ADAPTING URBAN FORESTS TO CLIMATE CHANGE: APPROACHES FOR ACTION

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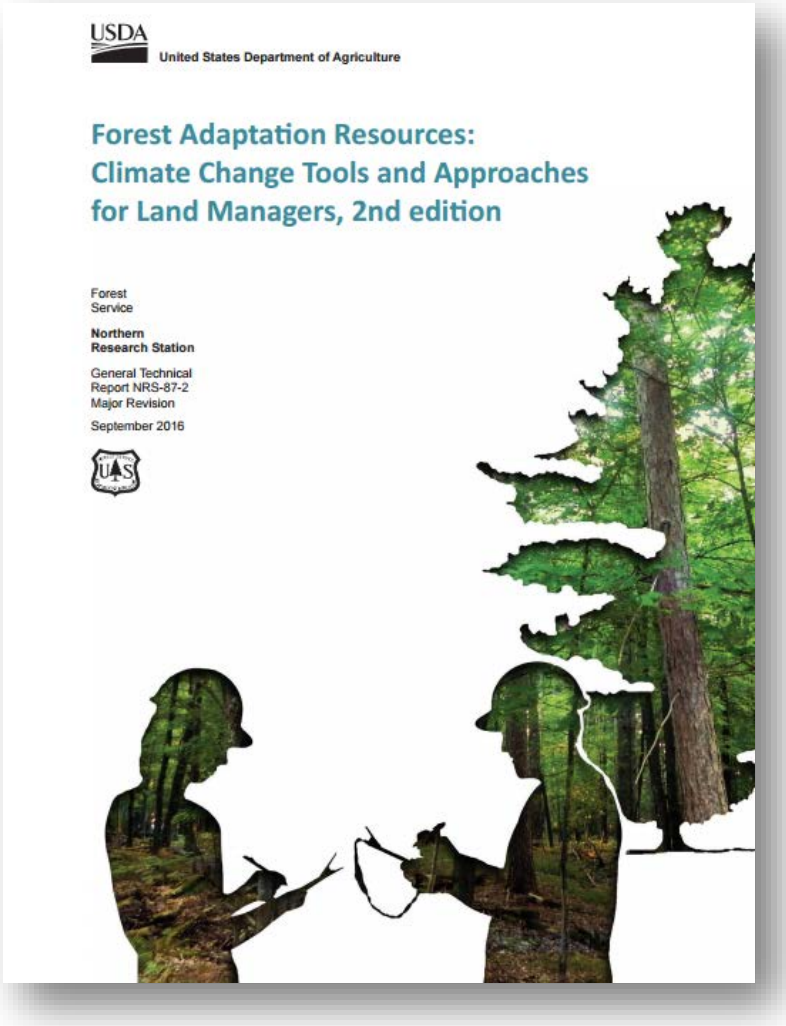
Actions for Adaptation

Adaptation actions are designed to specifically address climate change impacts & vulnerabilities in order to meet climate-informed goals/objectives.

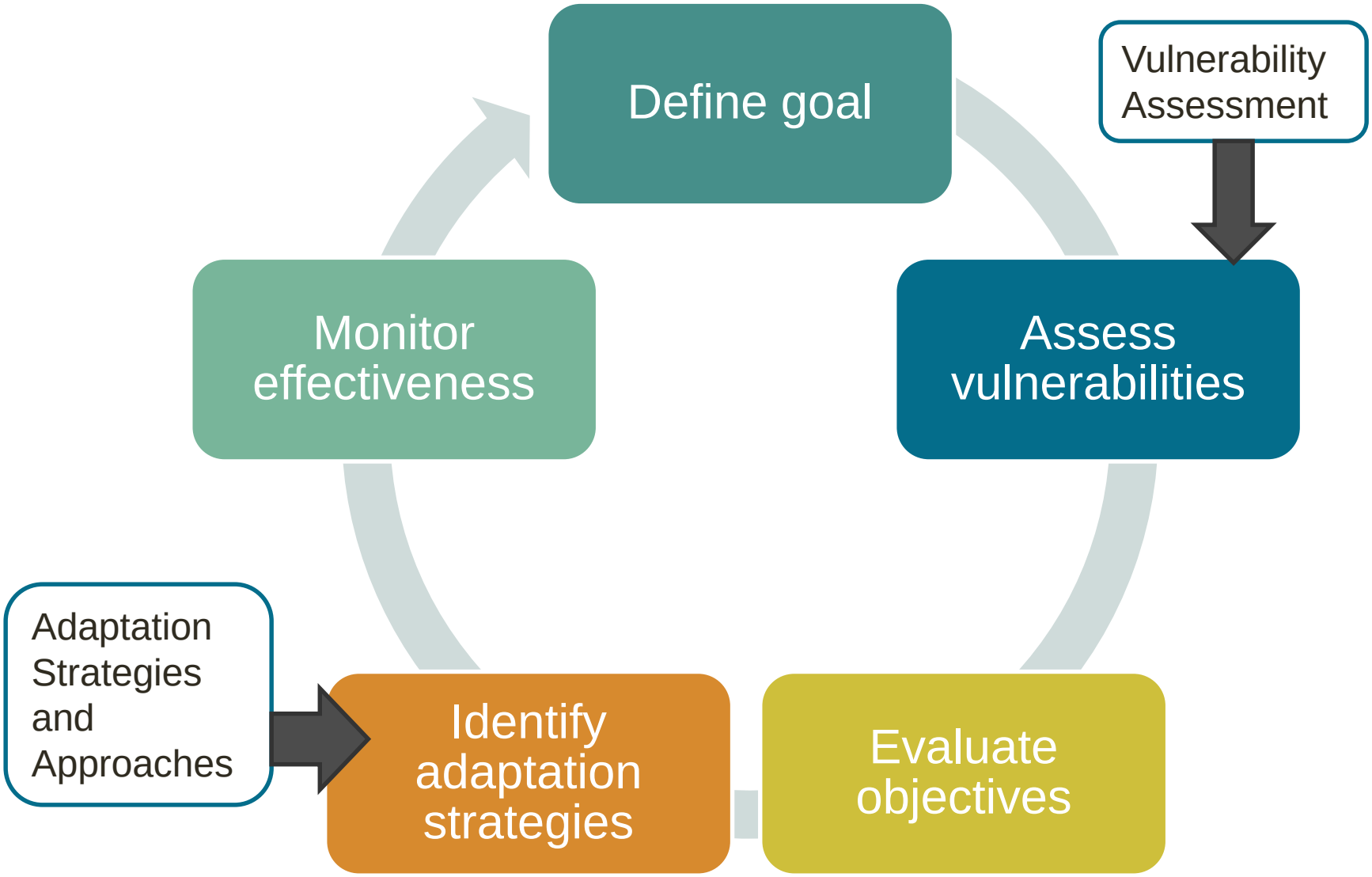
Forest Adaptation Resources

- Designed for a variety of land managers with various goals and objectives
- Tailored to eastern forests in rural and urban areas
- Does not make recommendations
- Two menus of adaptation strategies & approaches, including one for urban forest ecosystems



