LCCMR Minnesota Statewide Conservation and Preservation Plan

INSTITUTE ON THE ENVIRONMENT

UNIVERSITY OF MINNESOTA

C R Planning
Community Resources

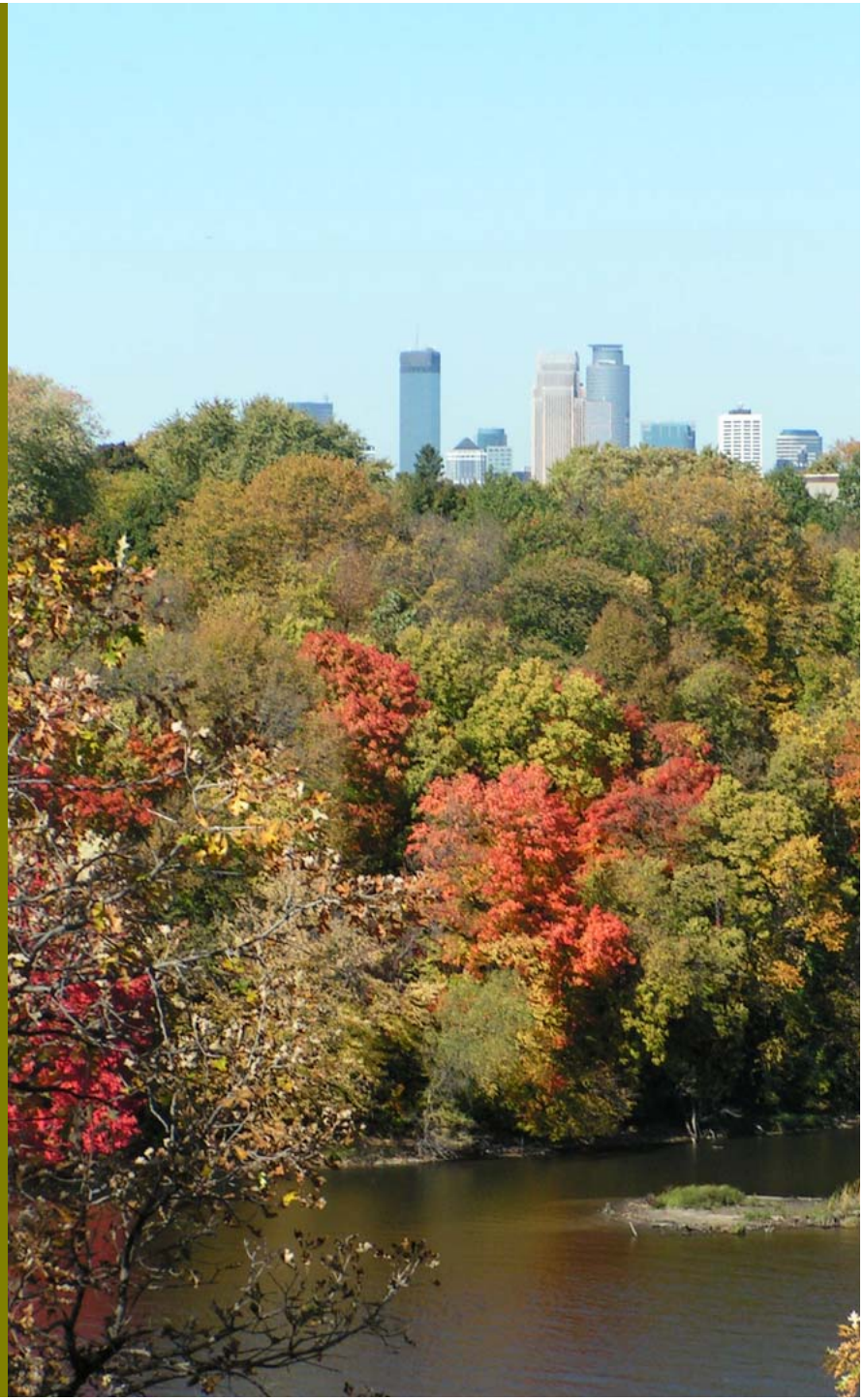
Bonestroo

Presenters

- Jean Coleman, CR Planning
- David Mulla, Univ. of Minnesota
- John Shardlow, Bonestroo

Project Goal

To achieve a better future for Minnesota's natural resources



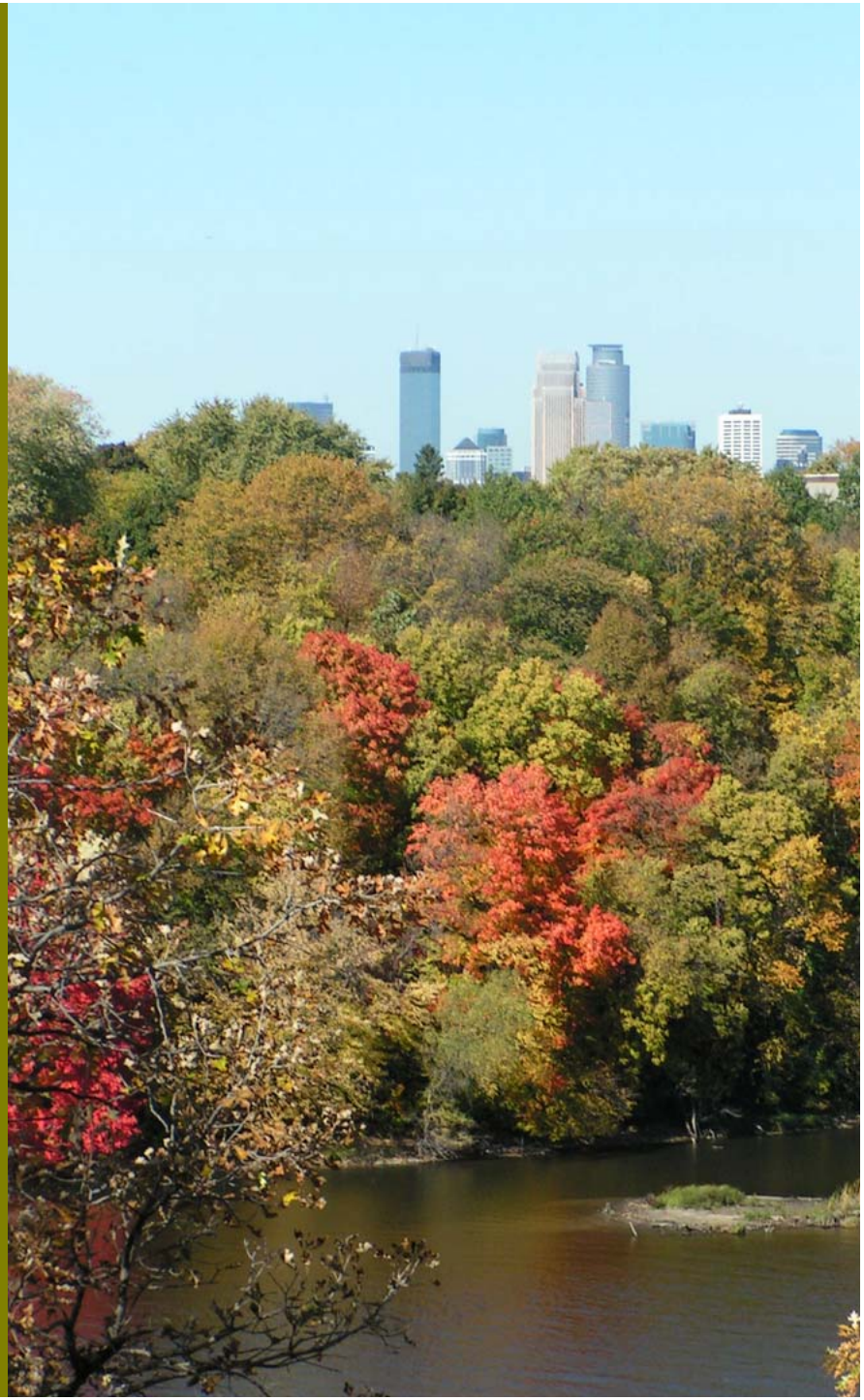
Project vision

- Common understanding – Phase I
- Useful tools – Phase II
- Environmental strategic plan

