

Where to Work tool

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Demo at <https://ncc.carleton.ca>



**NSERC
CRSNG**



Environment and
Climate Change Canada
Environnement et
Changement climatique Canada

Background

Project initiated by NCC/Carleton in 2020 (approx. \$1.2 million NCC, \$300K Carleton)

NSERC Alliance Grant for supporting research in 2021 (\$960K)

ECCC is partner on Alliance

New ECCC GnC in 2021 (\$386K) for additional research on priority-setting

Systematic conservation planning

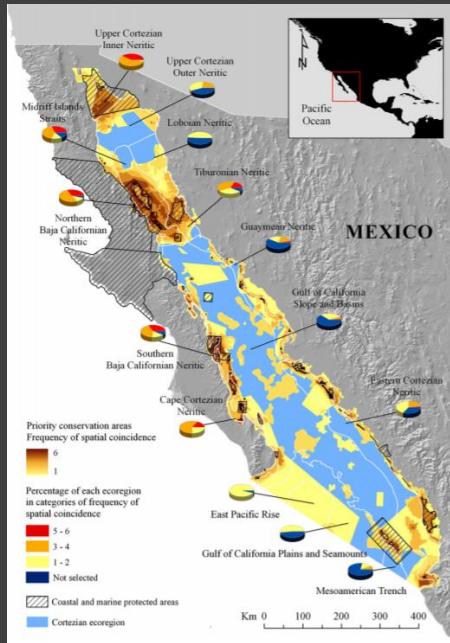
Provides evidence-based, repeatable, and structured approach for designing new protected areas that efficiently meet conservation objectives