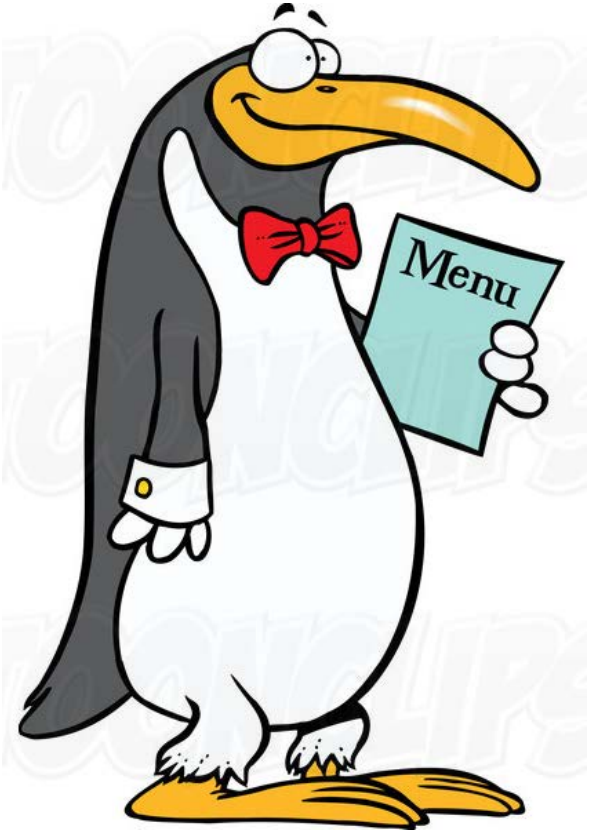
http://www.fs.fed.us/nrs/pubs/gtr/gtr_nrs87-2.pdf

Forest Adaptation Resources: Adaptation Workbook



Online Workbook

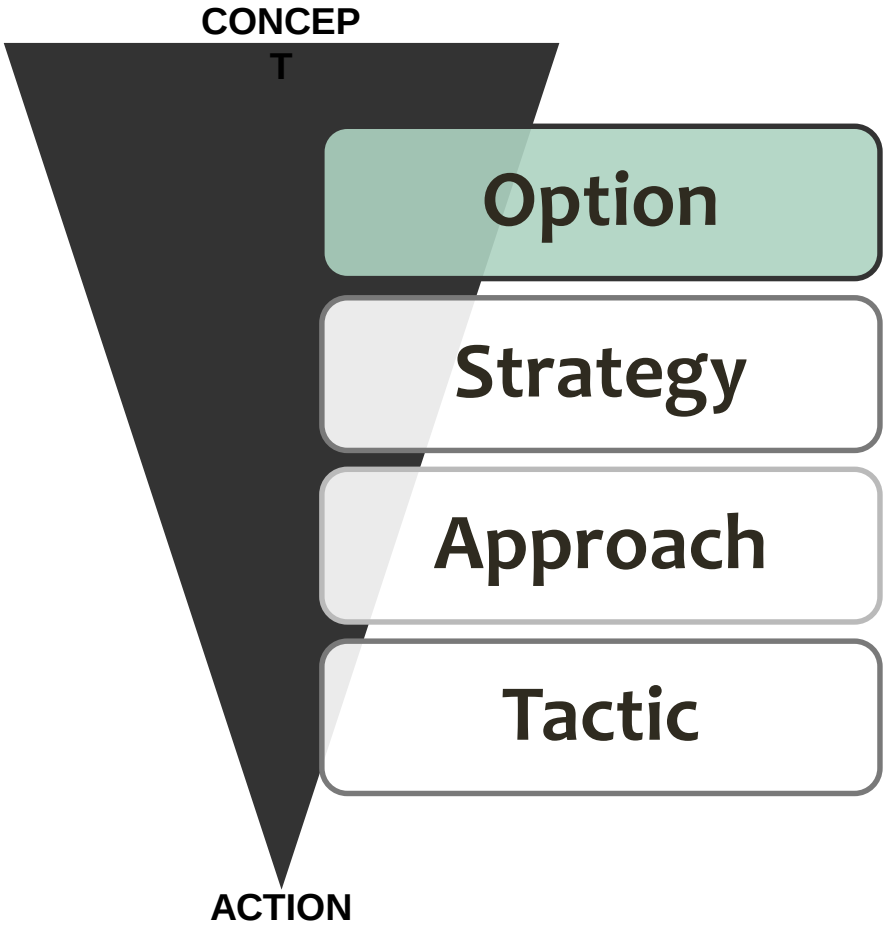
Adaptation Strategies & Approaches



A "menu" of possible actions that allows you to decide what is most relevant for a particular location and set of conditions.

