

**Indiana Invasive Species Council**  
**Meeting Minutes**  
**Wednesday 16 August 2023**  
**10:30 am to 1:30 pm Eastern Standard Time**

**1) Call to Order (M. Kraushar)**

**2) Roll Call (M. Kraushar)**

• **Council Members Present:**

- Matt Kraushar, (IISC Chair), Roadside Maintenance Specialist, representing Indiana Department of Transportation, [mkraushar@indot.in.gov](mailto:mkraushar@indot.in.gov)
- Alicia Kelley, IN CAPS State Survey Coordinator, representing Dean of Agriculture, Purdue University (Secretariat), [ajkelley@purdue.edu](mailto:ajkelley@purdue.edu)
- Megan Abraham, Director, Division of Entomology and Plant Pathology, representing Department of Natural Resources, [MAbraham@dnr.in.gov](mailto:MAbraham@dnr.in.gov)
- Eric Fischer, Aquatic Invasive Species Coordinator, representing Indiana Department of Natural Resources Division of Fish and Wildlife, [efischer@dnr.in.gov](mailto:efischer@dnr.in.gov)
- Heather Reynolds, Professor and Director of Graduate Studies in Biology, Indiana University, representing research, [hreynol@indiana.edu](mailto:hreynol@indiana.edu)
- Kate Sanders, Resource Specialist, representing Indiana State Department of Agriculture, [kasanders1@isda.in.gov](mailto:kasanders1@isda.in.gov)
- Joe Schmees, IN Freshwater Strategy Manager, The Nature Conservancy, representing land trusts, [joseph.schmees@tnc.org](mailto:joseph.schmees@tnc.org)
- Mike Warner, President of ArborTerra Consulting, Inc., representing Indiana forest industry, [mwarner@arboterra.com](mailto:mwarner@arboterra.com)
- Kelli Werling, Director of Swine Health Programs, representing Indiana State Board of Animal Health, [kwerling@boah.in.gov](mailto:kwerling@boah.in.gov)

• **Non-Council Members Present:**

- Dan Shaver, State Forester, NRCS Indiana, [daniel.shaver@usda.gov](mailto:daniel.shaver@usda.gov)
- Dawn Slack, State of Indiana Cooperative Invasives Management (SICIM), Project Coordinator / (Chair) IISC Invasive Plant Advisory Committee, [dawn@sicim.info](mailto:dawn@sicim.info)
- Ellen Jacquart, President of the Indiana Native Plant Society (INPS), Chair of the Monroe County – Identify and Reduce Invasive Species (MC-IRIS) initiative
- Bindu Paudel, PhD student (Advisor: Dr. Mo Zhou), Department of Forestry and Natural Resources, [paudel@purdue.edu](mailto:paudel@purdue.edu)
- Robert (Bob) Bruner, Exotic Forest Pest Educator, Department of Entomology, Purdue University, [rbruner@purdue.edu](mailto:rbruner@purdue.edu)
- Mo Zhou, Associate Professor of Forest Economics and Management, Purdue University, [mozhou@purdue.edu](mailto:mozhou@purdue.edu)
- Sophie Langfitt, Governor's Fellow, Department of Natural Resources, Division of Fish and Wildlife
- Katie O'Reilly, Illinois-Indiana Sea Grant, Aquatic Invasive Species Specialist, [keo@illinois.edu](mailto:keo@illinois.edu)

**3) Adoption of Agenda (M. Kraushar)**

- Discussion: None
- Motion: J. Schmees
- Second: K. Werling
- Vote: Pass

#### 4) Review and approval of minutes from prior meeting (M. Kraushar)

- Discussion: None
- Motion: A. Kelley
- Second: K. Sanders
- Vote: Pass

#### 5) Guest Presentation from Dr. Mo Zhou

- Title: A Retrospective Assessment of Conservation Cost Sharing's Success in Controlling Invasive Plants in Nonindustrial Private Forests
- See Appendix I for PDF of presentation
  - Note: This presentation represents preliminary data that should not be cited.
- Discussion
  - J. Schmees: Did you take into account that this is a competitive application process? Landowners may be more likely to rank their infestation severity as high when they are competing for a finite amount of money.
  - D. Shaver: Currently we are prioritizing medium/low infestations because they are easier to control, but it varies over the years.
  - M. Zhou: Another theory we have is that the rankings are inconsistent because some people have never dealt with invasives before, so they do not know what high/medium/low looks like, while people who have dealt with these issues before will have a better idea of the severity.
  - K. Sanders: Is the severity reported from landowners or from research scientist visits?
  - M. Zhou: The results shown are from the landowner survey.
  - J. Schmees: Do you know who did the removal work?
  - M. Zhou: We tried. Many landowners did the work themselves, but some did hire foresters. However, most landowners do not have a good record of what's been done. That is one of our biggest challenges. When our students are in the field, we have often found that what the landowner reported in the survey is quite different than what's there.
  - D. Slack: This is really interesting. I have a feeling there is so much bias baked into the survey results, because if you are a landowner and are overwhelmed with what's on your property, you have a tendency to skew things. I don't know how you would control for that. It's also interesting to see which species they rank as most severe. When we're out looking, we see multiflora rose as a problem, but we see more bush honeysuckle and shrubs.
  - M. Zhou: We agree there is a lot of bias. When we first designed the survey we tried to be as specific as possible because we want to capture all the information. However, we realized that it was too much to ask. It's overwhelming for a landowner to have all that information recorded very accurately. This is one reason we wanted to present at

