Highlights from the International Conference on Ecology and Transportation (ICOET):

Applications of Eco-Logical from the U.S. and Beyond

Wednesday, October 26, 2011 1:00 – 2:30 PM Eastern



Presenters

- Debra Nelson, New York State Department of Transportation
- John Walewski, Texas A&M University
- Kelly McAllister, Washington State Department of Transportation
- Henrik Wahlman, Swedish Transportation
 Administration

Moderated by Mary Gray, Federal Highway Administration, Office of Project Development and Environmental Review







Research Collaboration Networking International





Designed to Share what has been done to Promote Continuous Process Improvement





ICOET 2013 - ARIZONA

http://www.icoet.net/



Questions?



Eco-Logical:

http://www.environment.fhwa.dot.gov/ecological/eco_entry.asp

Eco-Logical Webinar Series:

http://www.environment.fhwa.dot.gov/ecological/eco webinar series.asp

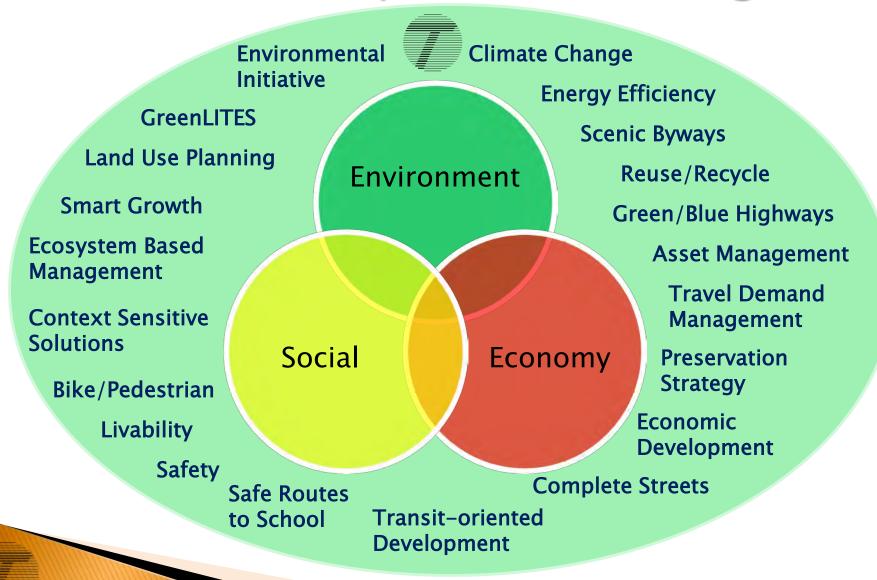
A Systems View of Sustainability bility

Incorporating Sustainability into NYSDOT's Strategic, Tactical and Operational Decisions



Debra Nelson, NYSDOT dnelson@dot.state.ny.us

Sustainability is Overarching



Sustainability Decision Levels

Why

 Strategic - Integrate Transportation and Natural Resources Planning to support a sustainable society



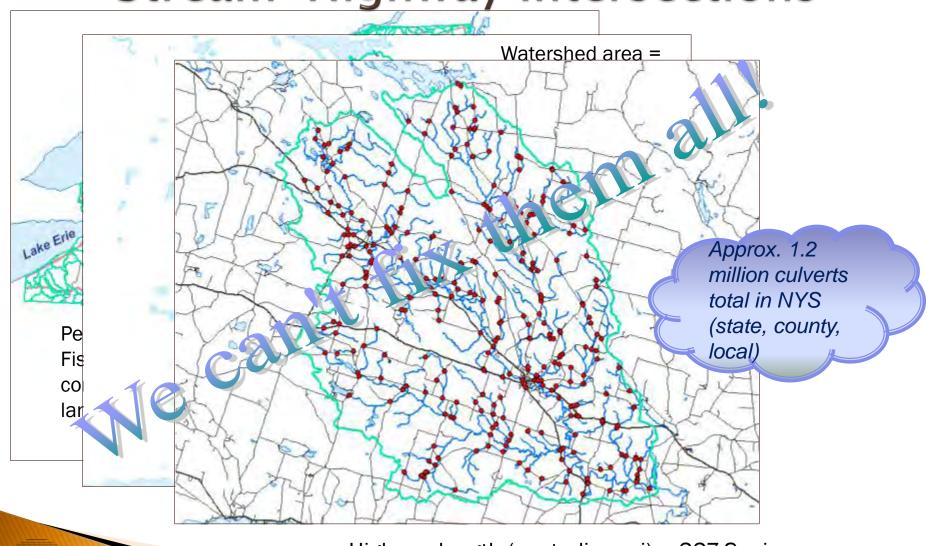
Tactical - Support a sustainable transportation system that protects and enhances natural systems



