| **FALL '09 POND E** | | **MOTHERS** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **5** | **6** | **8** | **9** | **19** | **20** | **21** | **22** | **24** | **26** | **unknown** | **TOTAL** |
| | **7** | | | 1 | | | 7 | 11 | | 6 | 0 (4) | 3 (4) | **28 (8)** |
| **FATHERS** | **10** | 0 (23) | | | 0 (13) | 0 (26) | 0 (1) | 0 (1) | 0 (1) | | 0 (21) | 0 (12) | **0 (98)** |
| | **11** | | | | | | | | | | | | **0 (0)** |
| | **15** | | 8 | | | 0 (1) | | | 0 (3) | | | 2 | **10 (4)** |
| | **17** | 1 | | | 0 (1) | | | | | | | | **1 (1)** |
| | **23** | 1 | | | 0 (2) | | | 1 | | 0 (1) | | 0 (2) | **2 (5)** |
| | **27** | | 1 (3) | 1 | 0 (1) | 0 (1) | | | | | 0 (2) | 0 (5) | **2 (12)** |
| | **unknown** | | | | | 1 (2) | 2 (1) | 4 | 0 (1) | | | 17 | **24 (5)** |
| | **TOTAL** | **2 (23)** | **9 (3)** | **2 (0)** | **0 (17)** | **1 (30)** | **9 (2)** | **16 (1)** | **0 (5)** | **6 (1)** | **(27)** | **22 (23)** | **200** |

Table 7. Results of genetic comparisons of allele frequencies among the source population, Fish Creek, and propagation related populations including Broodstock, progeny, and the Emiquon population at Fish Preserve Lake.

| **Population Comparison** | $X^{2a}$ | **df** | ***p*** |
|---|---|---|---|
| Fish Creek vs. Broodstock | 24.92 | 14 | 0.04 |
| Fish Creek vs. Progeny | ∞ | 12 | < 0.001 |
| Fish Creek vs. Emiquon | ∞ | 14 | < 0.001 |
| Broodstock vs. Progeny | 19.32 | 14 | 0.08 |
| Broodstock vs. Emiquon | ∞ | 12 | < 0.001 |
| Progeny vs. Emiquon | ∞ | 12 | < 0.001 |

[a] Probability of genetic differentiation estimated with Fisher exact test based on the allelic distribution across populations

**FIGURES JOB 4**

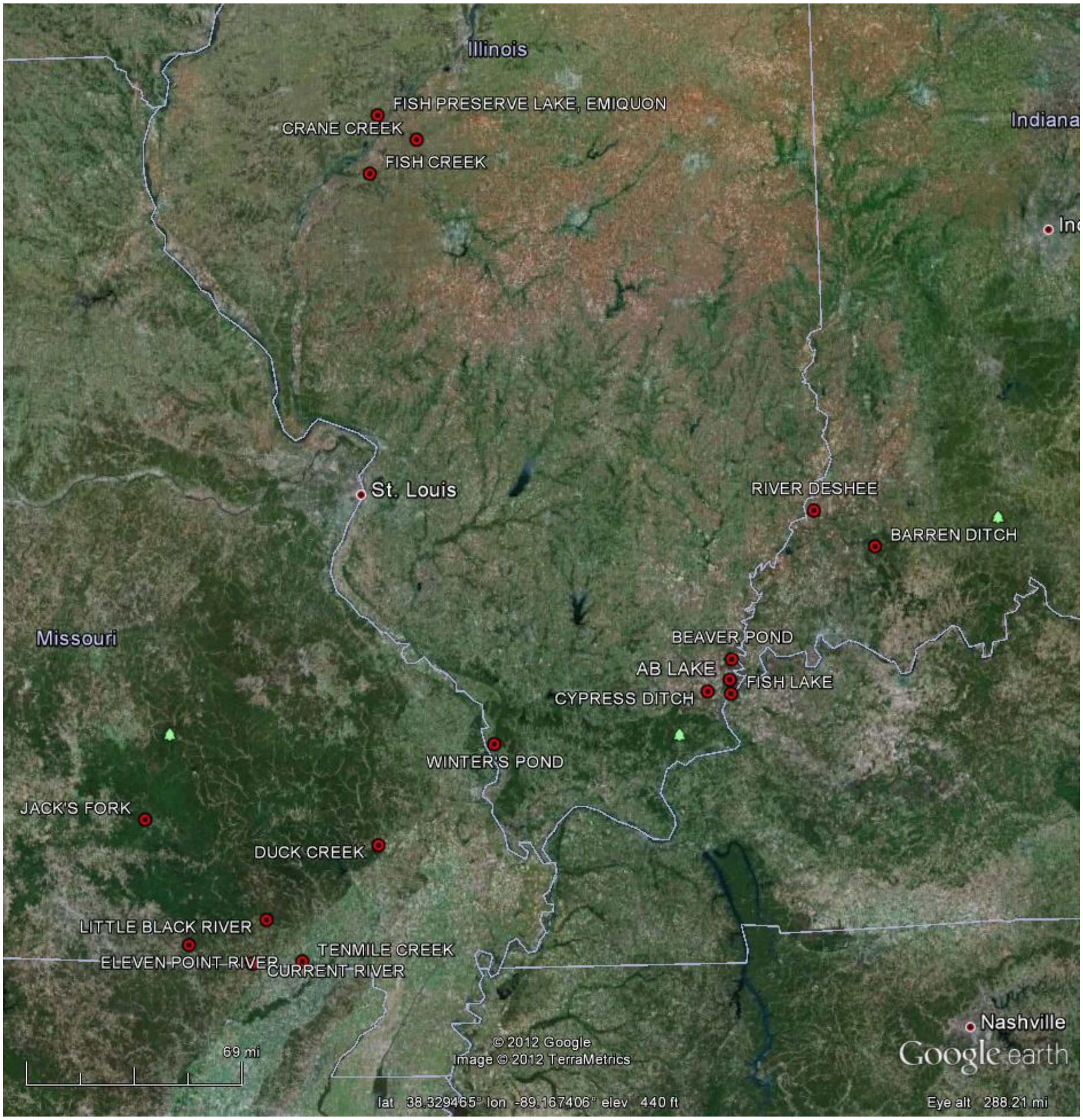


Figure 1. Map of sampling locations of redspotted sunfish from Illinois, Indiana, and Missouri. Fish Creek is where the broodstock were collected and Fish Preserve Lake in Emiquon National Wildlife Refuge is the location where progeny were ultimately stocked. Winter's Pond was sampled and all adults were subsequently identified as banded sunfish (B. Burr, pers. comm.)

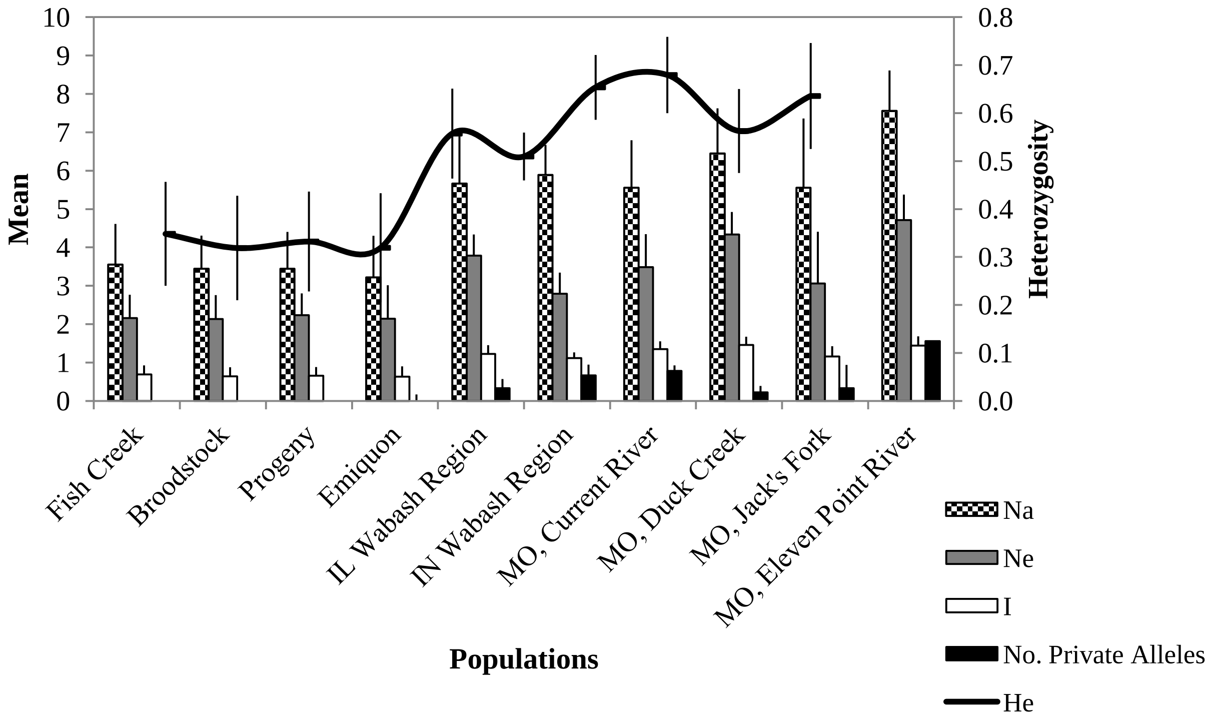


Figure 2. Measures of allelic diversity across both propagated and rangewide populations of redspotted sunfish. Na = No. of different alleles, Ne = No. of effective alleles, I = Shannon's Information Index, No. of Private Alleles = No. of alleles unique to a single population relative to all compared, He = expected heterozygosity.