www.adaptationworkbook.org/niacs-strategies

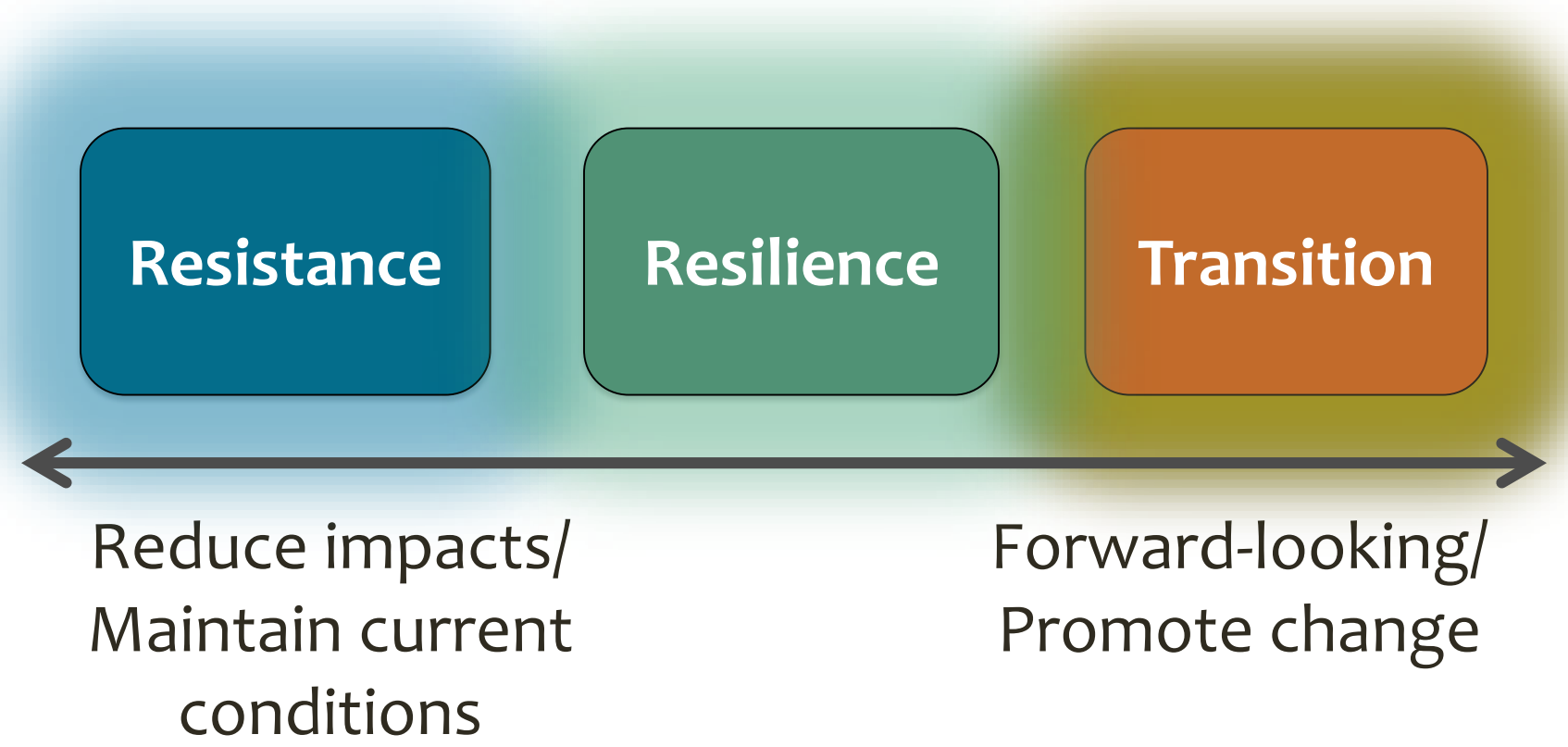
Adaptation Strategies and Approaches



Manage for Change:
System fundamentally becomes something different

Manage for Persistence:
Still be recognizable as being the same system

Adaptation Options

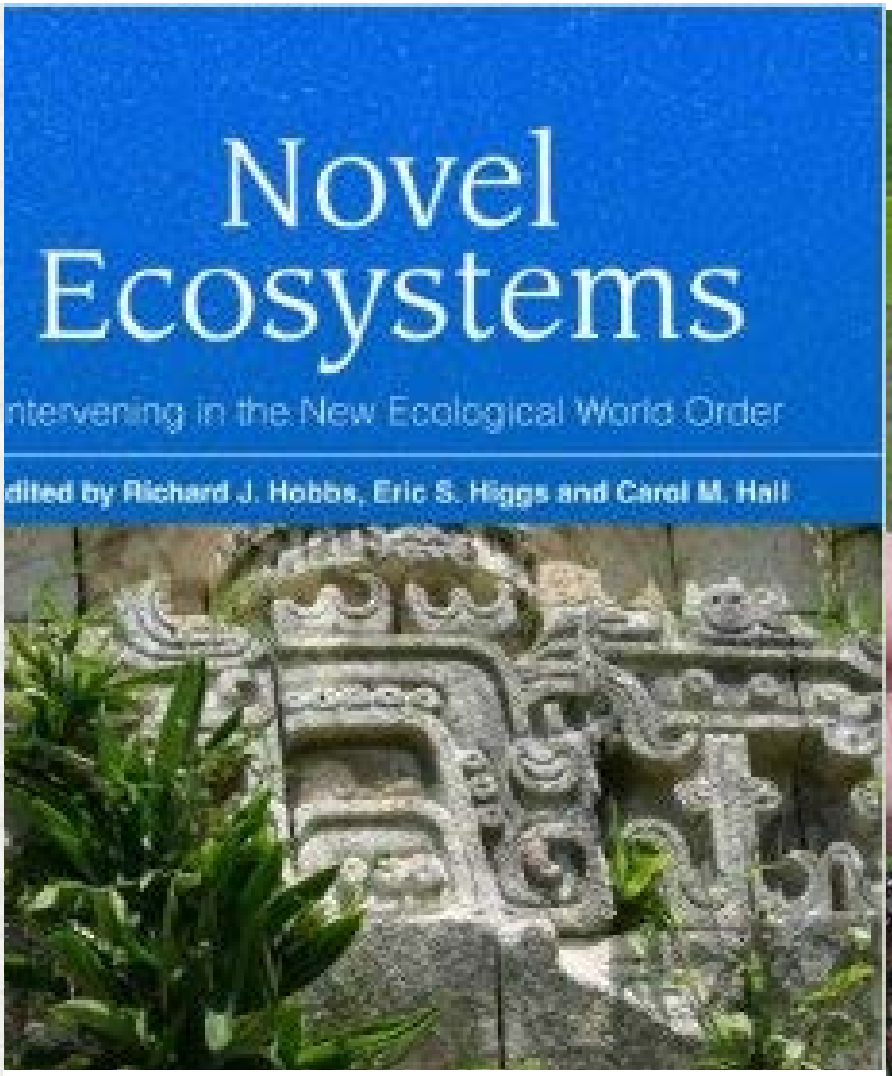


Resistance Examples

Resilience Examples

TRANSITION EXAMPLES

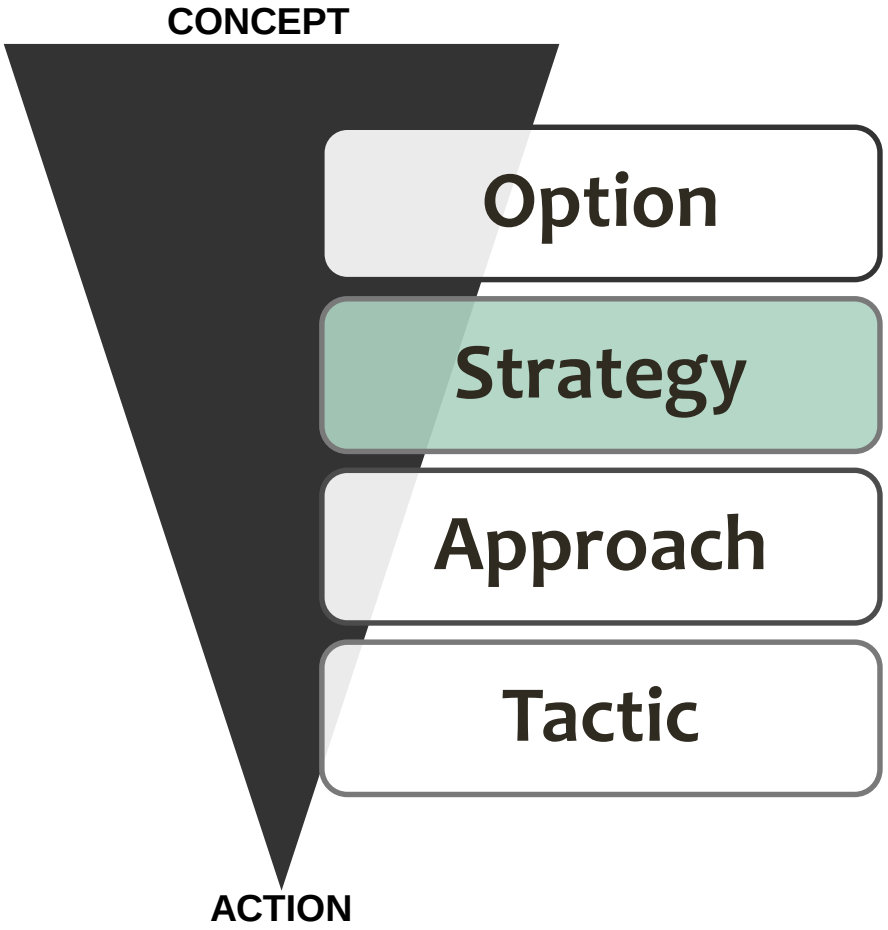