How

 Operational – Forward sustainable projects and actions that reduce environmental impacts and resource consumption

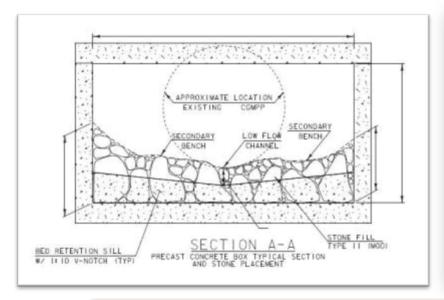
Stream-Highway Intersections



Highway length (centerline mi) = 337.8 mi Number of highway-stream crossings = 297

Designs, Specifications, Partnerships









InterACT - Multi-agency team "committed to ensuring that stream crossings are designed, installed and maintained in a manner that protects the ecological integrity of aquatic systems, while accommodating practicable technology, engineering criteria and human safety."







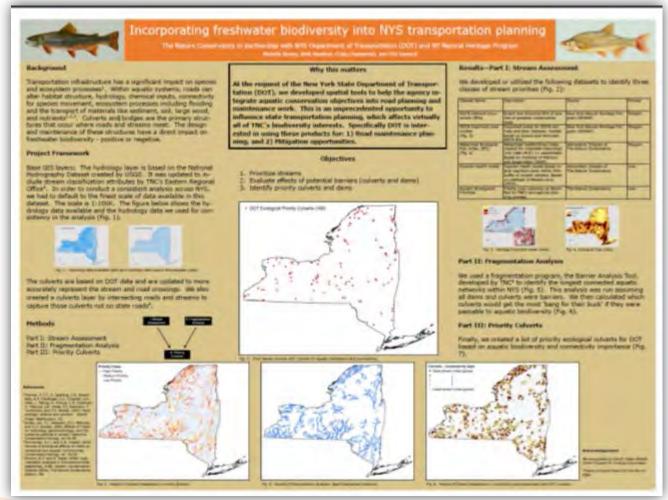






Sustainable Decisions: Science-based, Prioritized







Sustainable Society



Strategies for a New Age:
New York State's
Transportation Master Plan
for 2030



Comprehensive Wildlife Conservation Strategy (CWCS) to address the wildlife species in greatest need of conservation in the state. Defines a vision and establishes a strategy for state wildlife conservation and funding.

Strategies for a New Age: New York State's

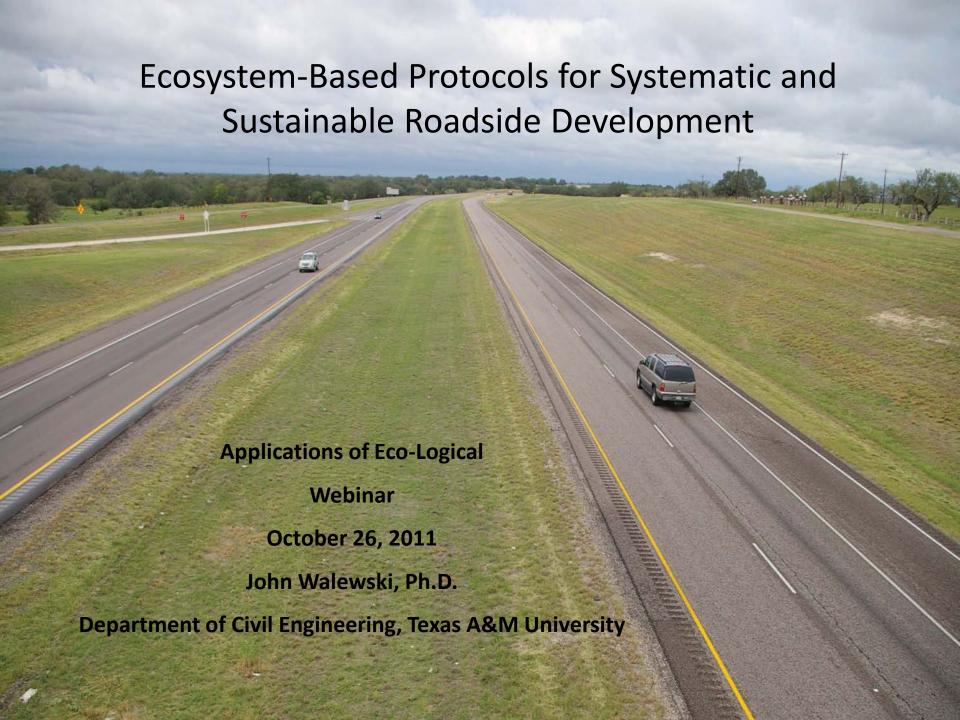
Transportation Master Plan for 2030 articulates a long-term, intermodal vision of the State's future transportation system and provides policy level guidance to achieve that vision.