Phase I

Creating a common understanding of change and drivers of change

Completed
July 2007

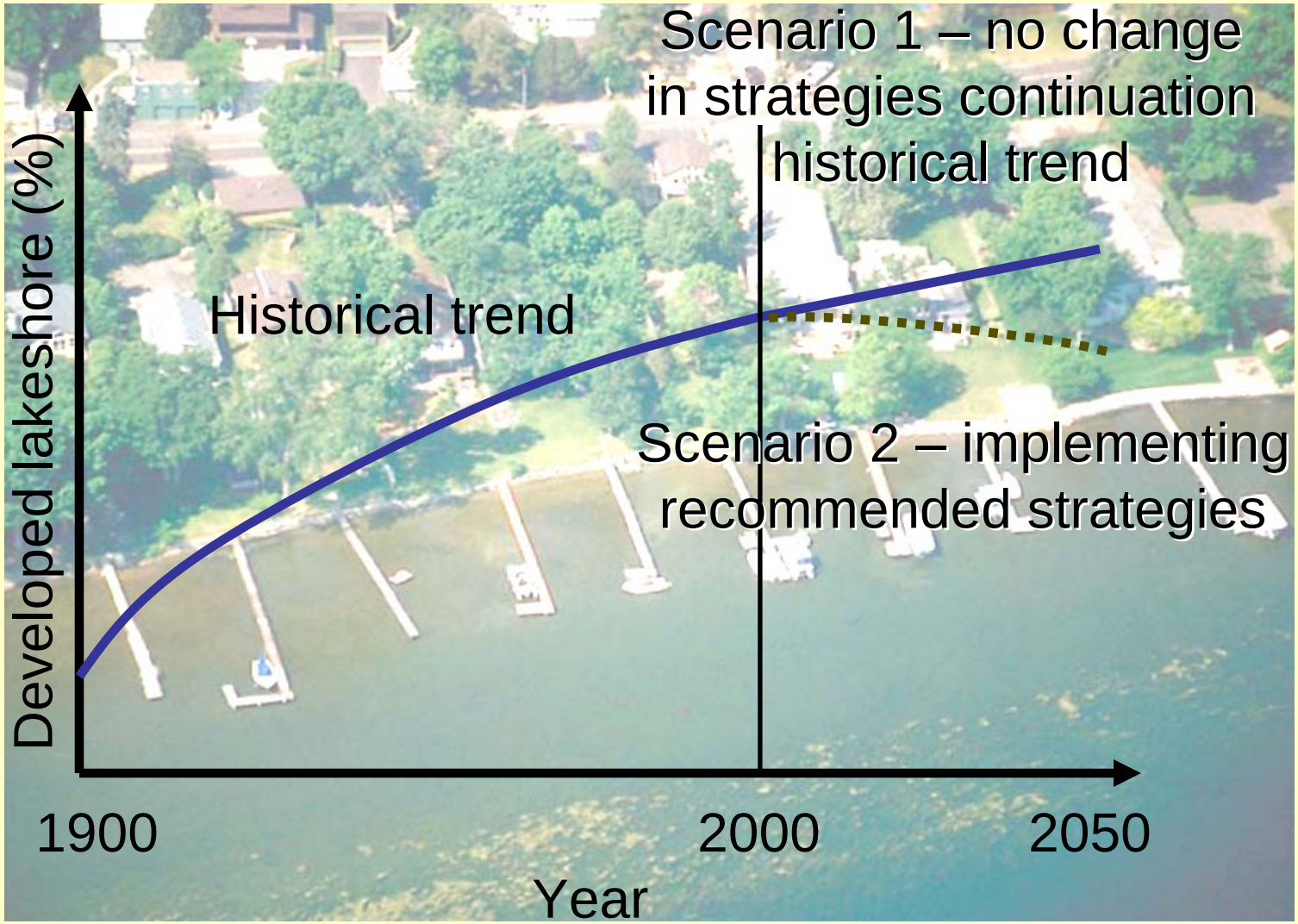


Our Work in Phase I

- 45 team members applied their broad scientific and applied knowledge
- Described our changing natural resources
- Identified and prioritized drivers of change affecting those natural resources
- Identified cross-cutting drivers

Phase I document at www.MNConservationPlan.net

Trend Analysis Example: Lakeshore Development



Photograph from MNDNR (Paul J. Radomski)