- this council, to ask if these numbers make sense to you. I also want to point out on the species data slide, this is showing the number of participants who reported this species on their property. It is showing presence, not severity.
- M. Kraushar: That may be bias in terms of knowledge of identification. Things with thorns tend to be noticed more quickly.
  - H. Reynolds: It's great that you got the ecological data. It will be interesting to compare what landowners say and what is found on the land between EQIP and non-EQIP participants. I look forward to seeing more of that. I also wanted to mention that in the latest issue of *Frontiers in Ecology & Environment*, there was a study on rangelands and looking at landowner's sense of place and how that influences their management.
    - H. Reynolds [in chat]: Here is the study I mentioned, in case there are any good connections for your work:
      - Relationship with the land as a foundation for ecosystem stewardship. Michael G Sorice, Kiandra Rajala, Bryan L Brown, Vanessa A Masterson, Samuel D Fuhlendorf. Pages: 282-288. First Published: 04 June 2023 <https://doi.org/10.1002/fee.2651>
  - M. Warner: My first impression on reported out-of-pocket expenses is that those numbers seem low. Maybe some landowners are not reporting all their costs, perhaps due to a lack of record-keeping. I'm involved in doing thousands of acres of invasive species removal and have a fairly good idea of what the out-of-pocket costs are.
  - M. Zhou: What do you think is a more realistic cost?
  - M. Warner: I would have expected over \$100 an acre.
  - M. Zhou: If the landowners hired a forester, the numbers they reported are relatively more reliable. If did the work themselves, they would often not report their own labor or resources in the costs. We tried to account for this by asking how many hours it took them and how much chemical they used. The out-of-pocket expenditure data is still under revision.
  - M. Kraushar: I have a question for Dan Shaver. If the EQIP participants are reporting approximately \$69 in out-of-pocket expenses, what does that look like on a total cost per acre basis when including the cost share expenses?
  - D. Shaver: The cost share program aims to cover about 75% of the cost of the actual work. The reported \$70/acre could be their 25% portion. When we look at the total cost over 3 years, for a high infestation, it is about \$1000/acre.
  - K. Sanders: I wonder if there is a bias between those who hire a forester versus those who remove invasives themselves, in that those who are doing the work themselves will report the severity as higher because they are viewing it through the perspective of how much work they have to do.
  - D. Slack: We may also play a part in influencing landowner perspectives because when we speak to them, we try to lessen the overall feeling of despair. I will reach out to you to talk further.

## 6) Member Reports

- **Indiana Department of Natural Resources, Division of Entomology and Plant Pathology (M. Abraham)**
  - Personnel changes
    - Ken Cote retired
    - Two new nursery inspectors: Will Drews and Bonnie Spindler
    - 14 total on staff
    - Vince Burkle is now the Assistant Director
  - We have submitted project ideas for PPA 7721 Farm Bill funding
    - \$13,000 honey bee survey
    - Wood borer/bark beetle to offset needs for CAPS survey
  - Bob Bruner is working on Forest Pest Outreach program. Spotted lanternfly billboards are in thanks to Bob's efforts.
  - Spotted lanternfly update
    - The issue is that the infestation is too large and there is not enough money. I was put on a five-year strategic plan committee to come up with the next five years direction for the USDA and the National Plant Board (NPB). They have decided we are going to allocate funds as: 80% in treatment and reduction; 15% in research; and 5% in outreach. Indiana is now eligible for treatment dollars. When we submitted a request for \$500,000 in treatment, we got \$150,000. We are trying to adjust our work plan to match the funding.
    - We know about two populations in Switzerland and Huntington. We now have it in Elkhart along railroad tracks coming from Toledo, Ohio area.
    - The USDA is putting most of the funding in the epicenter of the initial infestation rather than the leading edge. This may shift but we have to wait and see what happens. We just submitted a request for \$750,000 request but we are not sure what we will get.
    - In the meantime we are controlling SLF as much as possible to limit its movement into the state.
  - There is a new invasive of concern to Indiana: Box tree moth.
    - This pest came down from Canada. Recently all imports of boxwood from Canada have stopped. It is also in Michigan, Ohio, and New York.
    - The USDA quarantine requires that a red band is put on every boxwood coming from the quarantine area which states the boxwoods cannot be moved out of the area. However, this strategy is not successful in stopping movement of the pest.
    - There is difficulty finding the insect because nurseries regularly treat their boxwoods which suppresses the population. Once people plant the boxwoods in the landscapes and they are no longer treated, the insects become apparent.
  - Kudzu program is ongoing this year.
  - Spongy moth continues to encroach on northeast corner of the state. It's also pushing in from Cincinnati. We are deliberating treatment strategies for Indiana-Ohio.
  - State Fair Invasive Species booth: There were some minor changes in what communications were available, but hopefully we will have more in the future.

- We did a survey this year for Redbud vascular streak disease, which is being found along the east coast and in Tennessee. All we have found so far has been traced back to nurseries in infested areas that sent it in.
- Discussion:
  - E. Fischer: When will the Elkhart infestation be announced?
  - M. Abraham: As soon as I get official diagnosis from the USDA identifiers.
  - M. Kraushar: Are there other hosts for box tree moth?
  - M. Abraham: It's primarily boxwood.
- **The Nature Conservancy/Land Trusts (J. Schmees)**
  - We are doing a lot of invasives management on our properties and continuing to support Indiana Invasives Initiative.
  - Aquatic invasive workshop on August 26<sup>th</sup>
    - Learn basic aquatic invasive plant identification techniques, as well as how to manage aquatic invasive plants and native plant alternatives for use around Indiana lakes.
    - Action item: Joe Schmees to share workshop information.
- **Purdue University College of Agriculture (A. Kelley)**
  - Reminder about Purdue Extension Events in November and December
    - November 16 & 17 – Agriculture and Natural Resources Retreat
    - December 13 & 14 – Purdue Extension Professional Development Conference
- **Indiana Department of Natural Resources, Division Fish and Wildlife (E. Fischer)**
  - We are in our field season for federal grant funding. We are using Great Lakes Restoration Initiative funds to continue to treat aquatic vegetation such as starry stonewort, mostly centered in the northeast corner in the glacial lake areas. So far this season we have treated 350+ acres on 28 lakes, plus another 5-10 lakes with Lakes and River Enhancement funding.
  - We are in the middle of the State Fair. IDNR has the invasive species booth with outreach materials present.
  - Every year we are running a Great Lakes Region Landing Blitz.
  - Volunteers and DNR staff go out to boat landings and talk to boaters about prevention messaging.
  - Next year's dates will be shared with the Indiana Invasives Initiative for the CISMA's to help (typically middle of June to middle of July). There is interest in expanding the program outside of the current window but this is dependent on staff.
  - Discussion:
    - M. Abraham: We have seasonal staff who could potentially assist.
    - E. Fischer: Sophie [Langfitt] has also been assisting me with the program.
    - D. Slack: I would like to get Eric Fischer on the CISMA Lunch and Learn schedule to spread the word about possible survey assistance.
    - R. Bruner: Master Gardeners have public service requirements. If you reach out to the Extension Educators in those areas, they will help you get volunteers.
    - K. Sanders: Master Naturalists have those requirements as well.

