Indiana University's Woodland Campus: A case study of forest patch sustainability

Stephanie Freeman-Day and Dr. Burnell C. Fischer
Indiana University O'Neill School of Public and Environmental Affairs

- Case study focus: What patterns exist, evident in historic maps and planning documents, that relate to green patch sustainability over time?
- Literature review
  - Urban Patch Dynamics – Baltimore LTER Theme (Grove et al. 2015)
    - Temporal and spatial scale
  - Conserved patches – Ecosystem Services! (Nordman et al. 2018)
    - Highest net present value
  - Berlin study – Benefits of Urban Forest Patches (Kowarik et al. 2019)
    - Urban forest patches – remnants & emerging; novel ecosystems
  - Canopy cover change over time on UPenn campus (Roman et al., 2017)
    - Institutional support necessary to sustain or increase cover, change is slow
  - Urban forest street trees as a common-pool resource (Fischer and Steed, 2008)
    - How does this definition apply to forested/green patches in a campus setting?
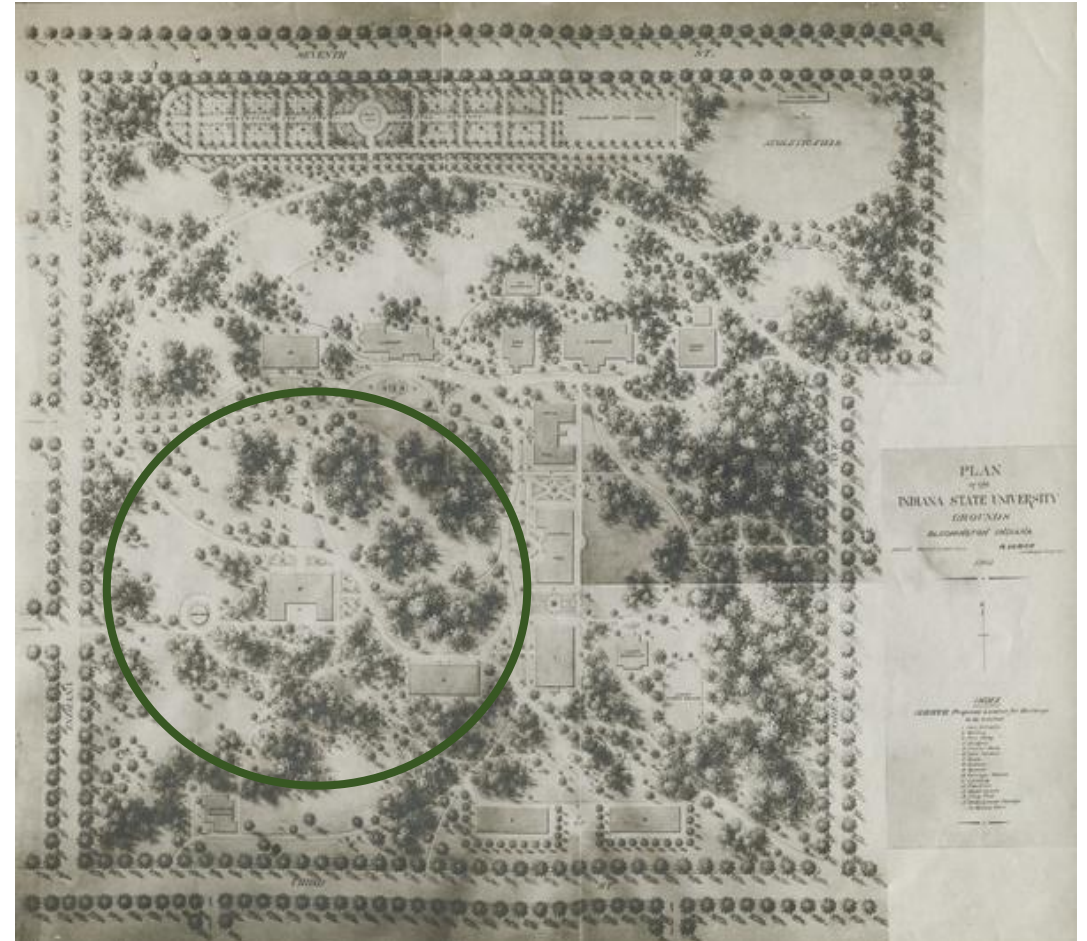
IU Bloomington Campus Case Study

