

1994 Wisconsin Trumpeter Swan Decoy-Rearing Final Report

by

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Introduction

High cygnet survival was a hallmark of the sixth year of the Wisconsin Trumpeter Swan Decoy-Rearing Program. The 1994 crew raised, despite two fairly serious health threats, twenty-five of twenty-five cygnets to fledging. Three birds died after fledging but before migrating. Twenty-two healthy swans left the Necedah National Wildlife Refuge the week of November 20.

To start the season Sumner Matteson, Randy Jurewicz and crew collected eggs in Alaska. The cygnets were hatched at the Milwaukee County Zoo under the supervision of Ed Diebold and the aviary staff. The cygnets were raised on the Necedah NWR (National Wildlife Refuge) managed by Bud Oliveira and crew. David Flaspohler coordinated the program under Sumner Matteson. One DNR LTE and four UW interns were responsible for the daily care of the cygnets. I, Jennifer Skoloda, was intern coordinator. Ann Normington, Julie Malec, Christine Tanzer, and Jennifer Cole, all from UW Madison, were the summer interns. Candice Bartholomew came on in the fall to help after the interns had left.

Preparation- cage building and imprinting

Preparation began on May 4 at a meeting attended by Ed Diebold, Ellen Saksefski, Sumner Matteson, David Flaspohler, Kerry Bauer, Barb Bodienstien, myself and Maureen Gross. We toured the zoo facilities, discussed this year's timetable, equipment needs and ways to avoid the joint problems that occurred last year in the cygnets' legs.

Work began earlier this year than in past years because the eggs from the captive pair at the Green Bay New Zoo were expected to hatch by the end of May. After a scheduled health check of the adult pair at Green Bay the pen left her eggs uncovered for approximately two hours and only one of the nine eggs laid by this pair hatched. This left us with ample time to get ready for the arrival of the Alaskan eggs.

On May 17 Rebecca Christoffel (last year's intern coordinator) came to Necedah with me and helped to pick out the first cage site. On May 24 Julie, Ann, Jennifer, David and myself moved equipment from the storage shed at Mead to the house in Babcock. I went to the Milwaukee Zoo on May 19 and disinfected the carpet and barriers. I returned two days later to set up the runway/brooder area and pulley system. Cage building began on June 2. All four interns, myself and David Flaspohler worked on the construction of the three cages. On June 13 Christine, Ann and I left for the zoo to begin imprinting. The interns who remained in Babcock worked on finishing the cages, assembling the blinds and practiced maneuvering in the float-tubes and blind. While at the zoo I stayed in contact with David and the interns at Babcock.

The Alaskan eggs which arrived at the zoo on June 11 started hatching June 14. A tape player was set up in the incubator room and played to the eggs for 2-4 hours several times a day. The cygnets were weighed and banded upon hatching. They were moved to the basement of the primate house via cardboard box once they had dried off. Once the cygnets were mobile, imprinting sessions were begun and run every 2-3 hours. The eggs this year hatched in rapid succession which necessitated checking the incubator several times during the night. Out of the 50 eggs collected in Alaska 47 hatched. Twenty-five were allocated to the decoy-rearing program and all survived their stay at the zoo. See tables and charts 1-3 for daily weights of the cygnets while at the zoo.

Ann Normington left the zoo on June 18 to go to the refuge. On June 19 a zoo vet performed a health check on the first brood of eight birds. He took cloacal swabs and checked the bird's feet and nares. All swabs were sent to Madison Wildlife Health. The cygnets were weighed, put into a kennel and taken to the airport. I flew with them to the Necedah airport where we were meet by Jennifer Cole in the truck. The birds were then driven to East Sprague-Mather flowage on the Necedah NWR where they were to be raised. This brood of eight birds (Brood 1) was assigned to Jennifer Cole and Ann Normington.

At the zoo Christine Tanzer ran imprinting sessions with the rest of the cygnets until I returned on June 21. On June 21 the second brood (of ten birds) was health checked by the vet and Christine flew with Brood 2 to Necedah. Brood 2 was also raised on East Sprague-Mather flowage. Julie Malec and myself were assigned Brood 2.

I ran sessions with Brood 3 (the seven remaining birds) on June 21. On the same day they had a health check and were flown to Necedah. Brood 3 was assigned to Christine Tanzer and David Flaspohler. This brood was raised on Pool 19 of the Necedah NWR. I cleaned up at the zoo-disinfected the carpet and barriers and packed equipment. By June 22 I was also at the refuge and the field season was underway.

Habitat description

East Sprague-Mather: Dominant emergent vegetation in this pool was burreed, spike rush, three-way sedge and wild rice. There are many grassy man-made islands, some of which have small trees growing on them. The substrate is mostly mucky and soft but there are some sandy spots. The pool is shallow except for two ditched areas. The shallower areas are choked with willows. Submergent vegetation consists mainly of St. Johnswort, nitella, najas, some pondweeds and some elodea. The pool is bordered by scrub-oak, sedge meadow, dikes with mature red pines and similar

wetlands. The locations of Sprague-Mather and Broods 1 and 2 are marked on the attached map.

Pool 19: Pool 19 consists of three pools connected by a channel. There is one central island in each pool. Two of the islands have trees on them (Oak and Birch). The cage island does not have any trees but has an abundance of stinging nettle, steeplebush and razorgrass. The main emergent vegetation was burreed, several sedge sp., three-way sedge, equisetum and smartweed. Pool 19 had an abundance of submergent vegetation including: elodea, zoster, nitella, najas and pondweeds. The pool is bordered by pine and oak forest to the north and east, oak barrens and sedge meadow to the west and similar pools to the south and east. The bottom substrate in the cage pool is sandy but gets softer in the other pools. See the attached map for the location of Pool 19 on the refuge.

Weeks 1-9 : days on the marsh

When the cygnets arrive on the marsh they spend the first day in their cage to get accustom to their new surroundings. After they were placed in the cage they were observed from behind visual barriers for at least one hour. On the second day the cygnets were led onto the water for one to two hours. Each day following the time spent on the water was increased so by the end of their first week on the marsh they were spending seven to eight hours outside of their cages.

While out with the birds observers recorded the following information: date, weather conditions, time out of and into cages, time cygnets spent on different activities, foods eaten, significant behaviors and reaction to aircraft.