Enhance connectivity for migration



Promoting New species assemblages

Planting future-adapted seedlings

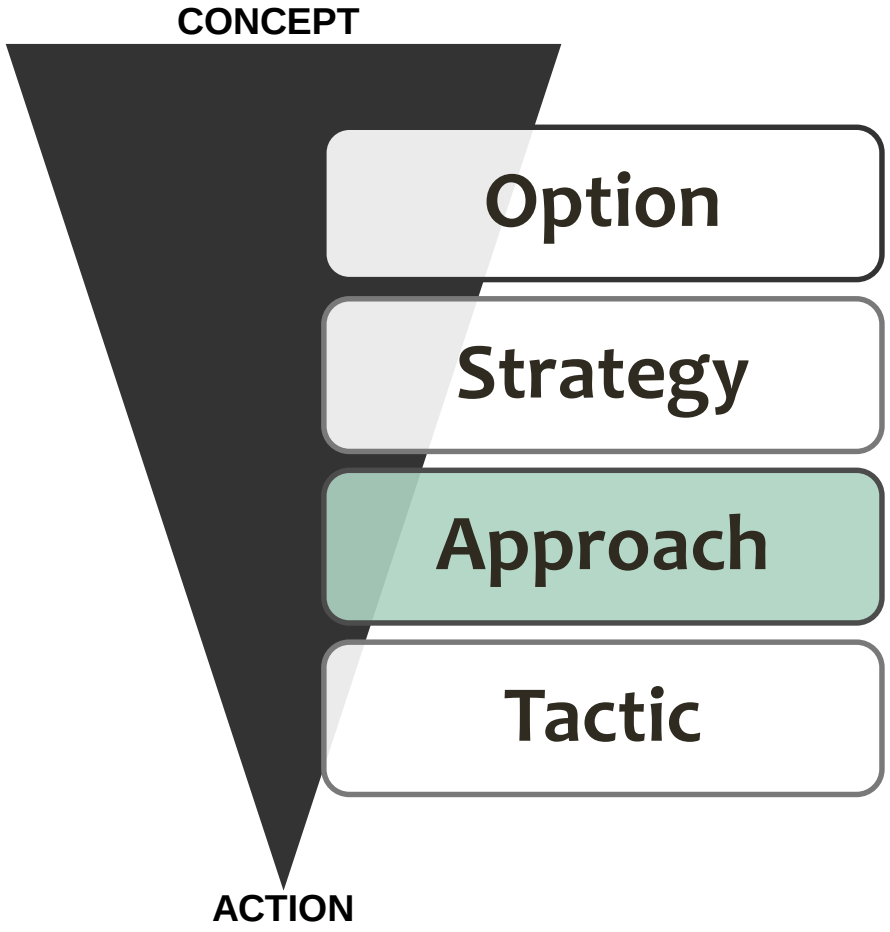
Adaptation Strategies and Approaches



Broad adaptation responses

- Sustain fundamental ecological functions
- Reduce the impact of existing biological stressors
- Reduce the risk and long-term impacts of severe disturbances.
- Facilitate community adjustments through species transitions

