

DRIFTLESS AREA NATIONAL WILDLIFE REFUGE

McGregor, Iowa

ANNUAL NARRATIVE REPORT

FY2005



DRIFTLESS AREA NATIONAL WILDLIFE REFUGE

McGregor, Iowa
Fiscal Year 2005

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Prepared by Date

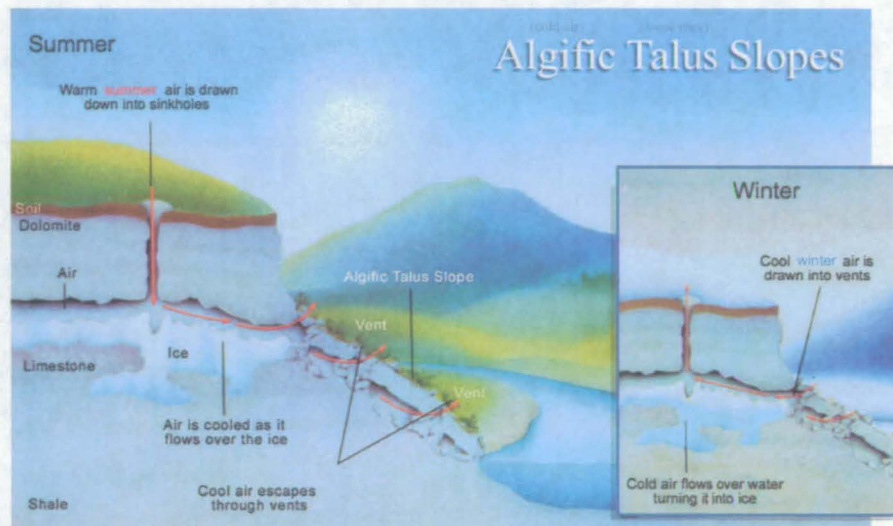
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INTRODUCTION

1. Location

The Driftless Area National Wildlife Refuge was established in 1989 for the protection and recovery of the threatened Northern monkshood and endangered Iowa Pleistocene snail. These species occur on a rare habitat type termed algific talus slopes. These are slopes with outflows of cold underground air that provide a glacial relict habitat to which certain species have adapted (see diagram below). The Driftless Area National Wildlife Refuge consists of nine units scattered throughout Allamakee, Clayton, Dubuque, and Jackson Counties in northeast Iowa. Total Refuge acreage is 775 acres with individual units ranging from 6 to 208 acres. Acquisition targets not only the algific slope, but surrounding buffer habitat that includes sinkholes important to air flow to the slope. Acquisition is ongoing, but limited due to insufficient funds.



Locations of the 9 units of the Driftless Area National Wildlife Refuge totalling 775 acres



2. Topography

Refuge units are primarily forested and generally consist of steep topography with narrow creek valleys, large rock outcroppings, and karst features. Riparian and grassland habitat also occur on the Refuge.

3. Points of Interest

The algific talus slope habitat of the Refuge harbors many unusual and rare plant and land snail species, some of which are also on the state threatened and endangered species list. These areas tend to be scenic with cliffs and rock outcroppings, springs, and coldwater streams.

4. Physical Facilities

The Refuge office is located at the McGregor District of the Upper Mississippi River National Wildlife and Fish Refuge, McGregor, Iowa. One Refuge Operations Specialist is assigned to the Driftless Area NWR.



Iowa Pleistocene snail



Northern monkshood

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Highlights

Final EIS and CCP submitted to the RO with updated LPP.

Fifth year of Iowa Pleistocene snail monitoring completed.

Botanical Survey completed at Kline Hunt Hollow Unit.

Management agreement signed with Iowa DNR for Pine Creek Unit.

More garlic mustard control undertaken at Howard Creek Unit.

TNC land steward assistant works at Refuge.

1. MONITORING AND STUDIES

1.a. Surveys and Censuses

The fifth year of Iowa Pleistocene snail monitoring was completed based on the monitoring protocol developed in 2001. Boards are placed on the algific slopes to facilitate finding snails. Snails under the sampling area crawl to the surface and onto the underside of the boards where they are more readily sampled. Monitoring includes sampling at five 'random' locations within an algific slope to determine snail distribution and then a mark-recapture sampling session for five days to gain specific population information. The following is from a report completed for 2005 monitoring.