Forward Four - Guiding Principles



"With Great Power Comes Great





Project Team Lead:

Sean Compton
Principal
TGB Partners, Inc.
Austin, Texas

Dr. Steve Windhager
Director, Landscape Restoration
Lady Bird Johnson Wildflower Center

Dr. John Walewski
Department of Civil Engineering
Texas A&M University

University of Texas at Austin



U.S. Drought Monitor

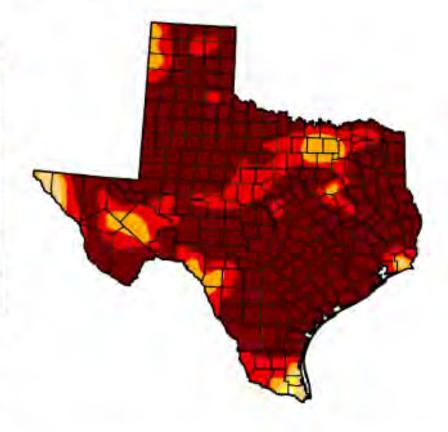
August 16, 2011

Valid 7 a.m. EST

Texas

Drought Conditions (Percent Area)

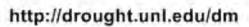
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.07	99.93	99.72	98.36	92.78	74.50
Last Week (08/09/2011 map)	0.07	99.93	99,48	97.99	94.27	78.26
3 Months Ago (05/17/2011 map)	0.00	100.00	97.01	92.40	80.02	47.87
Start of Calendar Year (12/28/2010 map)	7.89	92.11	69.43	37.46	9.59	0,00
Start of Water Year (09/28/2010 map)	75.57	24.43	2,43	0.99	0.00	0.00
One Year Ago (08/10/2010 map)	90.68	9.32	2,45	0.22	0.00	0.00



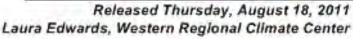
Intensity:



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



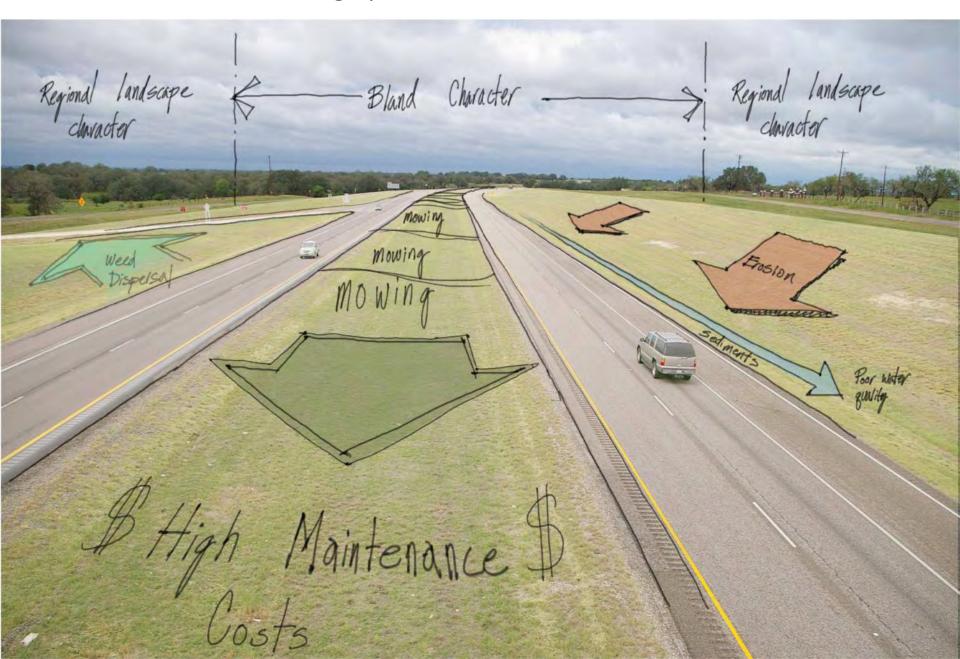




Problem & Solution

- Central Texas among the fastest growing regions in the country
 - Transportation network lagging
 - Sensitive ecology
 - New funding tools and authority at local level
- Williamson County Texas assertive in funding mobility needs using a road bond program and pass-through financing
 - \$350 million (2001) + \$228 Million (2006)
- Use of existing design and construction guidance, standards, & specifications...
 - State-wide with minor modifications
 - Not consistent with site ecology
 - Not sustainable?
 - Environmental...
 - Climate change...
 - Economical...
 - Social ...
- Eco-Logical concepts extended to construction specifications and ownership

Current Practices - The high price of a low cost solution to roadsides





Roadside Installation and 20 years Maintenance - Total Cost

TxDOT Urban Spec

Bermuda sod, TxDOT seed mixes, mowings on the entire ROW.

