Program: Ecological Restoration as a Strategy for Conserving Imperiled Butterfly Communities
Speaker: John Shuey, PhD, Director, Conservation Science, Indiana Office of The Nature Conservancy
Introduced by: David Culp
Attendance: 118
Guests: Steve DeVoe, Mary DeVoe, Colleen Mestichelli
Scribes: The Mutter Marines (Jim and Carol)
Editor: Carl Warner

John Shuey has been involved with the Indiana Nature Conservancy for 25 years. He is currently leading the effort to develop climate change adaptation strategies for the over 28,000 acres owned by the Indiana Chapter of the Conservancy. He has BS and MS degrees in evolutionary biology from Ohio University and a PhD from Ohio State in insect ecology.

The focus of his talk was on restoration efforts to reduce threats so that high biodiversity areas can persist in Indiana. Conservation is about both protecting wilderness and also fixing damaged systems. He spoke about two projects to restore connectivity between isolated plant and animal populations and increasing habitat size for habitat restricted species (both plants and animals). The first project took place in the Mata Atlantica – in the Southern Brazil Atlantic rain forest. The team worked on the coast at the base of the mountains (at sea level) near the town of Cuiriba, Parana', Brazil:

- The Brazilian rain forest is the richest in the world. It has twice number of wooded species than anywhere else in the world.
- 90 % of the Atlantic rain forest is gone and clearings are continuing to happen.
- Vast landscapes are purely agricultural and urban.
- Carbon sequestration/offset efforts were funded by General Motors, American Electric Power and Wisconsin Electric Power Co. They will receive carbon credits if/when those are approved.
- The project tried to fill in the gaps in the forest – "defragment" it.
- Data was collected before and at various stages of the project using butterflies as the measure. Two control communities were designated along with several other communities where either natural generation or tree plantation was used to restore the environment.
- John discussed the design of the project and tests as well as the results:
- Over six weeks 224 species of butterflies were identified (100 more than occur in Indiana).
- Cluster analysis showed that butterfly communities responded positively to their simple measures of forest quality, to include canopy density.
    - Conclusions:
- The restorations are healing the fragmented forest from a butterfly perspective.
- Forest species see restored habitat as useable just 15 years after initial restoration.

The second project discussed is here in Indiana in the Kankakee Sands area:

- There were three protected sites in that area that were not contiguous.
- The species of concern (rare) were all clustered around in the protected areas.
- Barriers to dispersal lead to random population extinctions and no easy recolonization.
- The Nature Conservancy (TNC) bought 8,000 acres of land in between the 3 protected areas to enlarge the protected area and to restore the connectivity between them.

- TNC established a native seed nursery on site with 140 species and ended up with 600 species planted. They buffered the land from adjacent land uses. This is considered the richest botanical restoration in the US.
- Testing found animals in the connectivity area to include portions of the area that were agricultural and one field that was let go and not seeded.
- Insects, birds and mammals – several ecological guilds were studied.
- Interestingly, there was an exact correlation between moths (771 species counted) and the restoration areas but not with pollinators (e.g., bees and butterflies) that range out over the landscape.
- Another interesting situation concerns the Regal Fritiary butterfly – endangered in Indiana:
    - 25 years ago it was found in just 3 places in Kankakee Sands and nowhere else in the entire State.
    - Now they are found all over the restoration area.
    - AND they've jumped to another area with none in between.
- Conclusions:
    - Conservative species of plants are high in native prairie and high-diversity restoration areas.
    - Conservative insects follow the same pattern with highest numbers in native prairie and high diversity restoration areas.

TNC estimates that the last of restoration should be finished within two years; that will result in 28.5 square miles of contiguous conservation, 40% of which is restoration.

Bison were brought in to enhance the restoration. They create medium to short grass for birds that like that. Those grasses are also important for butterflies. Bison also create wallows by rolling around; the plants that come in are milkweeds which are great for monarchs and other butterflies. They are helping to restore the grassland habitat.

Indiana TNC is working with Illinois to create connectivity across both states on the border, a region called the Kankakee Sands Project Area. It will be 40,000 acres when done.

Q&A:

Host plants for Regal Fritiary butterflys are 3 species of violets. Those seeds were put into the conservation areas.

Restoration Process: e.g., Jasper-Pulaski and Kankakee Sands:

- First step was to cut down trees while keeping those native to the area; then planting more native trees. They'll be managed with fire.
- The natural hydrology must be restored then the seen mix is planted. They do spray for invasive species.

Seeding process:

- Plant the whole field using pelletized fertilizer spreaders to drop seeds on the ground at rate of 14 seeds per square foot.
- Seeding is done in November; the frost-thaw cycle ensures they're buried in the ground. By year two the plants show themselves. By year three you can see them!

John Shuey

More information can be found at: https://www.in.gov/dnr/fishwild/3091.htm , https://www.nature.org/en-us/get-involved/how-to-help/places-we-protect/kankakee-sands/ , and https://tuesdaysinthetallgrass.wordpress.com/tag/kankakee-sands/ and much more by searching “TNC kankakee sands”.