Five random boards (0.124 m², 8 x 24 inches) were sampled at the same locations within slopes as previous years (Table 1). Snails captured on random boards were marked with plastic colored and numbered bee tags. We measured soil temperature with a six inch soil thermometer. Air temperature and humidity were recorded at each location. Boards were left in place for 2 days on all slopes.



Iowa Pleistocene snail tagged with Visible Implant Fish tag. These tags were first used in 2005. Photo by visiting photographer Alan Sheldon.

Table 1. Algific talus slopes on which Iowa Pleistocene snail monitoring was conducted in 2005 in northeast Iowa.

Slope name	Slope number	Owner	County
Buck Creek 2	81-99	The Nature Conservancy	Clayton
Buck Creek 1	81-98	The Nature Conservancy	Clayton
Bear Creek 5	86-281	Private	Fayette
Bixby State Park West	80-62	Iowa DNR	Clayton
Bankston West	83-207	US Fish and Wildlife Service	Dubuque
Dry Mill North 3	81-76	US Fish and Wildlife Service	Clayton
White Pine 2	80-33	Iowa DNR	Dubuque
Cow Branch West	85-229	US Fish and Wildlife Service	Clayton
Howard Creek 3	86-247	US Fish and Wildlife Service	Clayton
Dry Mill East	81-137	Private	Clayton
Lytle Creek 6	86-297	Iowa DNR	Jackson

At sites 81-98, 86-281, 80-33, and 83-207, the same 32 by 48 inch (0.991 m²) mark-recapture location was used as in the previous three years. A two by two inch grid on each board was used for recording snail location as an x, y coordinate. Boards were checked for five consecutive days after placement and then removed from the slope. Soil temperature, soil moisture, air temperature and humidity were recorded at each visit. A rain gauge was placed at each mark recapture location and checked each of the five days to evaluate whether moisture may affect snail captures. Snails five millimeters or larger were marked with colored and numbered bee tags or visible implant fish tags attached with superglue. Juvenile snails, less than five millimeters, were marked with individual color combinations of paint. Shell diameter, shell height, umbilicus diameter, and number of whorls were measured with a caliper to the nearest 0.5 mm on each snail. Population estimates were derived using the same methods as Henry et al. (2003). Model Chao-M_{th} of program CAPTURE was used to analyze the mark-recapture data.

Sampling took place from June 2 through June 30, 2005. Photos from photo points established in 2001 were retaken in 2004 and are stored at the Refuge office in McGregor, Iowa.

Mark-recapture

Slope 80-33 and 81-98 captures were again very low as in most previous years (Table 2, Figure 1). Slope 83-207 had a similar number of captures this year as in 2004. The number of captures was the lowest of any of the four years on slope 86-281, as was the number of individuals (Table 2). However, this site still had a high number of snails compared to the other sites that were sampled. Capture probability (p-hat) in 2005 was lower for all sites compared to last year (Table 2). Density estimated from mark recapture surveys ranged from 29.26 snails/m² on slope 83-207 to 241.17 snails/m² on slope 86-281.

Random board captures

Random board monitoring was completed on 11 slopes this year (Table 1). The number of snails captured on random boards ranged from zero to 20 (Table 3). Captures at individual board locations were variable between years ranging from 11 in 2002 to 40 in 2004. The total number of snails captured on random boards was 64 compared to 98 in 2004, 67 in 2003, 84 in 2002, and 135 in 2001 (Table 3). Some sites had no captures.

Sampling results from random boards versus mark recapture will be evaluated further to determine if the results support the double sampling scheme that has been used for snail monitoring. Additional population modeling will also be completed on all years of data where sufficient data exists.

Table 2. Snail population estimates (N) from mark-recapture surveys, 2001-2005. $\hat{p}$ is capture probability. The total number of snail captures includes recaptures. The number of individual snails captured is given in parentheses.