For the first week and a half that the birds were on the marsh propane heaters were run in the cages at night. These heaters were checked two times a night; at 10PM and 2AM. We did this using a rotating schedule. A two person team would do the 10PM check one night and the 2AM the next, rotating times with another team. The weather this year was unusually warm for June. Temperatures were in the 90's during the day and stayed warm overnight. Because of this we had a very difficult time regulating the temperatures in the cages. Often the temperature at the 10PM check would be over 100 degrees (even with all the felt flaps raised). Then at 2AM the heaters would have blown out because the flaps were up and the temperature would be below 90 degrees.

Daily routine was to have one person out with each of the three broods and have one person clean cages and run errands. Four days a week four of the field crew would be on duty and one person would have off. Three days a week two people would have off and 3 people would be on. On the days that only three people

were on we would have to both clean cages and take the birds out, which made for long days for us and short days for the birds. We were fortunate to have David come and help out on most of these 3-person days. If he could not make it Virginia Patton (a Wildlife Health intern) sometimes came and filled in. This routine was disrupted when in the last week of June five birds became ill and had to be shipped to the UW vet school. When the birds were returned 2 birds from Brood 1 were not reaccepted into their brood and it was necessary to have two observers and two decoys take the birds out. This arrangement lasted for three weeks and was difficult for the observers and the birds. The events are detailed the health section of this report.

When the birds got older Broods 1 and 2 were difficult to get into their cages and would require a second person in a blind to help pressure them into the cages at night. This was usually the cage cleaner who would canoe to the cage sight at the end of the day, put on a blind and help corral the birds when they were led close to the cage. We never had to use a canoe to scare any of the birds into their cages and Brood 3 never needed a second blind.

The cygnets were weighed and re-banded every two weeks. At these checks the alarm call was played while we handled the birds. Nares and feet were checked for leeches. See tables 4-9 for band changes and weights. A complete health check was done by Wildlife Health on July 19.

Some other main events include the removal of the brooders when the birds were five weeks old, Predator scares in August and the removal of cage fabric when the birds were eight weeks old.

We began weaning the birds from the blind when they were eight weeks old. We left them for an hour to an hour and a half at a time by planting the decoy's pole in the bottom substrate and then sneaking away in the blind. Observers in Brood 1 had trouble with the birds following the blind away from the decoy and would have to wait until the birds were busy eating before they could get away. The birds would be clustered around the decoy, sometimes "crying" when the observer returned. After one week most of the birds would leave the decoy but would be close enough to be found easily when we returned.

Media days were held on July 20 and August 15. News articles on the decoy-rearing program appeared in the following papers: Juneau County Star Times, Wisconsin Rapids Daily Tribune, Marshfield News Herald, Onalaska Community Life, LaCrosse Tribune, Milwaukee Journal (Travel Section). Copies of most of these articles are included at the end of this report. Stories were also aired on WCOW 97.1FM and a series on the Trumpeter Swan Program was on Channel 3 in Madison. Twenty-five

people attended a public tour sponsored by the Natural Resources Foundation on August 20.

Life after 9 weeks

At the age of nine weeks (August 18) the cygnets had almost all of their feathers and were large enough to begin spending the night outside of their cages. The cages were cleaned and locked for a last time. Observers continued to spend six hours a day out in the marsh with the birds until August 23 when the interns left for the summer. After this, several volunteers (John Goodman, Kate Lewandowski, Mitch Bergeson and Becky Abel) came at intervals to help me out until Candice started on September 7.

A final health check and banding was done on August 21. Kerry Bauer, Barb Bodienstien, Lisa Hartman, Mitch Bergeson and Mike Mossman drew blood, took cloacal swabs and fecal samples. The birds' measurements were taken and they were given USFWS leg bands and green and white neck collars.

Broods 1, 2 and the two ostracized birds were congregated in Pool 1 on the refuge. Brood 1 was moved September 1. 53K and 54K were moved on September 2. Brood 2 was moved September 15. Brood 3 was left in Pool 19 where they were raised. I decided to move 1 and 2 because they did not have sufficient food at Sprague-Mather pool. Brood 3 was not moved because they had plenty of food for the fall and I thought they would be safer staying in an area that was not so close to a waterfowl hunting area.

The day after 53K and 54K were moved to Pool 1 they were hanging out with Brood 1. We had placed their decoy out of sight of Brood 1's decoy so the two groups would not mix and 53 and 54 would not be attacked. The two birds seem to be drawn to the other swans despite the fact that they got picked on when they came to close. At the time that the two groups mixed we were still going out in the tube with the swans but were also watching them from shore. Aggression towards 53 and 54 seemed to lessen when the decoys were stationary.

September 22 Broods 1 and 2 mixed. In past years broods that were congregated on a single body of water kept to themselves and did not mix company. Candice and I went out in the blinds and tried to separate the broods using two decoys. It did not work. All the swans seemed confused and there was much nipping and chasing, both inter and intra brood aggression. This calmed down after a few days but the broods never separated into their original groups again. They tended to group up and fly with their original brood mates but there would always be a few birds from the other brood in these groups.

The birds fledged soon after moving them, about September 20 and we removed the decoys on October 7.

Workers stayed out with the birds two to three hours a day until the weather became too cold (end of September). After this Candice Bartholomew or myself watched the birds two to three hours a day from shore. Candice worked from September 7 to October 28. The birds' health and behavior were monitored until November 15 when my job ended. I requested that the Necedah NWR staff keep track of the birds and notify us when they left the refuge on migration.

When I left the refuge Brood 1 and 2 were flying around a lot but seemed to be using Pool 2 as "home base". Brood 3 was flying daily but was still hanging around Pool 19. All the remaining birds seemed healthy, although I would have kept a close eye on 53K and 52K if I had stayed longer. They both seemed to be sleeping more than the other birds.

The fall was an excellent time to do further public education efforts. Candice and I talked to school groups touring the refuge and put up educational signs at the observation tower (copy included). I gave talks at a high school retreat in Kettle Moraine State Forest. We also posted signs warning hunters of the presence of swans on the refuge. We spoke to hunters whenever we saw them and put informational flyers on vehicle windshields. We kept track of these vehicles by recording vehicle color, make and license number. This was so we would not put a flyer on a vehicle more than once, but might also come in handy for law enforcement.