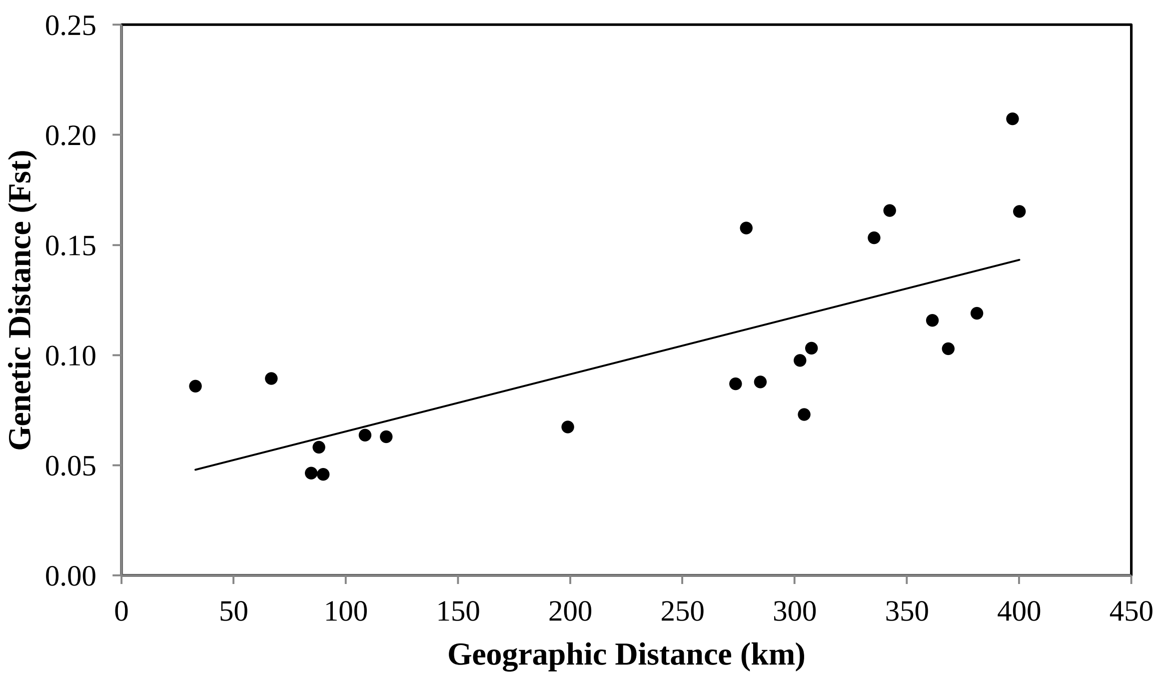


Figure 3. Results of mantel test that shows significant ($p$ = 0.01) isolation by distance of redspotted sunfish populations throughout Illinois, Indiana, and Missouri.

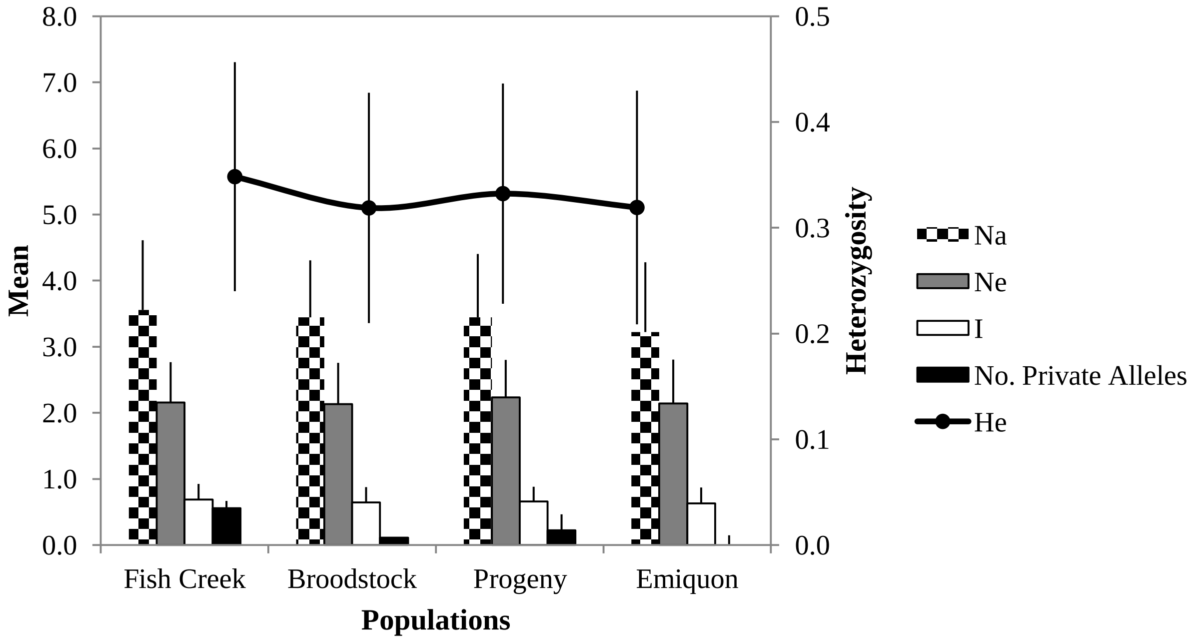


Figure 4. Measures of allelic diversity for all propagation related populations including the source population of Fish Creek. Na = No. of different alleles, Ne = No. of effective alleles, I = Shannon's Information Index, No. of Private Alleles = No. of alleles unique to a single population relative to all compared, He = expected heterozygosity.

Appendix. A complete list of genotypes for all individual redspotted sunfish assayed at nine polymorphic loci. List also includes four additional species that were collected as voucher specimens during the sampling efforts