\$204,210

TxDOT Rural Spec

TxDOT seed mix, mowings to the entire ROW.

\$163,895

Characteristics

- TxDOT Seed Mix
- 3 Mowings per year throughout ROW

Protocol Solution A

Sustainable solution on 100% of the ROW.

\$160,075

Protocol Solution B

Sustainable solution with 15% of vegetation maintained.

\$134,460

Characteristics

- Compost and native seed mix
- Rock berms and mulch fiber rolls
- 3 mowings per year in safety strip only

Ecoregions of Williamson County

Limestone Cut Plains



Common Plants: Blackjack Oak Little Bluestem Yellow Indiangrass Texas Indiangrass Sideoats Grama

Common Curlymesquite

Edwards Plateau



Common Plants:

Juniper Oak Mesquite Side oats grama Little bluestem Muhly grass

Blackland Prairie



Post Oak Savanna

Common Plants: Post Oak Silver Bluestem Little Bluestem Brownseed Paspalum Hackberry Yaupon

Common Plants: Big Bluestem Yellow Indian Grass Switchgrass Sugar Hackberry

Eastern Cottonwood

Elm Ash

Pecan



Example Erosion Control BMP - Modified Mowing Practices

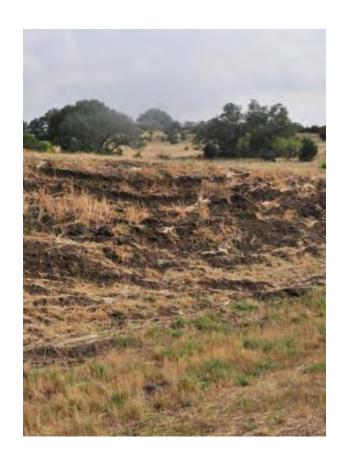
Reduce mowing to safety strip.

Benefits:

- Reduce maintenance costs
- Reduce potential erosion
- Stabilize slopes
- Improved safety for workers and motorists
- Contributes to a "sense of place"

Limitations:

Challenges public perception of roadway aesthetic



Findings/Recommendation

- Political will & end-user buy-in
- Life cycle cost does not equal construction cost
- Design to local environmental conditions
- Address solutions comprehensively with community buy-in
- Guidance on planning, design, construction & maintenance
 - Formatted as traditional construction specifications
- Separate landscape construction contract
- Adequate supervision of landscape construction
- Work with seed industry on developing adequate supply
- Develop and promote program for adjacent land owner seed collection
- Monitor and assess BMP/Protocol performance





WASHINGTON CONNECTED LANDSCAPES PROJECT: STATEWIDE ANALYSIS



WASHINGTON WILDLIFE HABITAT CONNECTIVITY
WORKING GROUP

DECEMBER 2010

Final statewide habitat connectivity analysis from the Washington Habitat Connectivity Working Group

