Cygnets Health

Twenty-five of twenty-five cygnets survived to fledging. Three birds died in the fall after fledging. The following is a detailed account of the health problems encountered this summer.

Our first health emergency occurred on June 27. The birds were only two and a half weeks old. Ann noticed that "light blue-right" (44K) was gaping while on a loaf site. That night we discussed the situation with Rebecca Christoffel who happened to be staying over night at the house. The year before they had a bird die of aspergillosis within 24 hours of the observer noticing the first symptoms (gaping). Because of this I decided the bird needed immediate attention. I talked to David and he agreed that we should take the bird to the UW vet clinic in Madison. The bird was taken down that night and Lisa Hartman was notified the next day. June 28 two more birds in Brood 1 were gaping (brown-right/54K and orange-right/53K) and were taken to the clinic that evening. On June 30 I noticed yellow-right (38K) gaping briefly while on a loaf site. The next day green-left (39K) was also gaping and both birds were transported to Madison on the evening of July 1.

All five birds were treated for pneumonia but test results were never received. The vet prescribed one antifungal and one

antibiotic drug as a precautionary measure. We were required to give them two pills twice a day for nine days. We did this at the cage site before going out with the birds in the morning and after bringing them in at night. The alarm call was played when we entered the cage to collect the sick birds. We felt this was very detrimental to the birds' conditioning. They became very accustomed to us.

On June 3, three days after leaving Brood 1, light blue-right was returned. It spent the first night back in a kennel that was placed inside the cage with the other birds. In the morning it was released to swim with the rest of the brood. It was reaccepted into the brood without incident. The same procedure was used to reintroduce the two Brood 2 birds on July 6. These birds were also reaccepted with out problems. The other sick birds from Brood 1 were not as lucky.

The birds from Brood 1 that were removed on June 28 (brown-right and orange-right) were returned to their brood on July 6, seven days later. This pair was kept in a kennel inside the cage overnight, like the other birds had been, but as an extra measure we ran the brood with two observers/two decoys. Jennifer Cole and myself took Brood 1 out on the first day orange and brown were back. After the first 40 minutes things seemed calm so I left with the second decoy. Things did not continue to go smoothly. There was major aggression towards the two returning birds and from that day until July 24 we had to use two decoys for that brood. At night we had to place them in a specially constructed enclosure in the cage. This period was physically difficult for the birds, emotionally difficult for the observers and left us short handed.

Something different had to be done, so David explored alternatives. Sommerset Pond could not take them and neither would captive-rearing, so on July 24 the birds were put in Brood 3 as a desperate, last ditch effort to get them accepted into a brood. Miraculously it seemed to work. David and Ann were with the cygnets for half the day with two decoys and after Ann left with the extra decoy there was no severe aggression. Alas, what seems to good to be true usually is and when Christine came to take the birds out of the cage the following morning she arrived to chaos. The introduced birds had not been put in a kennel overnight and had been picked on during the night. They had lost feathers and when she opened the cage door they took off and remained hidden for the entire day. Christine found them by going out in the blind and playing the follow me call after she had put the other birds in the cage for the night. That night I talked to David and we decided to build our own captive cage.

July 25 I began construction of a cage for the ostracized pair. With the help of Virginia Patton the cage was completed within two days. It enclosed land and water and was about ten by twenty feet. The birds experienced some stress due to their captivity, being listless and pulling out patches of their own feathers. We brought them a bushel of fresh aquatics daily and cleaned the cage every other day. They remained in this cage

until August 21 when they were banded and released. They were re-integrated into Broods 1 and 2 after these broods mixed when they were congregated on Pool 1 in the fall.

The other serious health problem we encountered over the summer was an outbreak of salmonella in Broods 1 and 2. In July observers noticed runny feces in the cages and results from the July 19 health check showed three birds in Brood 2 (yellow 4, white 105, green 40) and one bird from Brood 1 (yellow 24) were positive for salmonella. The field crew was informed of this on August 2 and Virginia Patton came up on August 8 and swabbed all birds in Brood 2 and 3, plus the caged pair. The results from these cultures showed four cygnets in Brood 2 (yellow 44, pink 127, green 40, red 86) were salmonella positive.

Wildlife Health made a decision to treat Brood 2 with an antibiotic-NAXCEL. This drug was administered for 3 days in a row (August 21, 22, 23) by intramuscular injection. The cygnets suffered side effects from the drug for almost four days. They were very lethargic and slept on the water. They had no appetite and drank constantly.

As an extra precaution Brood 1 and 2 were fed supplemental antibiotic food from August 24 to September 10. Because the birds were now roosting outside we had to take the food out to the birds in the float tubes. This provided an excellent example of what happens when swans become accustomed to getting handouts. They became very aggressive towards the blind, ripping at the fabric and pecking at the float tube, when it did not procure food for them.

Results from the August 21 health check show that the cygnets were already negative for salmonella before the administration of the antibiotic. Brood 2 was tested twice more (on 8/31 and 9/15) to make sure none of the birds were chronically infected. Both times results came back negative for salmonella.

The other health incidents of the summer are fairly mild compared to the two situations just described and are listed by brood in chronological order.

BROOD 1

07/17/94 Red 84 legs shook badly while loafing. It seemed fine the next day.

07/27/94 Observer thinks Red 84's voice is hoarse.

08/17/94 Blue 68 rested on a loaf site while others fed. It also held its right wing slightly askew and swam leaning to the left. It held its wing in this manner for three days and seemed normal after that.

BROOD 2

06/29/94 Lime green-right was observed having trouble walking. It would fall down and had trouble getting off a loaf site. It swam using only its right leg. The next day it seemed better and in another day it was swimming and walking normally.

07/06/94 Yellow 7's legs shook while preening. This continued for several days and again on 7/31. This bird was a "trouble maker"- leading other birds away from the decoy and refusing to follow.

07/26/94 Blue 61 had a chunk of skin hanging off its bill when it came out of the cage. The bird managed to smooth the skin back but had a scar for most of the summer, occasionally reopening the wound by scratching at it.

09/14/94 39K held one eye shut off and on for three days.

BROOD 3

07/11/94 Lime green-left had scratch above right eye which healed quickly.