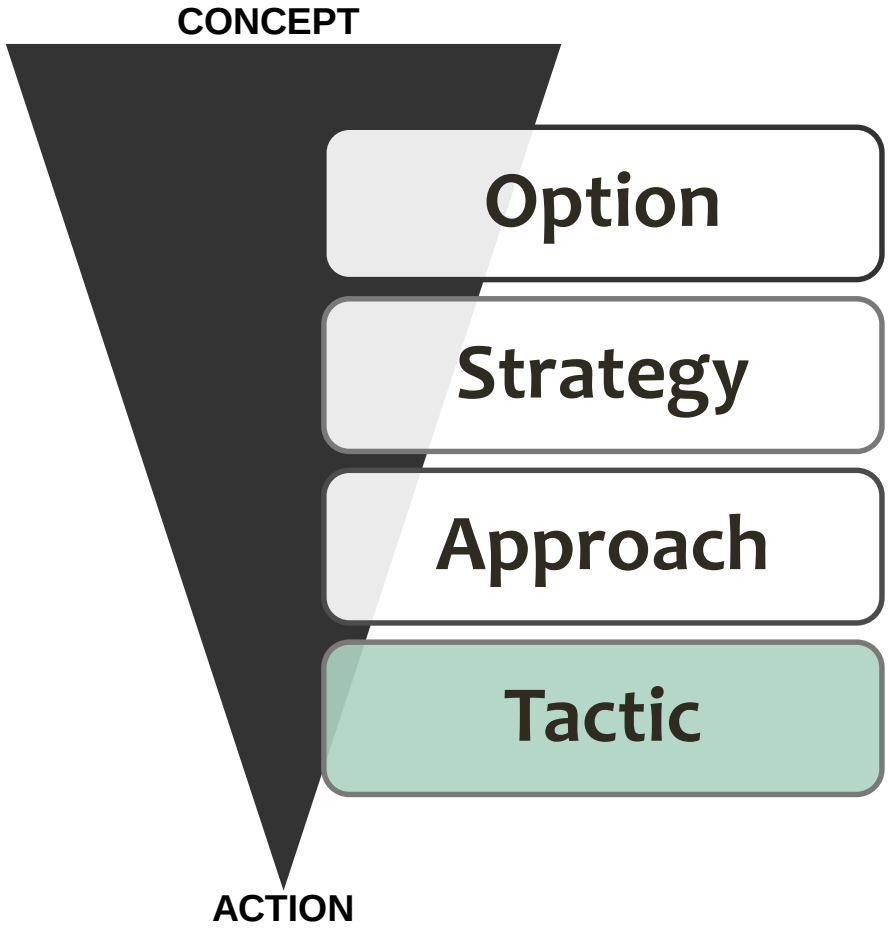
Adaptation Strategies and Approaches



More specific actions

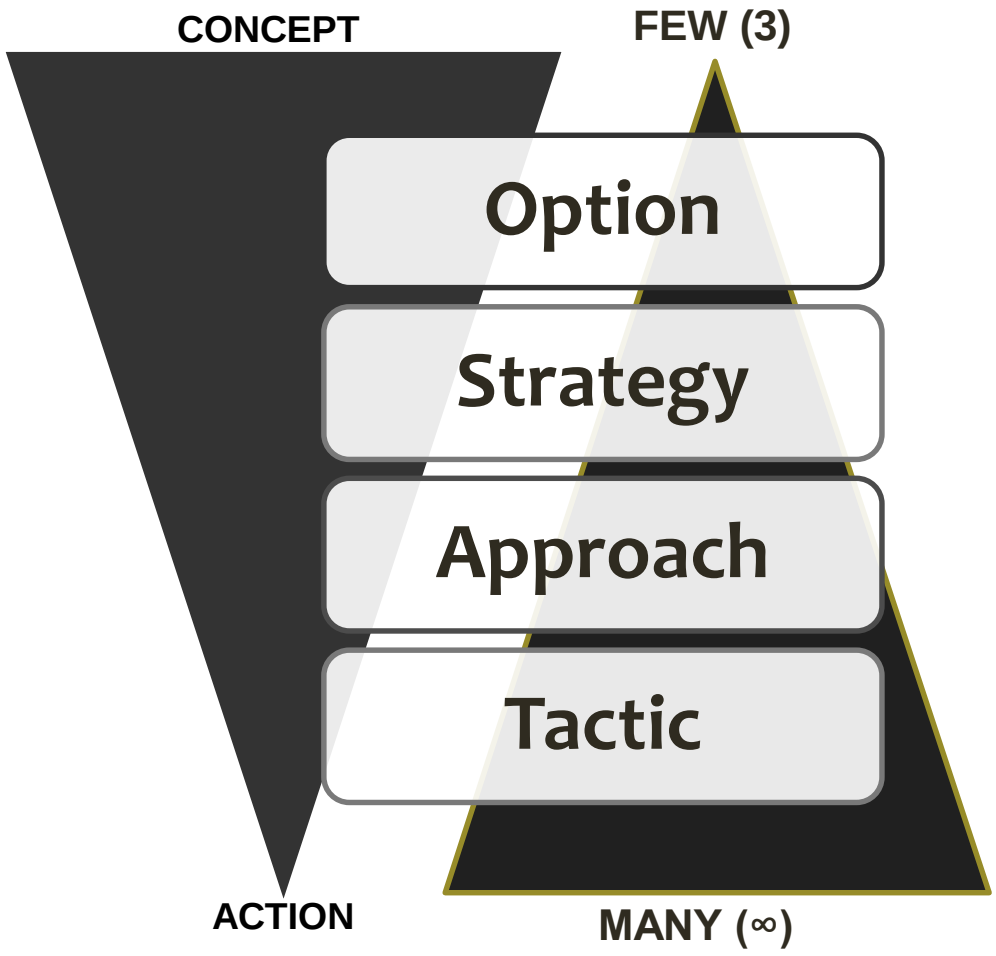
- Manage for species or genotypes with wide moisture and temperature tolerances.
- Introduce species that are expected to be adapted to future conditions.
- Move at-risk species to locations that are expected to provide habitat.

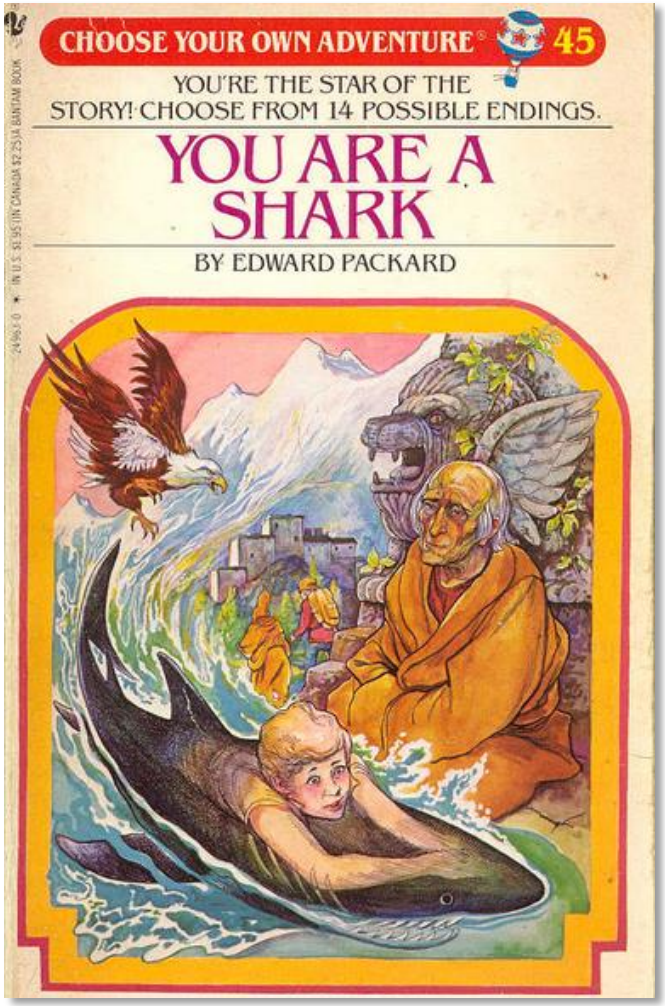
Adaptation Strategies and Approaches



Prescriptive actions selected by producer that are designed for individual site conditions and management objectives