Identification of Drivers of Change

Ultimate Cause of Change to Resource

Higher Order Driver of Change

Proximate Driver of Change

Change in the Resource

Development/ Demographics

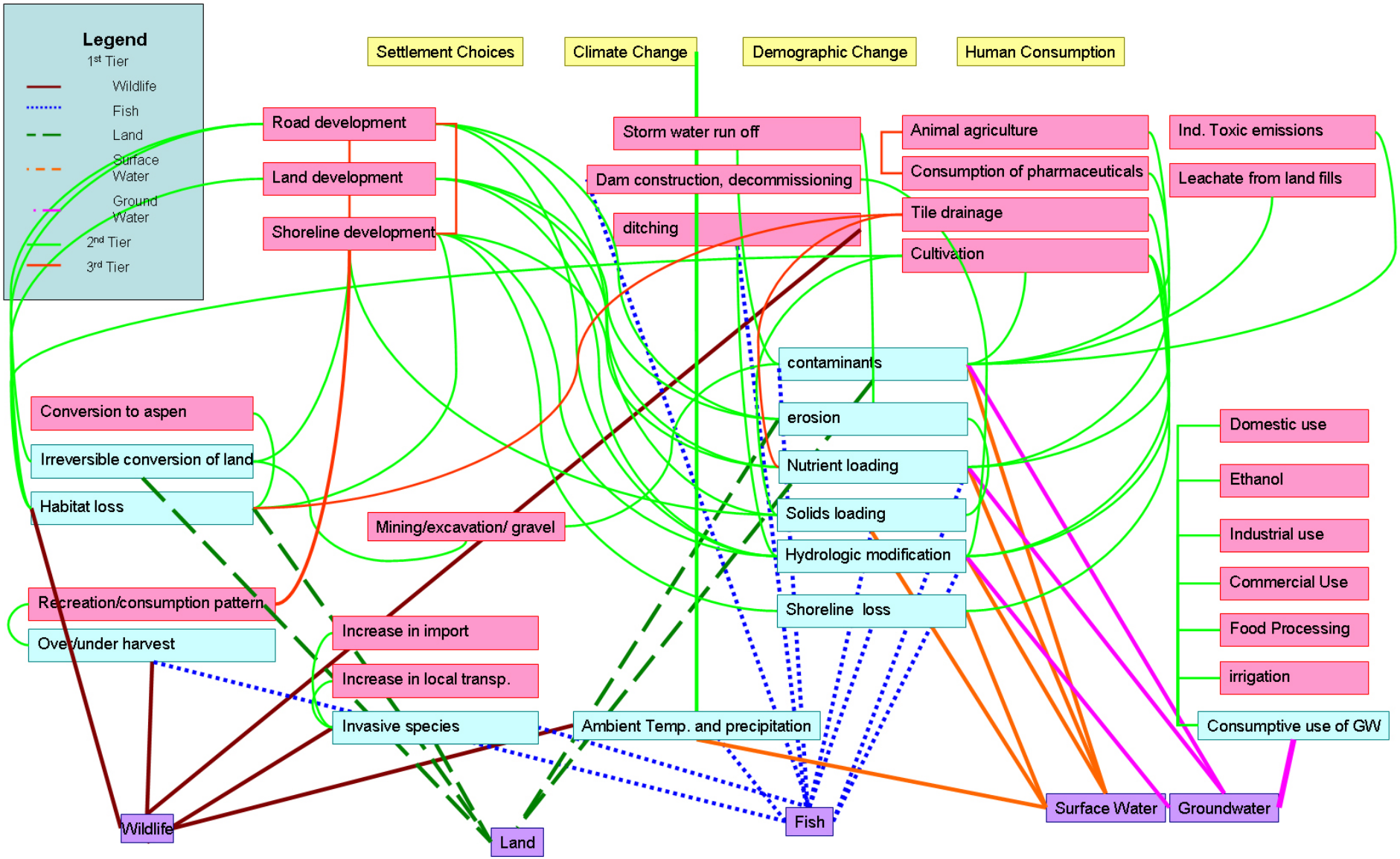
Where people live and what they consume

Shoreline Development

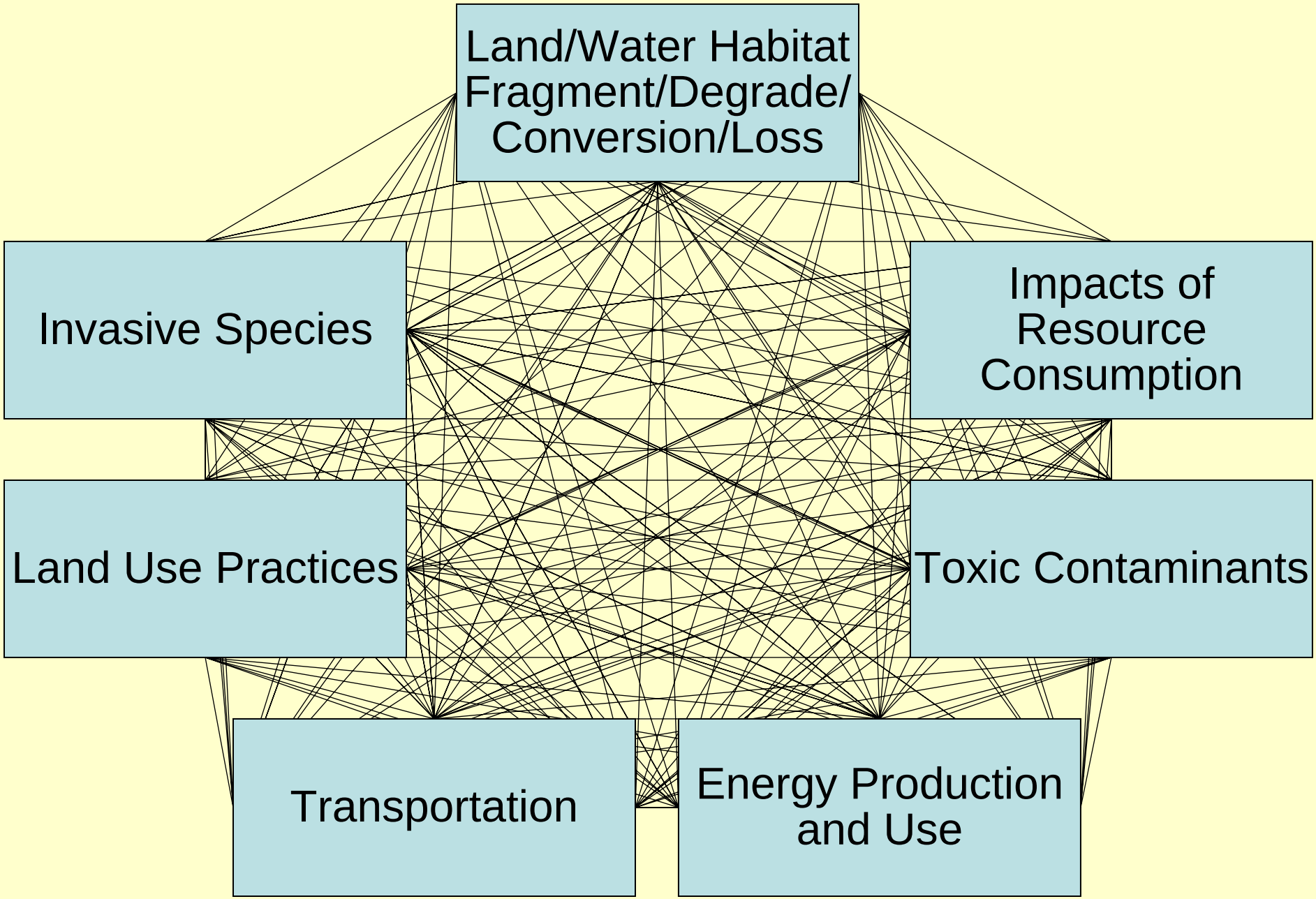
Nutrient Loading

Effect on Fish

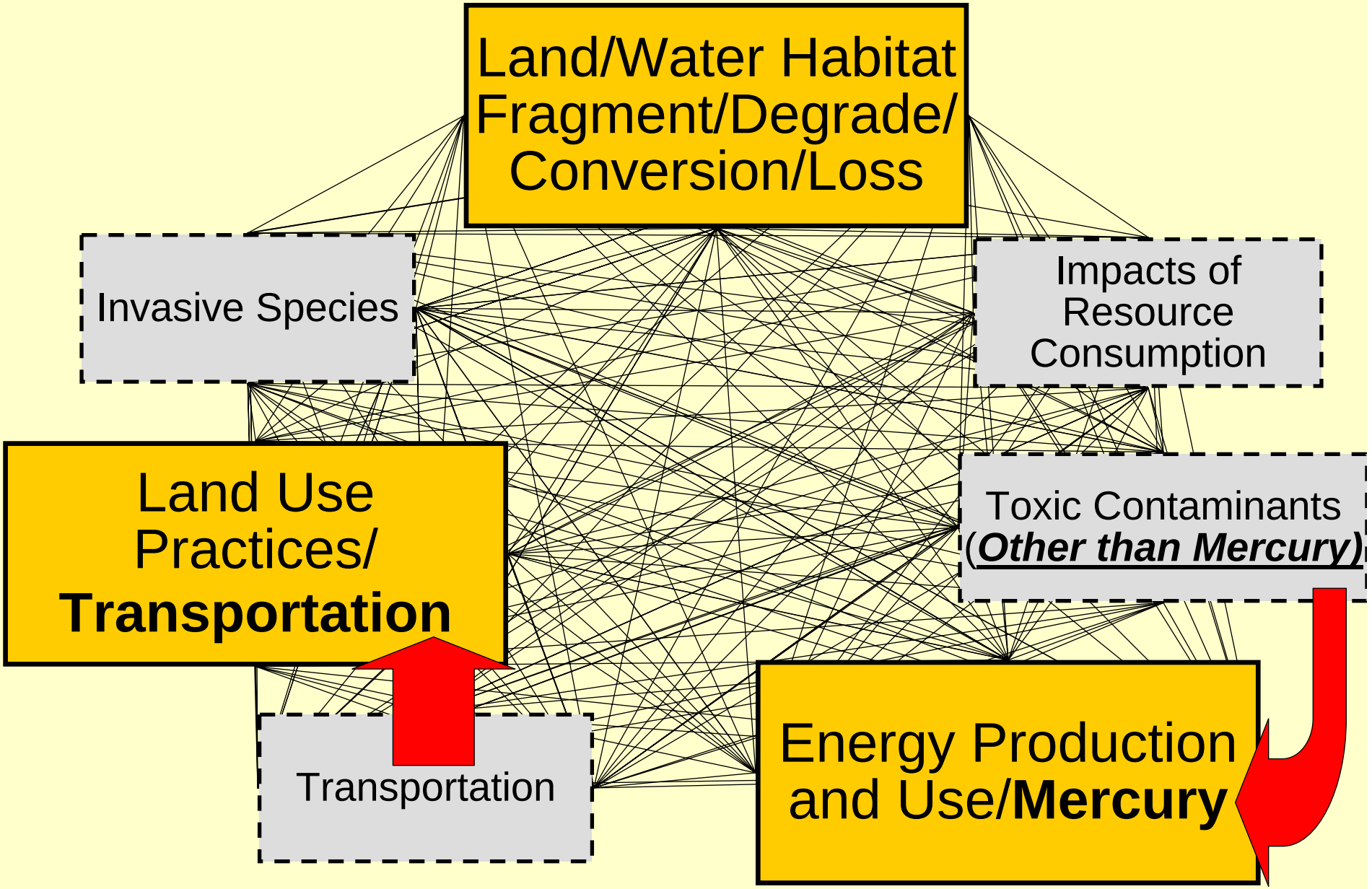
Drivers Affecting Multiple Resources



Key Issues Identified in Phase I



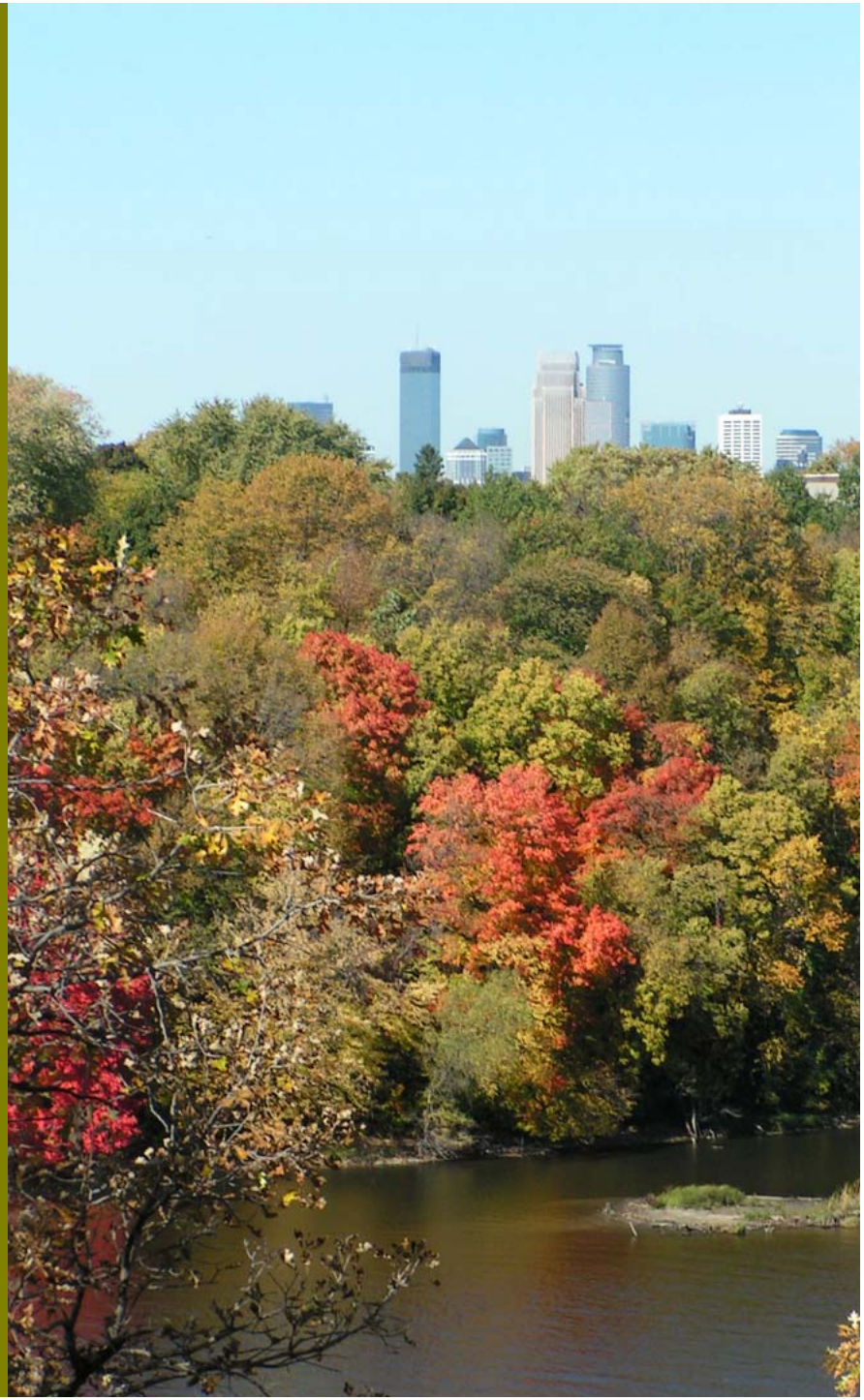
Focus Areas for Phase II



Phase II

Key Issue Analysis
and
Recommendations

To be completed in
June 2008



Phase II Products

1. PRIORITY AREA MAPPING
2. RECOMMENDED CONSERVATION STRATEGIES
   - LCCMR investment strategies: protection priorities, research, pilots/demo projects
