

November 29, 2018

## INDIANA BULLETIN NO. 190-18-02

**SUBJECT:** CPA – Purdue Vole and Cover Crops Projects

**Purpose:** To notify Field Offices of opportunities for farmers to participate in three Purdue Vole and Cover Crops Research Projects

**Expiration Date:** September 30, 2019

### **Background**

Indiana Natural Resources Conservation Service (NRCS) and the Conservation Cropping Systems Initiative (CCSI) continue to work with Purdue University's Department of Forestry and Natural Resources and are building on the efforts started in 2018 to help identify causes and solutions to farmers who experience issues with voles in cover cropped fields.

There are now three separate, but related projects that farmers can participate with Purdue (see the attached *Purdue Cover Crop Study Description*).

1. Cover crop and vole survey project:
  - Where = State-wide;
  - Criteria = Any producer who used **any type or mix of cover crop** in fall 2015 and/or fall 2017 and then planted to **soybeans in spring** 2016 and/or 2018;
    - Any cover crop farmer can participate REGARDLESS OF AMOUNT, OR LACK OF, vole damage!
2. Raptor perch and vole trapping project:
  - Where = Tippecanoe, White, Benton, Carroll, Fountain, Clinton, Montgomery, and Warren County farmers only;
  - Criteria = Fields that are/will be planted to **cereal rye (only)** in the fall/winter 2018, then soybeans in the spring of 2019;
3. Northern harrier sightings project:
  - Where = Statewide;

### **Cover Crop and Vole Survey**

Farmers with fields that meet the criteria above and are willing to work with Purdue will be asked to provide the following to Purdue:

- The shape/outline of their fields (Common Land Unit lines or other) to see if field shape influences vole damage;
- Responses to a survey that will evaluate vole damage relative to crop history; cover crop species; cover crop termination height; tillage; field border/buffer management; etc.
- Purdue will contact the farmers to obtain the information in the survey for each useable field, and work directly with the farmer on any other information, results, etc



Indiana NRCS will provide assistance to the cover crops and vole survey project as follows:

- a) NRCS will promote the opportunity with applicable NRCS clients, as appropriate (see the attached *Purdue Cover Crop Study Producer Handout*);
- b) Field Offices will gather maps at the request of the farmer (either hard copy or electronic):
  - i) If farmers need NRCS assistance sending their field locations to Purdue, they will be asked to sign a “Data Release Statement” (attached).
    - (1) If needed, District Conservationists can send the appropriate field identifiers (hard copy-marked maps, scanned marked maps, farm/tract/field numbers, or other means) along with the data release approval and the farmers’ preferred method to be contacted by Purdue (text, email, home or cell phone, etc.) to Jennifer Chen ([jennifer.chen@in.usda.gov](mailto:jennifer.chen@in.usda.gov)). Jennifer Chen will create shapefiles of the identified fields and send to Purdue.

### **Raptor Perch and Vole Trapping Project**

Following is more information for farmers with fields that meet the criteria and are willing to work with Purdue:

- Purdue will place 3 artificial raptor perches and trail cameras in appropriate fields in January. Cameras are monitored bi-weekly, and they will remain until Purdue is notified of impending cover crop termination by the farmer;
- Purdue will also live trap voles using Sherman traps just before cover crop termination and 7-10 days after soybeans are planted. All animals will be released live where they are captured;
- Purdue will survey fields for vole sign in the spring, and damage in the summer;
- Purdue will communicate closely with farmers to ensure equipment does not interfere with farming operations, and all equipment will be removed once the project is complete;
- Purdue can only use cereal rye fields for the in-field research. Producers using other crop types should be directed toward the cover crop and vole survey;

Indiana NRCS will provide assistance to the raptor perch and vole trapping project as follows:

- a) NRCS will promote the opportunity with applicable NRCS clients, as appropriate (see the attached *Purdue Cover Crop Study Producer Handout*);
- b) For NRCS clients in the identified counties that are interested in participating, please provide them the contact information for Megan Zagorski ([mzagorsk@purdue.edu](mailto:mzagorsk@purdue.edu));

### **Norther Harrier Sightings project**

Attached is a Fact Sheet about Northern Harriers and their roosts and more information about the study.