- **State Board of Animal Health (K. Werling)**
  - Agency Updates:
    - Effective July 1, 2023, the BVME moved back to be collocated with BOAH. The newly named Indiana Board of Veterinary Medicine (VetBoard) now operates alongside BOAH within the newly formed Indiana Center for Animal Policy (IN-CAP). As approved by the Legislature, BOAH has hired a Director for the new VetBoard, Laura Turner, JD, who joined the team in May 2023.
    - BOAH will begin the hiring process for a poultry veterinarian, an epidemiologist, and a poultry health specialist. Specifically, these positions will be critical to BOAH's ability to support the poultry industry with issues like Highly Pathogenic Avian Influenza (HPAI), Egg Drop Syndrome Virus (EDSV), and other high consequence diseases.
  - Animal Disease/Pest Issues:
    - After a 6-month streak without a case of egg drop syndrome (EDS) in Indiana, a new case was diagnosed on June 5, 2023, in 42-week-old, brown laying hens in LaGrange County. The premises was not a previously affected site, and the birds had been vaccinated as 12-week-old pullets (likely a vaccine administration issue).
    - In June, BOAH field veterinarians assisted IDOH in three counties, including Elkhart, Orange, and Marion with backyard poultry and environmental swabbing as a result of various Salmonellosis incidents.
    - IDOH has positively identified Asian Longhorned Tick (*Haemaphysalis longicornis*) nymphs in both Switzerland and Dubois counties. The Southern Indiana IDOH entomologist is currently working to perform tick drags on all applicable premises that have had cattle diagnosed with Theileriosis, in addition to areas that have a high likelihood to harbor the invasive tick.
    - Five bats have tested positive for rabies in Indiana this quarter. They were located in Huntington, Johnson, Marion, Marshall, and Steuben counties and involved exposure of cats, dogs, and humans. A total of 9 bats have tested positive for rabies this year.
    - BOAH conducted three foreign animal disease investigations this quarter. These cases ruled out vesicular stomatitis in a pony, rabbit hemorrhagic disease in a pet Flemish Giant, and Foot and Mouth Disease in a commercial sow farm.
    - As part of the summer season, BOAH animal health specialists performed inspections at local swap meets to ensure state requirements for animal traceability are being met. These events serve as opportunities in which information on animal identification requirements, certificate of veterinary inspection rules, record keeping for sales of poultry, how to register for a premises ID, and more is distributed.
    - In June, Florida reported its first case of CWD in deer. See updated map below.

## CWD in Captive, Wild Cervids



- Indiana wild pig eradication
  - Decreasing to detection level funding in upcoming fiscal year. Have been on level 1 elimination funding for the past 5-ish years. Current policy is to have detection level funds and activity for about 2 years before Indiana can claim wild pig eradication.
- Discussion:
  - M. Abraham: My understanding is that Asian longhorned tick is not a problem for humans.
  - K. Werling: That is also what I know. Our concern is its impact on livestock. We know that the Department of Health is doing work on the public health issue, but I am not familiar with that component.
  - D. Slack [in chat]: Any updates on Mute Swan populations?
  - K. Werling: I have not heard any updates on Mute Swan. That is mostly DNR, so BOAH doesn't do much of that work.
  - E. Fischer: I don't have the information but I can probably get it.
  - J. Schmees: Once we are on detection level funding for wild pigs, how difficult is it to go back to elimination funding?
  - K. Werling: We were told that we can go back to level 1 elimination funding if we need to. It is population based, so if we were able to document the level of population, that should help with getting that funding. Typically, we do detection phase for two years, then we can declare freedom or eradication, and then we no longer receive the funding.
- **Indiana Department of Transportation (M. Kraushar)**
  - Control efforts are underway in various areas, both contractually and in-house. Year-to-date acreages include:
    - ~34,000 acres of contracted broadleaf weed control (any broadleaf plants within 30' of pavement edge, as ROW allows) applied on odd numbered roads this year.
    - ~25,500 acres of contracted spot treatments conducted on Thistle/teasel; cattails/phragmites; johnsongrass; woody vegetation.
    - ~1000 acres of woody vegetation management note that this is not solely invasive species, but predominantly is.
    - ~4500 acres of invasive herbicide spot treatments from in-house crews.
- **Indiana Department of Agriculture (K. Sanders)**

- No updates at this time.
- **Research (H. Reynolds)**
  - No update at this time.
- **Forest Industry (M. Warner)**
  - Hoosier Hardwood Festival: August 25-27<sup>th</sup> at Boone County Fairgrounds
  - Forest management presentations and workshops will be available.
  - Ongoing invasives management workshops throughout Indiana
  - Breakfast with Foresters: Foresters meet with private landowners who are interested in forest management discussions.
- **Indiana Plant Advisory Committee and SICIM (D. Slack)**
  - SICIM & Indiana Invasive Initiative (III)
    - About 45 CISMAs, represent 48 counties, work in 72 counties
    - Completed surveys representing >40,000 acres; 1,342 landowner surveys
    - Completed 485+ weed wrangles, representing 3,800 volunteers and \$200,000 value for parks
    - Completed 180 outreach events and 6 conferences
    - 28 CISMA trainings throughout the year
    - We have reimbursed the CISMAs for weed wrangles at about \$100,000; two more reimbursement programs will be rolled out before the end of 2026. Goal is to provide \$250,00 to CISMAs over 3-year time frame.
    - Submitted funding requests through America the Beautiful and Sentinel programs; asking for \$250,000 for direct land management dollars
    - CISMAs are using EDDMaps and doing great to map their county
    - Fun Run Fundraiser
      - November 4<sup>th</sup>
      - Mill Race Park
      - Looking for teams
      - Action item: D. Slack to send information on Fun Run.
  - IPAC
    - Working through assessments
    - Tasked to look at tall fescue
    - A portion of the group met to discuss. The invasive plant list is not designed to qualify each species and how it can potentially be used to not be invasive. Our job is to assess invasiveness into natural areas. We do not feel we need to add a qualifier to species on that list.
    - Statement will be added to the top to clarify purpose of the list.
  - Discussion
    - H. Reynolds: Should we reach out to City of Bloomington Planning Department to make sure they understand what the list means? Dr. Patton had justifiable frustration, and perhaps the City of Bloomington needs to be educated.
    - D. Slack: Ellen Jacquart did connect Dr. Patton and the City of Bloomington