07/12/94 and 07/26 White-left and lime green-left legs shake while preening.

08/09/94 Green had a bloody left wing in the morning when it came out of the cage. The bleeding stopped that morning. It was probably a broken feather.

09/03/94 52K's breathing sounded wheezy. Other birds in the brood were observed snorting often.

09/29/94 All birds in the brood were wheezing, they sounded congested. The next morning we treated them with saline solution for nasal leeches but found none. All nares looked clear and their breathing sounded fine. Because they were acting "normal" (feeding, flying, preening) we decided it would be best just to keep a close eye on them.

10/04/94 When observing the birds through a scope I noticed that 51K had a laceration behind its left eye. I talked to Lisa Hartman about the cut and we decided to leave the bird to heal on its own. The cut healed well.

10/06/94 49K also had a cut in its head under and behind its left eye. This also healed well without treatment.

11/11/94 48K's right eye was bloody and swollen shut when I went to view the birds. 48K slept alone for the hour and a half that I watched the birds. I consulted Lisa Hartman immediately and that night Chris Danou and I caught 48K and I drove him to the Raptor Center in St. Paul on Saturday morning. This now one-eyed

bird was released into the wild again on 11/23. Lisa Hartman and I released it with Broods 1 and 2 on Pool 2 after we could not find Brood 3.

There were no confirmed snapping turtle attacks this summer. While observers saw "snappers" along their routes and on two occasions cygnets were startled by something underwater no injuries were attributed to turtles this summer.

Cygnets Mortality

Despite the two severe health threats this summer we did not lose any birds until October. The following gives detailed accounts of the three deaths.

On October 8 at 2PM Candice Bartholomew found 40K dead on Pool 1. Its body was on a peninsula close to the dike road. Tissue from the bird's back had been eaten. The only animal tracks near the carcass were raccoon tracks. Candice collected the bird, put it in a freezer and took it to Wildlife Health. The results of the necropsy show it had a massive aspergillosis infection. They were not able to determine whether the bird had been killed by a predator or just scavenged after it had died. The bird was seen feeding by itself on October 3, this was the only sign that it might have been sick.

On Thursday October 27, 1994 two cygnets (42K and 45K) were shot and killed on Necedah National Wildlife Refuge's Suk-Cerney flowage. Three people witnessed the shooting and came forward with what they saw. Carl Sanger, Tom Luetscher and Austin saw what happened and reported the incident. They gave an account of the shooting as well as license plate number to Dave Trudeau (refuge law enforcement) who went to the scene and retrieved the dead birds and collected shotgun shells. Warden Tom Jodarski was notified and went to question the involved parties.

Saturday October 29, Tom Jodarski, Bud Oliveira, Carl Sanger, Tom Luetscher and myself met to go over the case in detail. Mr. Sanger and Mr. Luetscher took us to the scene to show the warden the positions of people and swans involved. Tom Jodarski was given signed statements (written by the witnesses) and the swan carcasses. A summary of the witnesses story is as follows:

The three men were hunting on Thursday morning along the edge of Suk Cerney flowage approximately 70 yards from another group of hunters (four people and two dogs). They said it was a slow hunting morning. They were enjoying watching a group of 9 swan cygnets in the water only 20-30 yards in front of them. Carl says they observed the swans for about 5 minutes before another group came flying in. The two groups of swans called to

each other. The birds in the air passed in front of the other hunting party and our witnesses say that two people fired 4-5 shots in rapid succession. One bird crumpled and fell while the other bird that was hit fanned away from the group and landed in some reeds. The group that flew in gathered around the wounded bird as it died. A dog retrieved the closer bird.

The witnesses say that as soon as the shooting began they started yelling at the other hunters, saying that they were shooting at swans. Immediately Carl and Austin went over to confront the hunters while Tom went to the parking lot to record the license plate number of the car that was there. One of the hunters in the party that shot at the swans confessed to both Tom and Carl that what he had done was "stupid". He asked Tom if it would be better if he turned himself in and Tom said he thought it would. The man claimed they would go right to refuge headquarters and report the incident. The suspects did drive to the office and even went inside but did not tell anyone of the shootings. Tom, Carl and Austin followed them and went into the office. When they found out that the hunters had not told anyone they talked to Dave Trudeau and gave him what information they had.

Monday October 31 the warden met with the DA and on Wednesday November 2 the suspect was given a ticket. The ticket was for restitution for 1 bird (\$3,400), a fine of about \$1,030, one year revocation of hunting privileges and fifty hours community service. This person has until November 21 to decide if he wants to pay the ticket or go to court.

There really was no excuse for this tragedy to have occurred. There was plenty of public information (even a sign in the parking lot where the suspect had parked) and the day was bright and sunny with no other bird species in the air.

Cygnets Reaction to Military Aircraft

Much of the Necedah NWR is in the flight paths of Fort McCoy/Camp Douglas and we frequently had planes overhead. The cygnets were very frightened of the planes at first and would "cry" and huddle around the decoy. They grew accustomed to the noise throughout the summer and by the end of August would usually become quiet and alert, only stopping feeding for a moment when the aircraft went over. They sometimes ignored the noise completely. They would still become alarmed (flap across the water and huddle together) if the plane was unusually low and loud. For detailed accounts of the cygnets' reactions please see the daily log books. Pool 19 airspace had the heaviest use by military aircraft.

Cygnets Interaction With Other Bird Species

Interactions with raptors was so frequent I will not list individual encounters. Reaction of the cygnets to different raptors (Northern Harriers, Red Tail Hawks and some eagles) was to: become quiet and alert, huddle near the decoy or huddle in a group. Sometimes they would cry softly, although they did this less frequently as they got older. There was a greater reaction to a raptor when we saw the raptor and played the alarm call than when the cygnets spotted the bird first. As you would expect, the cygnets' level of alarm corresponded to how close the raptor was. Once they were roosting outside we stopped playing the alarm call for them and then their reaction to spotting a raptor was to become quiet, tilt their heads to watch it and sometimes gather together.

Another common encounter was with coots. There were thousands of coots on the refuge in the fall and they would often feed right next to and among the swans. The swans, for the most part, would ignore the coots but would nip and chase them if they came to close.

All other interactions with other bird species are listed by brood and in chronological order.