- Research Question: How have IU's green spaces changed over time and what drivers relate to sustainability of campus natural areas?

- Methodology: IU archives
  - Historical maps and drawings beginning in 1902
  - Consultant drawings/plans beginning in early 1900s
    - Planning process evolves over time into Master Plans
  - Online research through archived documents labelled as "maps"
  - Looked for patches being labelled by name, pictorially or not at all
  - Tracked by individual patch and over time

- Natural woodlands->native/invasive plants->meadows->park-like spaces
  - Vegetation and green space typologies in 2010 IU Master Plan

Beginning in 1880s focus on natural areas

- Very early consultant pieces exist but drawings but have been lost

- 1902- drawing includes wooded/forest remnants with human-made additions plus several lakes and cave entrance

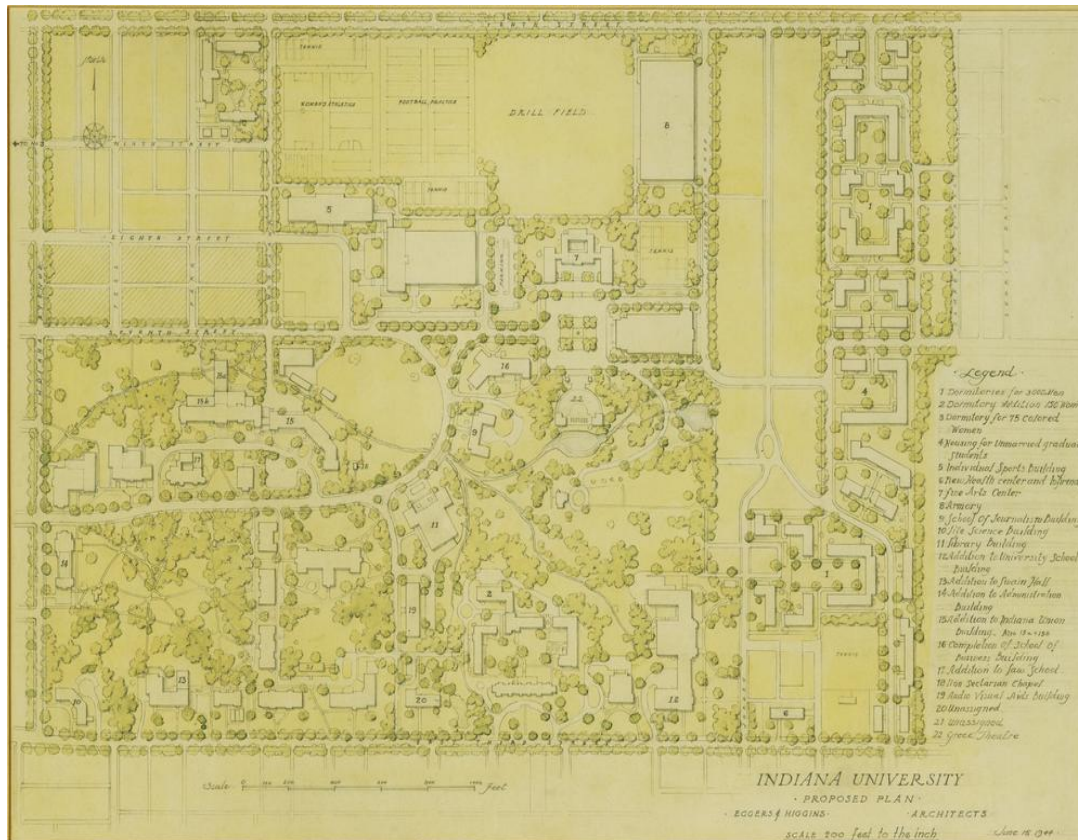- IU's Dunn's Woods purchase becomes Woodland Campus
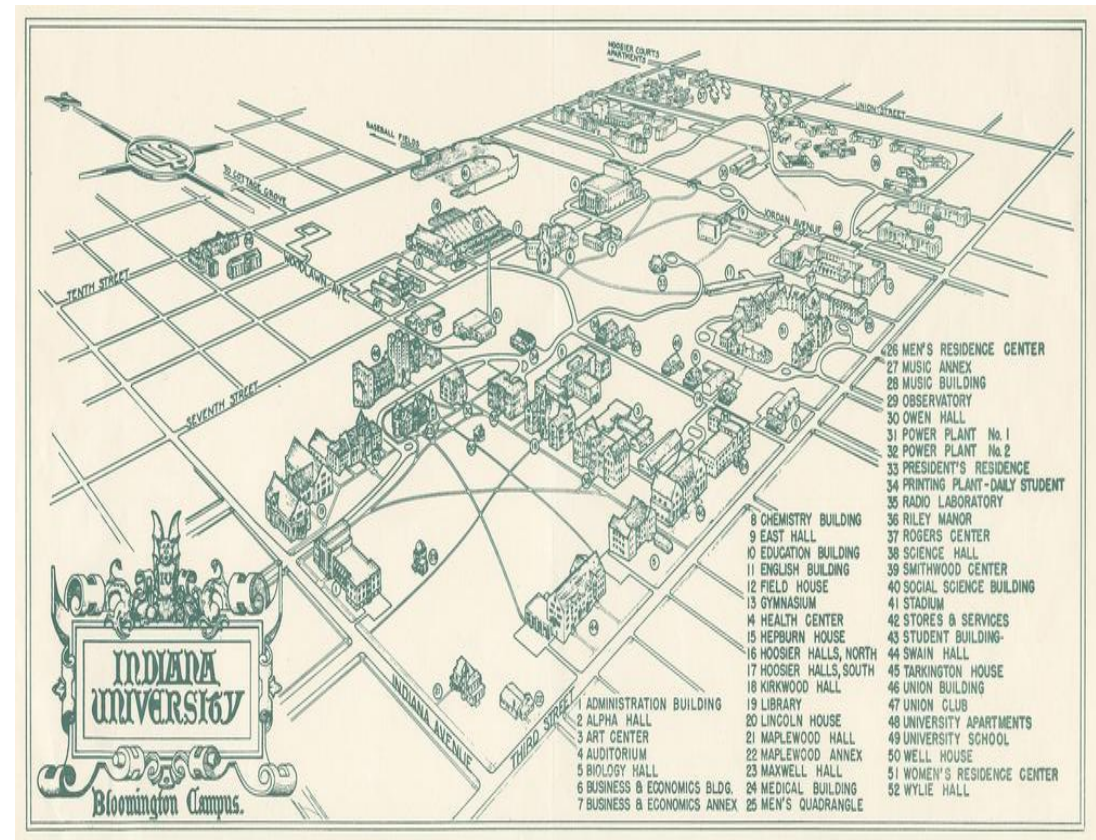
Woodland Campus, early 1900s and in 1994

View through **Dunn's Woods**, between 1901 and 1907, from left: **Maxwell Hall, Owen Hall, Wylie Hall, and Kirkwood Hall, Science Hall (Lindley)**