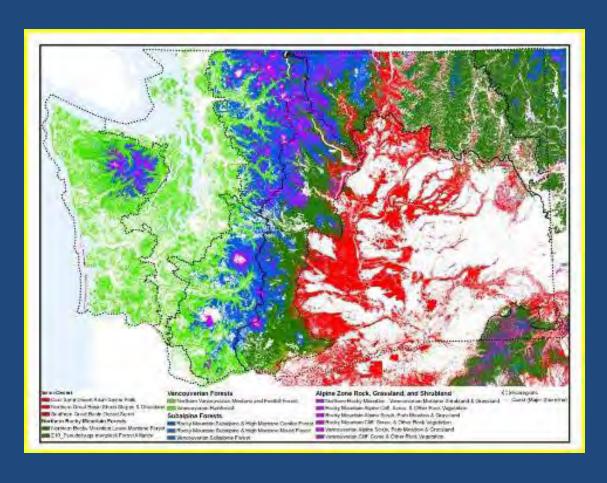


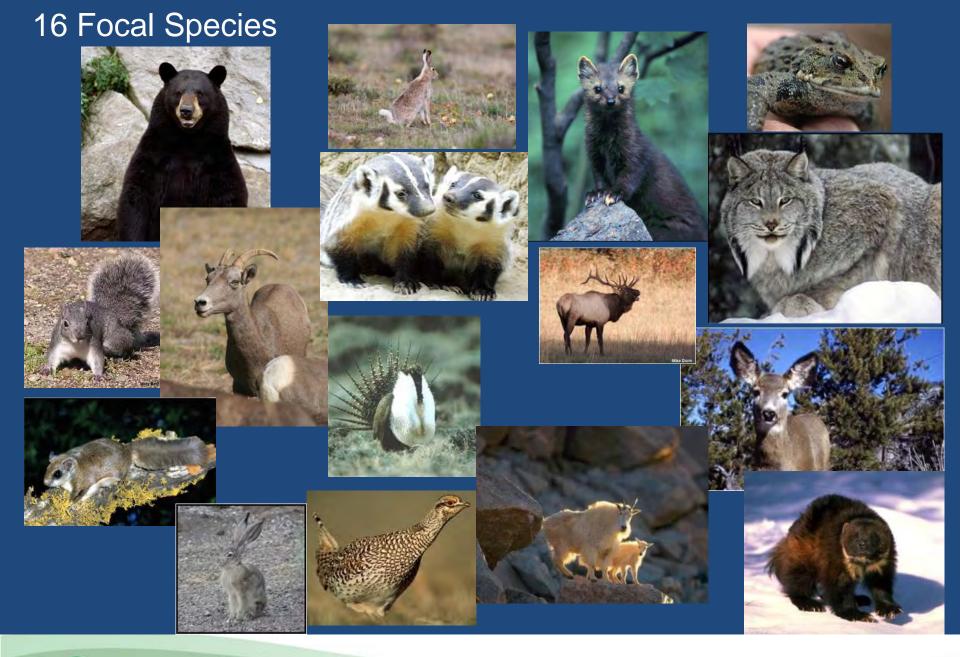


Cover photo, elk in meadow. © Rich Watson

National vegetation classification standard: Five major vegetation associations

Vancouverian Forests
Rocky Mountain Forests
Semi-Arid communities
Subalpine communities
Alpine communities



