

KEY CONCEPTS – TERMS

Adaptation

Actions that increase resilience and maintain the stable state of the system. For example, forming partnerships with local, lake conservation organizations to share information and raise funds to support lake health.

Stable State

The current 'state' of a system. For example, clear or tea-stained water in your lake.

Alternative Stable State

When a system shifts from one state to a different state. For example, when a clear lake becomes scummy due to uncontrolled algal blooms. These shifts could be positive or negative.

Resilience

The ability of a system to retain its basic function and structure after a disturbance. For example, the ability of a fish population to rebound after a fish kill.

Social-Ecological System

Complex integrated systems in which social systems (people) and ecological systems (nature) are interconnected. Lake ecosystems are a great example, as the people who live around and recreate on a lake are a strongly influential part of that system.

Systems Thinking:

Management decisions are likely to have nuanced, unexpected outcomes. Systems thinking is a management approach that accounts for the interconnected nature of social-ecological systems. This workshop will help participants think about relationships between social and ecological systems, and how understanding these connections could improve management outcomes.

Slow Variables:

Variables that can impact a system, but change slowly. Effects are felt over time, and are often factors that managers have little direct control over. These tend to occur at decade to century scales – like climate change or shifts in land use from agricultural to residential development.

Fast Variables

Variables in a system that are generally easy to measure and occur over days to years. Generally, these are things that managers actively focus on – like lake use and fish size.

Transformation:

When a system changes from one state to another, along with the resulting social response (i.e. actions that account for the shift in the stable state of the system). For example, forming a lake organization in response to the introduction of a new invasive species that is threatening lake health.

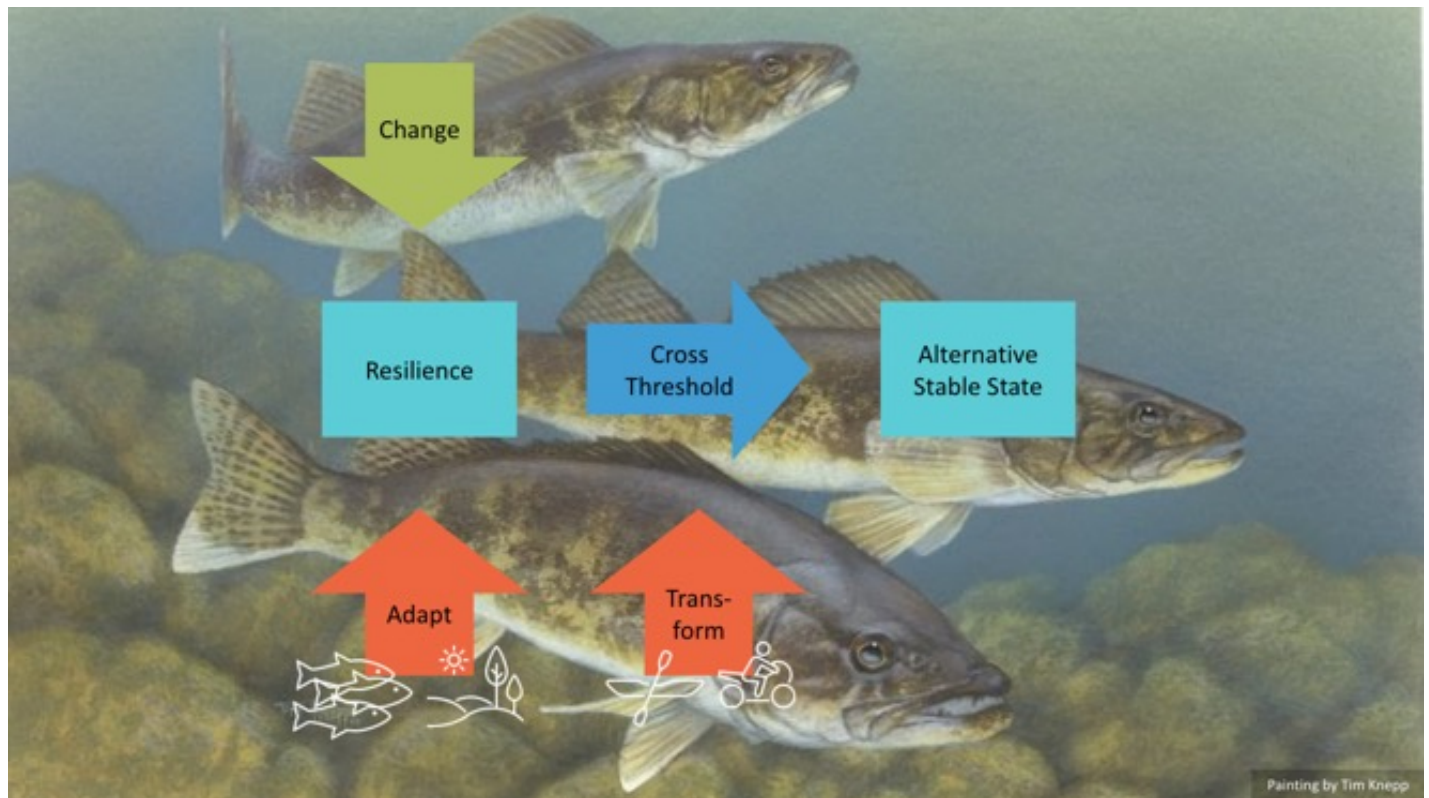
Cross-Scale Linkages

The links that occur in social-ecological systems across multiple scales, ranging from a single lake, up to the landscape, region, and beyond.