Slope #	Captures 2001	Est N ($\hat{p}$ -hat) 2001	Captures 2002	Est N ($\hat{p}$ -hat) 2002	Captures 2003	Est N ($\hat{p}$ -hat) 2003	Captures 2004	Est N ($\hat{p}$ -hat) 2004	Captures 2005	Est N ($\hat{p}$ -hat) 2005
83-207	24(16)	28(0.17)	9(4)	NA	20(11)	14 (0.29)	50(29)	54 (0.19)	30(17)	29(0.21)
95% CI		19-68				12-33		38-102		21-61
80-33	51(31)	38(0.27)	2(1)	NA	13(5)	5 (0.52)	5(2)	NA	2(1)	NA
95% CI		34-56				5-10				
81-98	38(28)	59(0.13)	114(86)	202(0.11)	12(8)	10 (0.24)	28(20)	44 (0.13)	1	NA
95% CI		38-133		142-327		9-23		27-109		
86-281	185(142)	396(0.09)	243(170)	290(0.17)	233(180)	470 (0.10)	197(172)	624 (0.06)	120(88)	239(0.1)
95% CI		281-604		238-381		351-671		423-986		162-396

Figure 1. Number of snails captured in 2001-2005 on four mark-recapture slopes.

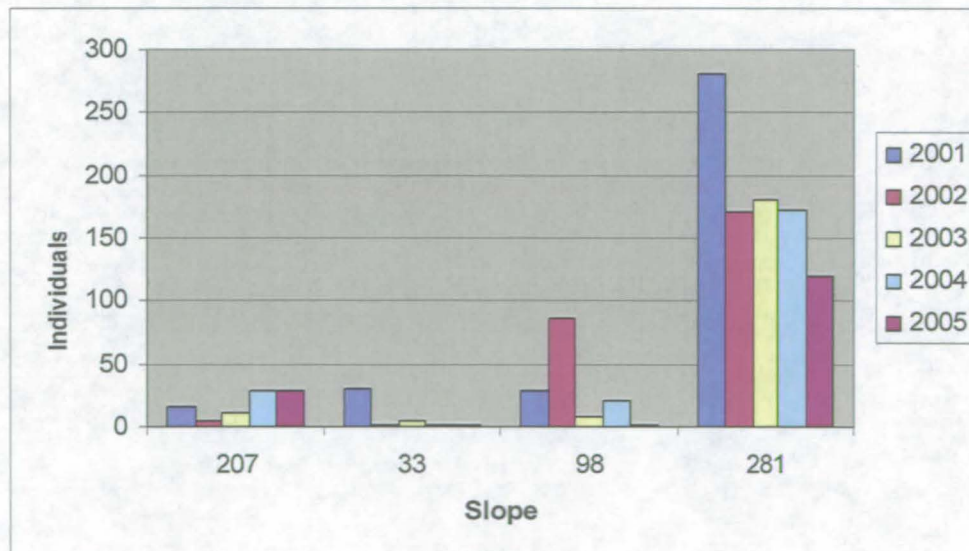


Table 3. Number of snails captured on random boards located on algific slopes, summer 2001-2005. ^a site not sampled in this year.

Slope number	Captures 2001	Captures 2002	Captures 2003	Captures 2004	Captures 2005
81-99	17	18	1	17	1
81-98	12	15	4	3	0
86-281	56	6	31	40	20
80-62	13	0	3	4	0
83-207	2	0	0	1	0
85-247	2	0	0	^a	^a
80-33	16	3	14	0	4
BB	^a	^a	0	^a	^a
85-229	1	0	0	0	0
81-137	^a	26	14	10	7
86-291	0	0	^a	0	^a
86-297	16	16	^a	22	17
81-76	^a	^a	^a	1	5
83-213	^a	^a	^a	0	^a

Environmental conditions

Soil temperatures ranged from 37.4 to 47°F at random board locations in 2005. Random board average soil temperature was 43.3°F. Overall average soil temperature during mark-recapture surveys was 44.4°F.

Snail Size Structure

Overall, the size distribution from random board data from 11 slopes again indicates predominance (79%) of mature individuals (shell diameter ≥5mm) similar to previous years' data. The size distribution in mark-recapture surveys was 55% mature snails compared to 89.8% in 2004 and 88% in 2003. Only one snail was captured on slope 98 and was an immature. Slope 80-33 had only three immature snails captured in 2001, none in 2002, two in 2003, none in 2004, and one in 2005. Slope 83-207 had five immature captures in 2001, none in 2002, three in 2003, eight in 2004, and two in 2005. Despite the overall greater number of captures, 86-281 had only four immature snails captured during mark-recapture sampling in 2005.