   - Policy changes
3. TREND ANALYSIS SUPPORTING RECOMMENDATIONS
4. EVALUATING CONSERVATION STRATEGIES
   - Qualitative cost benefit analysis
   - Stakeholder outreach

Phase II Team Members

	Land & Aquatic Habitat Conservation	Land Use Practices/ Transpor-tation	Energy Production and Use/Mercury	Cost Benefit Analysis	GIS and Data Support
University of MN	6	5	15	5	8
Bonestroo/ CR Planning	1	3			4
Stake-holders	7	11	4		
Agency staff	7	5	3		

Energy Production and Use: Phase II Products

David Mulla, University of Minnesota

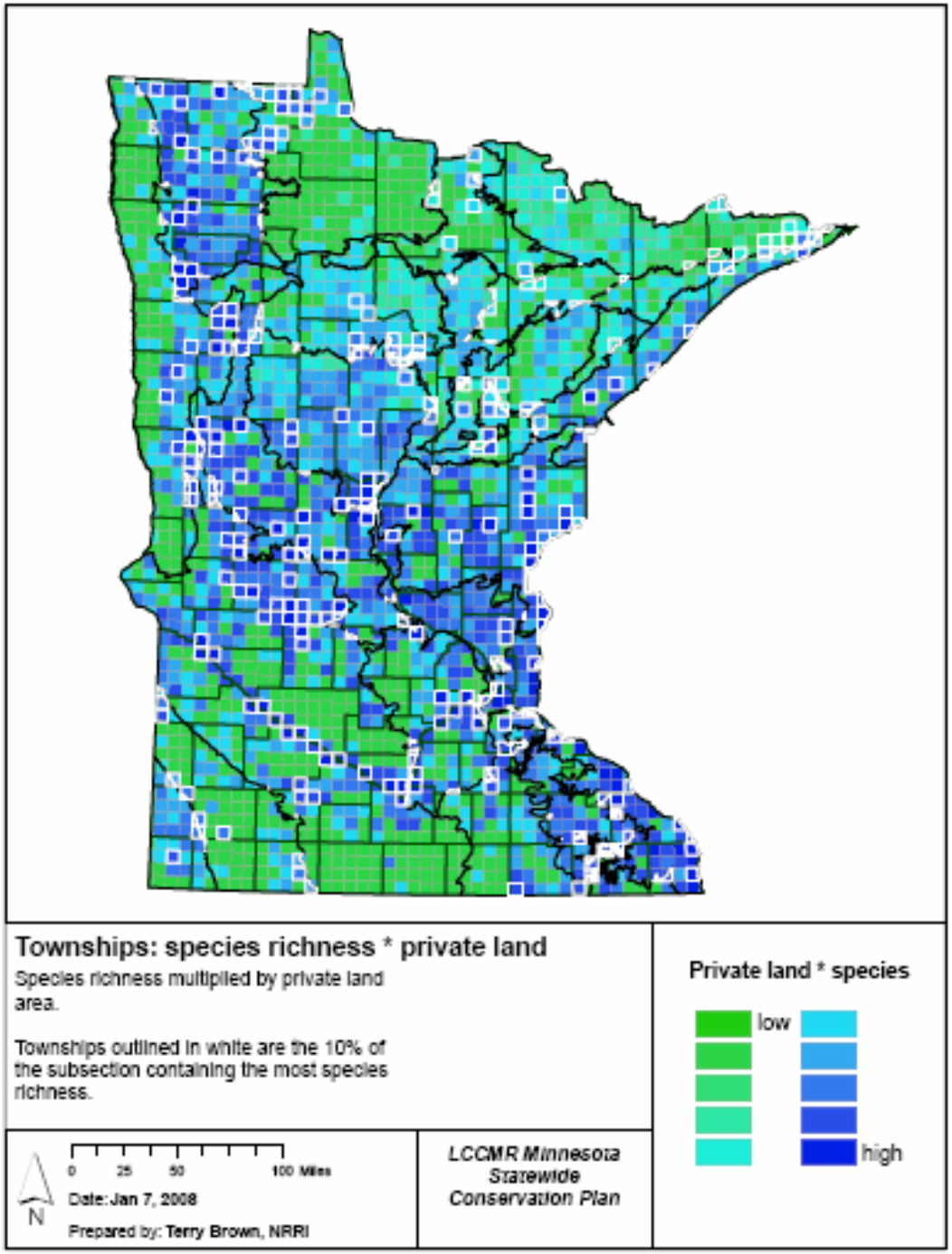
1. Identify energy trends/impacts, including the areas of:
   - Biofuels
   - Fuel Conservation
2. Identify/map priority natural resource areas likely to be affected
3. Identify energy-related investment & policy choices that impact natural resources