Purdue needs access to farms that have Northern Harrier roost sites to effectively study their diets – particularly to see if they are effective vole predators in areas of high cover crop adoption. Hawks, similar to owls, regurgitate pellets around roost sites. Bones, fur and other tissue in the pellets can be used to identify prey animals.

Purdue will scout reported areas to look for roost site and associated pellets.

Indiana NRCS will provide assistance to the cover crops and vole survey project as follows:

- a) NRCS will promote the opportunity with applicable NRCS clients, as appropriate (see the attached *Purdue Cover Crop Study Producer Handout*);
- b) If employees identify potential Northern Harrier roosts on a property, please share this opportunity with the landowner to see if they are willing to let Purdue collect data on their farm. To protect privacy, the landowner must contact Megan Zagorski ([mzagorsk@purdue.edu](mailto:mzagorsk@purdue.edu)) directly;
- c) If employees observe groups of Northern Harriers late in the day or early in the morning, but cannot identify the roost location, please notify Megan of the general area in which the Harriers were observed

Please share this opportunity and collaborate with your local partners as applicable.

Please direct questions related to this memorandum to Brianne Lowe, State Biologist at 317-295-5854 or Shannon Zezula, State Resource Conservationist at 317-295-5888.

Sincerely,

/s/ ROGER KULT Acting For

JERRY RAYNOR  
State Conservationist

Attachments: *Purdue Vole and Cover Crop Study - Field Boundary Sharing Statement*  
*Purdue Cover Crop Study Description*  
*Purdue Cover Crop Study Producer Handout*  
*Northern Harrier Fact Sheet*

cc: Joe Schmees, Executive Director, IASWCD, Indianapolis, Indiana  
Lisa Holscher, Director, Conservation Cropping Systems Initiative, Petersburg, Indiana  
Meg Leader, Director of Soil Health, ISDA, Indianapolis, Indiana  
Walt Sell, Assistant Program Leader, Purdue, LaPorte, Indiana

## Purdue Cover Crop Project Overview-For NRCS

Megan Zagorski and Abby Prieur (MS students, Purdue University) are studying associations of rodents and raptors to cover crop agriculture. Damage to soybeans in cover-cropped fields has been reported by farmers and has become a pressing concern. They are looking for ways to predict and prevent soybean damage through an in-field study. This includes temporarily installing artificial perches and cameras to monitor perch use by birds of prey, and placing live traps to monitor small mammal populations. Abby is also conducting a state-wide survey of cover-cropped bean farmers to illuminate farming practices and field attributes that may contribute to enhanced or reduced vole damage to beans.

The following bullets describe what Abby and Megan are looking for from cooperating producers and what the research consists of for each project. Please feel free to contact either student with questions at any time (aprieur@purdue.edu, mzagorsk@purdue.edu).

1. State-wide survey project:
  - Any cover crop farmer can participate REGARDLESS OF AMOUNT, OR LACK OF, vole damage!
  - Any producer in the state who used **any type or mix of cover crop** in fall 2015 and/or fall 2017 and then planted **beans in spring** 2016/2018
  - Abby will contact participating farmers to ask for FSA maps or shapefiles of relevant fields, and mailing addresses. She will then compile survey packets and send them through the mail.
  - There will be a single survey for each relevant field. Each survey is 10 questions and should take <5 minutes.
2. Fields that are/will be planted to **cereal rye this fall**, then **soybeans this coming spring**
  - Within 45 minutes of Purdue campus. Counties include: Tippecanoe, White, Benton, Carroll, Fountain, Clinton, Montgomery, and Warren.
  - It is important to re-emphasize that we only want to work in cereal rye fields for the in-field research. Producers using other crop types should be directed towards the survey.
  - Megan will place 3 artificial raptor perches and trail cameras in ag fields in January. They will remain until we are notified of impending cover crop termination. Cameras are monitored bi-weekly.
  - Abby will live trap voles using Sherman traps just before cover crop termination and 7-10 days after beans are planted. All animals are released live where they are captured.
  - Abby will survey fields for vole sign in the spring, and damage in the summer.
  - Abby and Megan communicate closely with producers to ensure equipment does not interfere with farming operations, and all is removed once the project is complete

3. Sightings of multiple harriers in the same area at dusk and/or dawn anywhere in the state and in any landscape type (farm-adjacent or otherwise)
  - Indicative of a roost site: see the harrier packet for more information.
  - Megan will scout reported areas to look for roost site and associated pellets.