Temperature Monitoring

Soil temperature data loggers (HOBO microstation) continued to be used for long term monitoring of temperatures. Temperature is the most important environmental factor in algific slope habitat. This year, we added five loggers at the Bankston, Pine Creek, Cow Branch, and Howard Creek units. Two loggers were placed in sinkholes and three in vents on the algific slopes. Altogether there are 9 loggers in place. One temperature sensor was attached to each data logger and placed in a cold air vent, approximately one to three feet vertically into the ground. The loggers collect temperature data twice a day, once in the morning and once in the evening. As this is intended to be a long term data set, data have not yet been evaluated.

Northern Monkshood Monitoring

Northern Monkshood monitoring is set up on a three year rotational schedule. Thirteen sites were sampled this year (Table 4). Preliminary results are shown in Figures 2 and 3.

Table 4. Northern monkshood monitoring sites, 2005.

Site name	Site number	Owner	County
Cow Branch East	228	FWS	Clayton
Cow Branch West	229	FWS	Clayton
Elkader South	83-166	private	Clayton
Guttenberg Golf	81-145	private	Clayton
Hickory Creek 3	83-165	FWS	Allamakee
Hickory Creek 4	83-168	FWS	Allamakee
Hickory Creek 5	83-205	FWS	Allamakee
Kline Hunt Hollow 1	161	private	Clayton
Kline Hunt Hollow 2	162	private	Clayton
Kline Hunt Hollow 3	170	FWS	Clayton
Kline Hunt Hollow 4	169	FWS	Clayton
Lytle Creek	295	FWS	Jackson
Miners Creek 2	132	private	Clayton

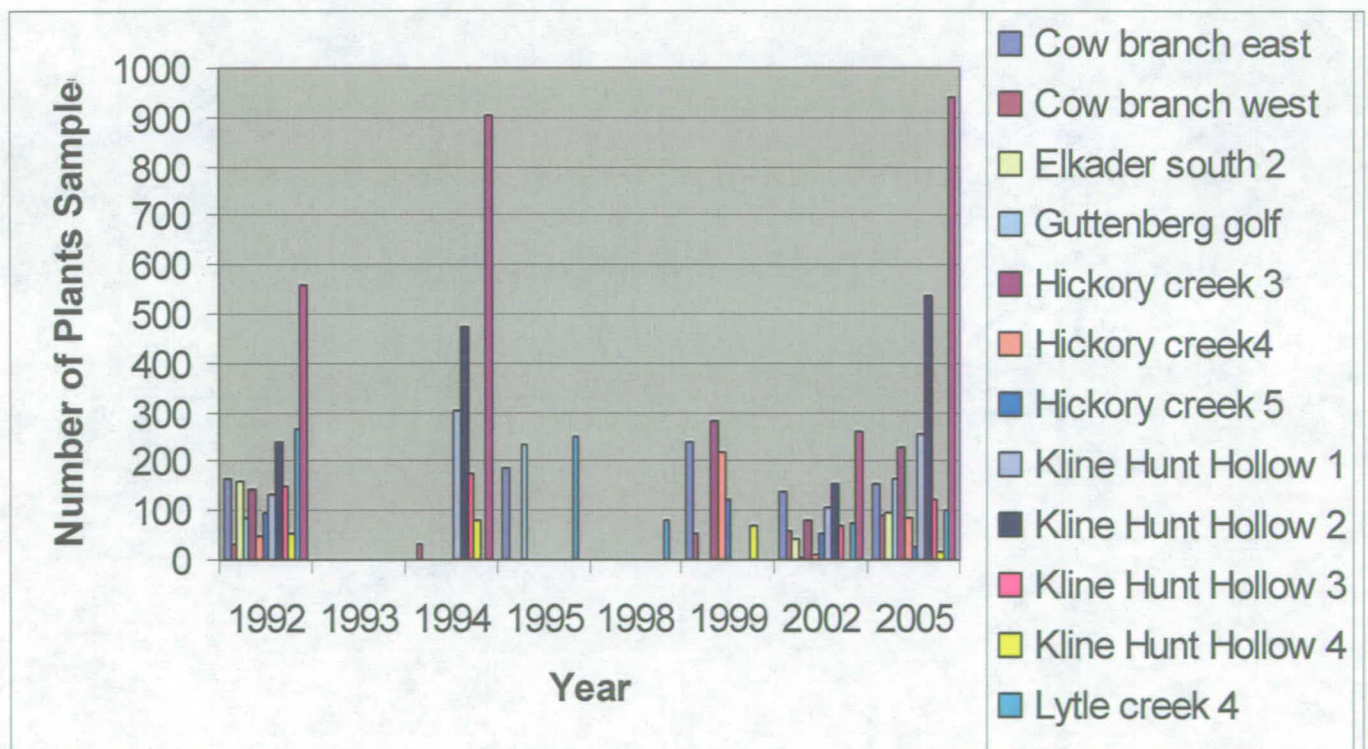


Table 5. Comparison of number of monkshood plants sampled at 2005 sampling sites.