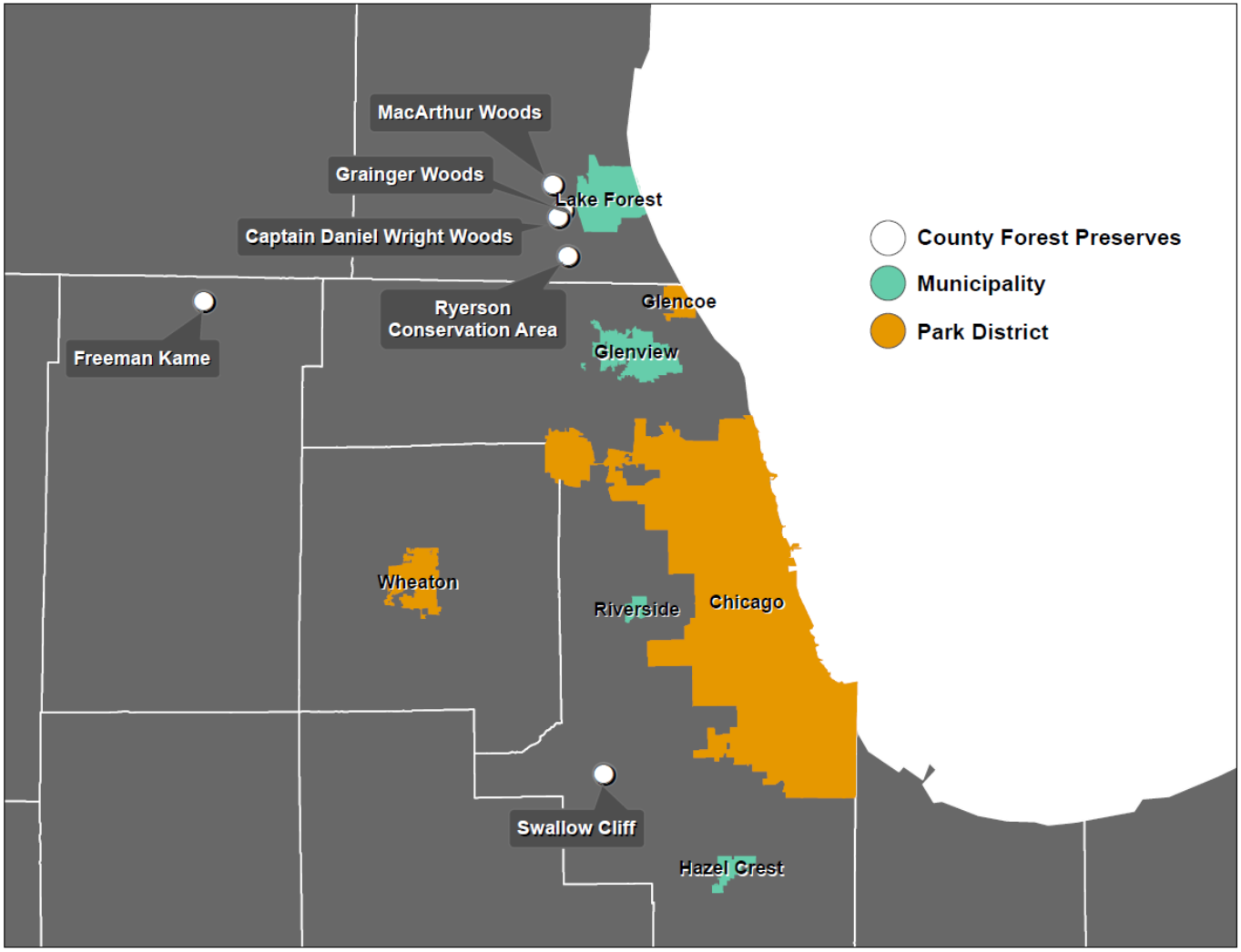
Adaptation Strategies and Approaches



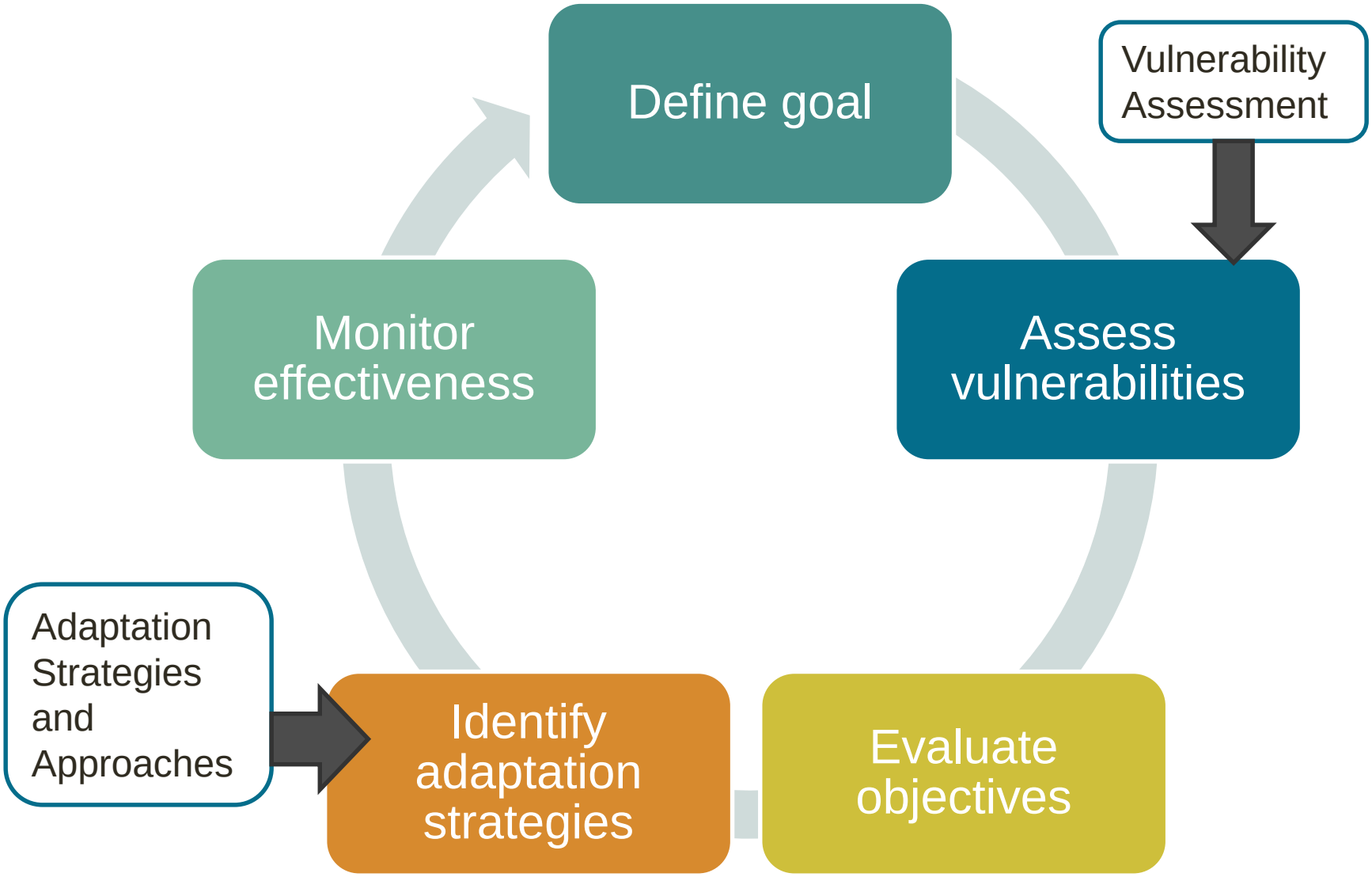


EXAMPLES

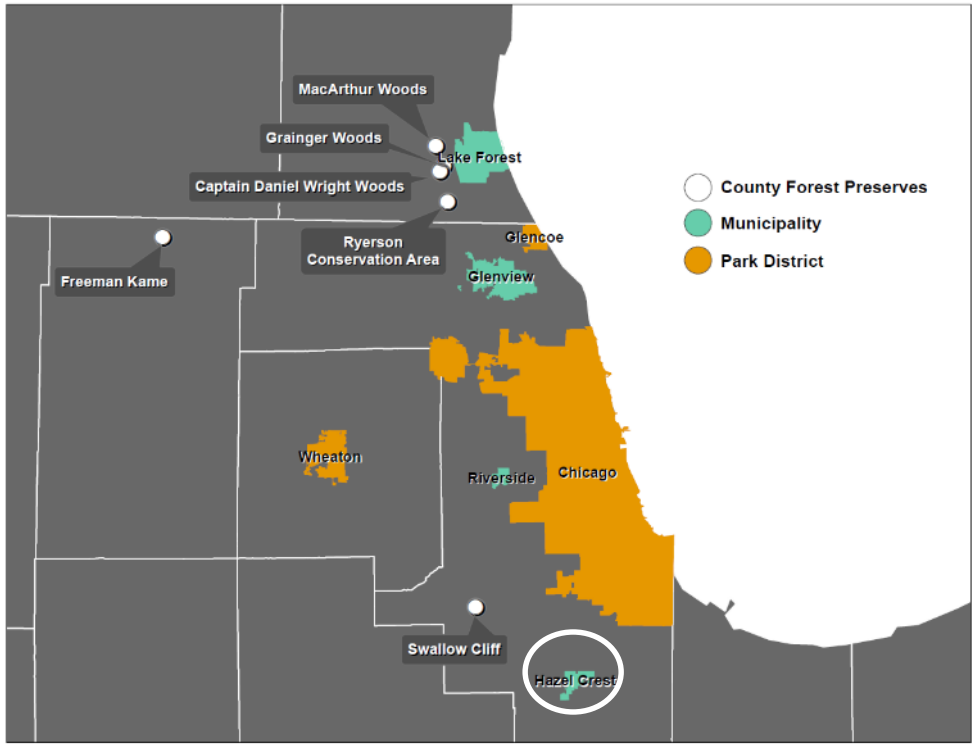
Pilot Communities



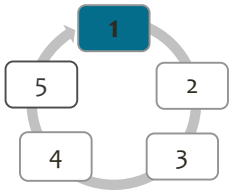
Forest Adaptation Resources: Adaptation Workbook