Real-world examples

Great Barrier Reef
Australia



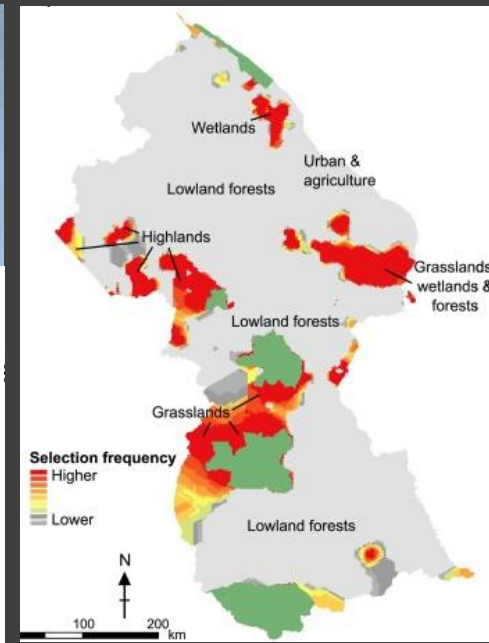
Gulf of California
Mexico



Fisheries and Oceans
Canada



National system
Guyana

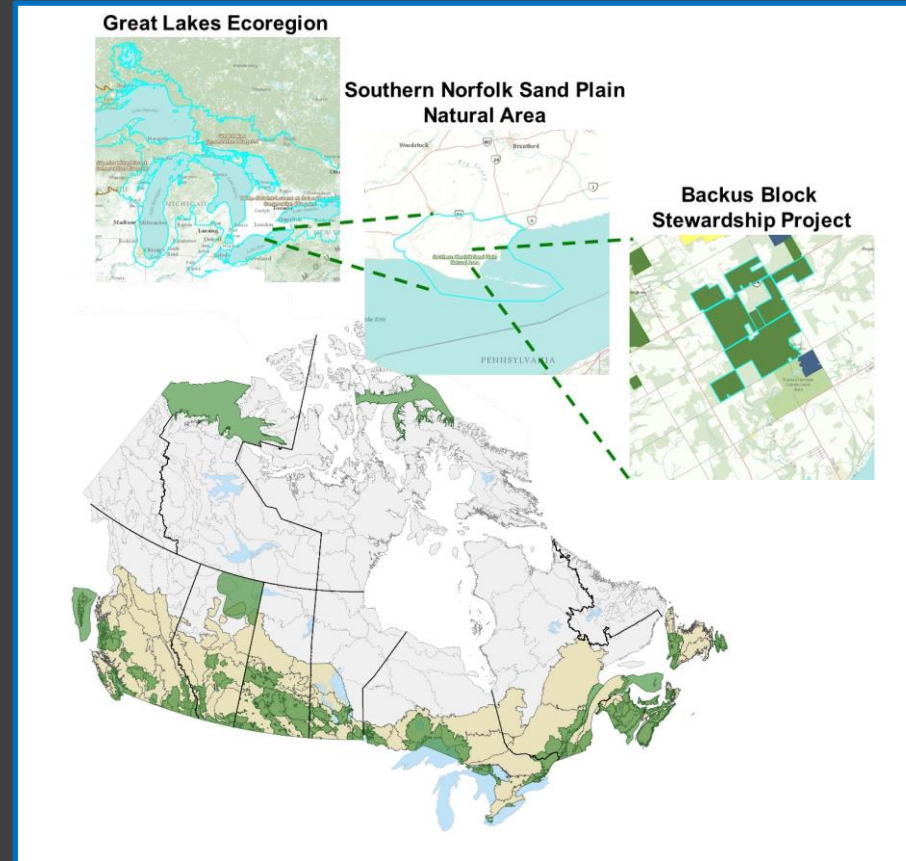


Decision support tools:



NCC's current planning approach

- NCC's current approach:
 - Hierarchical approach
 - Varies across regions
 - No prioritization beyond land securement
- Gaps and Challenges:
 - No roll-up
 - Little inclusion of threats
 - Time consuming and simplistic



Modernizing NCC's conservation prioritization methods

- Standardizing conservation planning framework across the country
- New tools and methods will be a game changer in the way NCC prioritizes where to work and what to do
- User friendly web tools, based on sophisticated scientific approaches
- Framed within Conservation Standards approach

Strengths of our tools

1. Easy-to-use graphical user interface
2. FAST! Near real time analysis for stakeholder meetings and discussions
3. Algorithm guarantees mathematically optimal results – consistent across Canada

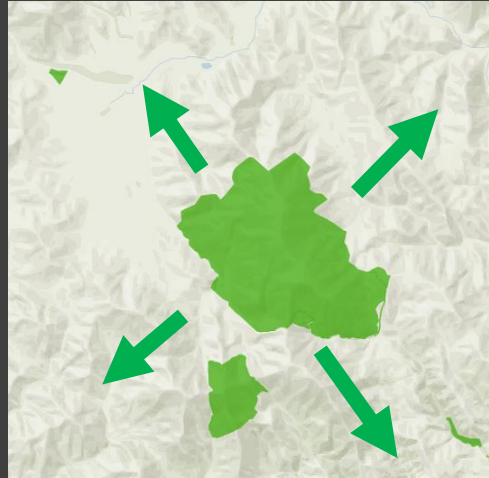
Framing a conservation planning problem

- Themes: facets of biodiversity that are important for conservation
- Goals: set to ensure a minimum percent coverage in solutions