Year	1992	1994	1995	1998	1999	2002	2005
Cow branch east	163		185		239	139	155
Cow branch west	32	31			52	58	89
Elkader south 2	158					43	98
Guttenberg golf	83		234			4	167
Hickory creek 3	145				281	80	227
Hickory creek4	47				220	9	83
Hickory creek 5	96				125	53	28
Kline Hunt Hollow 1	133	304				109	253
Kline Hunt Hollow 2	238	474				155	536
Kline Hunt Hollow 3	148	176				68	125
Kline Hunt Hollow 4	55	82			67	1	18
Lytle creek 4	264		250	81		77	102
Miners creek 2	561	904				261	943

The number of monkshood plants sampled at the 2005 sites was variable, but generally within the same range as previous years. An analysis of all years of data for all sites is needed to determine long term trends in monkshood populations. There are currently 14 years of monitoring data with one to five years of data on any particular site.

A botanical survey was completed at the Kline Hunt Hollow Unit by Bill Watson of Cedar Falls, IA. Mr. Watson is a professional botanist who has completed inventories in northeast Iowa for algific slopes, prairies, and other habitats. Previously, most plant information for algific slopes was cursory information gathered by the scientist who discovered each site. There are very few detailed plant lists for these unique sites. A total of 135 taxa representing 51 families were recorded at Kline Hunt Hollow. Of the total reported, six taxa are found in the current listing of state endangered/threatened/special concern vascular plants of Iowa. These include *Aconitum noveboracense* (northern monkshood), *Carex media* (intermediate sedge), *Chrysosplenium iowense* (golden saxifrage), *Equisetum scirpoides* (dwarf-scouring rush), *Rhamnus alnifolia* (alder buckthorn) and *Streptopus roseus* (rosy twisted stalk). Exotic species observed on the slopes which may be a problem include *Alliaria petiolata* (garlic mustard) and *Poa* spp. (bluegrasses), particularly *P. pratensis* (Kentucky bluegrass). The population of garlic mustard is scattered across the slopes and in the surrounding forest where it appears to be more prevalent. At present, this highly invasive species does not appear to have built up large numbers of plants on the algific talus slopes. Whether this is due to the early stages of invasion or that the species is sufficiently hindered by the colder and more open nature of the habitat is unknown. Some individual plants appear smaller and possibly more stressed than plants in the surrounding forest. However, garlic mustard was observed growing in close proximity to state listed species such as golden saxifrage. This species and others including *E. scirpoides* are low growing and easily overtopped, which could impact population dynamics and reproduction.



Bill Watson surveying plants at the Kline Hunt Hollow unit.

2. HABITAT RESTORATION

2.b. Upland Restoration

Cedar trees were cut from an area below one of the prairie remnants at Howard Creek unit. Native grasses occur under the cedars and their removal was an attempt to rejuvenate additional remnant areas. Box elder, prickly ash, and buckthorn were removed from portions of the grassland areas at Howard Creek unit.

3. HABITAT MANAGEMENT

3.d. Farming

Neighboring landowners, John Wessel and Gene Schenke, farmed 71 acres at the Pine Creek unit. Schenke had 14.6 acres in corn and 33 acres in hay. Wessel farmed 23 acres in corn. These fields will eventually be planted with trees.

3.f Fire Management

Brush piles were burned at the Howard Creek unit, and 10.7 acres were burned on April 27. The burn plan was for 134 acres including forest area on the unit for control of garlic mustard. New fire breaks were established for this larger burn area. However, weather and available personnel limited the burn to the prairie remnants. Fuels in the east prairie burned well and hopefully killed small brush expanding into it.



Constructing fire breaks at the Howard Creek Unit.

3.g. Pest Plant Control

Garlic mustard was removed from two algific slopes (Howard Creek 2 and 3) at the Howard Creek unit by carefully hand pulling it. This was the fourth year of removal. Large plants are no longer present except on the unreachable cliff faces, but juvenile plants continue to emerge from an undoubtedly large seed source. Plants were bagged and removed from the site. In addition, Driftless Land Stewardship, LLC. was contracted to complete garlic mustard control on a portion of the Howard Creek unit. They sprayed, pulled, and torched about 5 acres of forest above the algific slopes. This combination of methods appears to be working on other areas they have treated.