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Adult | Illinois, Fish Creek | 143/172 | 292/308 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Adult | Illinois, Fish Creek | 143/172 | 288/292 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Adult | Illinois, Fish Creek | 172/172 | 288/316 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Adult | Illinois, Fish Creek | 168/172 | 308/316 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Adult | Illinois, Fish Creek | / | / | / | 152/152 | 276/276 | 206/206 | 146/146 | / | 171/171 |
| Adult | Illinois, Fish Creek | 143/172 | 288/288 | 286/286 | 165/173 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Adult | Illinois, Fish Creek | / | 233/312 | / | / | / | / | / | / | / |
| Adult | Illinois, Fish Creek | 172/176 | 296/304 | 286/290 | 152/152 | 276/279 | 206/206 | 146/146 | 283/283 | 171/171 |
| Adult | Illinois, Fish Creek | 172/172 | 288/308 | 290/290 | 152/165 | 276/276 | 206/206 | 144/146 | 250/283 | 171/171 |
| Adult | Illinois, Fish Creek | 168/172 | 288/316 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Adult | Illinois, Fish Creek | 168/172 | 288/296 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Adult | Illinois, Fish Creek | 168/172 | 272/288 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Adult | Illinois, Fish Creek | 143/143 | 288/288 | 290/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Adult | Illinois, Fish Creek | 143/172 | 288/308 | / | 152/173 | / | / | / | / | / |
| Adult | Illinois, Fish Creek | 143/143 | 272/296 | 305/305 | 152/152 | 276/276 | 206/206 | 144/144 | 250/250 | 171/171 |
| Adult | Illinois, Fish Creek | 143/168 | 272/296 | 286/301 | 152/152 | 276/276 | 206/206 | 144/146 | 250/283 | 171/171 |
| Adult | Illinois, Fish Creek | 172/172 | 300/308 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Adult | Illinois, Fish Creek | 143/172 | 284/308 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Adult | Illinois, Fish Creek | 168/172 | 308/316 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Adult | Illinois, Fish Creek | 168/172 | 296/296 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Adult | Illinois, Fish Creek | 143/168 | 296/304 | 290/305 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Adult | Illinois, Fish Creek | 172/172 | 272/296 | 286/290 | 152/165 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Adult | Illinois, Fish Creek | 168/168 | / | / | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Adult | Illinois, Fish Creek | 172/172 | 284/292 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Adult | Illinois, Fish Creek | 168/172 | 288/296 | 290/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Adult | Illinois, Fish Creek | 143/168 | 272/316 | 290/293 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Adult | Illinois, Fish Creek | 168/168 | 316/324 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Adult | Illinois, Fish Creek | 172/172 | 296/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Adult | Illinois, Fish Creek | 168/168 | 296/316 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Adult | Illinois, Fish Creek | 143/172 | 284/284 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Adult | Illinois, Fish Creek | 143/168 | 296/316 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Adult | Illinois, Fish Creek | 143/168 | 288/292 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Adult | Illinois, Fish Creek | 143/168 | 288/308 | 286/286 | 165/165 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Adult | Illinois, Fish Creek | 143/172 | 272/288 | 286/305 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Adult | Illinois, Fish Creek | 168/172 | 288/288 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Adult | Illinois, Fish Creek | 168/172 | 288/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Adult | Illinois, Fish Creek | 168/172 | 296/308 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock | Illinois, Fish Creek | 143/172 | 284/288 | 282/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| 2008 Pond D Broodstock | Illinois, Fish Creek | 168/172 | 288/304 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| 2008 Pond D Broodstock | Illinois, Fish Creek | 143/172 | 288/288 | 286/290 | 152/165 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| 2008 Pond D Broodstock | Illinois, Fish Creek | 143/143 | 272/300 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| 2008 Pond D Broodstock | Illinois, Fish Creek | 168/172 | 296/304 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| 2008 Pond D Broodstock | Illinois, Fish Creek | 168/172 | 288/288 | 290/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| 2008 Pond D Broodstock | Illinois, Fish Creek | 143/172 | 284/316 | 286/305 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| 2008 Pond D Broodstock | Illinois, Fish Creek | 143/172 | 272/328 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| 2008 Pond D Broodstock | Illinois, Fish Creek | 172/172 | 292/300 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| 2008 Pond D Broodstock | Illinois, Fish Creek | 172/172 | 296/296 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| 2008 Pond D Broodstock | Illinois, Fish Creek | 143/172 | 272/300 | 286/286 | 165/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| 2008 Pond D Broodstock | Illinois, Fish Creek | 168/172 | 272/292 | 286/286 | 165/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| 2008 Pond D Broodstock | Illinois, Fish Creek | 143/172 | 284/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 172/172 | 300/328 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 172/172 | 292/328 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 172/172 | 288/296 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 287/287 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 288/296 | 290/293 | 152/173 | 276/276 | 206/206 | 146/146 | 250/287 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 288/296 | 282/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 284/296 | 282/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2008 | Pond D | 168/168 | 284/316 | 293/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/168 | 296/328 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 168/172 | 288/296 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 287/287 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/143 | 272/300 | 286/286 | 165/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 288/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 272/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/168 | 300/304 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 172/172 | 272/300 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 272/292 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 272/300 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 172/172 | 300/328 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 288/296 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/287 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 284/296 | 282/286 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 288/296 | 282/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 172/172 | 284/296 | 282/293 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Progeny, Fall 2008 | Pond D | 172/172 | 272/304 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/287 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/143 | 272/288 | 286/290 | 152/165 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 172/172 | 272/304 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 172/172 | 272/296 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 284/288 | 282/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 172/172 | 292/328 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/356 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 284/296 | 282/286 | 152/152 | 276/276 | 206/206 | 146/146 | / | 171/171 |
| Progeny, Fall 2008 | Pond D | 172/172 | 272/288 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 272/296 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 284/320 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 168/172 | 272/300 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 172/172 | 272/300 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 300/328 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 172/172 | 288/296 | 282/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 172/172 | 272/300 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 284/296 | 282/286 | 152/152 | 276/276 | 206/206 | 146/146 | 250/287 | 171/171 |
| Progeny, Fall 2008 | Pond D | 172/172 | 288/296 | 290/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 300/328 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 172/172 | 284/296 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 284/300 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 168/172 | 272/300 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 272/300 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/143 | 272/284 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 172/172 | 284/296 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 168/172 | 304/328 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 288/296 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 272/292 | / | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 284/296 | 290/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 168/172 | 272/300 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 172/172 | 288/296 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 300/300 | 286/286 | 165/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 300/328 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 284/288 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Progeny, Fall 2008 | Pond D | 143/172 | 300/328 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/143 | 272/300 | 286/286 | 165/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/143 | 284/300 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 272/288 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/168 | 288/300 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 284/284 | 290/305 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/143 | 288/300 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/143 | 288/300 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/333 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/143 | 272/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 284/316 | 282/305 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 300/300 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 284/296 | 282/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/143 | 288/300 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 288/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 284/296 | 282/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/143 | 288/300 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/356 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/143 | 272/284 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 288/296 | 282/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/168 | 272/304 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 172/172 | 288/296 | 293/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 288/296 | 282/286 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 272/300 | 286/286 | 165/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 172/172 | 288/296 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 292/328 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 272/292 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/168 | 272/304 | 286/290 | 152/165 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/143 | 300/300 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 284/284 | 286/290 | 173/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 272/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 292/300 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 168/172 | 288/296 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 284/296 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2008 | Pond D | 172/172 | 292/328 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Progeny, Fall 2008 | Pond D | 143/172 | 300/328 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/143 | 272/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 288/300 | 286/286 | 165/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 168/172 | 288/296 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 288/300 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/168 | 288/300 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 143/172 | 292/328 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 172/172 | 284/292 | 282/286 | 173/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond D | 168/172 | 288/304 | 293/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Spring 2008 | Pond D | 172/172 | 300/328 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 284/288 | 282/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/143 | 272/300 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 284/296 | 286/290 | 152/173 | 276/276 | 206/206 | / | 250/287 | 171/171 |
| Progeny, Spring 2008 | Pond D | / | / | / | / | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 272/288 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 272/300 | 286/286 | 165/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 288/300 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 168/172 | 288/296 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 287/287 | 171/171 |
| Progeny, Spring 2008 | Pond D | 168/172 | 296/328 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/143 | 284/300 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 288/300 | 286/290 | 152/165 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 272/292 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/168 | 272/296 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/287 | 171/171 |
| Progeny, Spring 2008 | Pond D | 172/172 | 272/292 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 300/328 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | / | / | / | / | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 300/308 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 300/328 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 172/172 | 272/292 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 172/172 | 272/300 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 272/292 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/143 | 284/316 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 172/172 | 284/288 | 290/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, | Pond D | 143/172 | 272/292 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Spring 2008 | | | | | | | | | | |