Three Scenarios

- Examine 3 overarching energy & environmental policy scenarios relevant to future sustainable energy systems
  1. Continuation of **current** energy & environmental policy & incentives
  2. Shift to policies/practices that promote **significant conservation** of energy and alternative energy sources
  3. Scenario 2 + policies/practices that promote **significant environmental benefits** from land use practices
- For each scenario: identify trends, evaluate biofuel options, recommend strategies

Agricultural Land Use Options

- 3 major options for Ag. Landscapes
  - *Corn-soybean rotation*
    - Probably more corn, collection of corn biomass
  - *Monocultures of perennial energy crops*
    - Switchgrass, miscanthus, hybrid poplar, others
  - *Polycultures of perennial energy crops*
    - Grass-legume mixtures, native prairie plantings
- For each overarching scenario:
  - We will determine expected pattern (think mosaic) of options across ag. landscapes
  - We will determine expected benefits/costs of each pattern
- Potential impacts of each scenario & option on the environment will be considered



Example of mapping step:

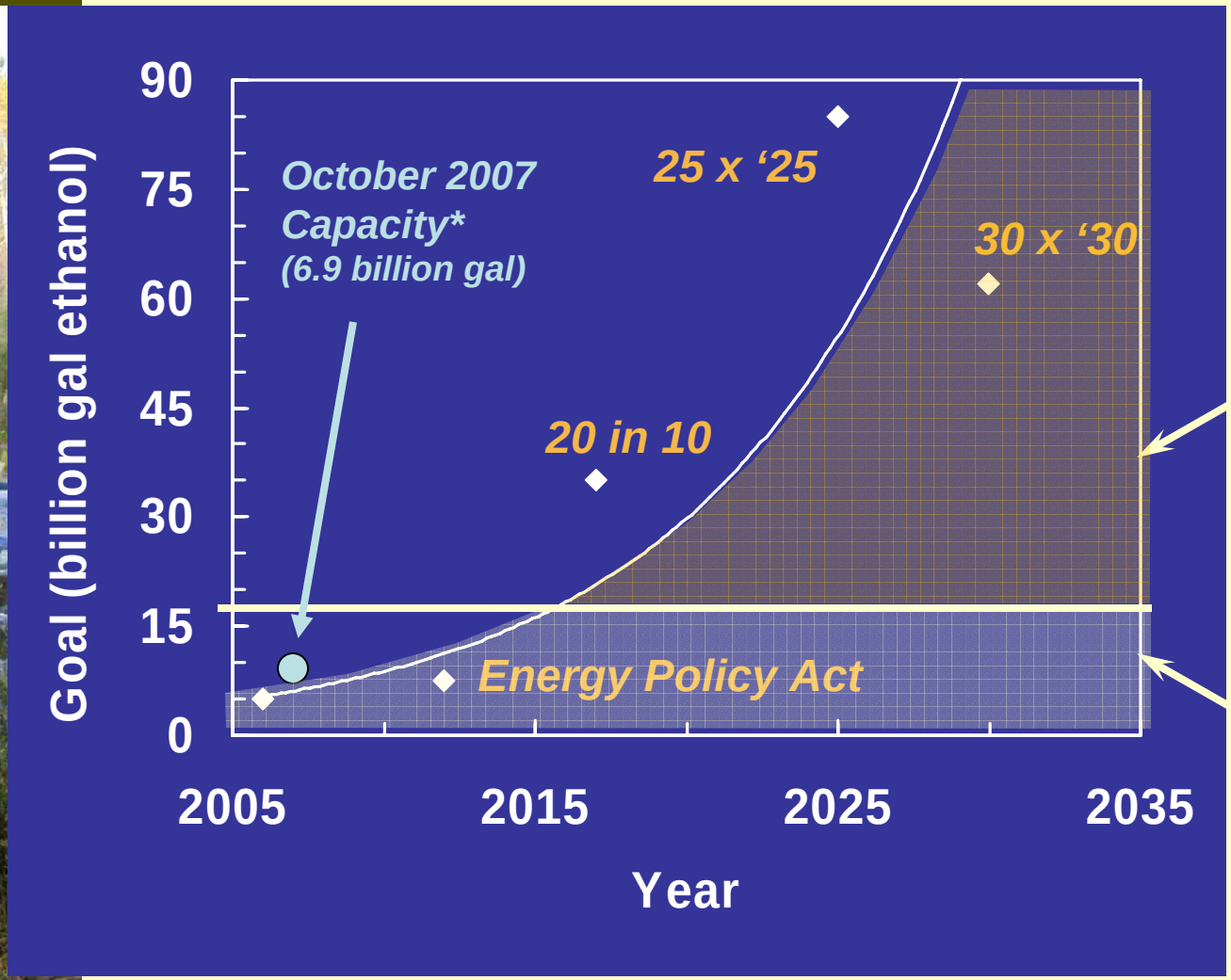
Species of Greatest Conservation Need

Species richness by township

and

Top 10% of townships within each Ecological Section

Trend: Growing Demand for Cellulose Biofuel - from where?



Gap for Cellulosic ethanol to fill

Ethanol from corn (NCGA**)