BROOD 1

- 07/15/94 A black tern swooped low over the cygnets. The observer played the alarm call.
- 08/17/94 Sandhill cranes flew over calling to other cranes on the ground. Cygnets became alert and stopped feeding for 5-10 seconds.
- 08/11/94 Canada geese fly over, birds tip their heads to watch.
- 08/31/94 Sandhill cranes nearby were calling loudly. The cygnets became alert, stopped feeding and moved closer to the decoy.

BROOD 2

- 06/28/94 A small heron sp flushed on the opposite side of the island that the swans were sleeping on. Observer played alarm call. The cygnets were startled awake and then held necks erect for 5 seconds.
- 07/08/94 The brood swam past a dead duckling floating upside down in the water. They were very alarmed and shied away from it.

- 07/19/94 A female blue-wing teal tried to feed among the birds. The teal came within five feet of the decoy. The cygnets were very alert and watched it until blue 61 chased it away.
- 07/25/94 An american bittern flew over. The cygnets were alarmed but did not cry.
- 08/12/94 Two sandhill cranes were feeding close to the cygnets and were calling to each other. The swans are alert and curious- watching the cranes.
- 08/04/94 A flock of canada geese flushed from a nearby pool as the brood moved up a channel. The cygnets were very startled and huddled together and cried.
- 08/26/94 An egret fed in the same pool as the swans but they ignored it.
- 10/03/94 A bald eagle attacked a bird. Three cygnets were feeding apart from the group when the eagle flew over. Two of the three birds saw the eagle soaring over and became alarmed. The bird that did not notice the eagle was feeding with its head under water. The eagle dove at the bird (talons outstretched). Just before impact the swan pulled its head out of the water and saw the eagle. It ducked just in time, the eagle missed the cygnet by about twelve inches. The eagle came around for another half-hearted try. The swans resumed feeding as soon as the eagle flew away.

BROOD 3

- 06/27/94 A black tern, defending a nest, dove at cygnets. The cygnets look concerned but go back to preening.
- 07/01/94 Two broods of blue-wing teal share the pool with the brood, cygnets ignore them.
- 07/07/94 Cormorant displayed, birds ignore it.
- 09/04/94 Five cranes flew over the birds, they turn their heads to look.
- 09/06/94 Turkey vulture soars over, birds turn heads to look.
- 09/14/94 Great blue heron swoops over birds. They call out and gather together.
- 09/16/94 Geese fly over, birds ignore them.

- 09/26/94 Crow was calling loudly from dike. The cygnets became still and alert.
- 09/28/94 **Same species interaction: Three yearling swans in pool with brood. Cygnets loafing; the yearlings go up onto island with brood. The cygnets raise their heads and look at the three then go back to sleep. When the brood wakes and leaves the island (practice flying) the yearlings follow. The cygnets ignore the yearlings.

Feeding Habits

The feeding habits of the three broods varied at each location and changed over the summer. Tables 10-12 outline the broods' feeding habits from their second week of life to their tenth. Foods listed as preferred are those that the cygnets feed on for least 25 percent of the time spent feeding. I can only make broad generalizations on the percent time cygnets spent feeding on specific species.

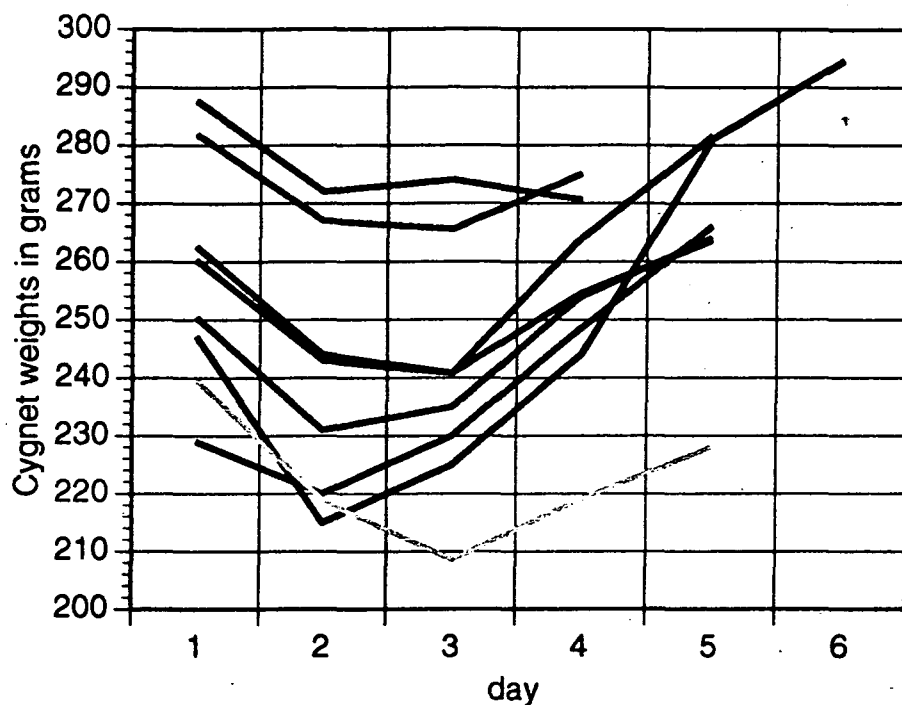
Brood 1 spent almost 90 percent of their time eating burreed (probably because there was not much aquatic plant diversity on their daily route). Brood 2 also did not have a broad "menu". They ate nitella almost 50 percent of the time (we spent approximately half the day in pools that had nitella-pools on the morning route had little submergent aquatics). They ate burreed and pondweed for almost the remaining 50 percent of their feeding day. Brood 3 was "spoiled" and had a wide variety of aquatic plants to choose from. They favored equisetum (horsetail) and completely mowed down any they encountered. Zoster was also a overwhelming favorite that they spent at least 25 percent of their time eating through out the summer.