| Progeny, Spring 2008 | Pond D | 172/172 | 288/316 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Spring 2008 | Pond D | 168/172 | 288/296 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 168/172 | 288/296 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Spring 2008 | Pond D | / | / | / | / | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 296/328 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 272/272 | 286/286 | 165/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/143 | 272/300 | 286/286 | 165/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 284/296 | 282/286 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 172/172 | 272/300 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 284/300 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 172/172 | 300/328 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 284/288 | 282/286 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 172/172 | 288/296 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/287 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/168 | 272/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/143 | 284/300 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | / | / | / | / | 276/276 | 206/206 | 146/146 | 287/287 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 284/296 | 282/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/143 | 272/272 | 286/286 | 165/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 300/328 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 172/172 | 284/296 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/143 | 272/284 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 168/172 | 272/304 | 286/293 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 272/304 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 172/172 | 288/296 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/143 | 272/288 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 272/292 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 272/292 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | / | / | / | / | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 272/284 | 282/286 | 152/173 | 276/276 | 206/206 | 146/146 | 250/287 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 288/296 | 282/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/143 | 284/300 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/143 | 272/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 168/172 | 288/316 | 290/305 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Progeny, Spring 2008 | Pond D | 172/172 | 272/300 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 272/272 | 286/286 | 165/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/143 | 284/300 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 172/172 | 284/296 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/143 | 288/300 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 172/172 | 272/292 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | / | / | / | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 272/300 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/168 | 288/300 | 286/290 | 152/165 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 272/300 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/143 | 272/300 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 272/300 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 172/172 | 272/296 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 172/172 | 288/296 | 293/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 272/300 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 272/292 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 172/172 | 272/304 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/287 | 171/171 |
| Progeny, Spring 2008 | Pond D | 168/172 | 296/328 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 250/287 | 171/171 |
| Progeny, Spring 2008 | Pond D | / | / | / | / | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 172/172 | 272/292 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 172/172 | 288/296 | 293/305 | 152/152 | 276/276 | 206/206 | 146/146 | 287/287 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 300/304 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 272/300 | 286/286 | 165/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/143 | 288/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 284/304 | 282/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Spring 2008 | Pond D | 168/172 | 284/304 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/143 | 272/272 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 172/172 | 292/328 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 288/296 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Spring 2008 | Pond D | 168/172 | 304/328 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Spring 2008 | Pond D | / | / | / | / | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/168 | 304/328 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 300/328 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Progeny, Spring 2008 | Pond D | 143/172 | 288/296 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 288/296 | 282/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Spring 2008 | Pond D | 172/172 | 300/328 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/172 | 284/284 | 290/305 | 173/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond D | 143/143 | 272/300 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2008 Pond E | Illinois, Fish Creek | 143/143 | 288/296 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Broodstock 2008 Pond E | Illinois, Fish Creek | 143/172 | 272/292 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2008 Pond E | Illinois, Fish Creek | 143/168 | 288/296 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2008 Pond E | Illinois, Fish Creek | 172/172 | 296/316 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2008 Pond E | Illinois, Fish Creek | 143/168 | 292/296 | 286/305 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2008 Pond E | Illinois, Fish Creek | 168/168 | 296/304 | 290/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2008 Pond E | Illinois, Fish Creek | 168/172 | 284/296 | 290/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2008 Pond E | Illinois, Fish Creek | 143/172 | 288/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2008 Pond E | Illinois, Fish Creek | 143/168 | 304/316 | 290/293 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2008 Pond E | Illinois, Fish Creek | 168/172 | 296/304 | 290/293 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2008 Pond E | Illinois, Fish Creek | 143/172 | 272/292 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/172 | 272/288 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 296/316 | 286/290 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 296/304 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 296/304 | 290/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/143 | 292/316 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 168/168 | 304/316 | 290/293 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 172/172 | 288/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 288/304 | 286/293 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/172 | 284/292 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/172 | 296/304 | 290/293 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 304/304 | 293/293 | 173/177 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/143 | 288/296 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 168/168 | 296/304 | 293/293 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/143 | 288/296 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 172/172 | 272/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/172 | 292/296 | 293/305 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/143 | 272/304 | 286/293 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Progeny, Fall 2008 | Pond E | 143/172 | 288/292 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 296/304 | 290/293 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/172 | 296/296 | 286/290 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 272/316 | 286/293 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 168/172 | 292/296 | 286/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 168/172 | 292/304 | 293/305 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 296/296 | 290/305 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 172/172 | 272/288 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/172 | 272/316 | 286/290 | 165/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/172 | 288/288 | 286/290 | 152/173 | 276/276 | 206/206 | / | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 292/304 | 286/293 | 165/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/143 | 288/288 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 292/304 | 286/293 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 284/292 | 290/305 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 272/296 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/172 | 272/288 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/143 | 292/296 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/172 | 304/304 | 290/293 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 172/172 | 288/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 168/172 | 292/304 | 286/293 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 168/172 | 292/296 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 168/172 | 284/288 | 286/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/172 | 304/304 | 290/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/172 | 284/316 | 290/290 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 292/304 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 168/172 | 292/304 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/143 | 292/316 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 168/172 | 292/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 168/172 | 292/296 | 286/293 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 292/296 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 288/296 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/172 | 288/288 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 296/316 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Progeny, Fall 2008 | Pond E | 143/143 | 288/296 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 284/296 | 290/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/143 | 272/304 | 286/290 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/172 | 288/288 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 304/316 | 290/293 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/143 | 288/288 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 288/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 168/168 | 284/304 | 290/290 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 172/172 | 272/300 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/143 | 288/292 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/172 | 272/316 | 286/293 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 284/304 | 293/293 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/143 | 272/316 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/143 | 288/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 168/168 | 304/316 | 290/293 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 168/172 | 284/304 | 290/293 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 172/172 | 272/288 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 296/304 | 290/293 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 168/172 | 284/316 | 290/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 272/304 | 286/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/333 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/172 | 296/316 | 293/293 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 288/292 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 168/172 | 272/316 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 272/304 | 286/293 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 292/296 | 286/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 168/168 | 296/316 | 290/293 | 173/173 | 276/276 | 206/206 | 146/146 | 283/333 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/172 | 288/292 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 296/296 | 286/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/172 | 272/288 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 168/168 | 296/296 | 290/305 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/172 | 292/304 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 168/172 | 272/304 | 286/290 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/143 | 272/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall | Pond E | 168/172 | 304/304 | 293/293 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| 2008 | | | | | | | | | | |
| Progeny, Fall 2008 | Pond E | 143/168 | 292/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 292/296 | 290/305 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 284/296 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 296/304 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/333 | 171/171 |
| Progeny, Fall 2008 | Pond E | 168/172 | 296/304 | 293/293 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 168/172 | 296/304 | 290/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/172 | 292/296 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/172 | 288/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/172 | 284/288 | 286/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 143/168 | 288/304 | 290/290 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 168/172 | 296/316 | 290/293 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2008 | Pond E | 168/168 | 296/304 | 290/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 168/172 | 284/316 | 293/293 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 284/296 | 290/305 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/143 | 288/296 | 286/290 | 152/165 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 168/172 | 304/304 | 290/293 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 288/292 | 286/305 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 272/296 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 296/304 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 296/296 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/143 | 288/296 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 292/296 | / | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/172 | 304/316 | 290/290 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 296/304 | 286/293 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 288/292 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 168/168 | 296/304 | 290/293 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 168/168 | 296/304 | 293/305 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/172 | 272/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 168/168 | 292/296 | 293/305 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | / | 284/304 | 290/293 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/143 | 288/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 168/172 | 284/296 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Progeny, Spring 2008 | Pond E | 168/168 | 284/296 | 293/305 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 168/172 | 292/304 | 286/290 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/172 | 272/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/143 | 292/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 168/172 | 296/316 | 290/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/172 | 288/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 288/296 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/143 | 288/296 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 168/172 | 272/296 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/172 | 296/316 | 290/293 