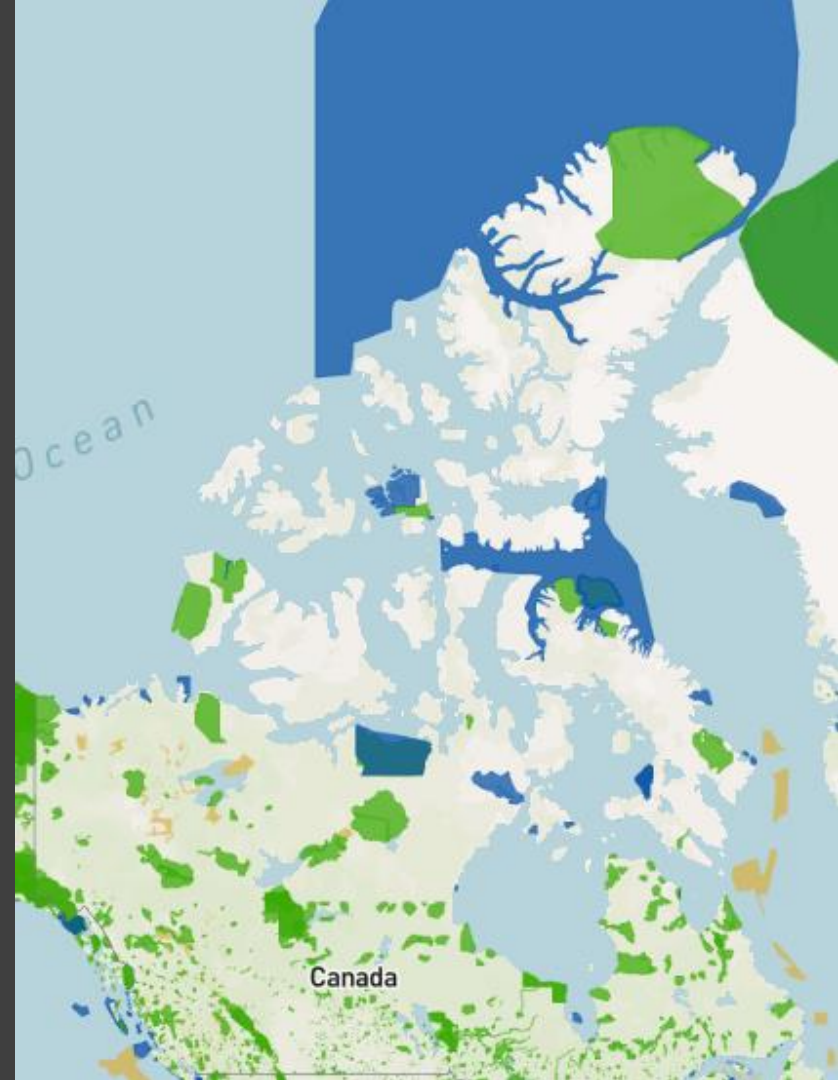
Framing a conservation planning problem

- Weights: properties of places that impede or improve conservation efforts (e.g. carbon sequestration, climate risk)
- Factors: indicate importance for avoiding or covering
- Factor 0 \rightarrow 100:
 - important to cover
- Factor 0 \rightarrow -100:
 - important to avoid



Framing a conservation planning problem

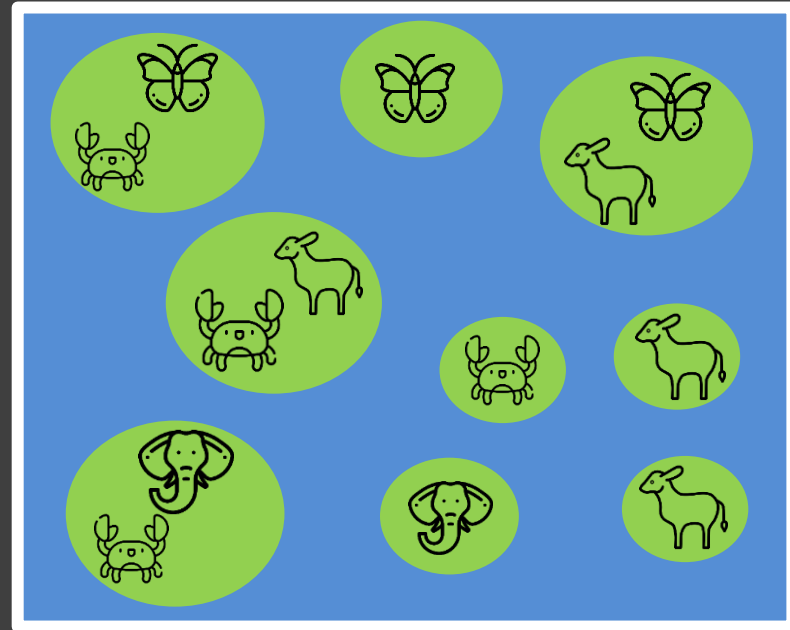
- Includes: places that are already managed for conservation
- By selecting Includes, solutions can build on existing conservation efforts