Acknowledgements

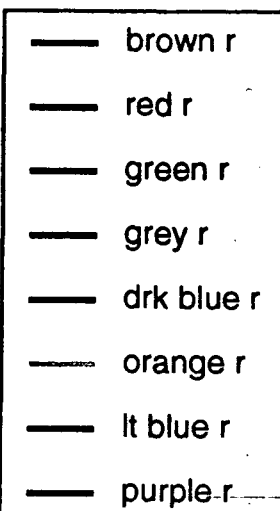
This project would not be possible without the support of many generous contributors. We would-like to thank everyone who participated in the decoy-rearing project. Special thanks go to the following organizations; The Society for Tympanuchus Cupido Pinnatus for the funding that supplied my salary for the season. I am personally very grateful for the opportunity to be involved in such a worthwhile project and to experience such a majestic creature close up. We thank the Zoological Society of Milwaukee County for their donation that funded four interns for the summer. Ocean Spray provided us with a comfortable place to live for the summer, this made a difficult job easier. LaCrosse Footwear donated waders that kept us warm and dry during our eight hour shifts in the marsh. Many thanks go to the Natural Resources Foundation for all their fund raising efforts... Again, without support from these and other sponsors, Wisconsin might not have an additional 22 magnificent trumpeter swans flying free in the state this fall.

Table 1

CYGNET WEIGHTS AT ZOO Brood 1

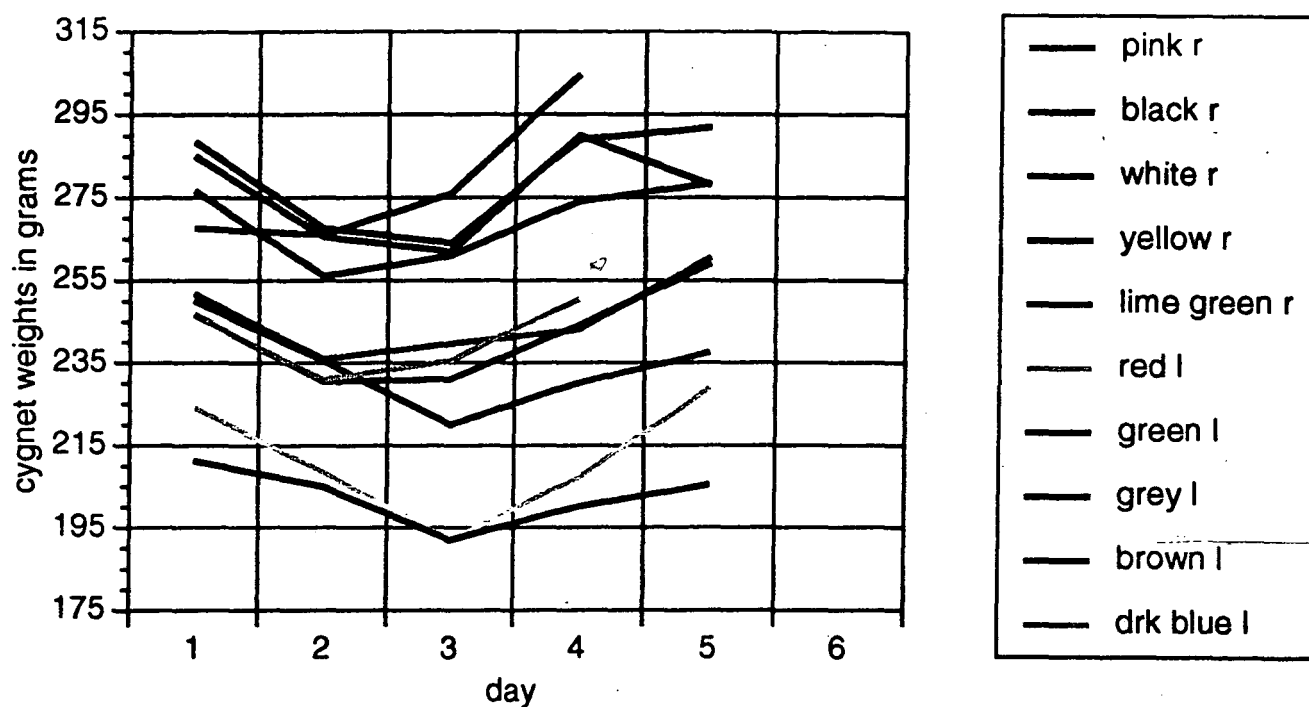


band color



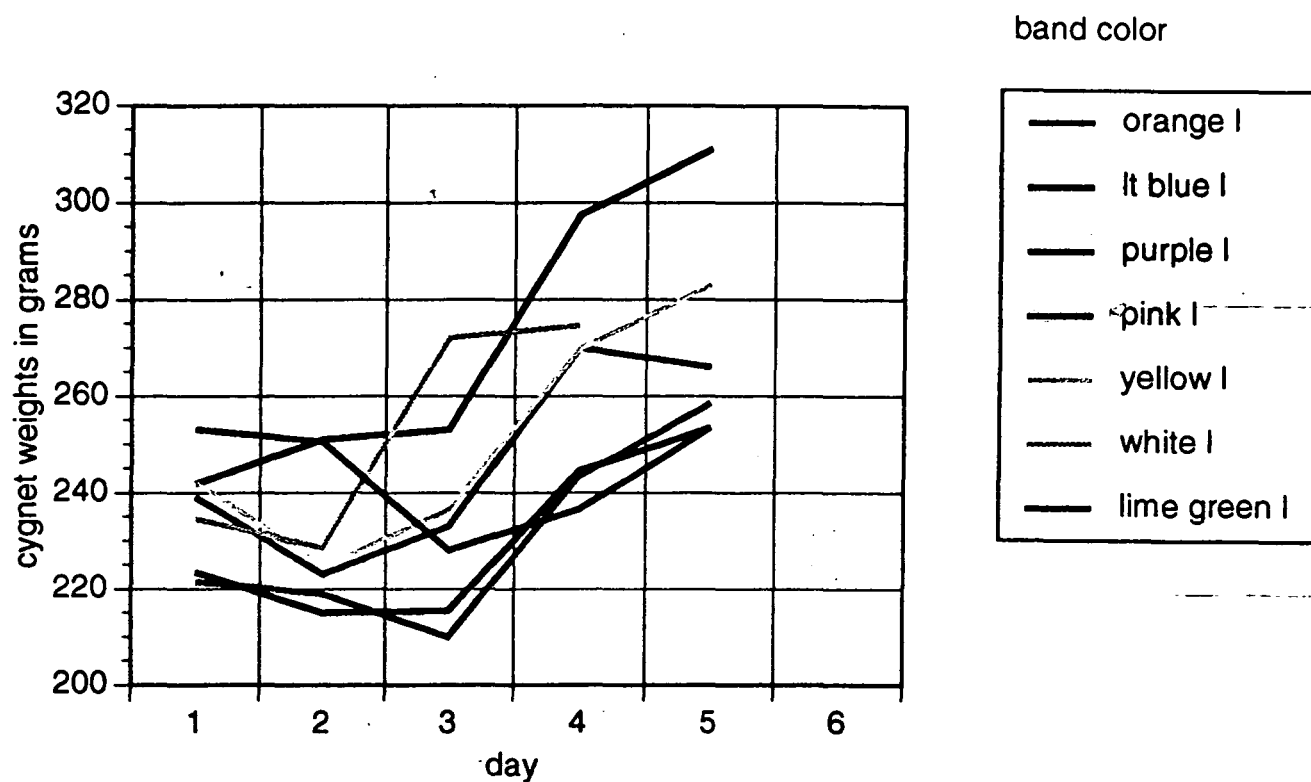
brown r	229	220	230	248.5	266	
red r	247.1	215	225	244	281	294.5
green r	262.5	244	240.8	254.5	263.5	
grey r	250.3	231	235	254	264	
drk blue r	260.2	243	240.8	264	281.5	
orange r	239.4	219	208.5	219	228	
lt blue r	287.7	272	274	270.5		
purple r	281.9	267	265.5	275		

