



Streamlining Sage-Grouse Environmental Regulation through a GIS enabled Web Application

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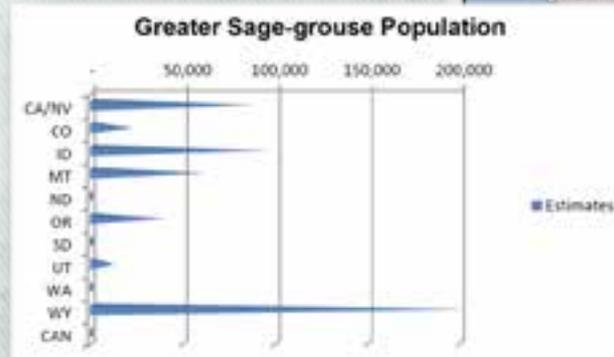
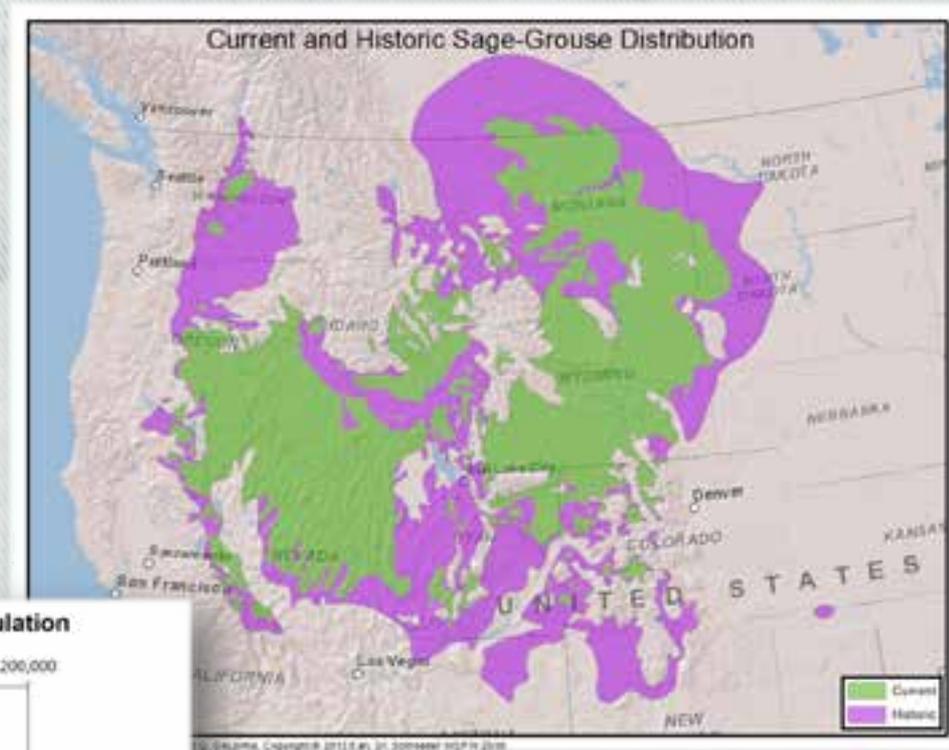
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Sage-Grouse Background: Plight of the Greater Sage-Grouse (*Centrocercus urophasianus*)

- Historical populations – 1.6M to 16M
 - Declines in the 1920's and 1930's attributed to hunting
 - Declines in the 1960s and 1970s attributed to loss of habitat
 - Declines have slowed since 1985
- In 2000, USFWS estimated between 100,000 and 500,000
- Currently occupying approximately percent of their historical range



Greater Sage-grouse Conservation Primer
Series Primer # 1

Sage-Grouse Background: Managing Greater Sage-Grouse Habitat

Sage-Grouse Habitat Characteristics

- Depend on a variety of shrub-steppe habitats throughout life cycle
- Very little sagebrush within range remains undisturbed or unaltered
- Sagebrush is long lived (up to 150 years)
- Sagebrush is difficult to restore