- E. Jacquart: The information on the Invasive Plant List is accurate; it sounds like Dr. Patton disagrees with the city’s interpretation of the assessment. I have been communicating with the Planning Department and letting them know this is an issue. They are aware that Dr. Patton disagrees with their use of the educational list in the zoning ordinances in Bloomington.
- H. Reynolds: Can the IISC have a role in speaking directly with the Planning Department? They might need that education from us.
- E. Jacquart: I can do that. I can touch base with D. Slack to come up with a statement of what it means to be a “medium” on the list, how we interpret that, and present it to the planners. We can then ask them to reevaluate how they are choosing to use this information.
- H. Reynolds: And maybe we can provide more insight on tall fescue in particular, because that is a tricky species. We should CC Dr. Patton on these communications.
- Action item: D. Slack and E. Jacquart will work together to develop a statement that can be added to the website to clarify what the rankings can be used for. They will also help distribute that to the Bloomington Planning Department.
- D. Slack: My current summary statement is “This list contains species capable of harming natural areas and the assessment process evaluates the invasiveness or the invasive characteristics of that species as it relates to our native species and our natural areas.” We need to be careful insinuating that a species is not that invasive under specific circumstances, because these situations can change, and the invasiveness of a species might become worse over time.
- H. Reynolds: As long as we continue to have rankings, we need to stand by what that means. The statement needs to clarify what a “low”, “medium”, and “high” ranking means. I don’t feel it is harmful to follow up with the City of Bloomington and provide more insight on this species and our position on it.
- E. Jacquart: We can follow up with the City of Bloomington on rankings and how they should use the list.
- D. Slack: It’s important to remember that tall fescue is a significant challenge in prairies, wet prairies, and savannahs. Where cool season fire is used, it does have a tendency to bolster the growth of fescue. It is challenging to manage for people doing restorations in those systems. There are nuances to think about, but I think talking to the City of Bloomington is very appropriate.
- M. Kraushar: I will add that IPAC is constantly on the look for participating members on review committee. If you have or know of someone who can serve in that capacity, I think it would be great to have more experts assist with that.

## 7) Old Business

- Outstanding Action Items from prior meeting(s)
  - Action Item: M. Abraham to provide timeline for amendment process to Council and listserv.

- M. Abraham: The timeline is no longer possible due to House Bill 1623. All state entities need to make sure that all of their rules are put in by the end of this year or they no longer exist. DNR has taken the position that they are not doing anything else until this is taken care of. So, every rule is on hold right now until House Bill 1623 is situated. Terrestrial Plant Rule is on the agenda to be addressed in early 2024.
- E. Jacquart: Can you clarify where we are in the process?
- M. Abraham: We have the fiscal analysis developed and the approval to move forward from the Executive Office. We haven't heard anything from Office of Management & Budget (OMB) or anyone who would give preapproval before going to council.
- E. Jacquart: Has the OMB seen it?
- M. Abraham: No.
- E. Jacquart: When would it go to OMB?
- M. Abraham: After the first of the year. The legal team is not addressing anything with any rules unless it has to do with HB 1623.
- M. Warner: What was the result of the fiscal analysis?
- M. Abraham: Because the rule is a staged rollout, there is no fiscal impact.
- D. Slack: Are you thinking a five-year phase out period?
- M. Abraham: It will depend on what OMB suggests; last time they made us put in verbiage that we would wait another year. If they do that again, we could put in a 3-year roll out, which would actually be 4 years. But it will depend on other people.
- Update on Media Committee (R. Bruner and A. Kelley)
  - A. Kelley: Different communication strategies will depend on the audience and message for the social media pages. It would be helpful for the council to provide some idea on what is the target demographic and desired message for that audience.
  - M. Abraham: All of DNR social media is controlled by Communications. When you have to get anything through Communications it can be difficult.
  - M. Kraushar: I feel the intent for the media outreach is to provide an additional platform to disseminate invasive species information. For example, Invasive Species Awareness Week was during the same week as Construction Zone Awareness Week, so it was difficult to spread any information through the Department of Transportation during that time. Having another potential avenue would be useful.
  - R. Bruner: We should temper our expectation, because social media engagement is a large time commitment, and we are limited on what we can dedicate to it.
  - A. Kelley: Anyone is welcome to send me information or messaging they would like to disseminate through the various channels that we currently have.
  - Katie O'Reilly [in chat]: 100% agree with Bob's comments, and consistency on social media is really important! Sea Grant is always happy to share info with our followers.
  - D. Slack [in chat]: IPAC is very active on FB, and DEPP helps us with that.

- J. Schmees: We should also consider that Purdue most likely has a policy on how to handle comments.
- R. Bruner: Yes, Purdue does have a policy. The good thing is that it is not that stringent. I think the best avenue moving forward is to use profiles that already exist currently and have a following. The Report Invasives social handles would be a good idea. We just need an idea of what you want highlighted.
- Elect Chair Position
  - K. Werling expressed interest in taking on the role.
  - M. Kraushar: Motion to accept Kelli Werling.
    - First: M. Abraham
    - Second: K. Sanders
    - Vote: Pass
- Biennium Report
  - Action item: M. Kraushar will work with K. Werling on drafting report.