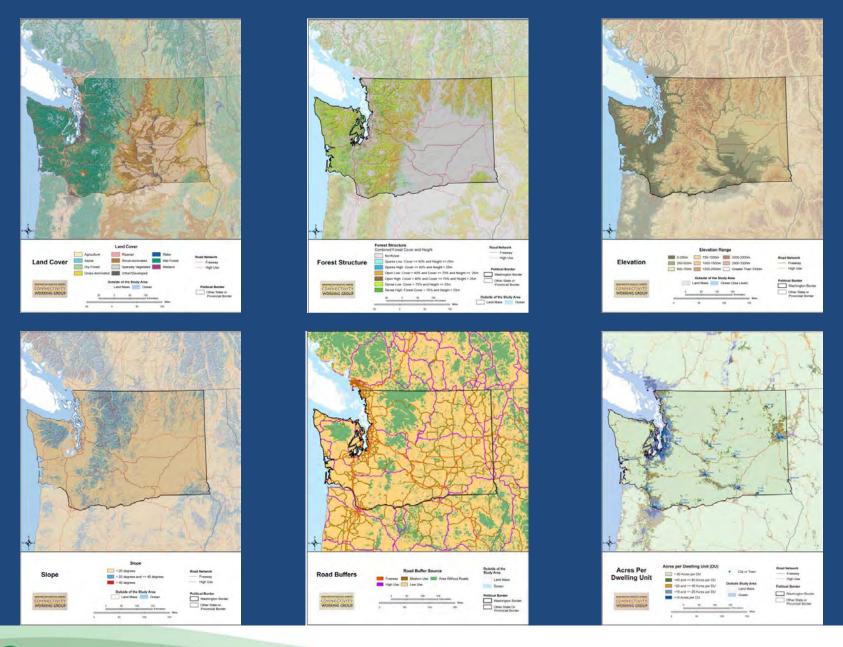


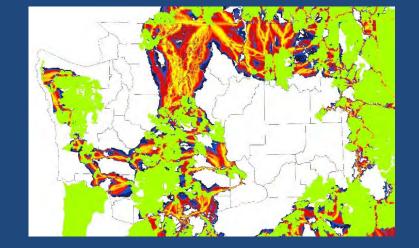
Landscape integrity approach

Focuses on the stage, not the actors

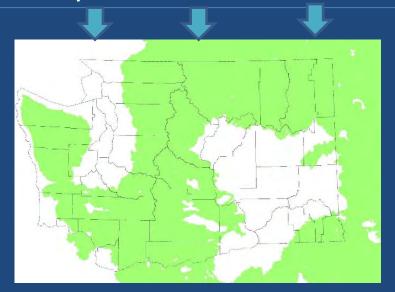




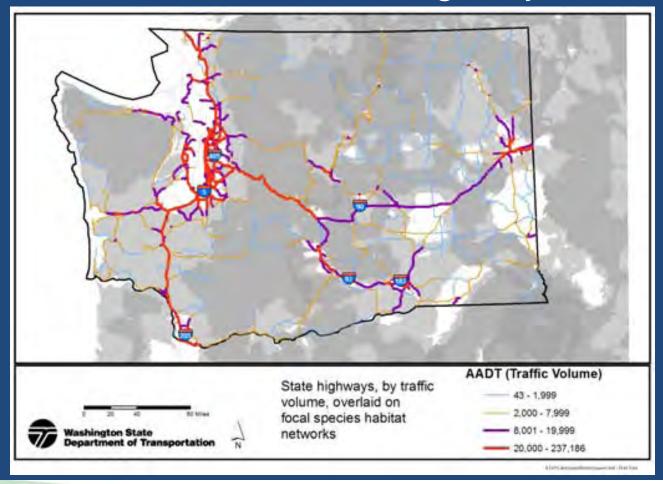




Core habitat (green) and linkages (yellows ,reds, & blues) combine to produce a connected habitat network



Habitat networks & highways



Landscape analysis in early planning – green infrastructure

The Götaland line example





Henrik Wahlman Environmental specialist, ecology Jönköping, Sweden





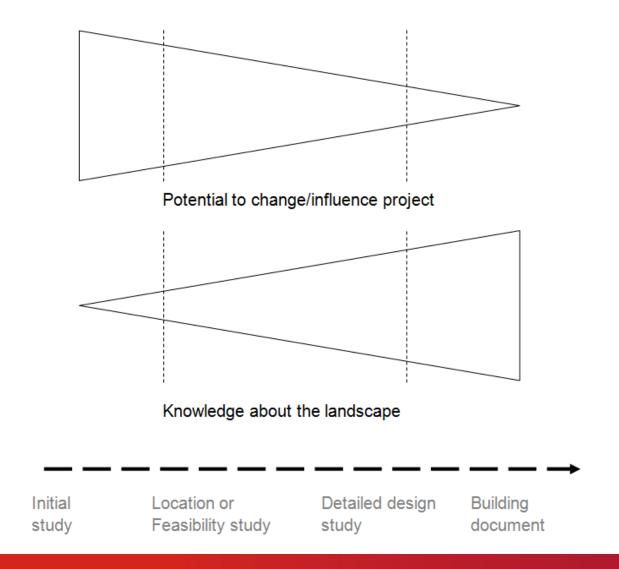


The Gotaland line in Sweden

- Connecting Stockholm –Gothenburg with a new, high speed railroad
- Several separate projects.
- We studied the major part, 230 km Linköping-Borås
- Estimated cost (15 billion USD)
- Top speed 250 km/h (320 km/h)
- Initial study phase (geography barely set)



Road- and railroad-planning thus far...



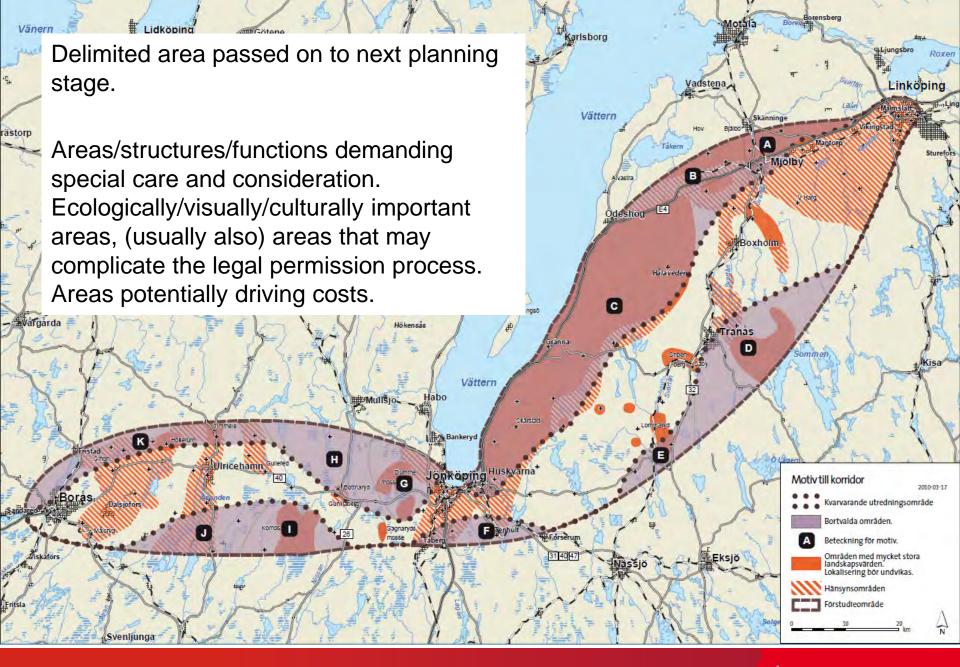
- Knowledge too late!
- Small potential to change the planned project
- Based on knowledge about legally protected objects/areas

Process questions:

- Where should the line NOT go?
- Areas that demands more detailed investigations?
- Different landscape sensitivities?