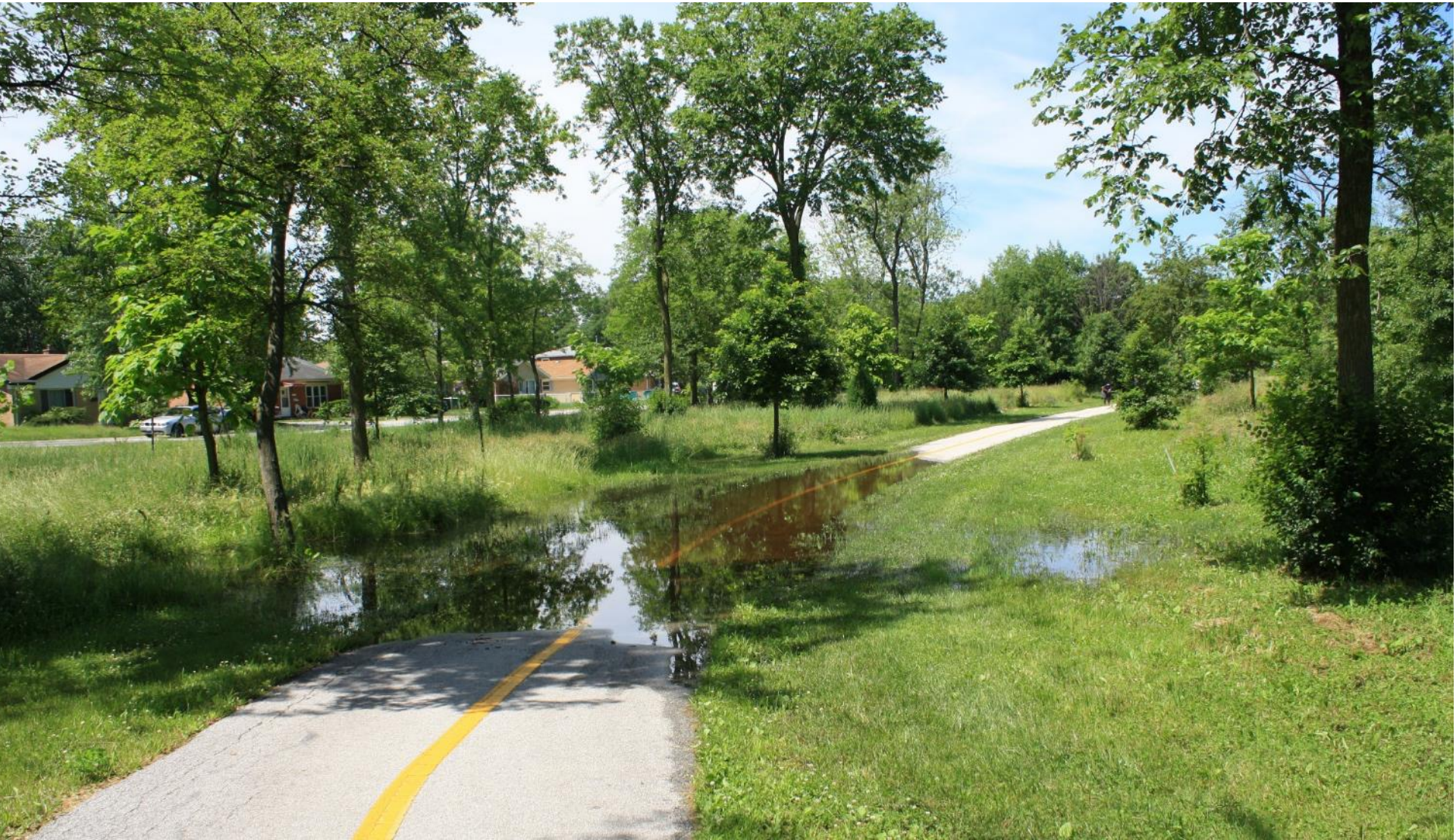


Hazel Crest


MacArthur Woods
Grainger Woods
Lake Forest
Captain Daniel Wright Woods
Ryerson Conservation Area
Glencoe
Glenview
Freeman Kame
Wheaton
Riverside
Chicago
Swallow Cliff
Hazel Crest
County Forest Preserves
Municipality
Park District