CYGNET WEIGHTS AT ZOO Brood 2



pink r	288.4	267.5	264	289	292	
black r	284.9	265.5	262	290	278	
white r	267.5	266	276	304.5		
yellow r	276.5	256	261	274	278.5	
lime green r	251.7	236	239.5	243	260.5	
red l	224.2	208.5	192	207	229	
green l	249.9	235.5	220	230	237.5	
grey l	211.2	205	192	200	205.5	
brown l	246.7	230.5	231	244	259	
drk blue l	246.6	231	235.5	250.5		

CYGNET WEIGHTS AT ZOO Brood 3



orange I	239	223	233	270	266	
lt blue I	223.5	215	215.5	244.5	253.5	
purple I	221.5	219	210	243.5	258.5	
pink I	241.9	251	253	297.5	311	
yellow I	242.3	224.5	236.5	270	283	
white I	234.5	228.5	272	274.5		
lime green I	253.1	250.5	228	236.5	253.5	

Table 4

BROOD 1 Band changes

ZOO BAND color-leg	CHANGE 1 7/3	CHANGE 2 7/19	CHANGE 3 8/2	FINAL BANDING
red- rt	red 84	red 88	red 84	42K
brown-rt	pink 147	pink 148	pink 149	54K
green-rt	green 39	green 26	green 26	41K
grey-rt	white 124	white 121	white 124	45K
dk blue-rt	blue 60	blue 69	blue 68	43K
lt blue-rt	blue 55	blue 60	blue 57	44K
orange-rt	yellow 10	yellow 29	yellow 29	53K
purple-rt	pink 133	pink 134	pink 130	40K

Table 5

BROOD 1 Bi-weekly weights

Band	weights in kilograms			
	7/3	7/19	8/2	8/21
40K	1.25	2.95	4.5	6.8
41K	1.2	3.0	4.5	6.2
42K	1.2	2.5	4.1	6.5
43K	1.2	2.95	3.8	5.9
44K	1.25	2.55	4.1	5.7
45K	1.15	2.6	4.0	5.7
53K	1.15	1.95	3.4	5.8
54K	1.18	1.85	3.6	6.5

Table 6

BROOD 2 Band changes

ZOO BAND color-leg	CHANGE 1 7/3	CHANGE 2 7/19	CHANGE 3 8/2	FINAL BANDING
pink-rt	pink 134	pink 127	pink 127 ^o	35K
black-rt	green 40	green 40	green 40	56K
white-rt	white 113	white 113	white 114	33K
lime-rt	green 27	green 27	green 27	36K
red-l	red 98	red 97	red 86	57K
brown-l	yellow 2	yellow 4	yellow 44	55K
grey-l	white 106	white 105	white 103	34K
dk blue-l	blue 61	blue 61	blue 55	37K
yellow-rt	yellow 7	yellow 7	yellow 7	38K
dk green-l	pink 136	pink 136	pink 136	39K

Table 7

BROOD 2 Bi-weekly weights

Band	weights in kilograms			
	7/3	7/9	8/2	8/21
33K	1.05	2.5	4.0	5.6
34K	.85	1.9	3.2	4.6
35K	1.05	2.6	4.1	5.6
36K	.95	2.3	3.8	5.9
37K	1.00	2.6	4.1	6.2
38K	1.3	2.5	4.0	6.2
39K	1.05	2.2	3.5	5.3
55K	1.00	2.5	4.1	5.8
56K	1.15	2.45	4.1	6.1
57K	1.00	2.4	3.8	5.4

Table 8

BROOD 3 Band changes

ZOO BAND color-leg	CHANGE 1 7/2	CHANGE 2 7/19	CHANGE 3 8/3	FINAL BANDING
orange-1	red	red	red 100	48K
lt blue-1	yellow 19	yellow 21	yellow 21	46K
purple-1	blue	blue	blue 67	51K
pink-1	pink	pink	pink 137	50K
yellow-1	yellow 5	yellow 6	yellow 4	47K
white-1	white	white	white 110	49K
lime-1	green	green	green 29	52K

Table 9

BROOD 3 Bi-weekly weights

Band	weights in kilograms			
	7/2	7/19	8/3	8/21
46K	.87	2.45	4.0	5.4
47K	.95	2.5	4.7	6.2
48K	.85	2.6	4.3	6.4
49K	1.0	3.0	5.2	6.8
50K	.99	3.0	4.5	6.6
51K	.90	2.5	3.8	5.5
52K	.93	2.45	4.5	6.1