Social Resilience

Resilience in the social system is just as important as resilience in the ecological system. Social resilience comes from people being willing to work together and knowing what to do or who to contact when something happens on the lake. Activities like community cookouts, learning events, and Facebook groups can help build and maintain social resilience.

KEY CONCEPTS – CONCEPT MAPS

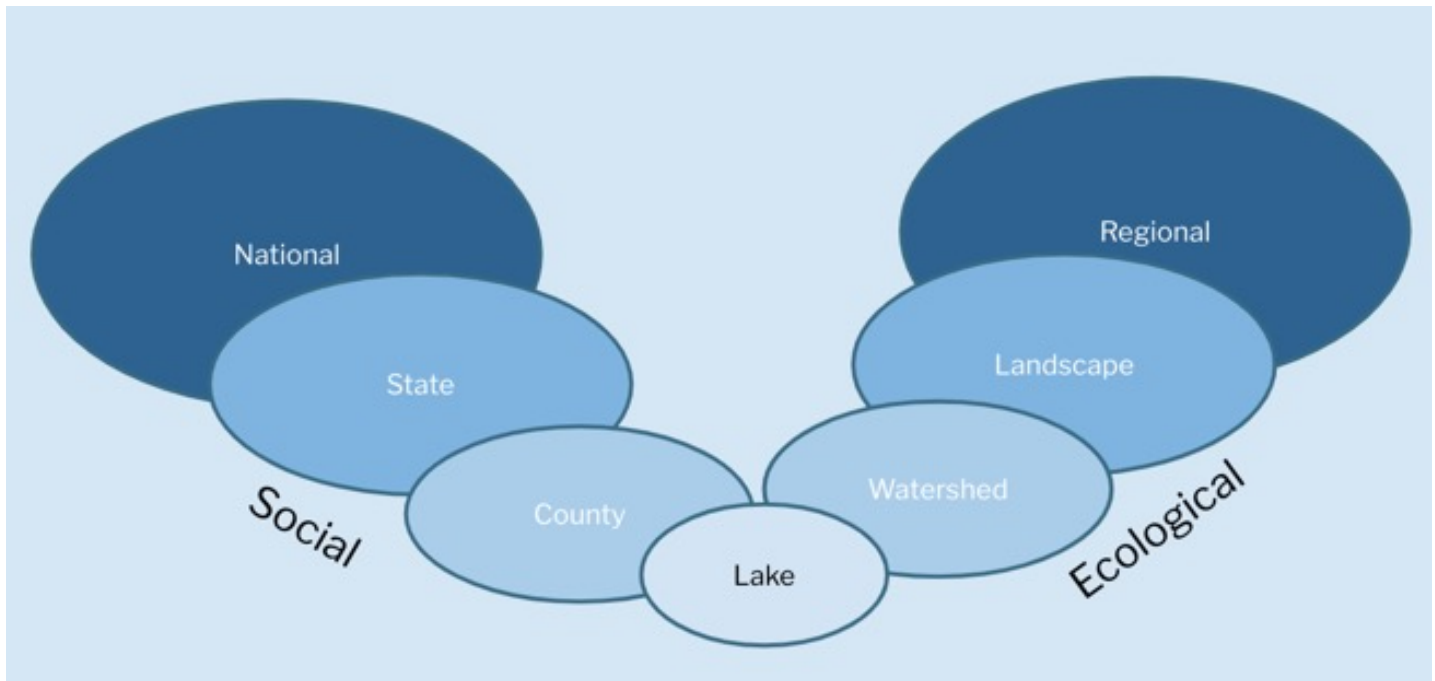


Managing for resilience

Resilience refers to a system's capacity to experience a change and maintain its structure and function. In other words, the ability to absorb changes without meaningful change in the system. Take, for example, the walleye fish population of a lake. The shoreline may be developed, the water temperature may rise, or the adult fish may be caught to an extent without

a meaningful change; however, at some point a threshold is crossed and the adult fish population may disappear, transforming the system to an alternative stable state. Adaptation is an approach that lake organizations can use to increase resilience of the system, like communicating the benefits of a natural shoreline or leaving fallen trees in the lake as habitat for young fish.