*RFA, http://www.ethanolrfa.org/industry/statistics/#C

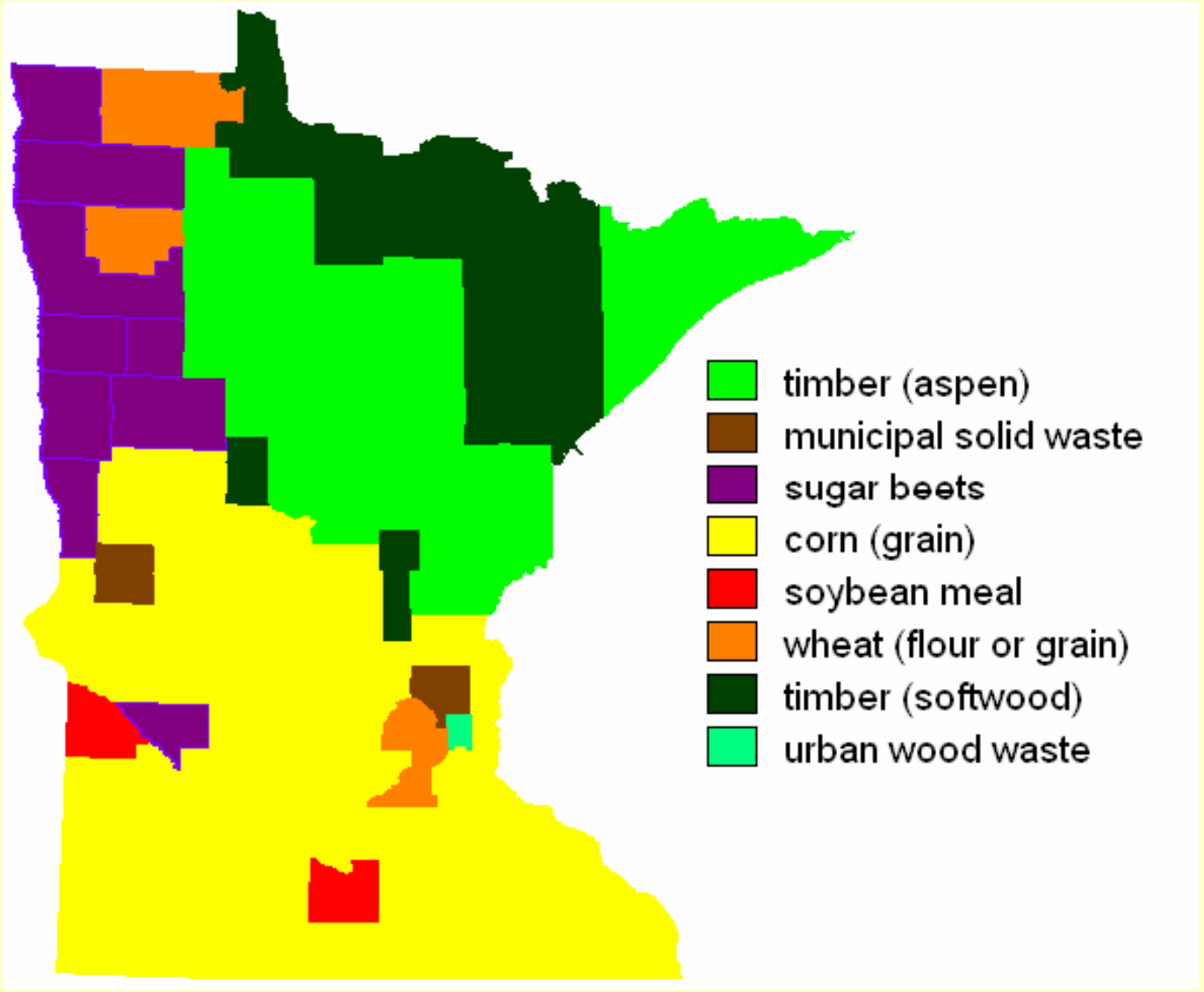
**NCGA, http://www.ncga.com/ethanol/pdfs/2007/HowMuchEthanolCanComeFromCorn0207.pdf

Relevant Trends for Energy Conservation & Alternative Energy Scenario

Trends to be considered include:

- Better mileage standards
- Electric plug-in cars
- More mass transit
- Increased wind and solar energy
- Deep injection of carbon
- Decreased carbon footprints
- Others?

Largest bio-feedstock by county in Minnesota



Incentives for Perennial Biofuel Crops on Marginal/Vulnerable Soils

Productivity ↑

High Productivity/Low Vulnerability Soils: High Suitability for Annual Biofuel Crops	High Productivity/High Vulnerability Soils: High Suitability for Perennial Biofuel Crops
Low Productivity/Low Vulnerability Soils: Moderate Suitability for Perennial Biofuel Crops	Low Productivity/High Vulnerability Soils: High Suitability for Perennial Biofuel Crops

Vulnerability →

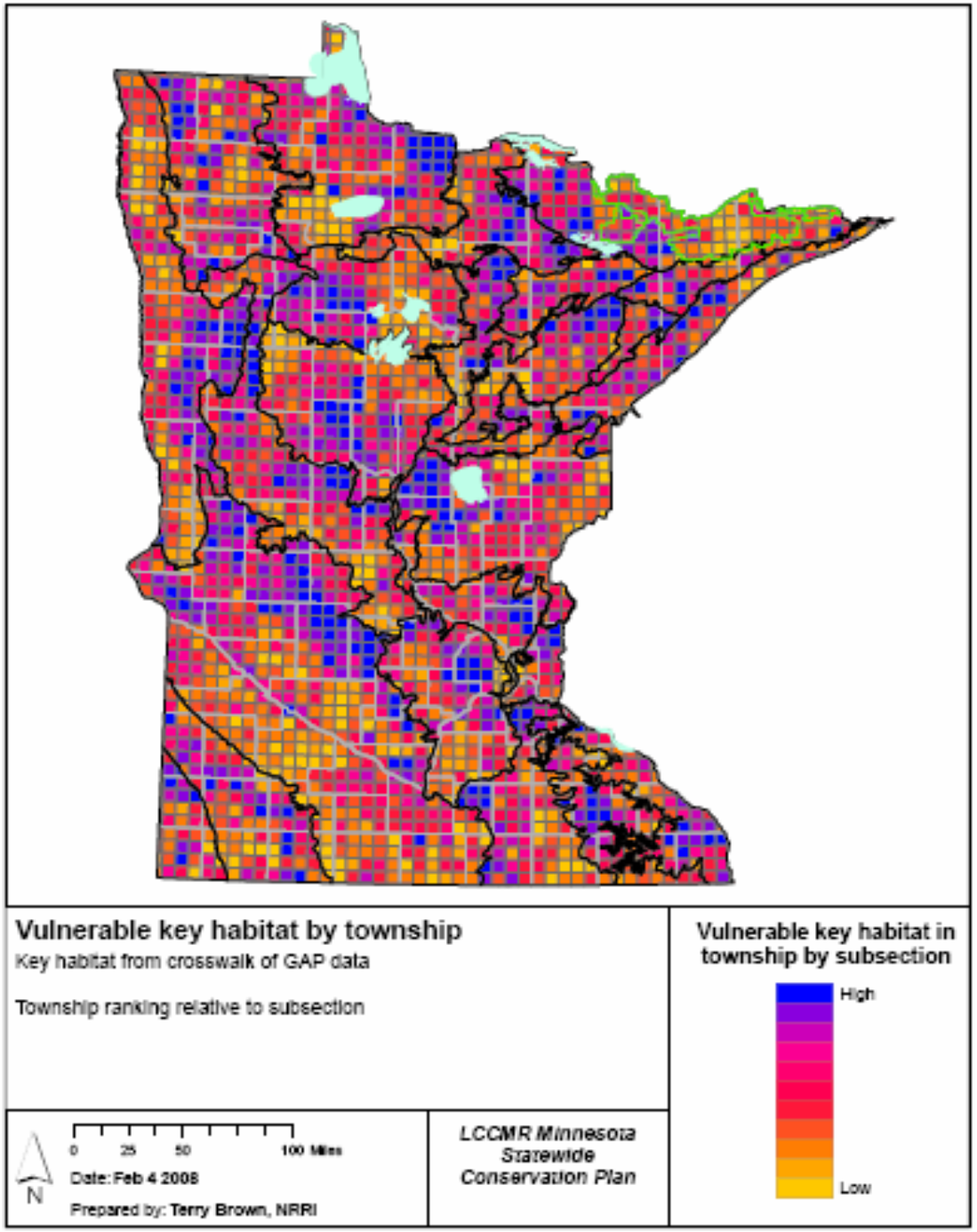
Land & Aquatic Habitat Team: Phase II Progress

Jean Coleman, CR Planning

1. PRIORITY AREA MAPPING
2. RECOMMENDED CONSERVATION STRATEGIES
   - LCCMR investment strategies: protection priorities, research, pilots/demo projects
   - Policy changes
3. TREND ANALYSIS SUPPORTING RECOMMENDATIONS