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/172 | 288/288 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/143 | 272/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/172 | 272/288 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/143 | 288/296 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/172 | 288/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/172 | 288/292 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 292/296 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 296/316 | 293/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/143 | 288/296 | 286/290 | 152/165 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 296/304 | 293/293 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/143 | 296/296 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/143 | 288/296 | 286/305 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 296/296 | 286/293 | 152/165 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 296/304 | 286/290 | 152/165 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/172 | 272/316 | 286/293 | 165/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 288/304 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 168/168 | 296/316 | 290/290 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/172 | 304/316 | 293/293 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 288/304 | 286/290 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/143 | 272/316 | 286/293 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 168/172 | 272/316 | 286/293 | 165/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 292/304 | 286/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 168/168 | 304/304 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Progeny, Spring 2008 | Pond E | 143/172 | 272/288 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 296/304 | 286/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 272/296 | 286/293 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 168/172 | 292/296 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 168/168 | 284/296 | 286/293 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/172 | 296/304 | 290/293 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 168/172 | 284/304 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 292/296 | 293/305 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/172 | 292/304 | 286/293 | 165/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 288/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 288/304 | 286/290 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 272/296 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 168/168 | 288/292 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 296/296 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 292/296 | 286/305 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 168/168 | 296/316 | 293/293 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 288/296 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 296/296 | 286/305 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/172 | 292/296 | 293/305 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/143 | 288/296 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 168/168 | 284/292 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 296/304 | 290/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 296/296 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 288/304 | 290/290 | 165/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/143 | 288/292 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 272/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 296/304 | 290/290 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/172 | 300/304 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 272/304 | 286/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 296/304 | 286/293 | 152/165 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 284/296 | 286/290 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/143 | 292/316 | 286/290 | 165/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/172 | 284/292 | 290/305 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Progeny, Spring 2008 | Pond E | 143/168 | 296/304 | 286/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 143/168 | 296/316 | 290/293 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Spring 2008 | Pond E | 168/172 | 304/316 | 293/293 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond B | Illinois, Fish Creek | 168/172 | 288/288 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Broodstock 2009 Pond B | Illinois, Fish Creek | 143/172 | 288/296 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond B | Illinois, Fish Creek | 143/168 | 292/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond B | Illinois, Fish Creek | 172/172 | 288/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond B | Illinois, Fish Creek | 143/172 | 288/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 287/287 | 171/171 |
| Broodstock 2009 Pond B | Illinois, Fish Creek | 143/172 | 288/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond B | Illinois, Fish Creek | 143/172 | 284/316 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond B | Illinois, Fish Creek | 143/143 | 288/296 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond B | Illinois, Fish Creek | 143/172 | 284/316 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond B | Illinois, Fish Creek | 143/172 | 284/308 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond B | Illinois, Fish Creek | 143/168 | 288/300 | 286/290 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond B | Illinois, Fish Creek | 172/172 | 296/316 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/356 | 171/171 |
| Broodstock 2009 Pond B | Illinois, Fish Creek | 143/172 | 300/304 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | / | 171/171 |
| Broodstock 2009 Pond B | Illinois, Fish Creek | 143/172 | 308/316 | 305/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond B | Illinois, Fish Creek | 143/172 | 284/316 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond B | Illinois, Fish Creek | 172/172 | 288/316 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond B | Illinois, Fish Creek | 172/172 | 288/316 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/356 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/296 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/168 | 288/292 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 316/316 | 293/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/143 | 304/308 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/288 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 296/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 284/288 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 316/316 | 290/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 284/288 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/296 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 292/308 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Progeny, Fall 2009 | Pond B | 143/168 | 288/296 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/316 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/296 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/288 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/300 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/316 | 290/293 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/292 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/143 | 292/308 | 286/286 | 152/152 | 276/276 | 206/206 | / | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/296 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 284/292 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/288 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/143 | 284/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/168 | 292/296 | 286/286 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 284/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/288 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 308/316 | 290/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/143 | 288/308 | 290/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 284/296 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/288 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/143 | 288/308 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/143 | 288/292 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 284/288 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/168 | 288/304 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/296 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/288 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/316 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/296 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/316 | 286/293 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 296/316 | 290/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/143 | 288/308 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/168 | 288/304 | 286/290 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Progeny, Fall 2009 | Pond B | 172/172 | 288/316 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/296 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 292/316 | 286/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/288 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/143 | 288/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 316/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/143 | 288/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/288 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/143 | 288/304 | 290/290 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/168 | 288/292 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/296 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 292/308 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 284/288 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 296/316 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/316 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/288 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/143 | 288/292 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/304 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/288 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/288 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/143 | 288/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/316 | 290/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/292 | 286/286 | 152/152 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 284/288 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/288 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/143 | 288/300 | 290/290 | 152/165 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/316 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/288 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/288 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/288 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 284/288 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/168 | 296/304 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/288 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Progeny, Fall 2009 | Pond B | 172/172 | 288/288 | 293/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/143 | 288/304 | 286/286 | 152/152 | 276/276 | 206/206 | / | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/168 | 288/288 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/316 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/296 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/143 | 288/292 | 286/290 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/296 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 296/304 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/168 | 288/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 284/288 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 292/308 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/288 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/308 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/292 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/168 | 288/296 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/304 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/143 | 292/296 | 290/290 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/316 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 304/308 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 304/316 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/296 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/308 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/143 | 288/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/316 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/308 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/288 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 284/316 | 290/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 284/288 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/168 | 288/292 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 316/316 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/288 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Progeny, Fall 2009 | Pond B | 143/143 | 292/308 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/143 | 300/316 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/296 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/308 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/296 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 284/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/288 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/300 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/288 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/296 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/288 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/288 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/143 | 288/292 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/288 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 284/288 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/168 | 288/304 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 292/308 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/288 | 290/293 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 284/292 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/288 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/288 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/296 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/168 | 288/296 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 284/288 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 316/316 | 290/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/288 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | / | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/168 | 288/296 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/168 | 288/288 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/168 | 288/292 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/143 | 284/316 | 290/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/168 | 288/296 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Progeny, Fall 2009 | Pond B | 172/172 | 284/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 284/316 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/288 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/288 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/168 | 288/288 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/292 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 164/168 | 288/296 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 300/316 | 286/305 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/308 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 304/316 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 284/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/316 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 284/296 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/143 | 288/308 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 296/320 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/164 | 284/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/168 | 288/296 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/316 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/296 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/300 | 286/290 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/296 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/316 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/288 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/288 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/316 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/168 | 296/304 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/296 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/300 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/288 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 296/296 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall | Pond B | 143/168 | 288/296 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| 2009 | | | | | | | | | | |