Conservation planning as optimization

- Themes: Different species
 - Goals: ≥ 1 population per species
- Weights: None
 - minimize # islands
- Includes: None

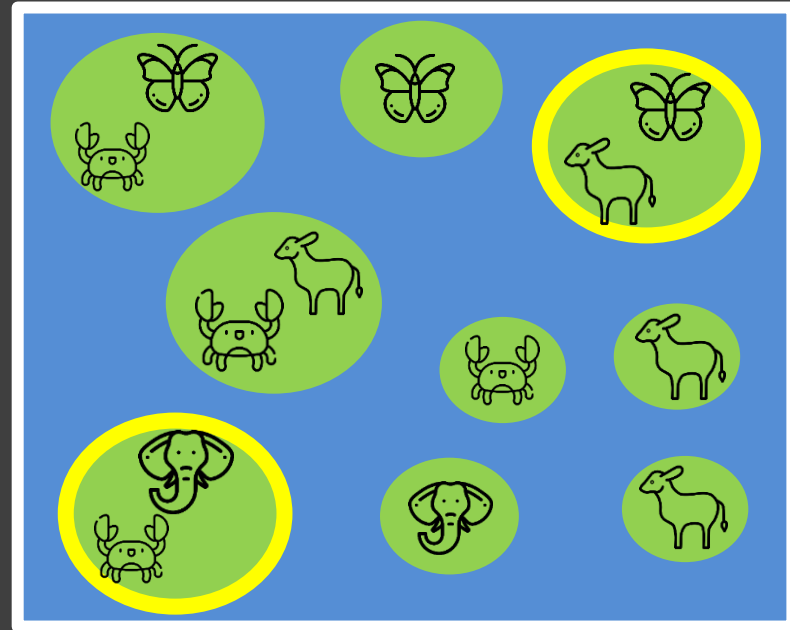
What's the solution?



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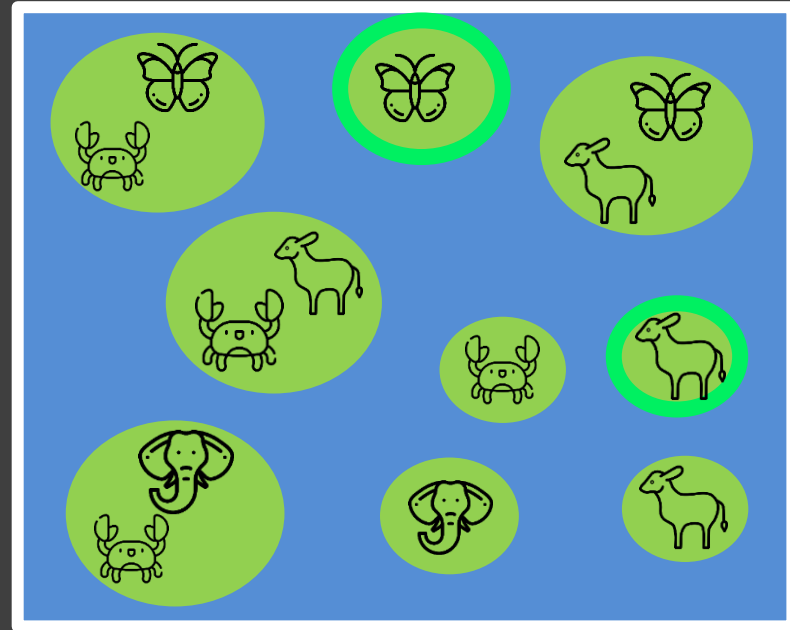
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Conservation planning as optimization

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- Includes: **Existing reserves**

