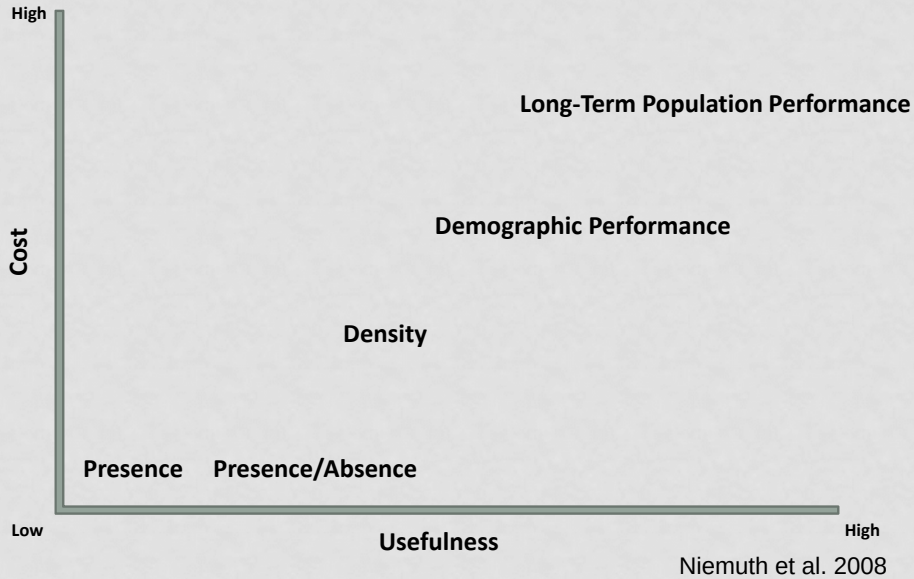
Modeling Approaches for Landscape Conservation in Region 6

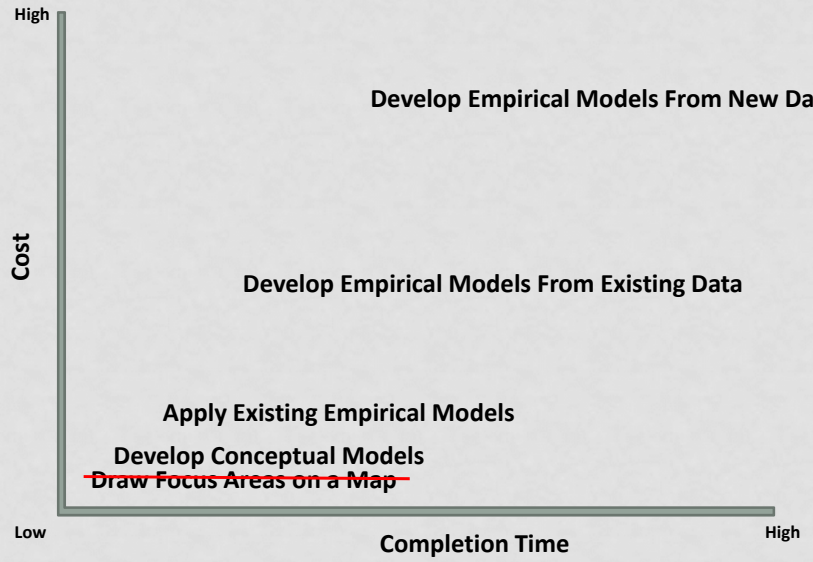
ARCGIS MODELBUILDER APPLICATIONS

Different Model Types



Niemuth et al. 2008

Model Development



Conceptual Models: Mallard Breeding Pairs

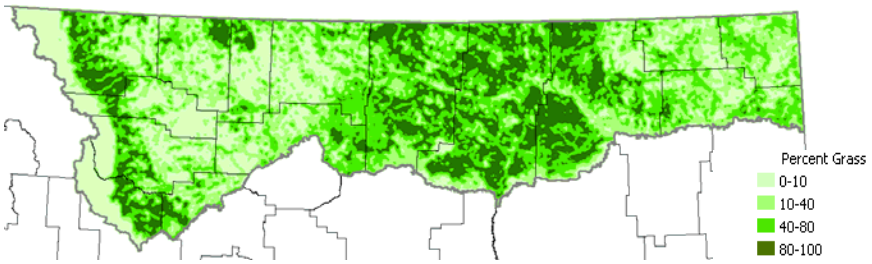
$$PAIRS = f(WETLAND\ FREQUENCY * PERENNIAL\ COVER)$$

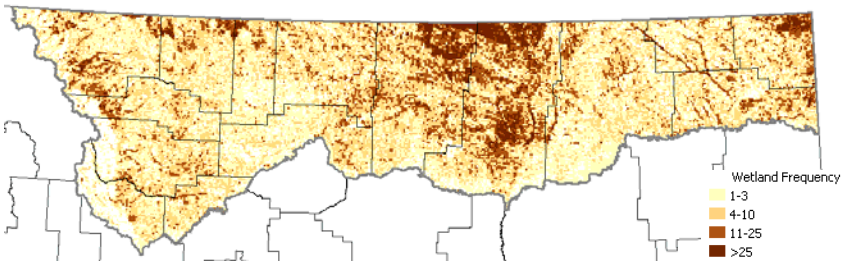
- Perennial nesting cover - Northwest Region GAP Landcover classes