#### **8) New Business**

- Next Meeting date
- Wednesday, 8 November, 10:00 AM
- Location: TNC 1<sup>st</sup> option; BOAH 2<sup>nd</sup> option

#### **9) Review of assigned action items**

- J. Schmees: Share information about the Aquatic Invasive Workshop
- E. Fischer: Share dates for Landing Blitz
- D. Slack and E. Jacquart: Draft statement on high/medium/low rankings for the IPAC website
- D. Slack: Share info about the Fun Run fundraiser
- M. Kraushar: Draft biennial report and circulate draft via email prior to next meeting

#### **10) Adjournment**

- Motion: M. Abraham
- Second: K. Sanders
- Vote: Pass

## APPENDIX I

Presentation by Dr. Mo Zhou: Understanding Non-industrial Private Forest Landowners'  
Characteristics and Their Participation in Conservation Cost Sharing Programs

# *Understanding Non-industrial Private Forest Landowners' Characteristics and Their Participation in Conservation Cost Sharing Programs*

Bindu Paudel<sup>1</sup>, Mo Zhou<sup>1</sup>

<sup>1</sup>Department of Forestry and Natural Resources, Purdue University



# Introduction

- Biological invasion recognized as one of the four greatest threats to forest
- An estimated loss of \$2.1 billion by invasives plants in the US annually (Pimentel et al. 2005)
- Expected to worsen more with climate change (Bertelsmeier et al. 2013)
- Federal spending on invasive management increased nearly five-fold since the early 2000s (Corn and Johnson, 2015)
- Increase in involvement of Non-industrial Private Forest (NIPF) landowners for financial assistance in invasive management

# Introduction

## Environmental Quality Incentive Program (EQIP)

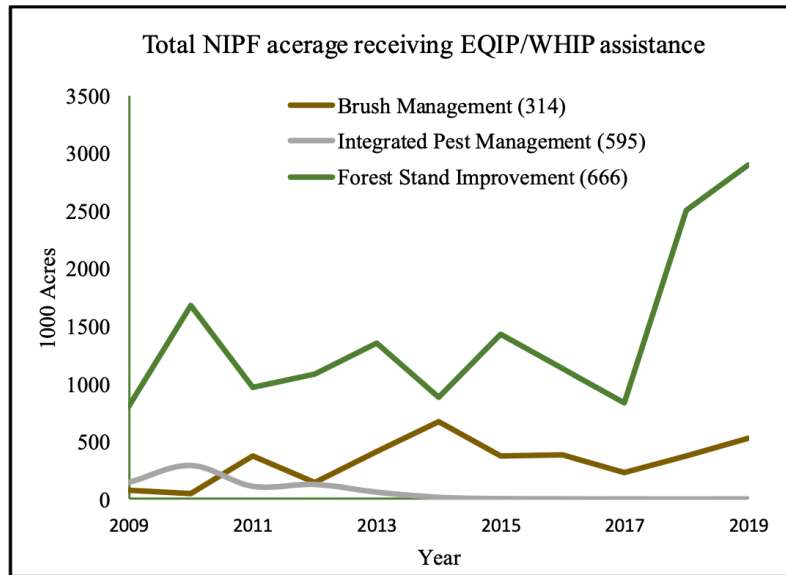


Figure 1. Total acreage of NIPFs that obtained EQIP/WHIP assistance for land conservation practices

Source: USDA-NRCS, National Planning and Agreement Database

- Started providing cost sharing to forest land conservation practice following the 2008 Farm Bill
- Spending on EQIP averaged \$1.4 B from 2009 to 2019, with over 2/3 spent on cost-sharing
- Three main practices that deal with invasive plant control in NIPFs
- Undertaken on nearly 20 million acres nationwide from 2009 to 2019 constituting approximately 40% of all NIPFs receiving EQIP assistance
- 75% flat rate payment of cost-share
- 90% rate for historically underrepresented

# Introduction

## Rationale of the study

- Limited information on the characteristics of NIPF landowners who participate in cost-share programs for controlling invasive species
- Challenges in tailoring interventions, and providing targeted support to maximize overall success in invasive species management efforts
- Understanding the characteristics and profile of their participation in cost-share programs is crucial for developing targeted outreach efforts and designing effective initiatives that actively engage landowners
- This will lead to more informed decision making by conservation program administrators and provide valuable guidance for future policy implementation



# Objectives

To contrast EQIP participants and non-participants in terms of:

- Landowner characteristics
- Forest characteristics
- Types and severity of invasion
- Expenditure in invasive control

# Data and Methods

## Study Area

- Indiana, US
- About 85% of forested land in Indiana is under NIPF ownership
- Hardwood industry relies heavily on local timber resources and ranks 6 in the manufacturing sector
- Eliminated on 30% (938 thousand acres) of NIPFs in Indiana, 1/3 of which received cost sharing (National Woodland Owner Survey, 2013)

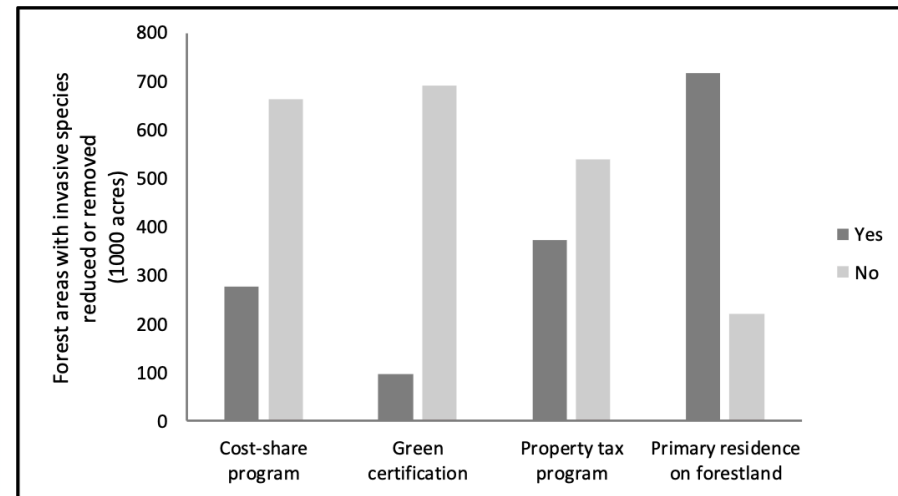


Figure 2: Variability in voluntary program participation that have invasive species removed or reduced  
Source: 2013 National Woodland Owner Survey

# Data and Methods

## Survey

- Conducted both Mail Survey and Web Survey of NIPF landowners
- August to October 2022
- Study period: 2000-2020
- Survey sent to 2,000 NIFP landowners
- Received back **258 Mail Surveys** and **157 Web Surveys**
- **Total Sample:** 415
- **Response Rate:** 20.75%

# Data and Methods

## Data Collection

**Invasive species Management:** removal of invasive plants, the area treated, out-of-pocket expenses, cost-share payment received, invasion severity, enrollment in conservation programs.

**Forest and Landowner Attributes:** Total forest acreage, length of ownership, residence near forest, timber sales, adoption of forest management practices, landowners' socio-demographics.