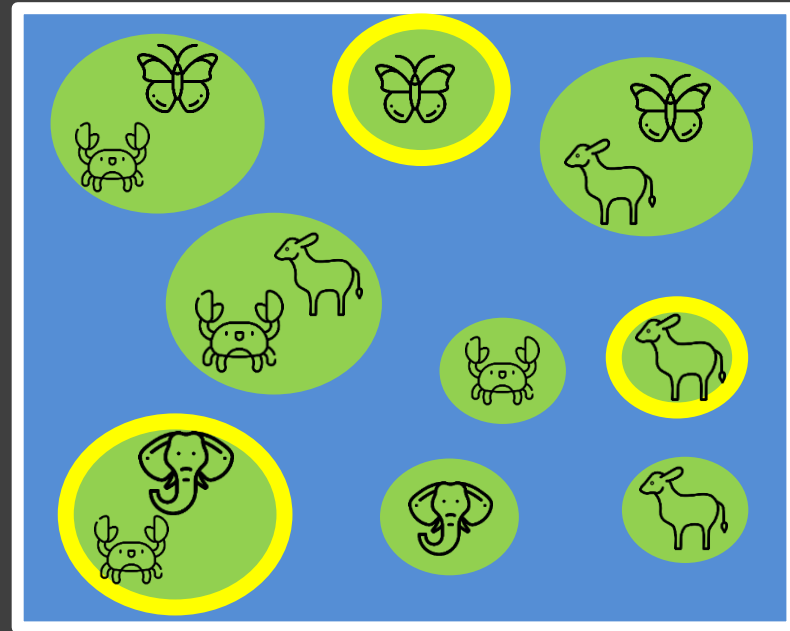
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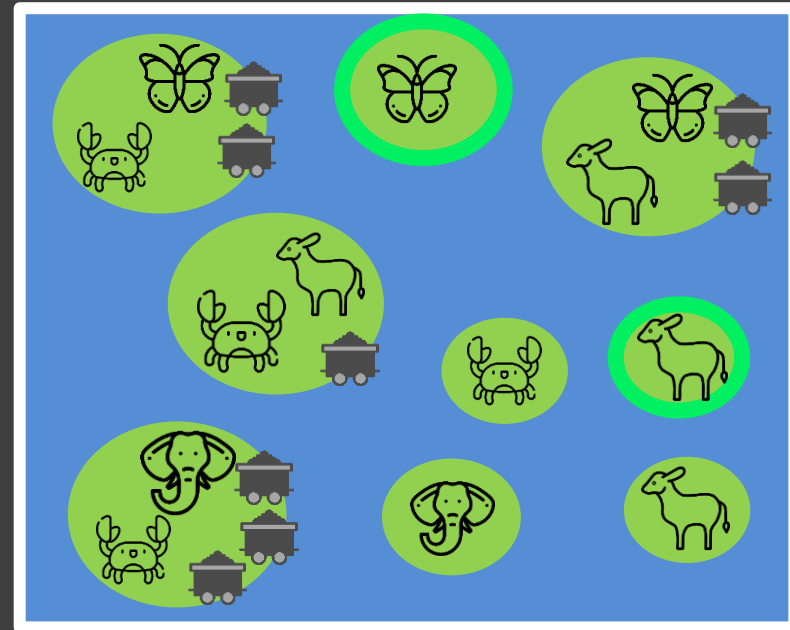
What's the solution?