| Progeny, Fall 2009 | Pond B | 143/143 | 288/316 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 284/288 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/308 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 284/292 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/288 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 316/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/316 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/292 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/143 | 292/308 | 286/305 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/304 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/172 | 288/300 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/168 | 288/296 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/300 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 168/172 | 288/304 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/304 | 290/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 143/168 | 288/296 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond B | 172/172 | 288/316 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond E | Illinois, Fish Creek | 143/168 | 288/300 | 286/290 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond E | Illinois, Fish Creek | 168/172 | 288/316 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Broodstock 2009 Pond E | Illinois, Fish Creek | 143/172 | 296/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond E | Illinois, Fish Creek | 168/172 | 284/316 | 290/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond E | Illinois, Fish Creek | 143/168 | 288/300 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond E | Illinois, Fish Creek | 172/172 | 292/304 | 286/290 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond E | Illinois, Fish Creek | 172/172 | 304/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond E | Illinois, Fish Creek | 172/172 | 292/304 | 286/290 | 165/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond E | Illinois, Fish Creek | 143/172 | 284/312 | 282/286 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond E | Illinois, Fish Creek | 168/172 | 288/308 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond E | Illinois, Fish Creek | 172/172 | 284/296 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Broodstock 2009 Pond E | Illinois, Fish Creek | 168/172 | 288/292 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond E | Illinois, Fish Creek | 172/172 | 288/316 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond E | Illinois, Fish Creek | 172/172 | 296/308 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond E | Illinois, Fish Creek | 143/168 | 288/308 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Broodstock 2009 Pond E | Illinois, Fish Creek | 168/172 | 288/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Broodstock 2009 Pond E | Illinois, Fish Creek | 168/168 | 300/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/304 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 292/296 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/304 | 286/286 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 284/316 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/316 | 286/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 304/316 | 286/290 | 152/165 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/168 | 288/300 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 292/296 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 300/304 | 286/286 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 296/316 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 272/284 | 293/293 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 288/292 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 304/308 | 290/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/316 | 286/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 288/296 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 284/316 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 288/292 | 286/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 288/316 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 284/296 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 288/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 300/304 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 288/292 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 292/296 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 292/300 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 304/308 | 286/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 308/316 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 300/304 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 284/296 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 272/288 | 286/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/300 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/292 | 286/286 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Progeny, Fall 2009 | Pond E | 168/172 | 304/308 | 290/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 288/292 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 288/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 304/316 | 286/290 | 152/165 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/316 | 286/290 | 152/165 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 296/304 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/292 | 286/290 | 152/165 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 288/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 304/308 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 284/316 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/300 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 304/308 | 286/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 296/308 | 286/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 300/308 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 316/316 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 300/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 288/292 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 288/316 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 296/308 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 288/292 | 290/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/143 | 284/288 | 282/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 300/304 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/300 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 300/304 | 290/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 288/304 | 286/290 | 152/165 | 276/276 | 206/206 | 144/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 288/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/292 | 286/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 304/308 | 286/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/143 | 284/300 | 286/286 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 288/304 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 288/304 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/316 | 286/290 | 152/165 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Progeny, Fall 2009 | Pond E | 143/172 | 292/300 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 292/300 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 296/300 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/168 | 300/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/308 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 296/316 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/308 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 284/296 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 292/300 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 304/308 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/308 | 290/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/308 | 290/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 284/304 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 300/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 292/300 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 304/316 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/292 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/168 | 292/296 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 288/304 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 292/300 | 290/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 304/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/296 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/304 | 286/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 300/308 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 292/300 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/316 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 288/296 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 292/308 | 286/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 292/300 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 304/308 | 286/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 304/320 | 286/290 | 152/165 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/296 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Progeny, Fall 2009 | Pond E | 168/172 | 296/300 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/143 | 288/296 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 296/296 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/292 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/292 | 286/286 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 288/316 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/292 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 288/292 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 288/316 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 272/288 | 286/293 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 296/296 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 288/316 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/308 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/308 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 296/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 292/308 | 290/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | / | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/292 | 286/286 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | / | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 292/296 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | / | 286/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | / |
| Progeny, Fall 2009 | Pond E | 168/168 | 316/316 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/304 | 286/286 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 308/316 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 292/296 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/296 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 288/316 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/296 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 300/304 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/168 | 296/300 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 284/304 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/308 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Progeny, Fall 2009 | Pond E | 168/172 | 288/292 | 286/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/308 | 290/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 288/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 300/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 288/292 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 296/300 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/168 | 288/296 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/308 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 300/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/168 | 284/316 | 290/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 300/304 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 296/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/292 | 286/290 | 152/173 | 276/276 | 206/206 | / | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 304/308 | 290/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/292 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 284/316 | 290/293 | 152/152 | 276/276 | / | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 296/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 292/308 | 286/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 292/300 | 290/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 288/304 | 286/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/316 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 300/304 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 296/316 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/168 | 296/308 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 292/296 | 290/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 304/308 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/292 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/304 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 292/300 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/168 | 288/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 304/308 | 286/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 296/316 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 300/308 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Progeny, Fall 2009 | Pond E | 168/172 | 292/300 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 304/308 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 304/316 | 286/290 | 152/165 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/308 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/168 | 288/316 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/304 | / | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/296 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/292 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 292/308 | 286/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 288/304 | 290/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 292/304 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 308/308 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 288/292 | 286/290 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 292/300 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 300/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/172 | 288/296 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/296 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/292 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 292/296 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/168 | 300/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 296/316 | 290/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/292 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 292/316 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/308 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 284/296 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 292/316 | 286/290 | 152/165 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 300/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 288/292 | 286/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 143/168 | 300/316 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 288/292 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 304/316 | 286/290 | 152/165 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Progeny, Fall 2009 | Pond E | 168/168 | 300/316 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 304/308 | 290/290 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 168/172 | 288/304 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Progeny, Fall 2009 | Pond E | 172/172 | 284/296 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Adult | Illinois, Beaver Pond | 152/160 | 261/308 | 290/301 | 177/177 | 276/276 | 206/206 | 146/146 | 283/285 | 171/171 |