Post-WWII focus - forested areas in 1944 plan change to empty spaces surrounded by buildings, 1950 plan
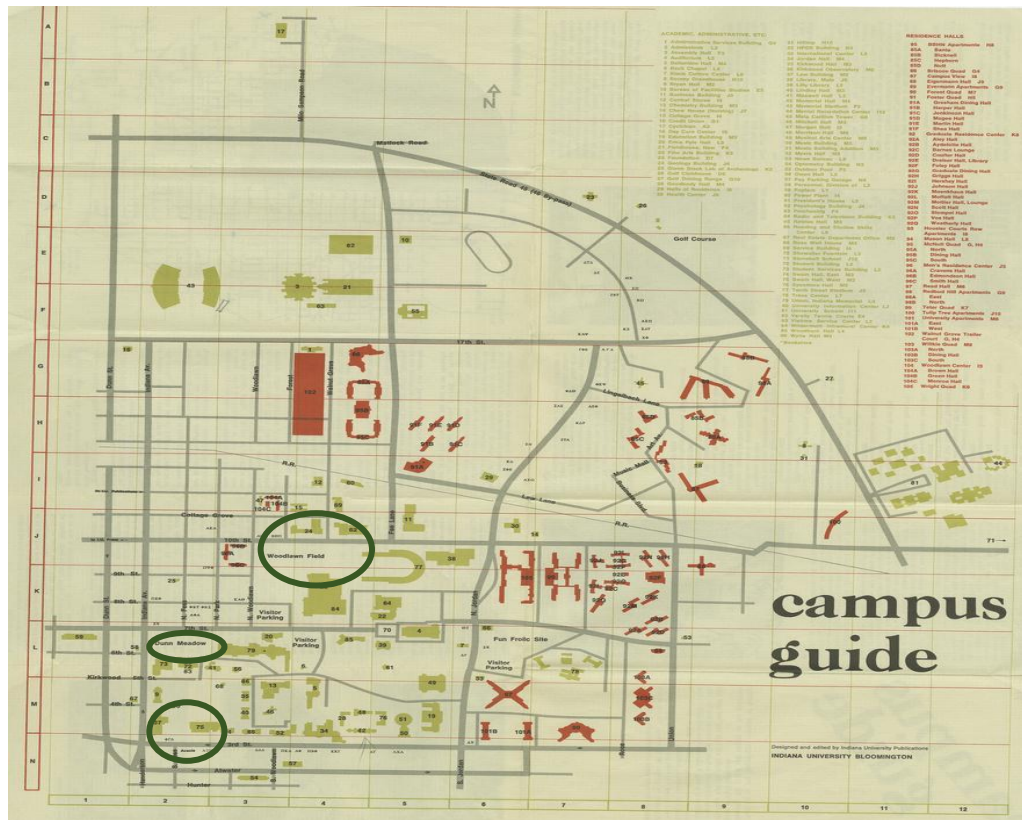
1944 Campus Plan

1950 Campus Map

1970s- Patch names return & Dunn's Woods controversy heightens awareness and protection

Group meets to save woods

By Christopher Cokinos
ids Staff Writer

"We're cutting em' down," a voice bellowed. "Save the woods!"

About seven faces glanced quickly in the voice's direction. They ignored the sarcastic comment, not knowing or seeming to care who the caller was.

Huddled on a path behind the IU School of Law, a few stragglers from Friday's lunchtime Save the Woods ribbon-tying ceremony quietly discussed the demonstration.

"Yeah, it was a success," a smiling Tom Zeller, spokesman for Save the Woods, said as he held green ribbon left over from the demonstration.

The rest of that green ribbon was tied to about 16 trees, and while many demonstrators were leaving, two others tied small ribbons around seven tiny saplings. "We're taking care of the children," said one student as he bound a sapling with a light green strip.

Zeller said not all of the 22 trees slated for removal had ribbons

Save the Woods members cite several environmental reasons for opposing the library expansion plan. One reason is that the area is used for biology classes. And, although the area is not a park, he said, it is a unique urban environment.

attached because "we wanted to make sure we got trees we know are going to be removed."