  Northwestern Great Plains Mixedgrass Prairie
  Northwestern Great Plains Shrubland
  Great Plains Sagebrush Steppe
  Northern Rocky Mountain Lower Montane, Foothill and Valley Plateau Grassland
  Western Great Plains Sand Prairie
  Pasture/Hay
  Introduced Upland Vegetation - Annual and Biennial Forbland
  Introduced Upland Vegetation - Perennial Grassland and Forbland
  Recently Burned Shrubland
  Recently Burned Grassland

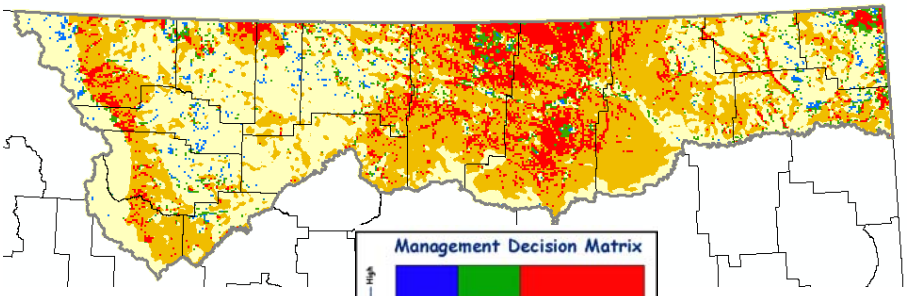
- Wetland frequency –Wetland Basins derived from NWI

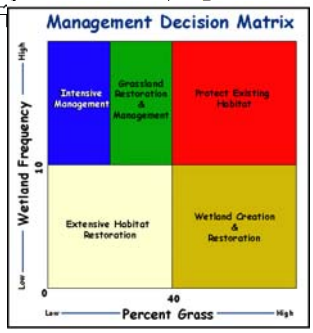
Conceptual Models: Mallard Breeding Pairs





Conceptual Models: Mallard Breeding Pairs





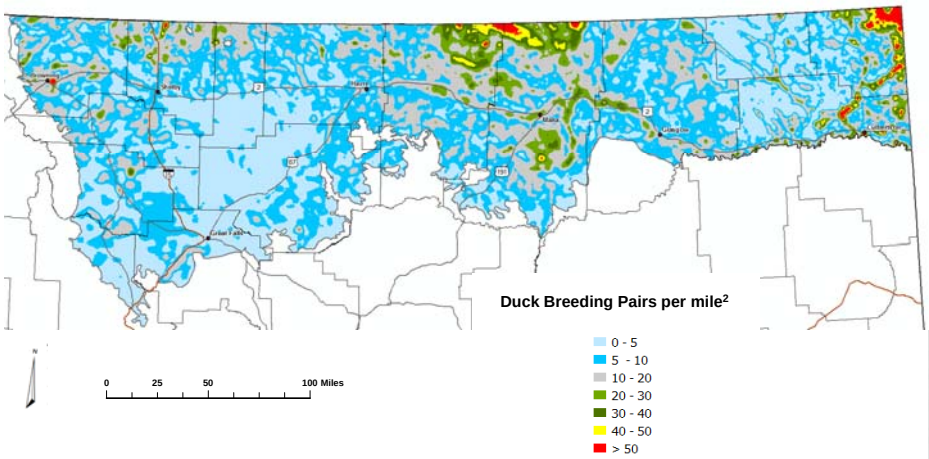
Applications:
PFW Strategic Plan
NAWCA Grants
Bowdoin CCP