# Data and Methods

## Methods

Categorized respondents as:

- Control if non-EQIP participants (invasives may have been removed)
- Treatment if EQIP participants

## Analysis

- Comparison of landowners' characteristics
- Comparison of forest characteristics
- Presence of invasive species
- Severity of invasive species

*(Light (L): <10%; Medium (M): between 10 and 50%; Heavy (H) >50%)*

- Computation of expenditure on invasive control

# Results

Table 1. Landowners' characteristics

<b>Socio-demographics</b>	<b>Total Sample (N=415)</b>	<b>Control (N=306)</b>	<b>Treatment (N=109)</b>
<b>Gender</b>			
Male	81.18%	78.97%	85.98%
Female	18.53%	20.60%	14.02%
<b>Age (Median)</b>	67	67	68
<b>Education</b>			
College degree or higher	86.57%	85.09%	89.72%
<b>Average Annual Household Income</b>	\$93,942	\$93,532	\$94,680

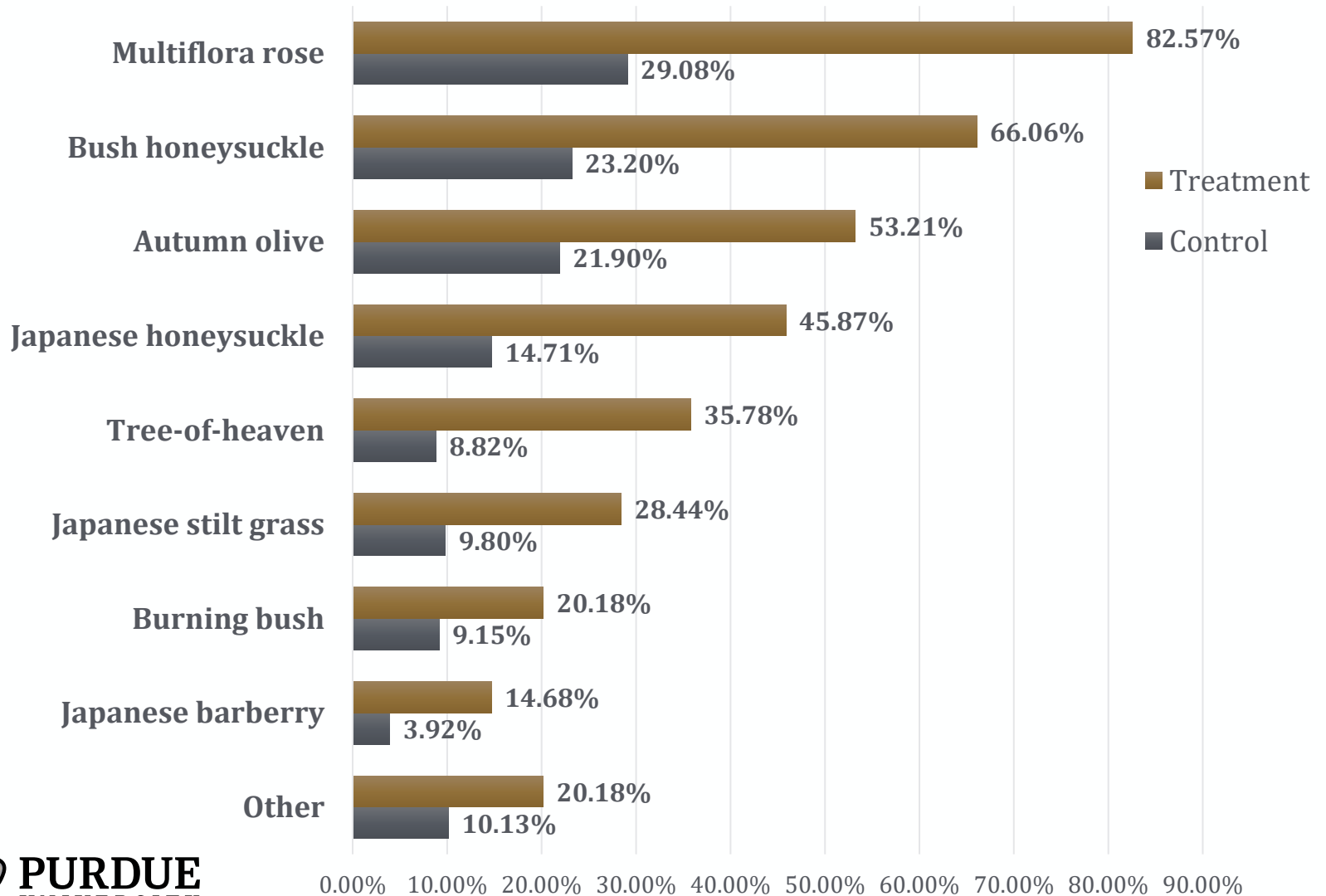
# Results

Table 2. Forest characteristics

<b>Statistics</b>	<b>Total Sample (N=415)</b>	<b>Control (N=306)</b>	<b>Treatment (N=109)</b>
<b>Average forest acreage</b>	73.40	63.60	95.28
<b>Average length of ownership (years)</b>	27.44	27.34	27.65
<b>Timber sales</b>	36.87%	29.41%	57.80%
<b>Residency near forest</b>	58.55%	55.56%	66.97%
<b>Adoption of other forest management practices</b>	64.32%	58.73%	71.29%