Conservation planning as optimization

- Themes: Different species
 - Goals: ≥ 1 population per species
- Weights: **Mining scores**
 - Minimize sum of scores
- Includes: **Existing reserves**

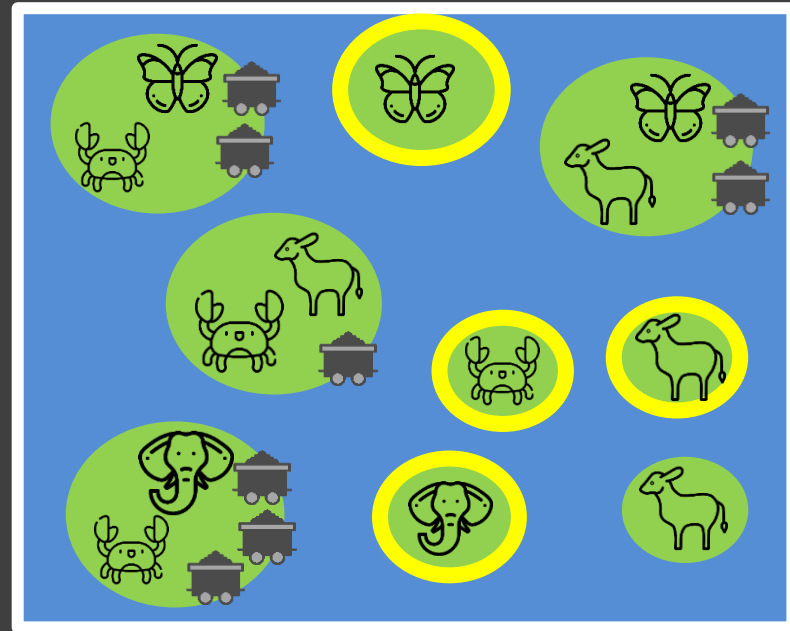
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Conservation planning as optimization

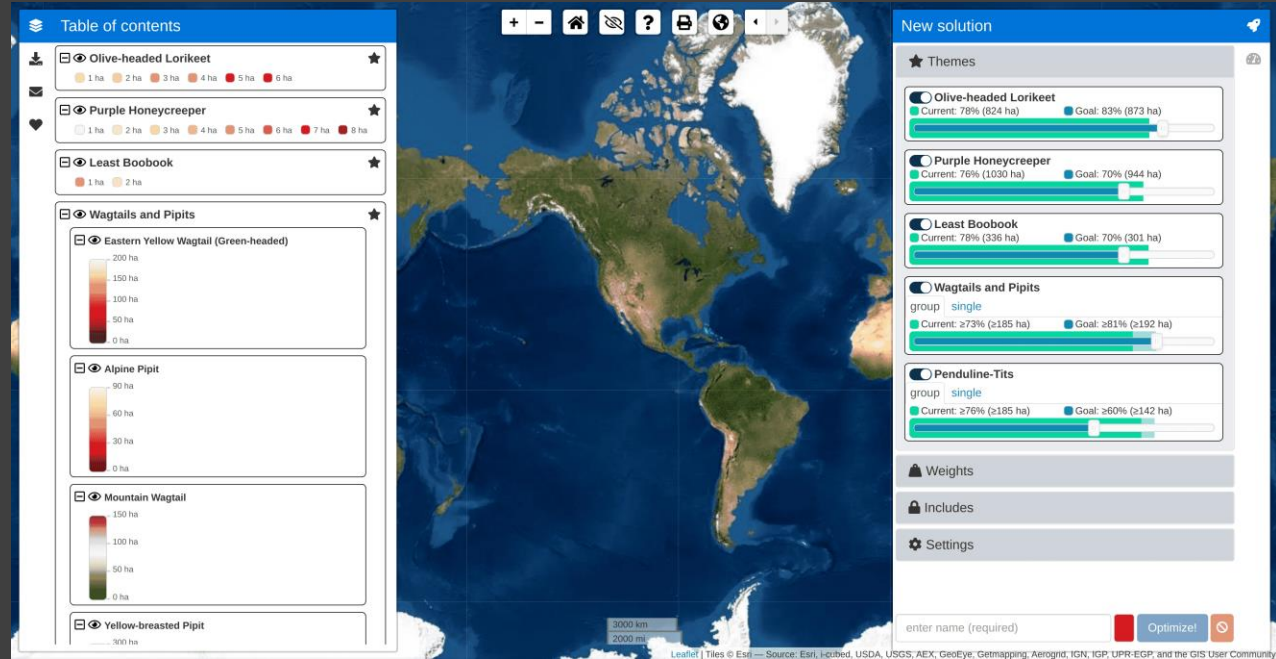
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What's the solution?