## Calling All Cover Croppers: Purdue University Research

Graduate students at Purdue University are studying vole damage to cover cropped soybeans. If you answer “yes” and are willing to help us with one or more of the questions listed below, please contact Abby Prieur at [abbyprieur@gmail.com](mailto:abbyprieur@gmail.com) (cell 770-635-3453) or have your District Conservationist share your contact information with Abby. You may also sign up to participate in the cover crops survey (#1 below) by visiting the following link. Thank you!

<https://www.cognitoforms.com/VoleResearch/VolesInCoverCropsSurvey>

1. For any farm in Indiana:
  - Did you plant **cover crops (any type or mix) in fall 2015 or fall 2017**, then plant **soybeans the following spring** AND
  - Are you willing to provide field-specific information by **filling out a 10-question survey** for each of one or more fields?
2. For farms within 45 minutes of Purdue (Benton, Carroll, Clinton, Fountain, Montgomery, Tippecanoe, Warren, and White):
  - Do you have fields that are/will be planted to **cereal rye this fall**, followed by **soybeans this coming spring** AND are within 45 minutes of Purdue’s campus?
3. If you **see multiple harriers** in the same area (any county) at dawn or dusk, especially near grasslands this winter, can you contact us immediately?

# Help Purdue with Vole-Northern Harrier Study

Northern Harriers (*Circus hudsonius*, also known as Marsh Hawks) are an iconic Midwestern species. Primarily associated with marshes and grasslands, they can be found in Indiana throughout the year, flying low over fields and suddenly turning to pounce on prey. Harriers preferentially hunt areas of high prey density, including remnant prairies, CRP grasslands, alfalfa fields, and old fields.<sup>6</sup> Anecdotal evidence indicates that they may also hunt cover crop fields, and in doing so, consume pest species such as voles. However, as native prairies have disappeared, their population has declined. In Indiana, the breeding population is listed as state endangered.

Harriers are an important predator of agricultural pests, including voles. Although they are opportunistic in their feeding, in areas with high vole densities, particularly in winter, voles comprise anywhere from 79-98% of their diet.<sup>2</sup> Thus, they can be an extremely valuable vole predator, and may assist farmers in reducing vole numbers. Purdue researchers ask for your help in studying whether cover crops might lead to even more voles eaten by harriers. Notifying researchers of harriers would be greatly appreciated (see contact information below).

Northern Harriers are easily recognizable. All individuals have a characteristic white band on their rump and a feathered facial disc, similar to owls. As in owls, their facial disc helps channel sound to their ears, improving their ability to hear mice and voles moving amongst dense vegetation. Adult males (Fig. 1) have been called “grey ghosts” due to their pale gray plumage with black wing tips. Adult females (Fig. 2) are brown, with a light belly and streaking on their sides. Juvenile harriers of



Figure 1: Adult male Northern Harrier. Note the white rump, facial disk, and black wing tips.  
© Dan Debolt



Figure 2: Adult female Northern Harrier. Note the light belly and brown streaking.  
© Bill Bouton