The aim was to create a common decision base material for both cultural, visual and ecological considerations



Landscape character assessment, a process

Aim: Deconstruct the landscape and find manageable and common characters.

- Characters can be evaluated against the railway and give understanding of what consequences a railway might give.
- Broad scale, cross-disciplinary. We did it in a Team with several experts.(natural, cultural, visual and others)
- Starts in the FIELD! Get your team out!
- Iterative process
- LCA is coupled with deeper thematic studies



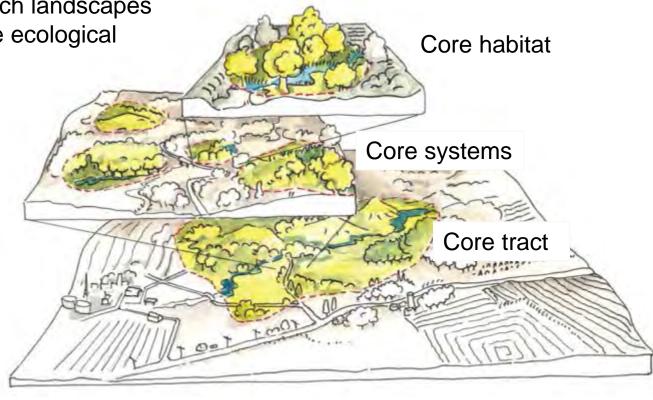
Green infrastructure: What did we do?