A large green plastic ribbon also was placed on Kirkwood Observatory's 27-foot-wide dome.

About 50 people took part in the ribbon ceremony, which featured Save the Woods members' talking about the controversial law school project and watching several demonstrators tie ribbon to trees.

Zeller and Douglas Hofstadter,

associate professor of computer science, spoke to participants as the group gathered on the path.

Tongue-in-cheek, Hofstadter called the ceremony an act of "solidaritree."

More serious remarks were made as well. David Frey, professor of biology, cited several environmental reasons for the opposition to the library expansion plan to encroach into the wooded area.

One reason, Frey said, is that the area is used for biology classes. And, although the area is not a park, he said, it is a unique urban environment.
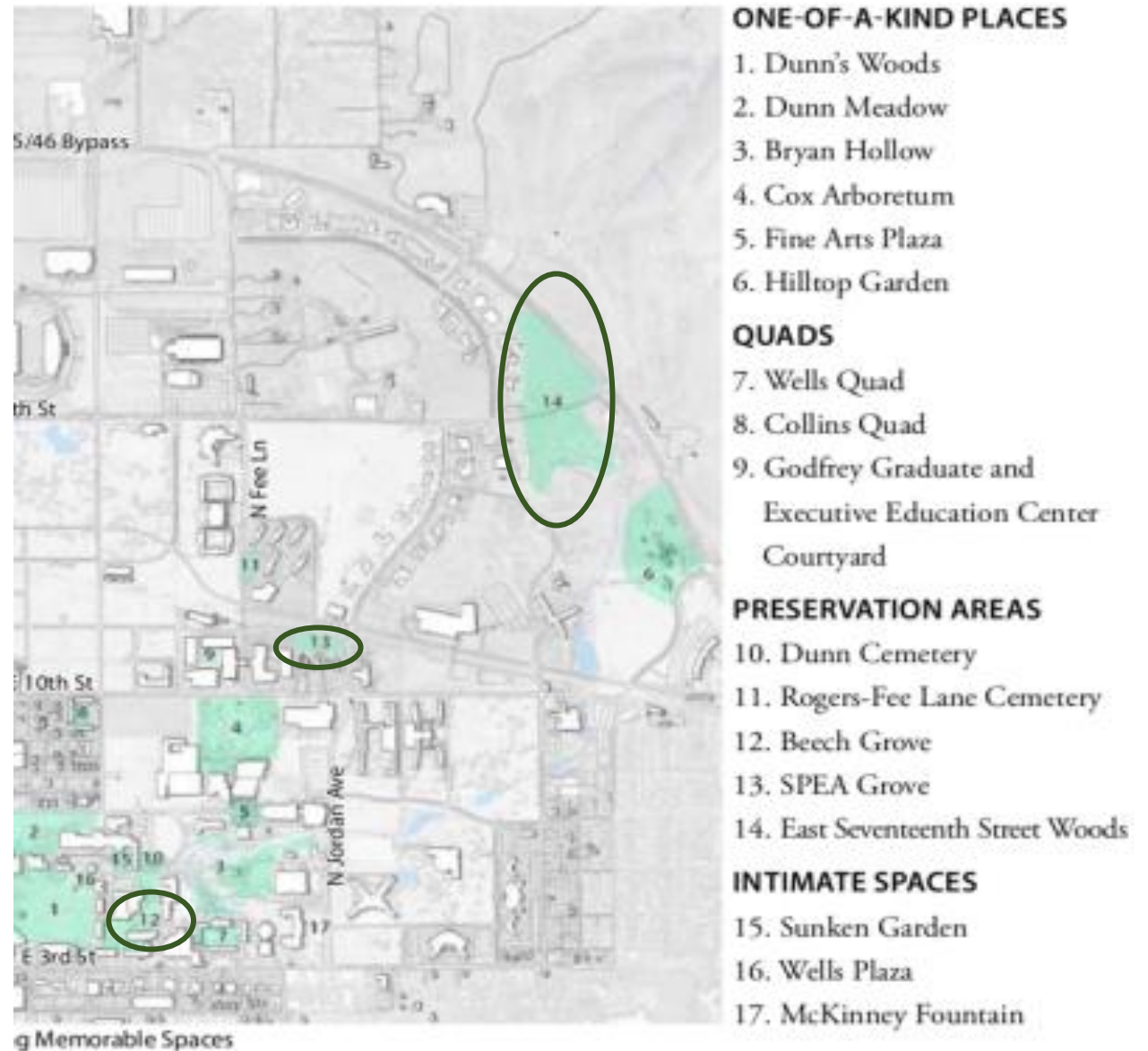
Save the Woods was organized two weeks ago to oppose the law school expansion plan and to seek an alternative plan. Members of the group said they acknowledge the law school's need for more library space but that the current plan would harm the environment.