# Results

Figure 3. Presence of Invasive Species





# Results

## Severity of Invasive Species

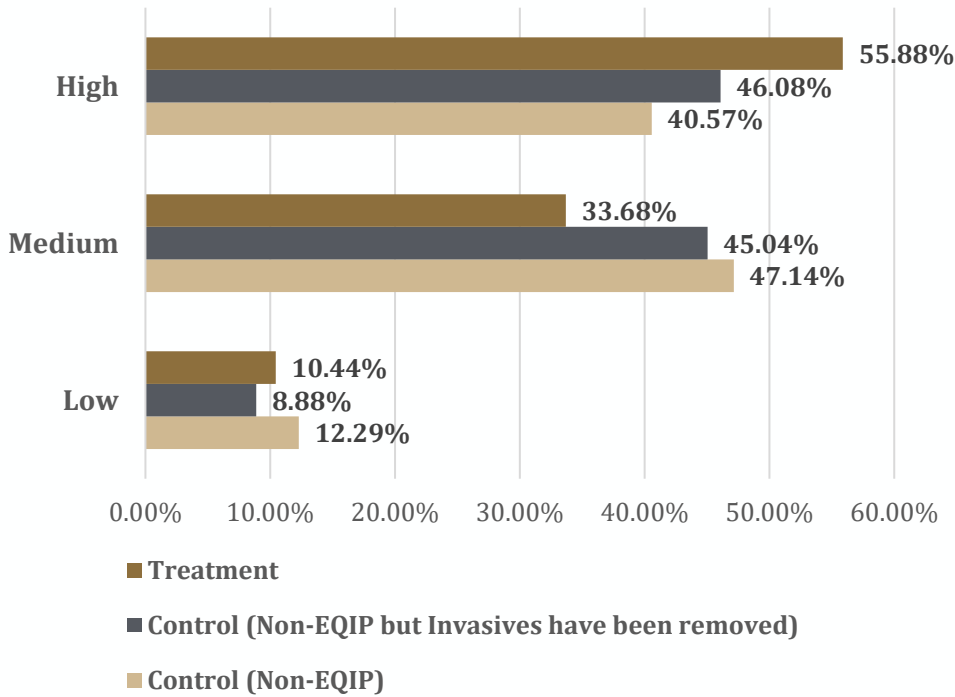


Figure 4. Severity of invasive species before removal

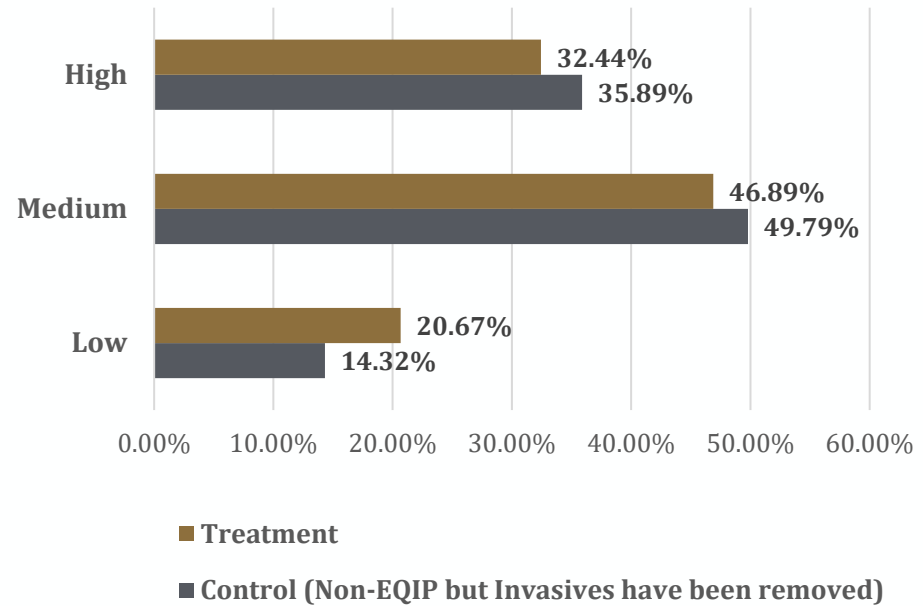


Figure 5. Severity of invasive species after removal

# Results

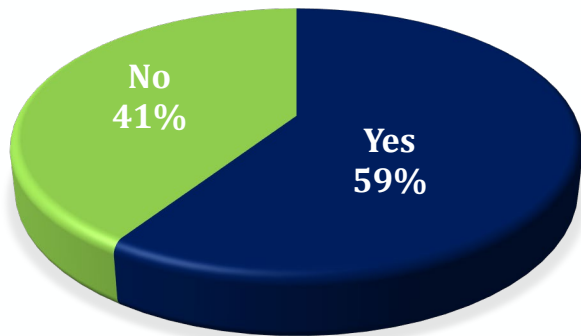


Figure 6. Removal of invasive species

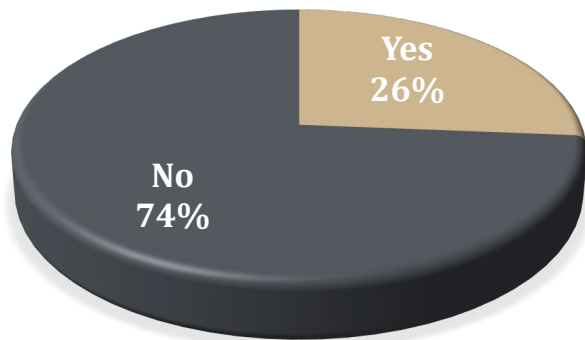
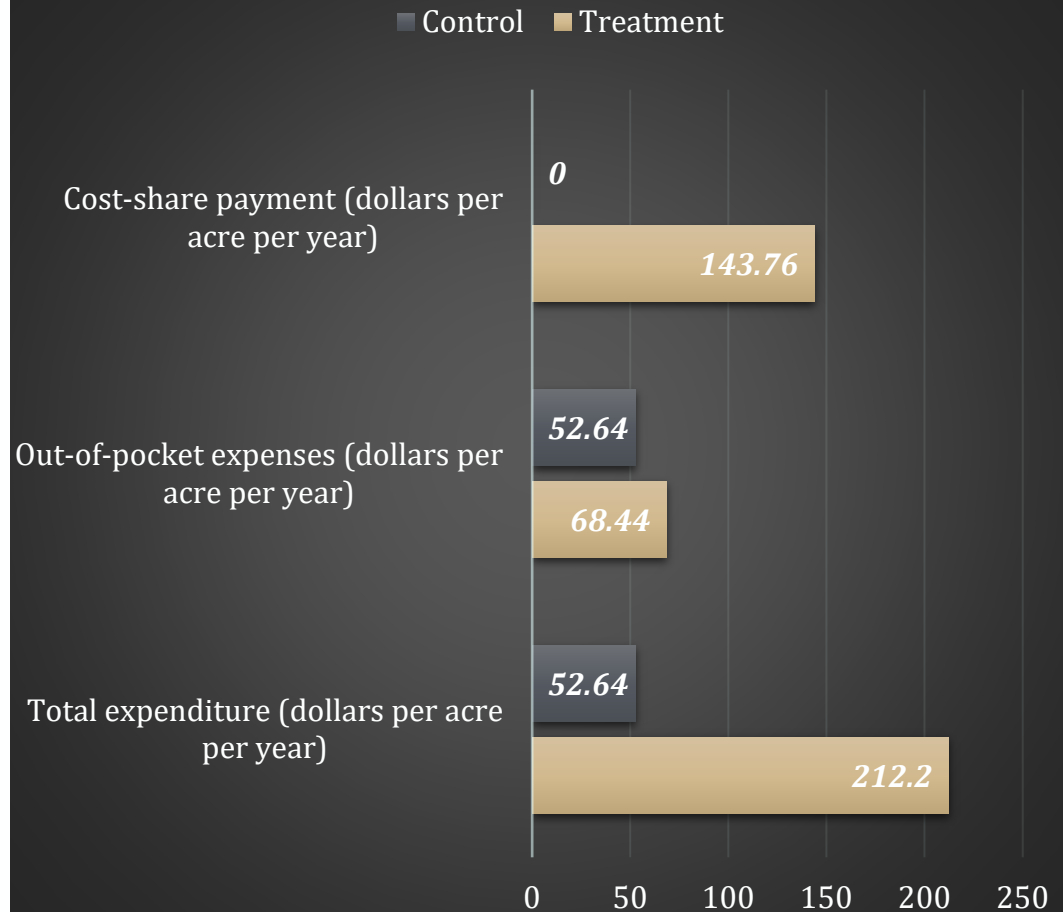