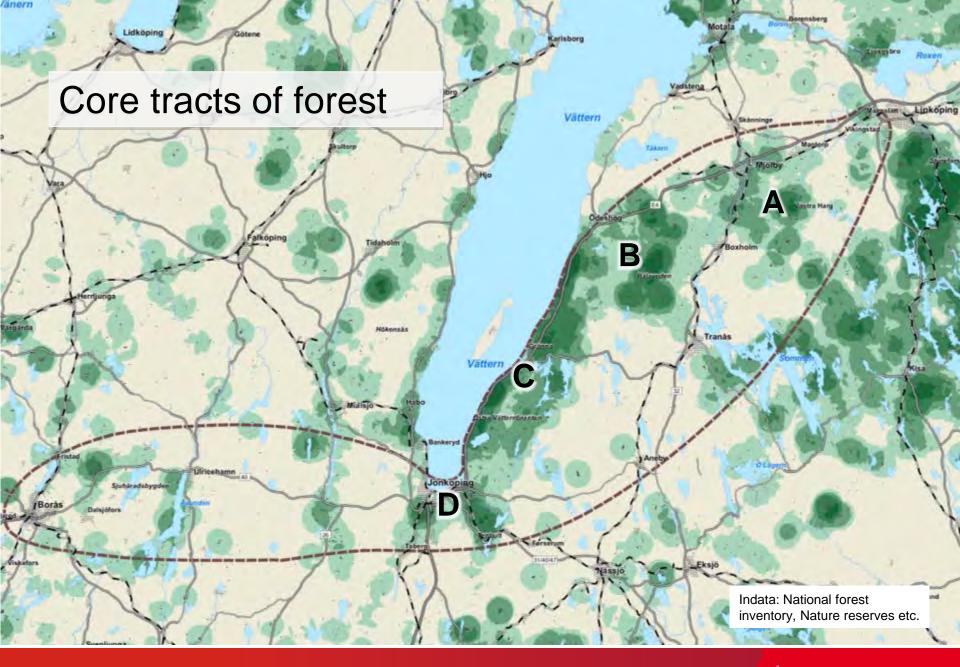
GIS-based analysis on existing data

Analysis of ecosystem functionality

 Identify biologically rich landscapes as well as large scale ecological

functions

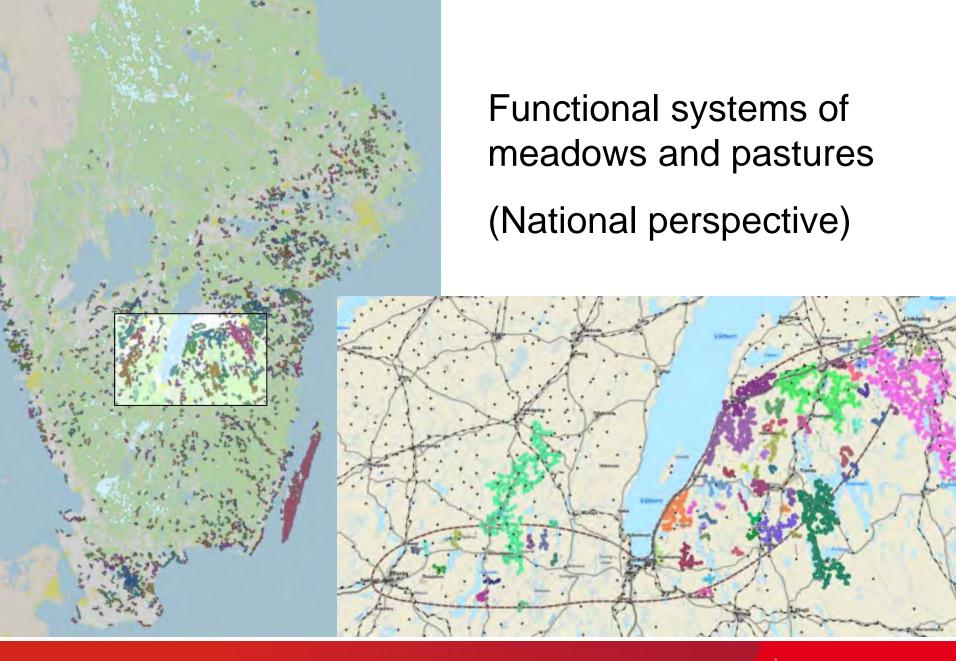


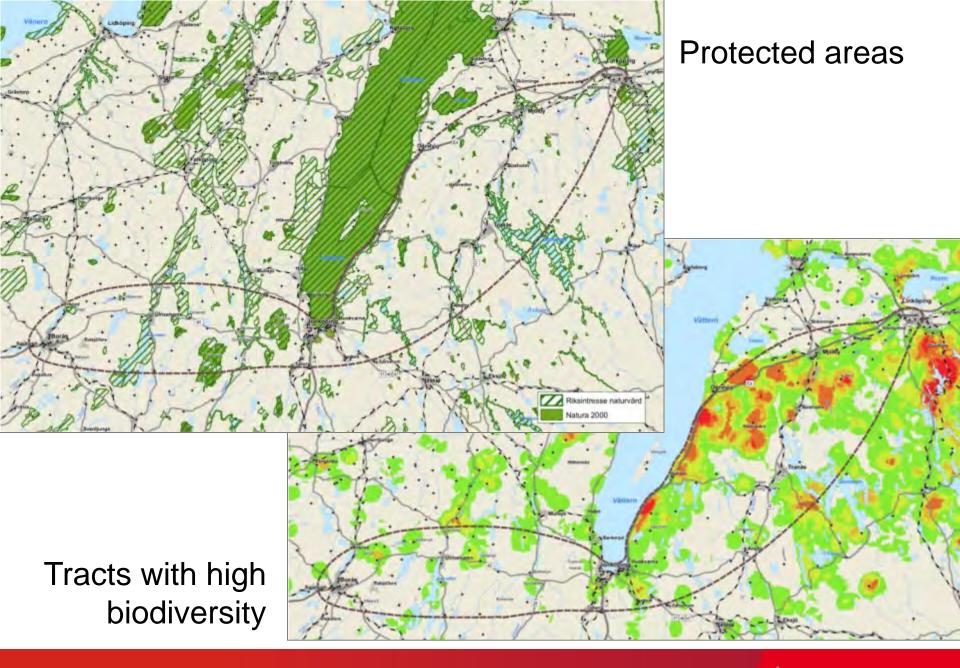


Core systems – Analyzing functional connections

- Key species are selected (relevant scale, knowledge about biology/ecology)
- Based on threshold values for these species:
 - Least area
 - Dispersal distance
 - Least number of core habitats
 - Least total area of core habitats







Conclusions

- The legal permitting process has to stop focusing on whether biodiversity hotspots are protected by legislation or not.
- •With analysis on the landscape level early on, high value areas and systems can be avoided.
- Areas or objects with high conservational/biological value that cannot be avoided can be highlighted and more in depth analysis on how to handle them can start early in the next planning phase, avoiding future bottlenecks.
- Cross-disciplinary approach can balance natural, cultural and visual aspects against each other. Reduces potential conflicts between fields of expertise later in the process and gives a better knowledge base. Was very well received by the public, NGOs and the permitting agencies and authorities. And it is FUN!
- Knowing the landscape early on makes it possible to influence budget, alignment and modeling.