Currently, the group is working on a letter and petition drive. Members will meet again tonight in Rawles 100.

Image from 2010 Master Plan- green spaces on IUB campus to preserve –

- Newly indicated "named" forested green spaces
  - SPEA Grove
  - Beech Grove
  - East 17th Street Woods
- Findings echo those in Roman et al. (2017) and increased interest in community sustainability

ONE-OF-A-KIND PLACES
1. Dunn's Woods
2. Dunn Meadow
3. Bryan Hollow
4. Cox Arboretum
5. Fine Arts Plaza
6. Hilltop Garden

QUADS
7. Wells Quad
8. Collins Quad
9. Godfrey Graduate and Executive Education Center Courtyard

PRESERVATION AREAS
10. Dunn Cemetery
11. Rogers-Fee Lane Cemetery
12. Beech Grove
13. SPEA Grove
14. East Seventeenth Street Woods

INTIMATE SPACES
15. Sunken Garden
16. Wells Plaza
17. McKinney Fountain

Selected patches histories (maps)

PATCH NAME	1902 Ulrich Plan	1944 Eggers and Higgins Plan	1950 map	1999 map	2010 Smithgroup Plan
Bryan Hollow	🌲	🌲	not indicated	🌲	labeled by name
Dunn Meadow	🌲	🌲	not indicated	labeled by name	labeled by name
Dunn's Woods	🌲	🌲	not indicated	labeled by name	labeled by name
Jordan Field	labeled by name	labeled by name	not indicated	not indicated	not indicated
Woodlawn Field	x	labeled by name	labeled by name	labeled by name	not indicated

🌲 = visually indicated by trees or green shading
x = not yet included in spatial extent of campus maps

Outcomes by 2010

- Expansion of campus has meant buildings take precedence
- Tree canopy cover for campus maintained at 20% from 2010-2020
- Newly created green patches rare
- Newly recognized patches (SPEA Woods, 17th Street Woods and Beech Grove) in continually forested areas

Green Patches on IU Campus as Commons

- Definition of Commons (E. Ostrom, McGinnis)- two elements
  - Difficult/impossible to exclude users from accessing Commons resources
  - Use of the resource does not inhibit others' enjoyment of the resource (subtractability)- includes ecosystem services
- Following Fischer and Steed (2008) for forested patches- trees and their spaces are resource units, competition for spaces (use for building, etc.) *would* remove resource and inhibit users' enjoyment
  - Protected status (label on map?/formal designation) could prevent subtractability, making the patch fit the definition of a Commons

Expansion of pilot study-> Urban forest patches from a socio-ecological systems perspective

- Applying pilot study to more complex metro areas
  - Public vs. private land, multiple owners, city center-city edge
  - Patch Ecology – current ecological condition of patches
    - Availability of past assessments of ecological conditions?
  - Social impacts for/on protection
  - Institutional analysis- drivers of patch conservation
- Next projects
  - City of Bloomington Patch Analysis
  - Sample patch analysis for Marion County