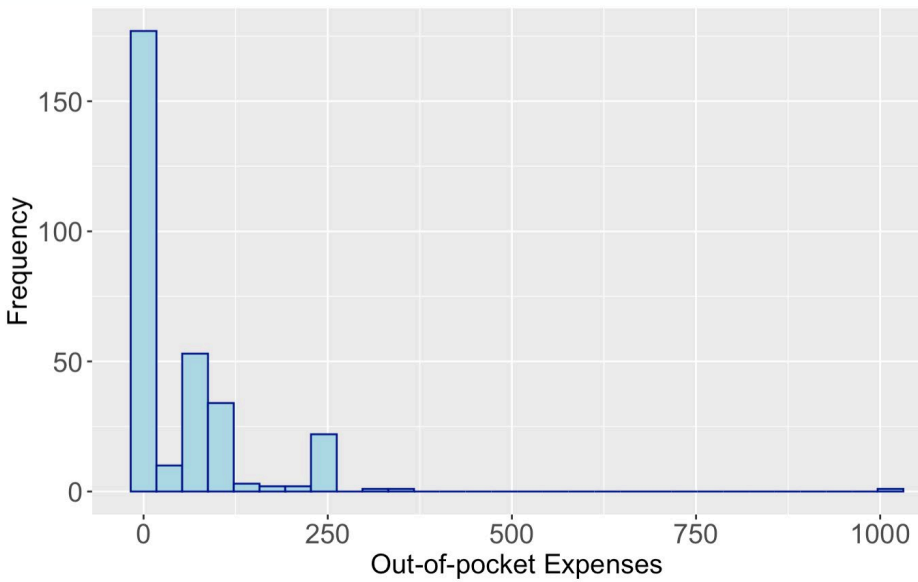
Figure 7. Cost-share payment received

Figure 8. Average Spending on Invasive Species Control

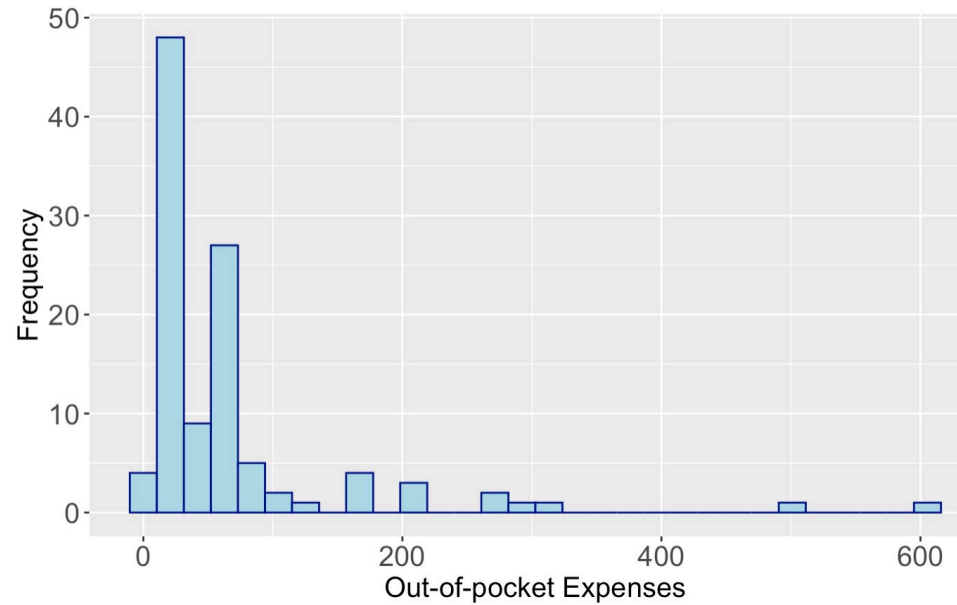


# Results

## Distribution of Out-of-pocket expenses



**Figure 9. Out-of-pocket expenses in control group**



**Figure 10. Out-of-pocket expenses in treatment group**

# Conclusions

- The control and treatment groups had similar socio-demographic characteristics.
- The treatment group had higher total forest acreage, and timber sales than the control group.
- The treatment group had a higher percentage of landowners living near the forest and higher adoption of other forest management practices than the control group.
- Multiflora Rose is found to be most abundant invasive species followed by Bush Honeysuckle and Autumn Olive in Indiana
- Most of landowners in treatment group had the severity level of High relative to landowners in control group

# Conclusions

- Among NIPF landowners, 59% removed invasive plants, while only 26% received cost-share payment.
- The average total expenditure for controlling invasive plants was \$212.20/acre/year for the treatment group and \$52.64/acre/year for the control group.
- The average out-of-pocket expenditure for controlling invasive plants was \$68.44/acre/year for the treatment group and \$52.64/acre/year for the control group.

*Thank You!*