CYGNET FEEDING HABITS FOR THE SUMMER OF 1994

Table 10

BROOD 1

AGE	FOODS EATEN	FOODS PREFERRED
2-4 wks	burreed, smartweed, elodea, wildrice, pondweed, nitella, green hair, spike rush, bladderwort, watershield, invertibrates, 3-way sedge.	burreed, elodea
4-6 wks	burreed, spike rush, nitella, 3-way sedge, pondweed, elodea, arrowhead, invertebrates	burreed, elodea, pondweed
6-8 wks	burreed, wildrice, spiders, arrowhead, nitella, pondweed*, zoster*, elodea*	burreed, arrowhead "Imported": zoster, pondweed and elodea
8-10 wks	burreed, spike rush, arrowhead, elodea, nitella	burreed, nitella

Table 11

BROOD 2

AGE	FOODS EATEN	FOODS PREFERRED
2-4 wks	pondweeds, wildrice, smartweed, green hair, spike rush, invertebrates, burreed, bladderwort, 3-way sedge, arrowhead, nitella, elodea	pondweed, burreed, nitella
4-6 wks	burreed, wildrice, pondweed, arrowhead, nitella	pondweed, burreed, nitella
6-8 wks	burreed, wildrice arrowhead, nitella, najas, elodea, pondweed	nitella, pondweed, burreed
8-10 wks	burreed, nitella, pondweed, arrowhead, bladderwort, wildrice	burreed, pondweed

* aquatics collected and brought to site 1 from site 3

CYGNET FEEDING HABITS FOR THE SUMMER OF 1994 cont.

Table 12

BROOD 3

AGE	FOODS EATEN	FOODS PREFERRED
2-4 wks	greenhair, pondweed, burreed, elodea, bladderwort, zoster, nitella, spike rush, arrowhead, invertebrates	zoster, pondweed, burreed
4-6 wks	equisetum, pondweed, nitella, arrowhead, zoster, burreed, elodea	equisetum, zoster, elodea
6-8 wks	elodea, nitella, pondweed, arrowhead, zoster, equisetum, dead catfish, watermoss, 3-way sedge, bladderwort	elodea, equisetum, arrowhead, zoster
8-10 wks	zoster, burreed, elodea, nitella, arrowhead, pondweed, alga, equisetum	zoster, elodea, burreed, equisetum

NECEDAH NATIONAL WILDLIFE REFUGE

Wood County
Jeu County

↑
NORTH

Public Roads

Refuge Roads/Trails

Ditch

Pools

Refuge Boundary

Hunting Zones

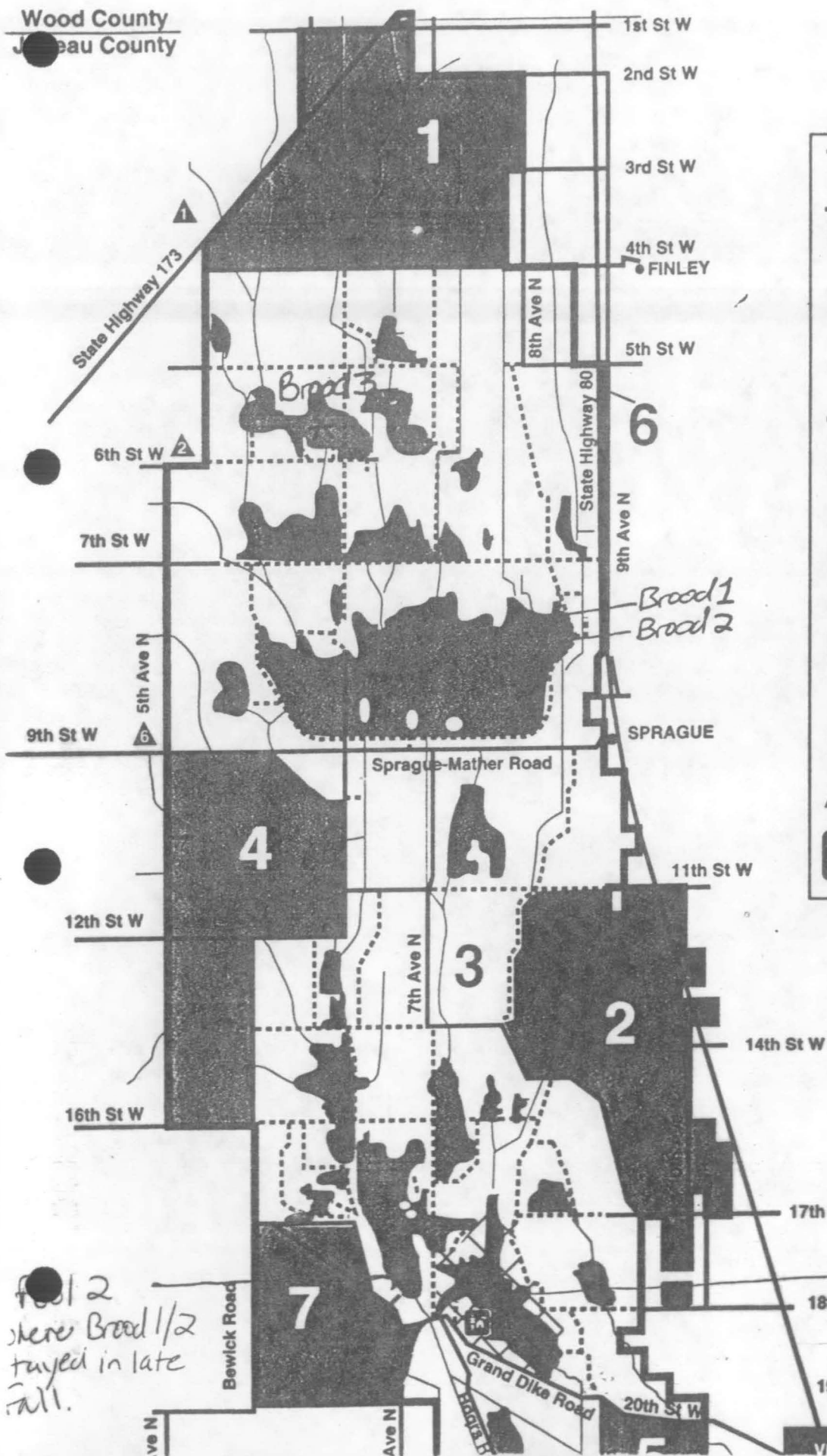
1,2,4,5,6,7

3

Permanent Closed
Area

1
State Public
Campgrounds

Refuge
Headquarters



Pool 1 -
Fall congregation
of Broods 1 & 2 : 53:
54K.