| Adult | Illinois, Beaver Pond | 160/168 | / | 286/297 | 169/169 | 276/276 | / | / | / | / |
| Adult | Illinois, Beaver Pond | 160/160 | 288/312 | 282/286 | 177/185 | 276/279 | 206/206 | 146/146 | 283/291 | 171/171 |
| Adult | Illinois, Beaver Pond | 152/156 | 292/308 | 286/290 | 165/177 | 276/276 | 206/215 | 146/146 | 250/283 | 171/171 |
| Adult | Illinois, Big Fish Lake | 147/176 | 304/304 | 293/301 | 169/173 | 276/279 | 189/206 | 146/146 | 285/285 | 171/171 |
| Adult | Illinois, Big Fish Lake | 138/138 | 280/312 | 286/293 | 177/177 | 276/276 | 206/208 | 146/146 | 271/283 | 171/171 |
| Adult | Illinois, Big Fish Lake | 143/160 | 300/300 | 293/305 | 165/185 | 276/276 | 189/189 | 146/146 | 283/283 | 169/171 |
| Adult | Illinois, Crane Creek | 143/172 | 288/308 | 278/286 | 152/165 | 276/276 | 206/206 | 146/146 | 250/250 | 171/171 |
| Adult | Illinois, Crane Creek | 143/172 | 296/308 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 250/250 | 171/171 |
| Adult | Illinois, Crane Creek | 143/172 | 288/308 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 250/250 | 171/171 |
| Adult | Illinois, Crane Creek | 143/172 | 304/308 | 286/301 | 152/173 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Adult | Illinois, Cypress Ditch | 143/172 | 280/280 | 286/290 | 169/185 | 276/276 | 189/206 | 146/146 | 283/285 | 171/171 |
| Adult | Illinois, Cypress Ditch | 172/172 | 308/333 | 293/293 | 173/185 | 276/294 | 189/215 | 146/146 | 271/285 | 171/171 |
| Adult | Illinois, Cypress Ditch | 147/152 | 288/296 | 293/297 | 169/177 | 276/294 | 189/200 | 146/146 | 283/283 | 171/171 |
| Adult | Illinois, Cypress Ditch | 147/160 | 288/292 | 293/305 | 161/185 | 276/276 | 189/189 | 146/146 | 283/285 | 171/171 |
| Adult | Illinois, Cypress Ditch | 147/168 | 284/292 | 290/305 | 165/173 | 276/276 | 206/206 | 146/146 | 269/283 | 171/171 |
| Adult | Illinois, Cypress Ditch | 152/160 | 280/292 | 290/297 | 169/177 | 276/276 | 206/206 | 146/146 | 283/285 | 171/171 |
| Adult | Illinois, Cypress Ditch | 152/160 | 292/304 | 286/286 | 169/177 | 276/276 | 197/206 | 146/146 | 271/283 | 171/171 |
| Adult | Illinois, Cypress Ditch | 147/172 | 304/333 | 293/301 | 169/177 | 276/279 | 215/215 | 146/146 | 283/285 | 171/171 |
| Banded sunfish, Adult | Illinois, Winters Pond | 147/176 | 288/288 | 229?/229? | 152/152 | / | 236/240 | / | 303/303 | 177/177 |
| Banded sunfish, Adult | Illinois, Winters Pond | 172/193 | 280/300 | / | 152/152 | / | 236/236 | / | 283/283 | 177/177 |
| Banded sunfish, Adult | Illinois, Winters Pond | / | / | / | / | 276/276 | / | / | / | / |
| Banded sunfish, Adult | Illinois, Winters Pond | 138/143 | 276/284 | / | 152/250? | / | / | / | / | / |
| Banded sunfish, Adult | Illinois, Winters Pond | 143/172 | 272/296 | / | / | / | 240/240 | / | / | / |
| Banded sunfish, Adult | Illinois, Winters Pond | 172/193 | 280/280 | / | / | / | 236/245 | / | 285/285 | 177/179 |
| Banded sunfish, Adult | Illinois, Winters Pond | 143/193 | 308/308 | / | 152/152 | / | 236/236 | / | 285/325 | 177/177 |
| Banded sunfish, Adult | Illinois, Winters Pond | 160/184 | 257/272 | / | / | / | 240/243 | / | 287/323 | 177/179 |
| Banded sunfish, Adult | Illinois, Winters Pond | 138/138 | 280/328 | 221?/229? | / | / | 236/240 | / | 323/325 | 177/177 |
| Banded sunfish, Adult | Illinois, Winters Pond | 160/172 | 284/284 | / | 152/152 | / | 240/240 | / | 285/303 | 177/179 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Banded sunfish, Adult | Illinois, Winters Pond | 176/184 | 296/296 | 286/288 | / | 301/301 | 240/240 | / | 283/285 | 177/177 |
| Banded sunfish, Adult | Illinois, Winters Pond | 176/193 | 280/292 | / | 152/165 | / | 236/236 | / | 285/333 | 177/179 |
| Banded sunfish, Adult | Illinois, Winters Pond | 143/152 | 257/280 | / | 152/173 | / | 236/236 | / | / | 167/177 |
| Banded sunfish, Adult | Illinois, Winters Pond | 138/156 | 253/304 | / | 152/169 | / | 236/240 | / | 285/285 | 177/179 |
| Banded sunfish, Adult | Illinois, Winters Pond | 172/184 | 261/261 | 229/229 | 152/152 | / | 236/236 | / | 283/285 | 177/177 |
| Banded sunfish, Adult | Illinois, Winters Pond | 176/184 | 296/296 | 286/286 | / | / | 236/236 | / | 285/297 | 177/177 |
| Adult | Indiana, Barren Ditch | 156/160 | 284/296 | / | 169/169 | 276/276 | 202/215 | 146/146 | 285/285 | 171/171 |
| Adult | Indiana, Barren Ditch | 160/160 | 296/296 | 293/297 | 169/169 | 276/279 | 195/206 | 146/146 | 285/285 | 171/171 |
| Adult | Indiana, Barren Ditch | 160/160 | 284/296 | 270/290 | 169/177 | 276/276 | 202/206 | 146/146 | 285/285 | 169/169 |
| Adult | Indiana, Barren Ditch | 160/184 | 284/296 | 290/293 | 177/177 | 276/279 | 202/215 | 146/146 | 285/291 | 169/171 |
| Adult | Indiana, Barren Ditch | 160/160 | 296/296 | 270/270 | 169/177 | 276/276 | 195/215 | 146/146 | 285/285 | 171/171 |
| Adult | Indiana, Barren Ditch | 156/184 | 296/296 | 270/290 | 169/177 | 276/276 | 202/206 | 146/146 | 269/285 | 171/171 |
| Adult | Indiana, Barren Ditch | 160/160 | 284/296 | 270/297 | 169/169 | 276/276 | 215/215 | 146/146 | 285/291 | 171/171 |
| Adult | Indiana, Barren Ditch | 160/160 | 296/296 | 293/297 | 177/177 | 276/276 | 195/206 | 146/146 | 285/285 | 171/171 |
| Adult | Indiana, Barren Ditch | 160/160 | 284/296 | 290/293 | 173/177 | 276/276 | 206/215 | 146/146 | 285/285 | 169/171 |
| Adult | Indiana, Barren Ditch | 152/152 | 292/296 | 270/290 | 177/177 | 276/276 | 202/202 | 146/146 | 285/285 | 171/171 |
| Adult | Indiana, River Deshee | 160/160 | 284/296 | 293/293 | 177/177 | 276/276 | 215/215 | 146/146 | 285/285 | 171/171 |
| Adult | Indiana, River Deshee | 160/184 | 320/320 | 282/286 | 177/181 | 276/276 | 206/206 | 146/146 | 279/285 | 171/171 |
| Adult | Indiana, River Deshee | 168/168 | 296/320 | 270/293 | 169/177 | 279/279 | 206/206 | 146/146 | 275/285 | 171/171 |
| Adult | Indiana, River Deshee | 160/160 | 300/320 | 286/297 | 177/197 | 276/276 | 206/206 | 146/146 | 269/285 | 171/171 |
| Adult | Indiana, River Deshee | 143/160 | 292/292 | 286/286 | 173/177 | 276/276 | 206/206 | 146/146 | 283/285 | 171/171 |
| Adult | Indiana, River Deshee | 184/184 | 304/324 | 293/305 | 177/185 | / | 206/206 | / | 269/269 | 171/171 |
| Adult | Indiana, River Deshee | 160/160 | 292/308 | 290/301 | 165/169 | 276/276 | 197/197 | 146/146 | 269/285 | 169/171 |
| Adult | Indiana, River Deshee | 152/160 | 276/296 | 290/293 | 177/185 | 276/279 | 197/197 | 146/146 | 279/283 | 169/171 |
| Adult | Indiana, River Deshee | 160/160 | 316/316 | 301/301 | 177/181 | / | 197/206 | / | 283/287 | 169/171 |
| Adult | Indiana, River Deshee | 164/164 | 280/320 | 290/305 | 169/197 | 276/276 | 197/197 | 146/146 | 275/285 | 171/171 |
| Adult | Indiana, River Deshee | 160/172 | 304/328 | 290/293 | 177/181 | 276/276 | 206/206 | 146/146 | 285/285 | 171/171 |
| Adult | Indiana, River Deshee | 160/168 | 288/300 | 293/293 | 177/177 | 272/276 | 197/197 | 146/146 | 269/285 | 169/171 |
| Adult | Indiana, River Deshee | 160/160 | 296/324 | 286/290 | 177/181 | 276/276 | 197/206 | 146/146 | 283/283 | 171/171 |
| Adult | Indiana, River Deshee | 160/160 | 280/316 | 282/297 | 169/169 | 276/276 | 206/206 | 146/146 | 285/285 | 171/171 |
| Adult | Indiana, River Deshee | 138/138 | 296/304 | / | 173/185 | / | 202/206 | / | 285/285 | 171/171 |
| Adult | Indiana, River Deshee | 160/160 | 288/320 | 293/293 | 169/181 | 276/276 | 206/206 | 146/146 | 283/285 | 171/171 |
| Adult | Indiana, River Deshee | 160/160 | 280/300 | 293/293 | 173/185 | 279/279 | 206/206 | 146/146 | 275/285 | 171/171 |
| Adult | Indiana, River | 160/160 | 300/300 | 293/305 | 177/185 | 276/276 | 195/206 | 146/146 | 283/285 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Deshee | | | | | | | | | |
| Adult | Indiana, River Deshee | 160/172 | 288/328 | 290/293 | 169/185 | 279/279 | 197/197 | / | / | 171/171 |
| Adult | Missouri, Current River | 147/152 | 284/288 | 282/301 | 173/173 | 276/283 | 202/202 | 146/146 | 283/283 | 171/171 |
| Adult | Missouri, Current River | 152/152 | 269/284 | 290/290 | 173/173 | 276/276 | 197/202 | 144/146 | 250/283 | 171/171 |
| Adult | Missouri, Duck Creek | 156/164 | 272/296 | 278/293 | 165/181 | 276/283 | 189/197 | 144/146 | 283/287 | 171/171 |
| Adult | Missouri, Duck Creek | 164/176 | 284/300 | 293/293 | 165/177 | 276/283 | 189/202 | 144/146 | 250/287 | 171/171 |
| Adult | Missouri, Duck Creek | 109/143 | 272/280 | 278/293 | 165/169 | 276/276 | 189/206 | 144/146 | 250/287 | 171/171 |
| Adult | Missouri, Duck Creek | 156/156 | 284/337 | 293/301 | 173/177 | 276/276 | 193/197 | 144/146 | 250/252 | 171/171 |
| Adult | Missouri, Duck Creek | 156/168 | 272/304 | 290/293 | 173/173 | 276/276 | 189/202 | 144/146 | 250/287 | 171/171 |
| Adult | Missouri, Duck Creek | 172/176 | 284/304 | 282/293 | 165/169 | 272/276 | 202/206 | 141/146 | 252/287 | 171/171 |
| Adult | Missouri, Duck Creek | 152/156 | 284/292 | 278/293 | 177/177 | 276/276 | 189/202 | 144/146 | 250/283 | 169/171 |
| Adult | Missouri, Duck Creek | 176/176 | 300/349 | 293/301 | 177/177 | 276/276 | 197/206 | 144/146 | 250/250 | 169/171 |
| Adult | Missouri, Duck Creek | 143/164 | 280/320 | 278/305 | 165/165 | 276/279 | 202/206 | 146/146 | 250/287 | 169/171 |
| Adult | Missouri, Duck Creek | 156/168 | 284/292 | 282/297 | 185/185 | 272/283 | 189/189 | 146/146 | 250/252 | 171/171 |
| Adult | Missouri, Duck Creek | 143/164 | 292/296 | 278/293 | 169/173 | 276/279 | 193/206 | 144/146 | 252/333 | 171/171 |
| Adult | Missouri, Duck Creek | 164/168 | 284/292 | 290/293 | 165/173 | 276/276 | 189/200 | 141/146 | 333/333 | 169/171 |
| Adult | Missouri, Duck Creek | 147/156 | 296/308 | 282/290 | 177/177 | 276/276 | 189/206 | 141/146 | 252/287 | 171/171 |
| Adult | Missouri, Duck Creek | 164/168 | 296/312 | 278/301 | 185/185 | 276/276 | 202/202 | 146/146 | 283/283 | 169/171 |
| Adult | Missouri, Duck Creek | 143/160 | 280/300 | 293/293 | 165/181 | 276/283 | 202/204 | 144/146 | 250/252 | 169/171 |
| Adult | Missouri, Duck Creek | 156/164 | 324/337 | 278/301 | 173/177 | 276/276 | 189/197 | 146/146 | 252/252 | 171/171 |
| Adult | Missouri, Duck Creek | 156/168 | 284/337 | 282/290 | 181/181 | 272/276 | 189/202 | 144/146 | 250/283 | 171/171 |
| Adult | Missouri, Duck Creek | 156/160 | 272/328 | 278/293 | 169/181 | 276/283 | 202/202 | 144/146 | 283/333 | 169/171 |
| Adult | Missouri, Duck Creek | 156/156 | 300/300 | 290/293 | 165/181 | 276/276 | 189/197 | 144/146 | 252/283 | 171/171 |
| Adult | Missouri, Duck Creek | 156/164 | 280/328 | 278/290 | 165/165 | 272/279 | 202/206 | 146/146 | 250/252 | 171/171 |
| Adult | Missouri, Eleven Point River | 152/160 | 296/304 | 293/293 | 169/177 | 276/276 | 202/204 | 144/144 | 277/314 | 169/171 |
| Adult | Missouri, Eleven Point River | 147/152 | 312/320 | 278/297 | 165/169 | 276/283 | 202/202 | 144/146 | 283/283 | 171/171 |
| Adult | Missouri, Eleven Point River | 134/160 | 249/324 | 290/290 | 169/169 | 276/302 | 202/202 | 146/146 | 285/289 | 171/171 |
| Adult | Missouri, Eleven Point River | 130/143 | 265/320 | 293/297 | 169/169 | 279/287 | 202/202 | 144/146 | 283/287 | 171/171 |
| Adult | Missouri, Eleven Point River | 134/147 | 257/324 | 293/297 | 169/169 | 276/279 | 200/206 | 144/146 | 281/285 | 171/171 |
| Adult | Missouri, Eleven Point River | 134/156 | 304/337 | 290/293 | 165/169 | 276/276 | 202/204 | 146/146 | 285/285 | 171/171 |
| Adult | Missouri, Eleven Point River | 156/172 | 249/280 | 253/290 | 169/169 | / | 200/202 | 146/146 | 277/295 | 171/171 |
| Adult | Missouri, Eleven Point River | 130/130 | 316/324 | 278/293 | 169/169 | 276/283 | 202/206 | 144/146 | 291/314 | 171/171 |
| Adult | Missouri, Eleven Point River | 130/164 | 300/320 | 290/293 | 169/181 | / | 202/202 | 146/146 | 283/301 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Adult | Missouri, Eleven Point River | 156/172 | 312/337 | 290/293 | 169/173 | 302/302 | 202/202 | 144/144 | 281/281 | 171/171 |
| Adult | Missouri, Eleven Point River | 147/152 | 280/300 | 290/293 | 169/177 | 279/279 | 202/204 | 144/146 | 295/314 | 171/171 |
| Adult | Missouri, Eleven Point River | 147/147 | 288/304 | 245/245 | / | / | 206/206 | 146/146 | 285/285 | 171/171 |
| Adult | Missouri, Eleven Point River | 134/152 | 312/312 | 297/301 | 169/173 | 276/287 | 202/204 | 144/146 | 285/287 | 171/171 |
| Adult | Missouri, Eleven Point River | 160/168 | 316/320 | 293/293 | 169/173 | 276/302 | 202/202 | 144/144 | 285/289 | 171/171 |
| Adult | Missouri, Eleven Point River | 160/164 | 261/300 | 278/290 | 169/177 | 276/276 | 202/202 | 144/148 | 291/301 | 169/171 |
| Adult | Missouri, Eleven Point River | 130/152 | 316/328 | 290/293 | 169/169 | 294/298 | 202/204 | 144/146 | 283/283 | 171/171 |
| Adult | Missouri, Eleven Point River | 130/152 | 312/316 | 290/297 | 169/169 | 276/302 | 202/204 | 144/146 | 277/283 | 171/171 |
| Adult | Missouri, Eleven Point River | 147/147 | 304/337 | 290/290 | 169/173 | 276/302 | 202/202 | 144/146 | 285/285 | 171/171 |
| Adult | Missouri, Eleven Point River | 130/147 | 276/337 | 278/282 | 169/169 | 279/279 | 200/204 | 144/146 | 283/287 | 171/171 |
| Adult | Missouri, Eleven Point River | 152/152 | 308/316 | 293/293 | 169/177 | 276/302 | 202/202 | 146/146 | 283/285 | 171/171 |
| Adult | Missouri, Eleven Point River | 156/156 | 276/276 | 278/297 | 169/169 | 279/279 | 202/206 | 146/146 | 285/291 | 171/171 |
| Adult | Missouri, Eleven Point River | 130/164 | 292/337 | 290/293 | 169/169 | 283/298 | 202/204 | 144/144 | 285/285 | 171/171 |