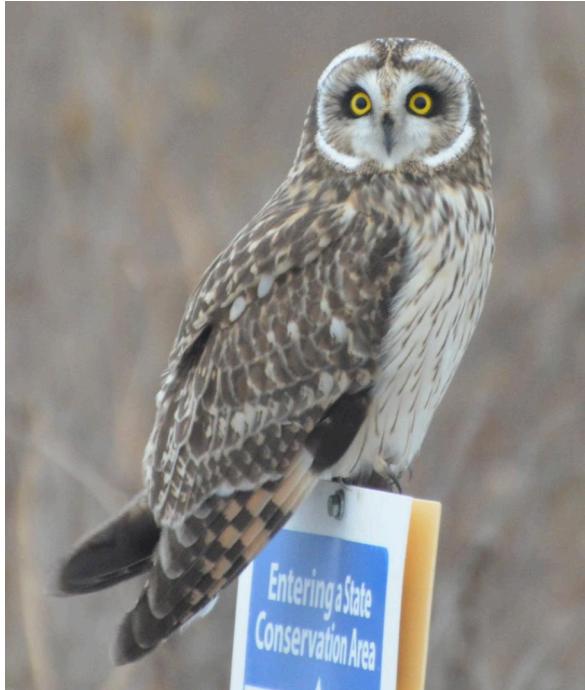


Figure 3: Short-eared Owls, when present, sometimes roost near harriers.  
© Andy Reago and Chrissy McLaren

both sexes resemble females, but are more rufous, particularly under their wings.<sup>6</sup>

In winter, harriers will often roost communally, sometimes in groups of dozens of individuals.<sup>3,6,7</sup> Harriers roost on the ground, often in tall, dense vegetation at a central location compared to the members' hunting grounds. Roosts can be identified most easily in the late afternoon by the presence of multiple harriers returning from all directions to a central location.

Alternatively in the morning, multiple Harriers leaving the same general area is another indication of a roost.<sup>3,6</sup> Additionally, Short-eared Owls (*Asio flammeus*, Fig. 3), although a rarer visitor in the greater Lafayette area, often roost near harriers, leaving after the harriers have returned for the evening.

## Contact Information

Do you think you have located a Northern Harrier or its roost? If so, please contact Megan Zagorski, M.S. student in Purdue University's Department of Forestry and Natural Resources: [mzagorsk@purdue.edu](mailto:mzagorsk@purdue.edu)

## References

- <sup>1</sup>Bildstein, K.L. 1976. "Behavior of Wintering Northern Harriers (*Circus cyaneus hudsonius*) and Other Raptorial Birds at Communal Roosts in South Central Ohio." M.S., The Ohio State University.
- <sup>2</sup>\_\_\_\_\_. 1978. "Behavioral Ecology of Red-Tailed Hawks (*Buteo jamaicensis*), Rough-Legged Hawks (*B. lagopus*), Northern Harriers (*Circus cyaneus*), American Kestrels (*Falco sparverius*) and Other Raptorial Birds Wintering in South Central Ohio." Ph.D., The Ohio State University.
- <sup>3</sup>\_\_\_\_\_. 1979. "Fluctuations in the Number of Northern Harriers (*Circus cyaneus hudsonius*) at Communal Roosts in South Central Ohio." *Journal of Raptor Research* 13, no. 2: 40–46.
- <sup>4</sup>Craighead, J.J., and F.C. Craighead. 1956. *Hawks, Owls and Wildlife*. Harrisburg, PA: The Stackpole Company.
- <sup>5</sup>Holt, D.W., and S.M. Leasure. 2006. Short-eared Owl. *Birds of North America Online*. Revised by D.A. Wiggins.
- <sup>6</sup>Macwhirter, R.B., and K.L. Bildstein. 2011. Northern Harrier. *Birds of North America Online*. Revised by K.G. Smith and S.R. Wittenberg.
- <sup>7</sup>Weller, M.W., I.C. Adams, Jr., and B.J. Rose. 1955. Winter roosts of Marsh Hawks and Short-eared Owls in central Missouri. *The Wilson Bulletin* 67(3):189–193.

I agree to allow the United States Department of Agriculture (USDA) Indiana Natural Resources Conservation Service (NRCS) to provide digital copies of my identified field boundaries to Purdue University's Department of Forestry and Natural Resources for the Vole/Cover Crop Project.

Printed Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

My preferred method for Purdue to contact me is (please list one):

\_\_\_\_ Cell # \_\_\_\_\_

\_\_\_\_ Text # \_\_\_\_\_

\_\_\_\_ Phone # \_\_\_\_\_

\_\_\_\_ Email: \_\_\_\_\_

My preferred method for Purdue to send the surveys of the identified fields is (please select one):

\_\_\_\_ Email: \_\_\_\_\_

\_\_\_\_ Address: \_\_\_\_\_