Land & Aquatic Habitat Team: Priority Mapping

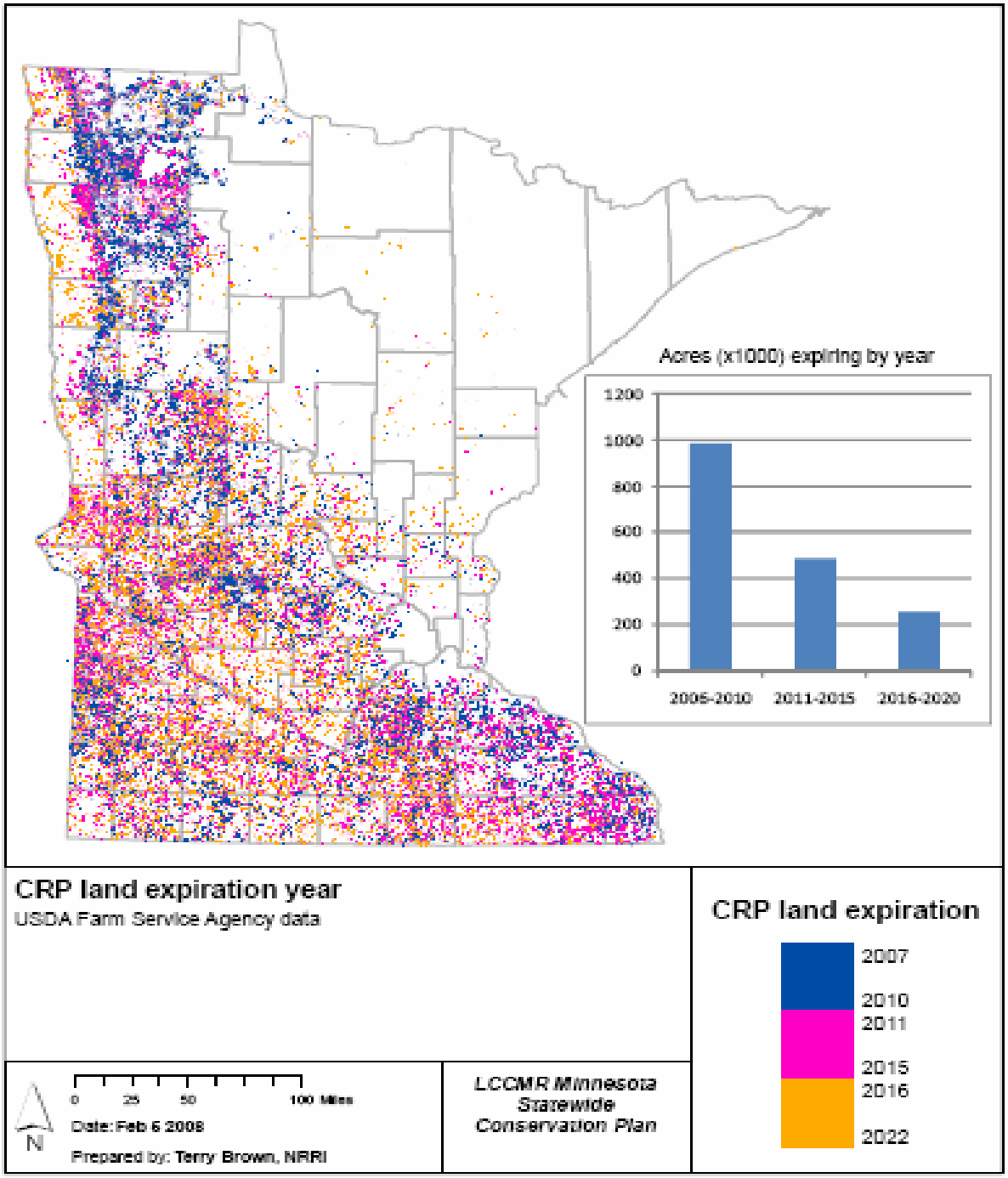
1. Biodiversity – two key data bases
    1. MN Species of Greatest Conservation Need
    2. MN GAP analysis – key habitats and species distribution
2. Large contiguous ecosystems and corridors
3. Change detection
    - Land use and trends
    - Ownership
    - Population density
    - Road networks
4. Current & desirable outdoor recreation areas
5. Surface and ground water priorities to be mapped



Example of mapping step:

Vulnerable key habitats

The darkest blue color in each Ecological Subsection shows the townships with the top 10% of vulnerable key habitats for that subsection



Trend Analysis Example:

Conservation Reserve Program

Year of expiration of enrolled acreage

Land Use Practices Team: Phase II Progress

John Shardlow, Bonestroo

1. RECOMMENDED CONSERVATION STRATEGIES
   - LCCMR investment strategies: protection priorities, research, pilots/demo projects
   - Policy changes
2. TREND ANALYSIS SUPPORTING RECOMMENDATIONS

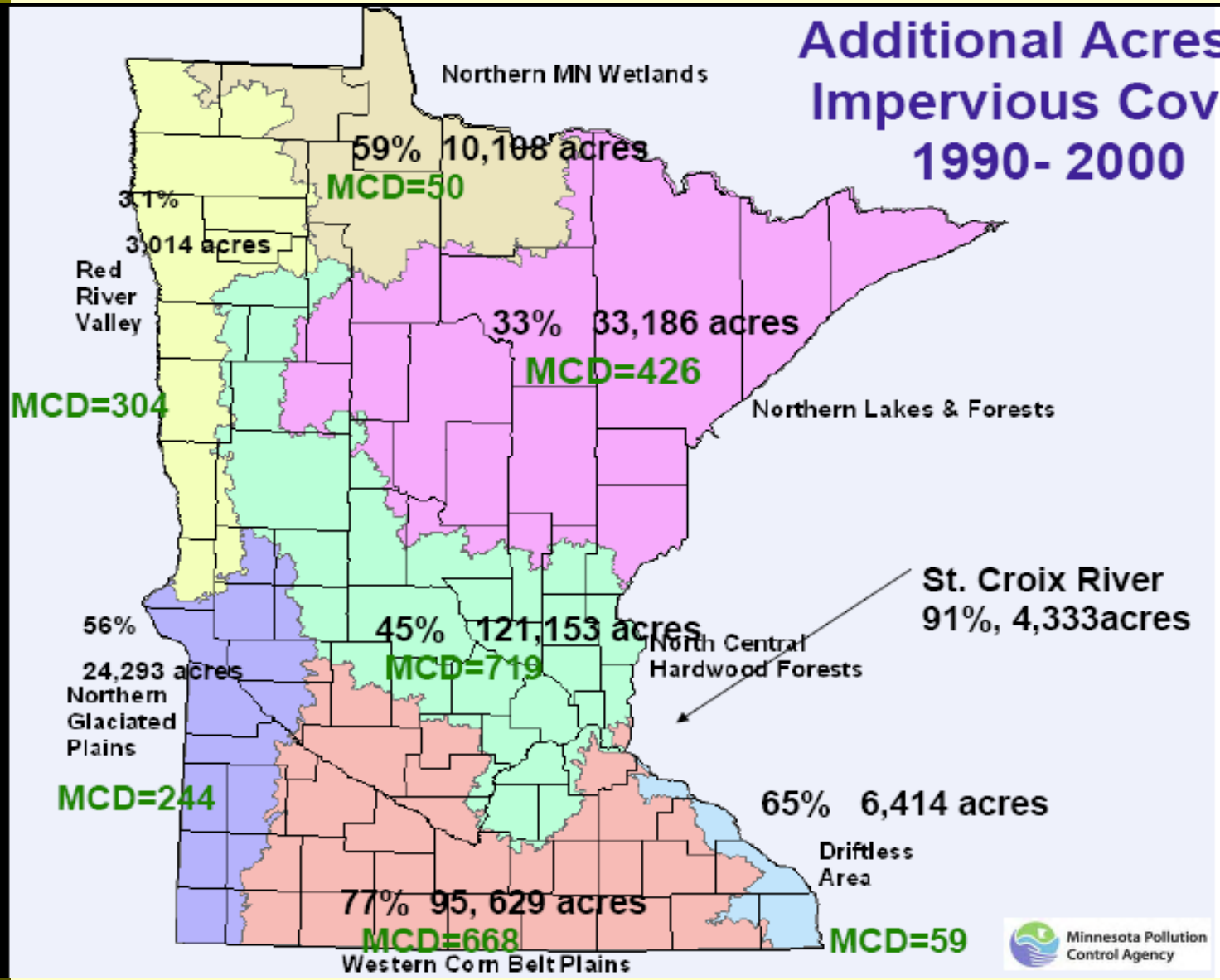
Land Use Practices Team

- Focus: How land is used on a particular parcel or site
  - Forest
  - Agriculture
  - Urban