The annual weed survey was completed. Garlic mustard, leafy spurge, wild parsnip, European buckthorn, and Canada thistle were identified as the top five weed species on the Refuge. Most of these occur at the Howard Creek unit. Garlic mustard is also present at Bankston, Fern Ridge, Hickory Creek, Lytle Creek, Pine Creek, and Cow Branch units.



McGregor District intern George Olson pulling garlic mustard at the Howard Creek Unit.



Driftless Land Stewardship torching garlic mustard with a propane torch at the Howard Creek Unit.

5. COORDINATION ACTIVITIES

5.a. Interagency Coordination

ROS Henry continued to work with the Iowa DNR to identify and coordinate with algific slope landowners who were willing to place conservation easements on their property. Three potential easements were identified and the DNR pursued and completed easements on these sites through their Landowner Incentive Program. Several sites were also visited at the request of partners or landowners who suspected algific slopes were present. Areas in Fayette, Clayton, and Dubuque Counties were visited. One such site was the spectacular Whitewater Canyon that straddles Dubuque and Jones Counties. It was recently acquired by the Dubuque County Conservation Board. Although some sites contained Canada yew and were cool, they were not producing cold air and did not have plants specific to algific slopes. Although no new slopes were found some beautiful areas were visited.



Whitewater creek in Dubuque County.

A management agreement was completed with the Iowa DNR for state land adjacent to the Refuge at Pine Creek in Clayton County. The Refuge will manage the state land as part of the Refuge.



The valley at the Pine Creek Unit that encompasses state and Refuge land.

5.b. Private Lands

ROS Henry maintained contact with several landowners who have Iowa Pleistocene snails and Northern monkshood on their property. Monitoring of these species occurred on some private sites. In particular, one landowner who also happens to be a logger came to a CCP meeting looking for advice on how to log his property without impacting the algific slope. Thanks to previous contacts, he knew his land contained the Iowa Pleistocene snail (in fact thought to be the largest population of all sites) and understood it was special. ROS Henry visited the site with him on a hot day and showed him the area to avoid with equipment. They also discovered another algific slope on his property across the valley. He seemed impressed and willing to be careful with the property.

6. RESOURCE PROTECTION

6.a. Law Enforcement

Refuge officer Nick Stavropolus worked the deer seasons on the Refuge. ROS Henry performed regular inspection of Refuge units. No citations were written.

6.g. Land Acquisition Support

The Refuge continued working with the Division of Realty to acquire the 25 acre Helle tract in Clayton County.

7. PUBLIC EDUCATION AND RECREATION

7.a. Provide Visitor Services

Signs were installed on the Howard Creek kiosk. Panel one is general Refuge System information, Panel two is Driftless Area Refuge information, and panel three is information specific to the Howard Creek unit.



Kiosk panels at the Howard Creek unit.

7.b. Outreach

Talks were given to the Audubon Society in Decorah and the Monona high school biology class. Tours were given to the UNI ecology class, to a photographer, and to Cedar Rapids Gazette and Prairie du Chien reporters. A story on endangered species that included information about Driftless Area Refuge was printed in the Gazette and a story specifically about the Refuge was printed in the Prairie du Chien paper.

ROS Henry assisted with Upper Miss River Fest and other activities on the McGregor District.

7.c. Hunting

Several deer, primarily bucks were taken with bow and arrow and muzzleloader from the Howard Creek unit. Some pheasant and squirrel hunting also occurred at the Howard Creek and Fern Ridge units. We do not currently have a method of counting these visitors other than contacts with a few of the hunters who regularly use the area.

8. **PLANNING AND ADMINISTRATION**

8.a. Comprehensive Conservation Planning

ROS Henry spent considerable time finalizing the EIS/CCP. A Land Protection Plan for expansion of the Refuge acquisition boundary was also completed as part of the CCP. The original acreage of approximately 700 acres has been exceeded and further acquisition required an updated LPP. The acreage is proposed to be expanded to approximately 6000 acres that includes the four states of the driftless area. The 15 year CCP proposes acquisition of 2275 acres to reach recovery goals for the Iowa Pleistocene snail and protect additional lands for Northern monkshood and species of concern. Four public meetings were held in the summer of 2005 to facilitate comments on the preferred alternative. A draft EIS/CCP with compatibility determinations was completed and submitted to the Regional Office by year's end.