KEY CONCEPTS – CONCEPT MAPS

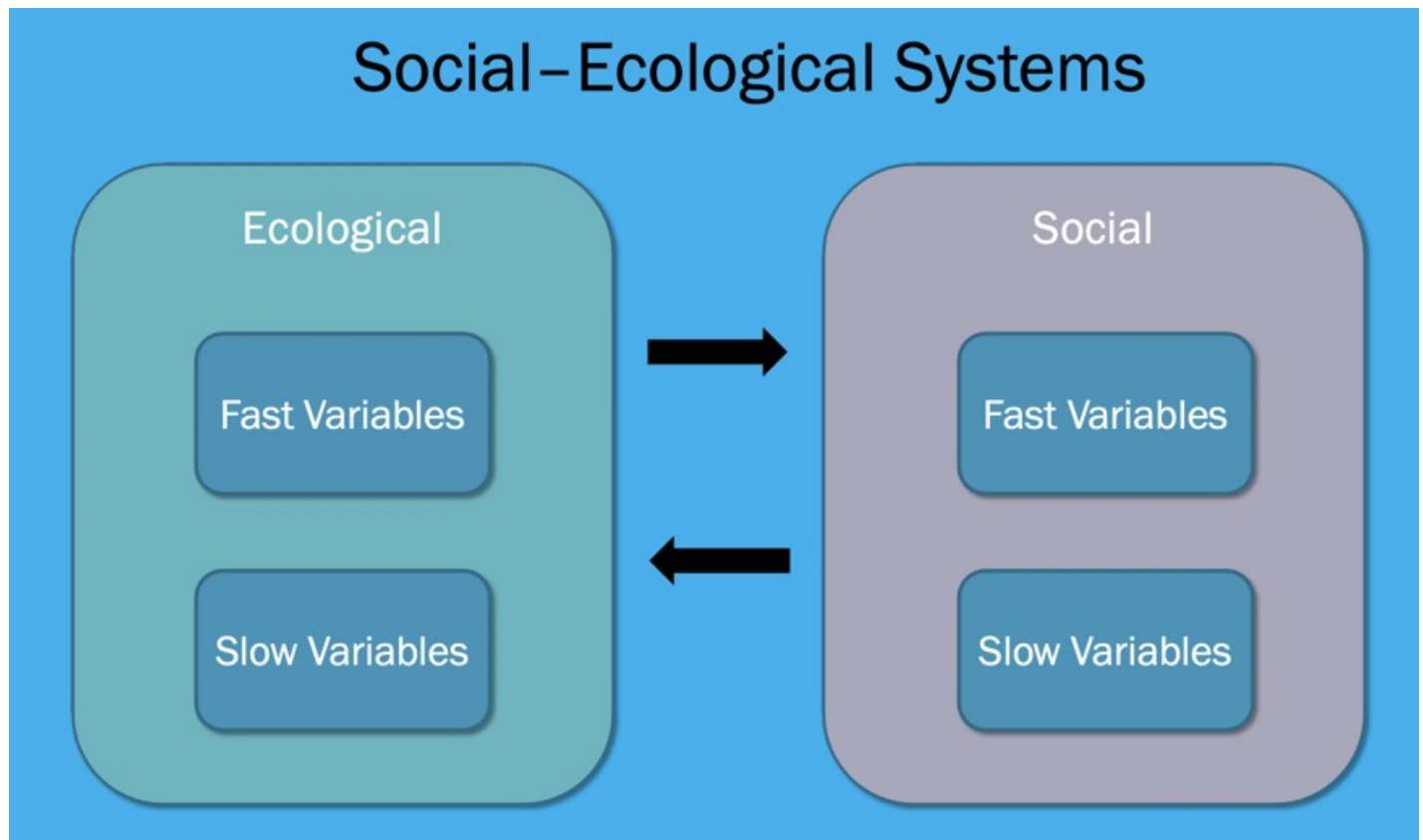


Cross-scale linkages

Scale affects social and ecological aspects of the system. Often, social and ecological scales are linked. For example, changes in farming activities at the landscape scale may encourage a lake

organization to partner with the county soil and water conservation department to collaborate with farmers to minimize the impact of runoff flowing into their lake.

KEY CONCEPTS – CONCEPT MAPS



Social-ecological systems

Social-ecological systems encompass fast and slow variables and include all social and natural processes that play out within the system. These systems are interconnected; change in one part of the system will impact all other parts of the system.

Processes in social-ecological systems happen at multiple scales – from your lake up to the

landscape, watershed, and beyond. The diagram below illustrates examples of nested social and ecological scales.

The Clean Water Act, a national policy, affects the management decisions and funding available to lake associations, which operate at the lake-scale. In contrast, the introduction of an invasive species in one lake may affect the entire watershed.