Ringleman et al. 2005

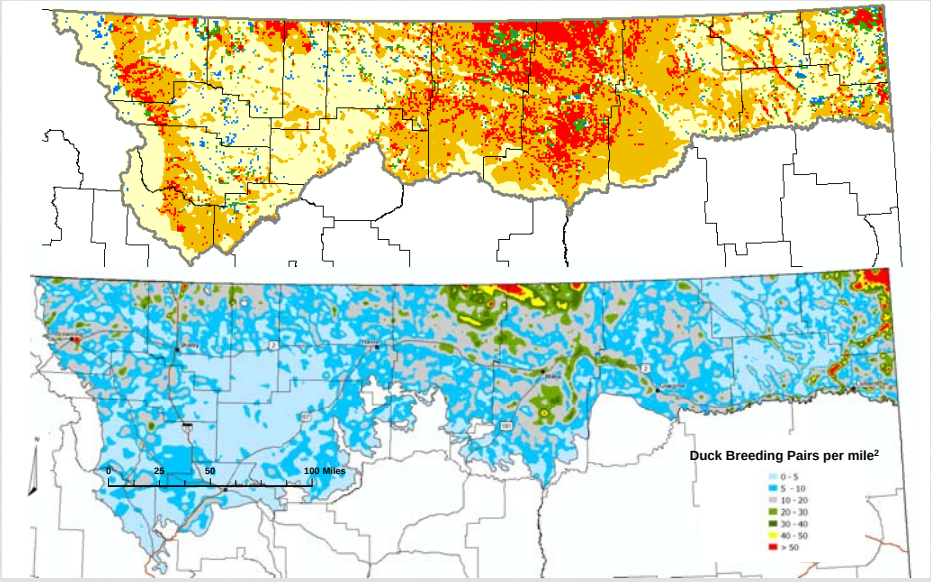
Conceptual Models

- PROs
  - Low monetary cost
  - Relatively low time investment
  - Potentially very useful
  - Generally precursors to empirical models
- CONs
  - Difficult to assess biological outcomes
  - Can be difficult to validate
- OTHER EXAMPLES IN REGION 6
  - MT PFW Grizzly Bear Mortality
  - PIF Grassland Bird Conservation Areas (GBCA)
  - Blackfoot Breeding Trumpeter Swan

Empirical Models: Mallard Breeding Pair Density

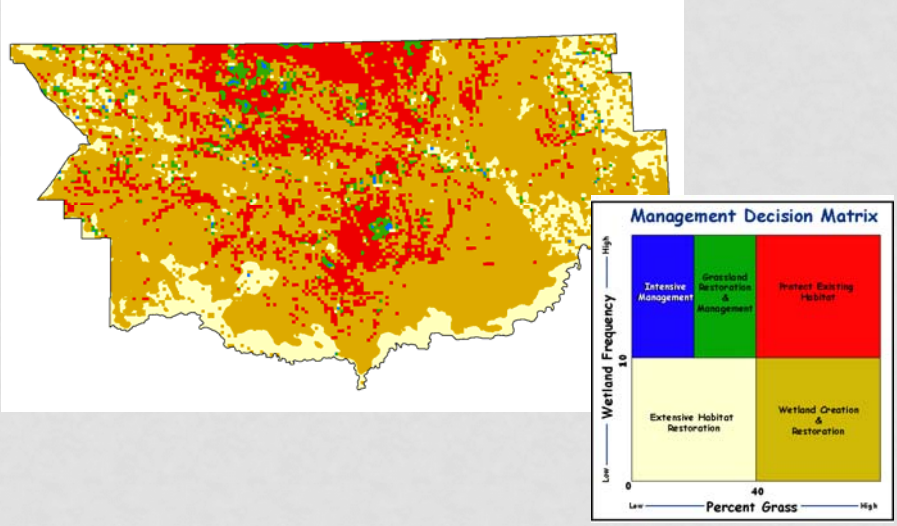


Empirical vs. Conceptual Models

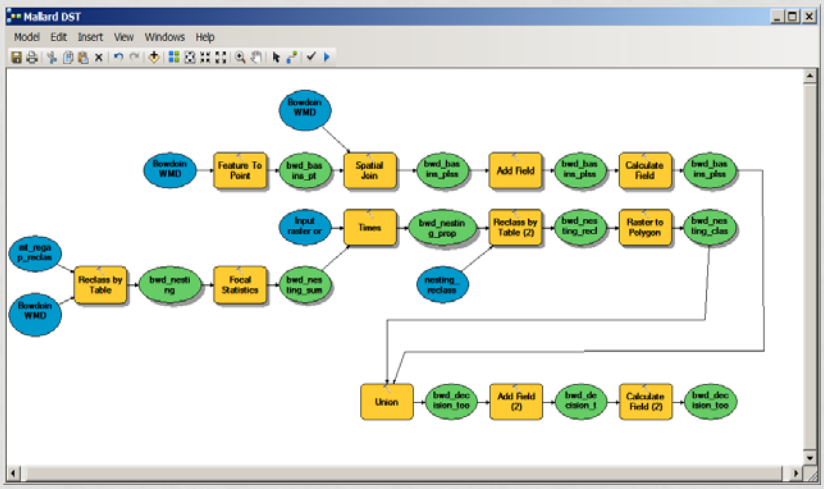


ModelBuilder Exercise

A Decision Support Tool for Breeding Mallard Management



ModelBuilder Exercise



ModelBuilder Exercise

Objectives:

- **Use ModelBuilder to build a conceptual model**
- **Calculate fields using logic with VB script**
- **Create decision support map guiding conservation actions**

Citations

Ringelman, James K., D.Casey, K. J. Forman, D.A. Granfors, R. R. Johnson, C.A. Lively, D.E. Naugle, N.D. Niemuth, and R.E. Reynolds. 2005. ***PPJV 2005 Implementation Plan***.

Niemuth, N.D., R.E .Reynolds, D.A. Granfors, R.R. Johnson, B. Wangler, and M.E.Estey. 2008. ***Models for Planning Wildlife Conservation in Large Landscapes***,. P 533-560 in J. J. Millspaugh and F. R. Thompson. Elsevier Science.