8.b. General Administration

ROS Henry attended Compatibility Determination training.

8.c. Safety

Monthly safety meetings were attended in conjunction with McGregor District.

8.d. Maintenance

Portions of old fence lines were removed at the Pine Creek unit with the help of McGregor District staff. 3800 pounds of scrap metal from fence posts, wire, tin, and farm debris in ditches was recovered for recycling. A fence was replaced between Dale Krieg and the Refuge at the Cow Branch unit. The fence was replaced between John Kluth and the Refuge at the Howard Creek unit.

8.e. Volunteers

The Nature Conservancy again supplied a summer intern to the Refuge. Mike Lommler worked 512 hours assisting with Iowa Pleistocene snail and Northern monkshood monitoring, CCP, data entry, invasive species control, signing, and some tasks on McGregor District as well. He also inspected and completed work on TNC preserves in northeast Iowa.

Volunteer Deanna Krambeer from St. Olaf, Iowa collected seed from the prairie remnants for replanting on the Howard Creek unit.

8.f. Personnel

Cathy Henry continues to be the ROS in charge of the Driftless Area NWR. John Lindell is the project leader for McGregor District which oversees the Driftless Area NWR.



TNC intern Mike Lommeler with a very tall monkshood plant at the Lytle Creek Unit (above). ROS Cathy Henry looking for snails at Howard Creek Unit (below).



9. WILDLIFE

9.a. Endangered/Threatened Species

See section 1a, surveys and censuses, for endangered species information.

9.g. Game Mammals

White-tailed deer continue to be abundant on most Refuge units, but in particular the Howard Creek unit as evidenced by trails and other sign. The Iowa DNR flew Howard Creek and Fern Ridge units during their winter deer surveys in 2003 and 2005. There were 31 deer in 2003 and 12 in 2005 at Howard Creek and 27 in 2003 and 17 in 2005 at Fern Ridge during the survey. This survey provides a one time look at deer on these areas and is part of a larger annual survey. Deer numbers do appear to be decreasing in Clayton County according to DNR biologists.



One of many White-tailed deer fawns on the Refuge.

9.h. Other Resident Wildlife

Wild turkeys continue to be abundant on Refuge units. Pheasants are present in good numbers at the Howard Creek unit.

10. ITEMS OF INTEREST

ROS Henry was contacted by a local citizen concerned that the County had sprayed a monkshood site. Upon investigating, the Clayton County roadside crew did go over the site with a wet blade tree saw that extends from the road. The blade releases a herbicide onto cut stumps as it cuts, therefore it was not a broadcast spray but likely did impact some monkshood plants. The monkshood was senescing by the time of investigation, so it was difficult to tell what the impacts might have been. ROS Henry met with the County roads people who admitted they did

know about the site, but failed to communicate it to the operator. A subsequent 'training' was held with the four person crew to make sure they knew of all the locations and the activities to avoid on those locations. The same monkshood site is experiencing gravel runoff from the adjacent road. After discussions with the county engineer it was determined that road grading procedures could be changed to avoid further erosion of the road onto the algific slope.

11. CLIMATIC CONDITIONS

Weather conditions can vary greatly from one Refuge unit to another across four counties. Temperature and precipitation data were obtained for Dubuque, Iowa and Prairie du Chien, Wisconsin where airports are located (Table 6).

Table 6. Average weather conditions for FY 2005 at Dubuque, IA and Prairie du Chien, WI. Precipitation is in inches, temperature in degrees Fahrenheit.

Month/Year	Dubuque		Prairie du Chien	
	Mean temp	Total precip	Mean temp	Total precip
Oct 2004	51	4.4	51	2.4
Nov 2004	41	1.85	41	2.58
Dec 2004	26	1.07	27	1.12
Jan 2005	19	2.00	19	1.32
Feb 2005	30	1.34	30	2
March 2005	35	0.90	35	1.08
April 2005	52	2.26	52	2
May 2005	56	2.72	57	2.05
June 2005	72	3.08	73	2.84
July 2005	73	1.43	73	5.7
August 2005	71	5.07	70	4.35
Sept 2005	66	1.91	66	6.35