Land use practices: Progress

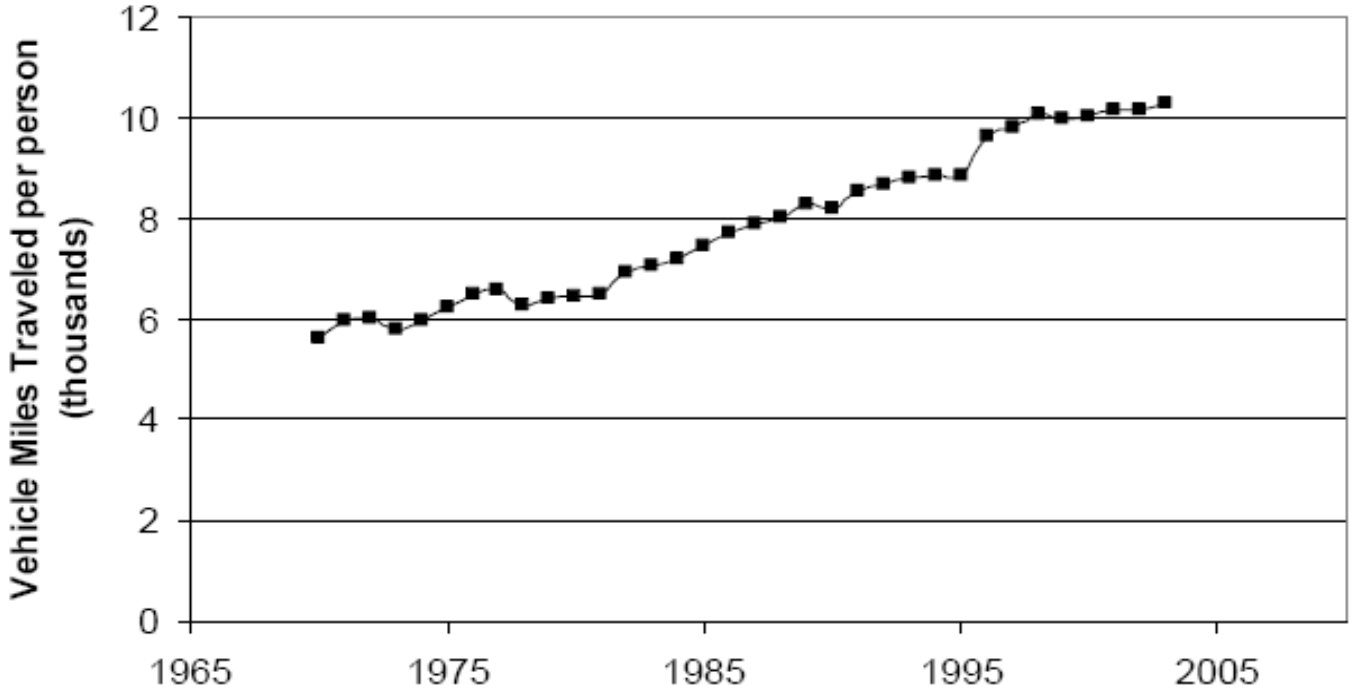
- Subcommittee work on recommendations
- Trends
  - Illuminate problems
  - Guide priorities
- Integrate with Transportation

Trend example: Impervious surface



Trend example

Annual Vehicle Miles Traveled per person in Minnesota, 1970-2004



Source: MPCA

Developing recommendations

- Three subcommittees focused on three distinct landscape areas
  - Agricultural
  - Forest
  - Urban

Recommendation Example

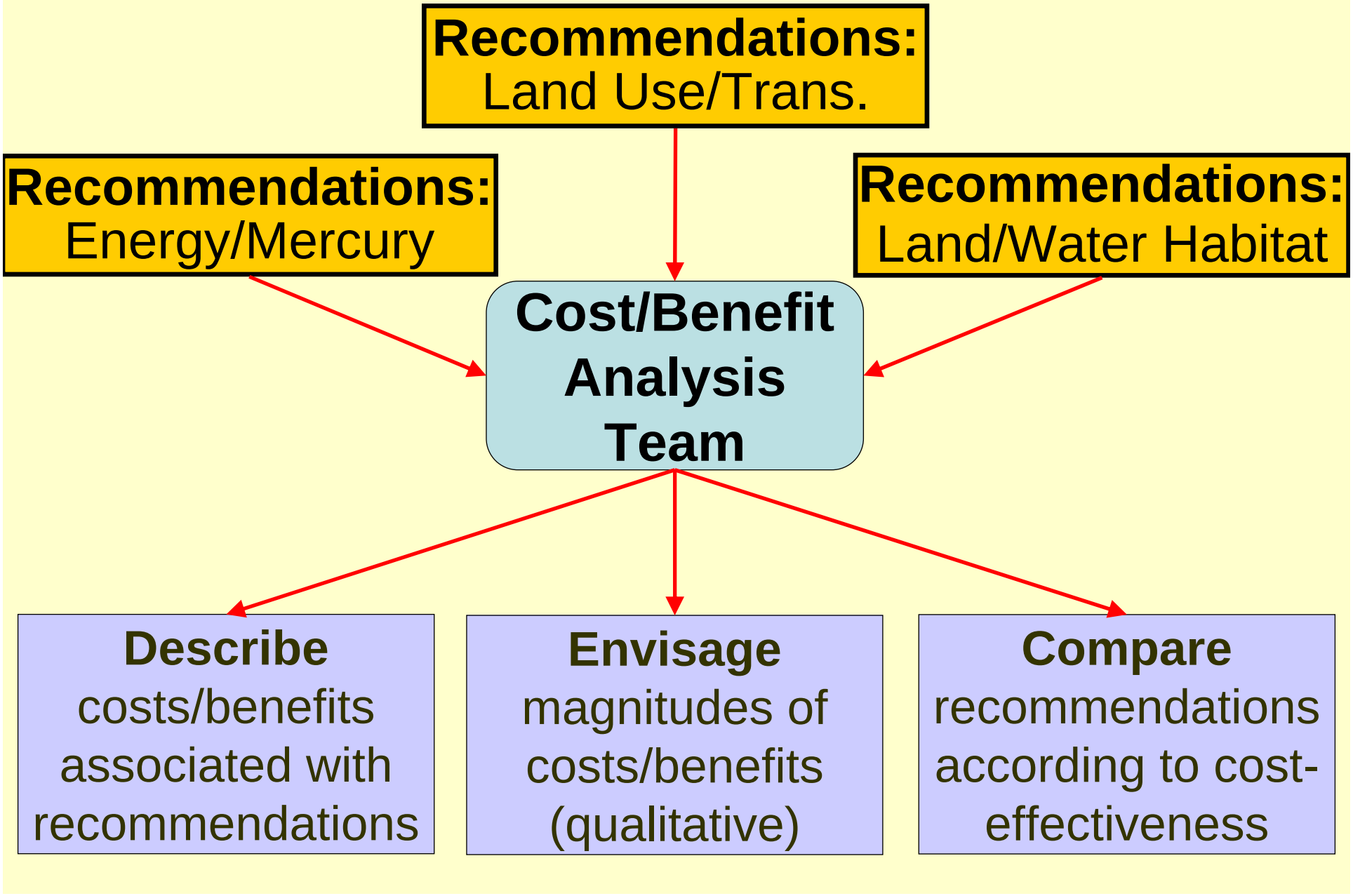
Urban Development

- Limit or reduce expansion of urban areas
- Reduce the effects of urban development
- Strategies with multiple benefits
  - High density leads to reduction in vehicle miles traveled and lower carbon footprint

Phase II Products

- Priority area mapping
- Recommended conservation strategies
  - LCCMR investment strategies – protection priorities, research, pilots/demonstration projects
  - Policy changes
- Trend analysis supporting recommendations
- Evaluating conservation strategies
  - Qualitative cost benefit analysis
  - Stakeholder outreach

Objectives of Cost Benefit Analysis (CBA)



Stakeholder evaluation of recommendations

- Late April stakeholder outreach meetings
- To be held in 3 locations across the state – ag, urban, forest
- A “working” workshop
- Purpose is to have stakeholders work through and understand the draft recommendations and comment on potential impact, feasibility, likely support, etc.

Thank You!

INSTITUTE ON THE
ENVIRONMENT

UNIVERSITY OF MINNESOTA

CR Planning
Community Resources

Bonestroo