Where to Work tool

- Interactive design
- Multiple modes
- Fast and accurate
- Explore uncertainty



Solutions in near real-time

Demo with Ontario pilot

<https://ncc.carleton.ca/>

Thanks for listening!



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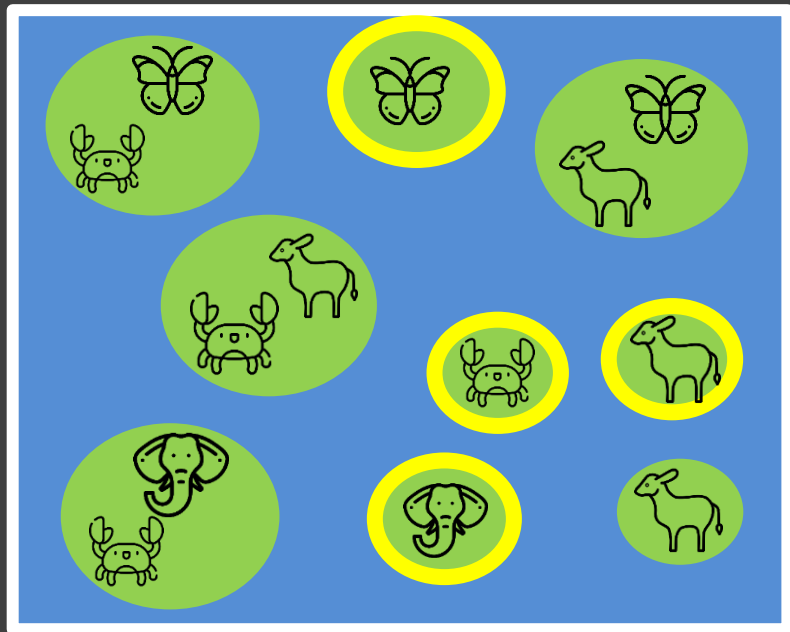
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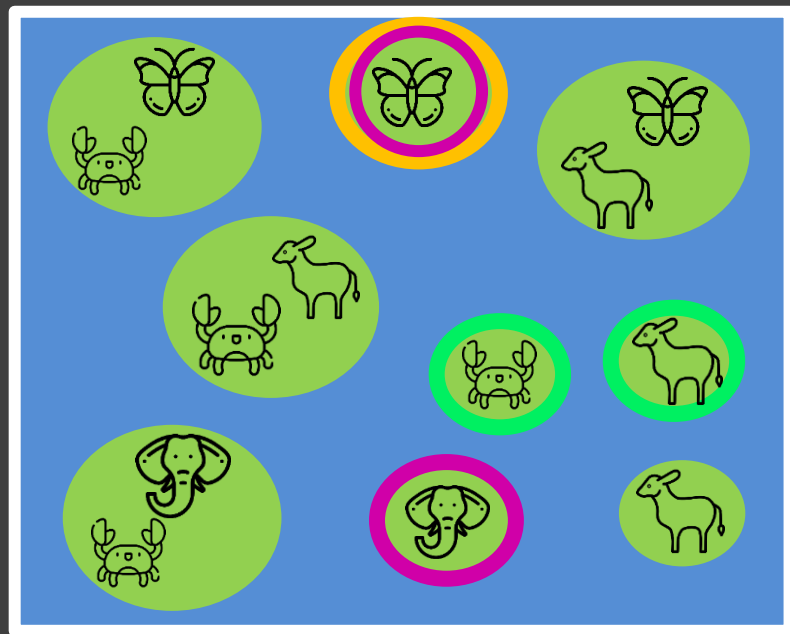
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Where to Work tool



Priority

What to Do tool



Restoration

**Eradicate
pests**

Weeding