Goal: Control Flooding in Flood-Prone Open Lands





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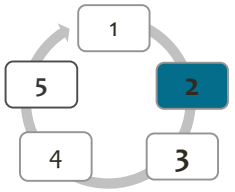


Moderate-High Vulnerability

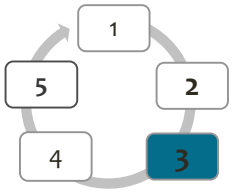
Impacts:

- Well-drained soils in most areas-drought susceptible. -
- Silver maple-dominated (vulnerable to wind storms). -
- Open lands in low-lying areas (flood prone). -

Adaptive Capacity:

- ISA-certified arborist on staff. +
- Low canopy diversity. -
- Lower financial resources (relatively low-income area). -
- Not a lot of community support for tree care, planting. -

Hazel Crest: Challenges and Opportunities



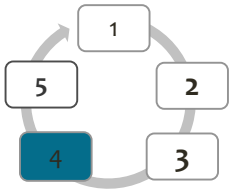
Challenges

- More heavy rain events could increase flooding, making it more difficult to manage
- Summer droughts could make seedling establishment difficult.

Opportunities

- May be able to plant a wider variety of species from further south

Adaptation Tactics



Minimize or eliminate flooding

Increase biodiversity

Select future-adapted tree species

Resistance

Resilience

Transition

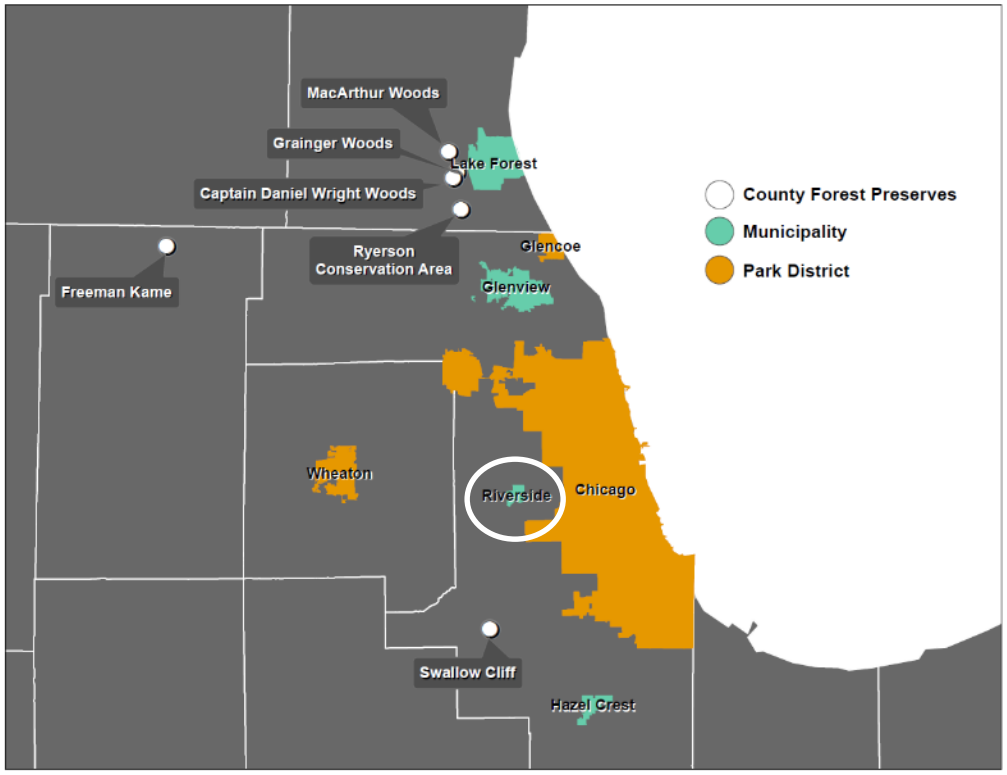
Reduce impacts/ Maintain current conditions

Forward-looking/ Promote change

Controlling Flooding with Dry Wells

Planting Flood-Tolerant Trees

RIVERSIDE


MacArthur Woods
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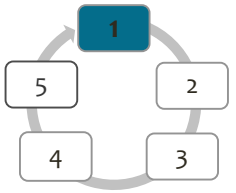
Glencoe
Freeman Kame
Glenview
Wheaton
Riverside
Chicago
Swallow Cliff
Hazel Crest
County Forest Preserves
Municipality
Park District

Goals: Replace Species lost to EAB
Restore Riparian Forests



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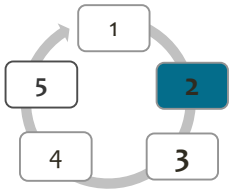


Low-Moderate Vulnerability

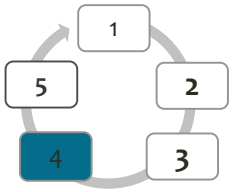
Impacts:

- Divided into two distinct areas:
  - South side: well-drained soils, trees more vulnerable to wind storms -
  - North side: compacted soils with high clay content -
- Deer herbivory and invasive species are both problematic.-
- Many oak species that could be susceptible to increased pest and disease pressure. -

Adaptive Capacity:

- National Historic Landscape District, Frederick Law Olmsted Design. +
- Trained forestry staff with planting list and long-term plan. +
- Diverse species, genotypes, age classes. +

Adaptation Tactics



Remove invasive buckthorn

Incorporate prescribed fire

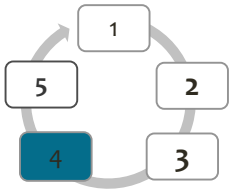
Plant tree species from southern climates

Resistance | **Resilience** | **Transition**

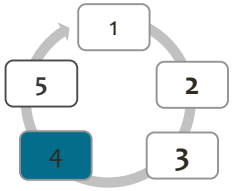
Reduce impacts/ Maintain current conditions

Forward-looking/ Promote change

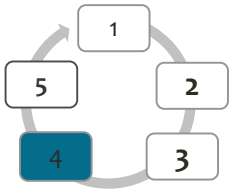
Remove Invasive Buckthorn



Incorporate fire into system to reduce invasive species and promote native seed bank



Plant Future-Adapted Species



Pecan

Bald Cypress

FINAL THOUGHTS

Uncertainty is guaranteed.

Management will be most effective if it integrates uncertainty, rather than pushing against it.

There is not a shiny new tool for climate change.

Rather, we have the same old tools but will need to use them in new ways.

Important Links

- Online workbook: adaptationworkbook.org

- Order a print copy of Forest Adaptation Resources: http://www.nrs.fs.fed.us/pubs/order/52760