| Adult | Missouri, Eleven Point River | 109/143 | 308/356 | 297/297 | 169/173 | 276/283 | 200/206 | 144/146 | 283/285 | 171/171 |
| Adult | Missouri, Eleven Point River | 152/156 | 312/324 | 293/301 | 165/169 | 276/279 | 202/204 | 144/146 | 281/283 | 171/171 |
| Adult | Missouri, Eleven Point River | 147/156 | 300/304 | 290/290 | 169/177 | 283/294 | 202/204 | 144/144 | 281/285 | 171/171 |
| Adult | Missouri, Eleven Point River | 118/152 | 288/300 | 290/305 | 169/169 | 283/283 | 202/202 | 144/144 | 281/283 | 171/171 |
| Adult | Missouri, Eleven Point River | 156/160 | 288/320 | 290/305 | 169/169 | 276/279 | 202/202 | 144/146 | 277/314 | 169/171 |
| Adult | Missouri, Eleven Point River | 147/152 | 280/296 | 278/290 | 169/169 | 276/276 | 202/202 | 144/146 | 285/295 | 171/171 |
| Adult | Missouri, Eleven Point River | 152/156 | 288/296 | 290/290 | 169/169 | 283/294 | 206/206 | 146/146 | 283/283 | 171/171 |
| Adult | Missouri, Jack's Fork | 147/147 | 265/284 | 259/297 | 173/177 | 279/279 | 197/202 | 146/146 | 250/250 | 171/171 |
| Adult | Missouri, Jack's Fork | 143/152 | 269/288 | 290/305 | 173/177 | 276/276 | 193/197 | 146/146 | 283/283 | 169/171 |
| Adult | Missouri, Jack's Fork | 138/156 | 269/300 | 282/305 | 177/177 | 276/276 | 202/202 | 146/146 | 283/289 | 171/171 |
| Adult | Missouri, Jack's Fork | 152/160 | 269/300 | 290/301 | 173/177 | 276/276 | 202/202 | 146/146 | 250/283 | 171/171 |
| Adult | Missouri, Jack's Fork | 152/168 | 284/328 | 282/290 | 169/173 | 276/276 | 193/197 | 146/146 | 287/289 | 171/171 |
| Adult | Missouri, Jack's Fork | 152/164 | 269/300 | 259/301 | 173/177 | 279/279 | 197/202 | 146/146 | 283/289 | 171/171 |
| Adult | Missouri, Jack's Fork | 152/152 | 269/288 | 259/290 | 173/173 | 276/279 | 193/197 | 146/146 | 283/283 | 171/171 |
| Adult | Missouri, Jack's Fork | 156/164 | 300/304 | 305/305 | 173/173 | 276/276 | 202/202 | 144/146 | 287/289 | 171/171 |
| Adult | Missouri, Jack's Fork | 152/160 | 261/269 | 259/305 | 173/177 | 276/279 | 197/202 | 144/146 | 250/289 | 171/171 |
| Adult | Missouri, Jack's Fork | 152/168 | 300/312 | 259/286 | 173/173 | 279/279 | 197/202 | 146/146 | 283/289 | 171/171 |
| Adult | Missouri, Jack's Fork | 152/152 | 261/288 | 282/293 | 173/177 | 276/276 | 197/202 | 144/146 | 289/289 | 171/171 |
| Adult | Missouri, Jack's Fork | 152/152 | 269/269 | 259/309 | 173/177 | 276/276 | 197/202 | 144/146 | 250/289 | 171/171 |
| Adult | Missouri, Jack's Fork | 143/168 | 269/284 | 301/305 | 173/177 | 276/276 | 193/202 | 146/146 | 283/283 | 169/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Adult | Missouri, Jack's Fork | 152/152 | 261/261 | 259/290 | 173/177 | 276/279 | 202/202 | 146/150 | 283/283 | 171/171 |
| Adult | Missouri, Jack's Fork | 152/160 | 284/300 | 305/305 | 173/173 | 276/276 | 193/202 | 144/146 | 283/283 | 171/171 |
| Adult | Missouri, Jack's Fork | 152/168 | 269/272 | 301/305 | 177/177 | 276/276 | 193/202 | 144/146 | 283/285 | 171/171 |
| Adult | Missouri, Jack's Fork | 152/168 | 261/312 | 259/282 | 169/173 | 276/276 | 197/197 | 146/146 | 283/285 | 171/171 |
| Adult | Missouri, Jack's Fork | 152/168 | 261/269 | 282/305 | 173/181 | 276/276 | 202/202 | 146/146 | 250/283 | 171/171 |
| Adult | Missouri, Jack's Fork | 152/152 | 292/304 | 259/282 | 173/173 | 276/279 | 202/202 | 146/146 | 250/287 | 171/171 |
| Adult | Missouri, Jack's Fork | 152/152 | 269/269 | 290/305 | 173/177 | / | 197/197 | / | / | / |
| Adult | Missouri, Jack's Fork | 156/164 | 261/300 | 282/301 | 169/173 | 276/276 | 193/202 | 146/146 | 289/289 | 171/171 |
| Adult | Missouri, Jack's Fork | 160/172 | 269/284 | 305/305 | 173/177 | 276/276 | 193/193 | 146/146 | 250/283 | 169/173 |
| Adult | Missouri, Jack's Fork | 156/160 | 269/269 | 305/305 | 173/173 | 276/279 | 193/202 | 144/146 | 283/289 | 171/171 |
| Adult | Missouri, Jack's Fork | 138/164 | 272/280 | 297/305 | 173/173 | 276/279 | 202/202 | 146/146 | 283/283 | 171/171 |
| Adult, Bluegill | Missouri, Jack's Fork | 147/164 | 261/284 | 238/282 | 156/156 | / | 219/251 | / | 190/289 | / |
| Adult, Green Sunfish | Missouri, Jack's Fork | 152/152 | 253/316 | 201/209 | / | 252/268 | 202/202 | 159/159 | 287/301 | 173/173 |
| Adult, Longear Sunfish | Missouri, Jack's Fork | 125/207 | / | 209/247 | 180?/236? | 264/283 | 185/193 | 148/148 | 248/250 | 165/175 |
| Adult | Missouri, Little Black River | 152/193 | 265/296 | 309/309 | 173/181 | 276/283 | 200/206 | 146/146 | 283/285 | 171/171 |
| Adult | Missouri, Little Black River | 152/160 | 284/284 | 290/305 | 173/177 | 279/283 | 189/197 | 146/146 | 271/289 | 169/171 |
| Adult | Missouri, Little Black River | 109/147 | 265/296 | 286/290 | 173/181 | 276/279 | 197/206 | 144/146 | 283/283 | 171/171 |
| Adult | Missouri, Little Black River | 152/152 | 265/292 | 286/309 | 173/189 | 276/283 | 197/202 | 146/146 | 283/344 | 169/171 |
| Adult | Missouri, Tenmile Creek | 168/176 | 272/296 | 282/286 | 173/173 | 279/287 | 189/197 | 144/146 | 283/285 | 169/171 |
| Adult | Missouri, Tenmile Creek | 147/168 | 229/300 | 174/290 | 173/177 | 276/287 | 189/189 | 144/144 | 283/350 | 169/171 |
| Adult | Missouri, Tenmile Creek | 101/152 | 288/296 | 282/305 | 169/173 | 276/276 | 197/202 | 141/141 | 283/283 | 169/171 |
| Adult, Warmouth | Missouri, Jack's Fork | 138/138 | 249/249 | 313/313 | / | / | 191/215 | / | 289/295 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 172/172 | 300/300 | 286/290 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/143 | 288/304 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/143 | 272/288 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 288/296 | 282/286 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 172/172 | 300/328 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 284/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 168/172 | 300/316 | 286/305 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/143 | 288/288 | / | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 272/272 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 272/296 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 168/168 | 296/316 | 290/305 | 152/173 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/143 | 288/300 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 288/304 | 286/290 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/168 | 284/304 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 284/300 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 300/304 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 287/287 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 284/288 | 286/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 296/296 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | / | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/168 | 284/288 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 300/328 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 272/296 | 286/293 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 172/172 | 272/300 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/143 | 300/300 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 272/272 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 172/172 | 272/284 | 286/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 300/328 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 168/172 | 288/300 | 286/305 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 288/296 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 172/172 | 296/316 | 286/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 272/300 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 168/172 | 272/292 | 286/290 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/143 | 272/296 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/143 | 284/284 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 168/172 | 272/300 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/168 | 288/316 | 282/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/287 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/143 | 300/316 | 290/305 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/143 | 284/288 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/143 | 272/284 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 172/172 | 288/296 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 296/296 | 282/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/143 | 288/288 | 286/290 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 272/292 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 272/284 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the | Emiquon National | 143/172 | 272/284 | 282/286 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Year 2009 | Wildlife Refuge | | | | | | | | | |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 272/304 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 296/300 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 296/328 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 168/172 | 272/328 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | / | 288/293 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 272/296 | 282/286 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 172/172 | 288/292 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 172/172 | 272/296 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 272/300 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 292/304 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 300/300 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/143 | 284/284 | 305/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/143 | 284/284 | 286/286 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 172/172 | 284/284 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/168 | 300/304 | 286/293 | 152/165 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 272/300 | 286/286 | 165/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 172/172 | 296/296 | 282/293 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/143 | 288/300 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 284/300 | 286/305 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 272/284 | 286/286 | 165/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 272/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 172/172 | 272/296 | 286/290 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 272/300 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 172/172 | 296/300 | 286/293 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 172/172 | 284/300 | 290/293 | 152/173 | 276/276 | 206/206 | 146/146 | 250/250 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 172/172 | 296/296 | 290/305 | 152/152 | 276/276 | 206/206 | 146/146 | 287/287 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 172/172 | 300/300 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/143 | 272/300 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 288/288 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 168/172 | 288/300 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 272/288 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 250/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/143 | 288/328 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 272/328 | 286/290 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 284/300 | 282/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 172/172 | 292/296 | 282/286 | 152/152 | 276/276 | 206/206 | 146/146 | / | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 288/296 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 272/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/143 | 272/300 | 286/293 | 152/165 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 292/328 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 168/172 | 304/316 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 288/300 | 290/293 | 152/173 | 276/276 | 206/206 | / | 283/287 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 168/172 | 296/304 | 290/293 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 272/272 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 172/172 | 288/304 | 290/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 172/172 | 272/296 | 286/293 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 172/172 | 288/328 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/143 | 284/304 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/356 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 296/316 | 293/293 | 173/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 172/172 | 284/292 | 290/290 | 152/152 | 276/276 | 206/206 | 146/146 | 283/356 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 272/300 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/172 | 284/300 | 286/286 | 165/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 172/172 | 292/296 | 282/290 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/168 | 288/300 | 286/290 | 165/165 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 172/172 | 272/288 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/143 | 284/284 | 290/305 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| Young of the Year 2009 | Emiquon National Wildlife Refuge | 143/143 | 288/300 | 286/290 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| < 1 year old 2009 | Emiquon National Wildlife Refuge | 164/172 | 288/296 | 290/305 | 152/152 | 276/276 | 206/206 | 146/146 | 250/287 | 171/171 |
| < 1 year old 2009 | Emiquon National Wildlife Refuge | 143/172 | 288/296 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/287 | 171/171 |
| < 1 year old 2009 | Emiquon National Wildlife Refuge | 143/172 | 296/300 | 282/286 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| < 1 year old 2009 | Emiquon National Wildlife Refuge | 143/172 | 288/296 | 286/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| < 1 year old 2009 | Emiquon National Wildlife Refuge | 143/168 | 296/300 | 286/290 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| < 1 year old 2009 | Emiquon National Wildlife Refuge | 143/172 | 288/288 | 290/290 | 152/152 | 276/276 | 206/206 | 144/146 | 283/283 | 171/171 |
| < 1 year old 2009 | Emiquon National Wildlife Refuge | 143/143 | 288/328 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| < 1 year old 2009 | Emiquon National Wildlife Refuge | 143/172 | 284/292 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| < 1 year old 2009 | Emiquon National Wildlife Refuge | 143/172 | 284/288 | 286/286 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |

| SAMPLE TYPE | LOCATION | RB-7 | RB-20 | LMAR-10 | LMAR-9 | LMAR-18 | LMA-120 | LMA-21 | LMA-116 | LMA-121 |
|---|---|---|---|---|---|---|---|---|---|---|
| < 1 year old 2009 | Emiquon National Wildlife Refuge | 143/172 | 272/272 | 286/290 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| < 1 year old 2009 | Emiquon National Wildlife Refuge | 143/172 | 272/300 | 286/290 | 152/165 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| < 1 year old 2009 | Emiquon National Wildlife Refuge | 143/172 | 272/316 | 286/305 | 152/152 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| < 1 year old 2009 | Emiquon National Wildlife Refuge | 172/172 | 272/328 | 286/290 | 152/173 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |
| < 1 year old 2009 | Emiquon National Wildlife Refuge | 172/172 | 284/328 | 290/305 | 152/173 | 276/276 | 206/206 | 146/146 | 250/283 | 171/171 |
| < 1 year old 2009 | Emiquon National Wildlife Refuge | 172/172 | 288/288 | 286/286 | 152/152 | 276/276 | 206/206 | 146/146 | 283/283 | 171/171 |