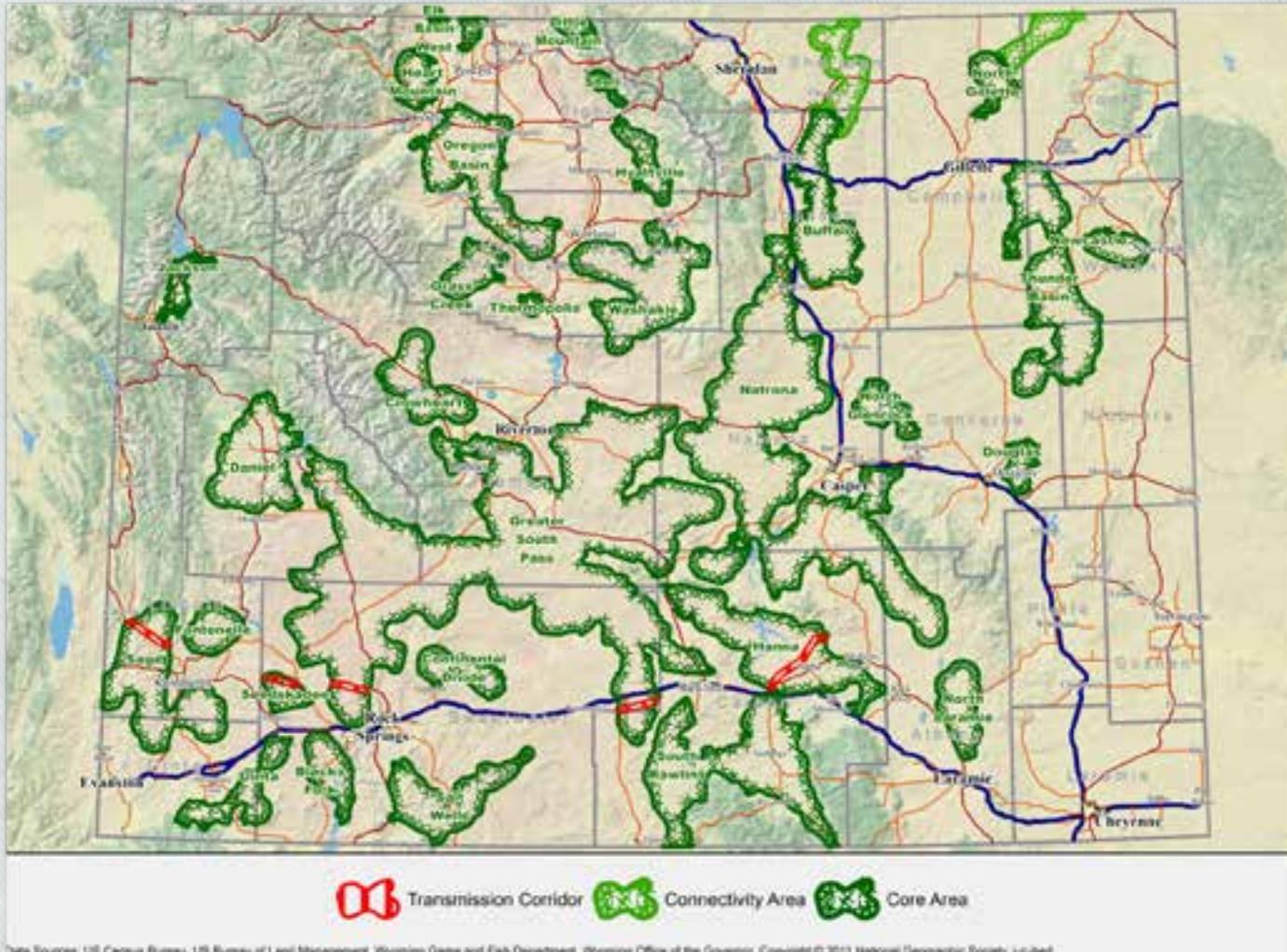


Core Area Strategy Background:

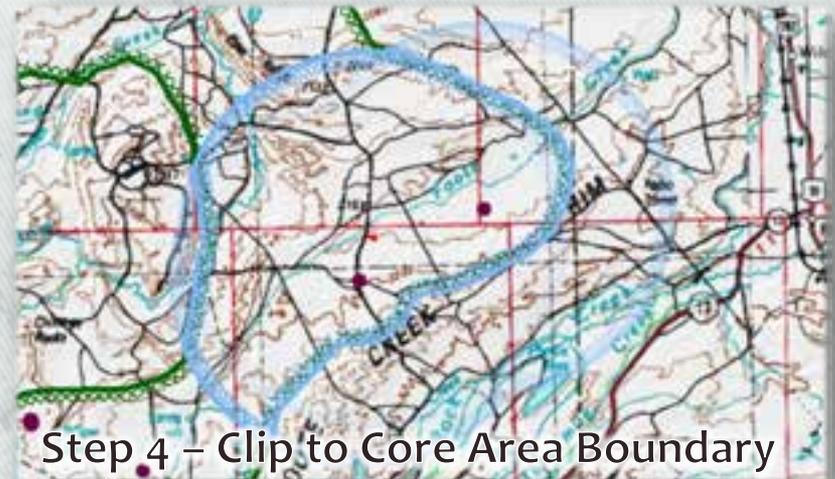
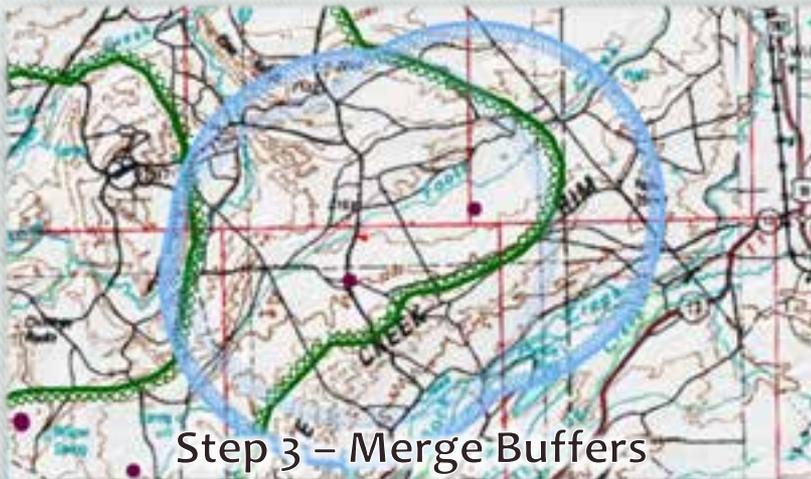
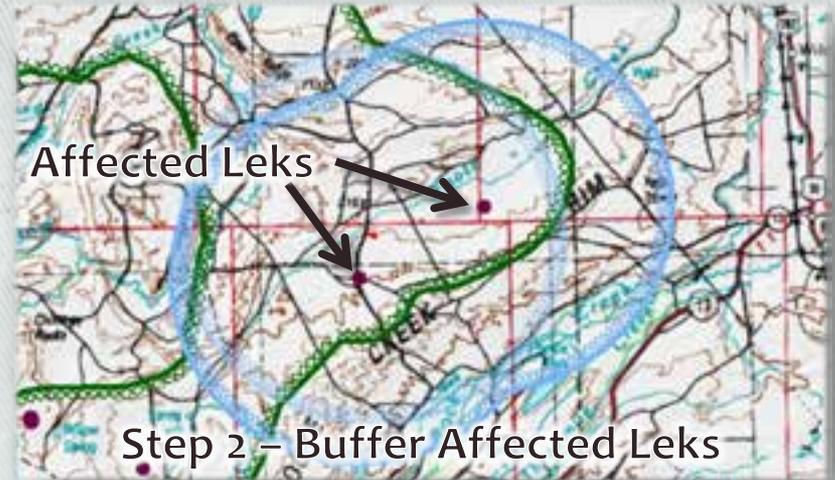
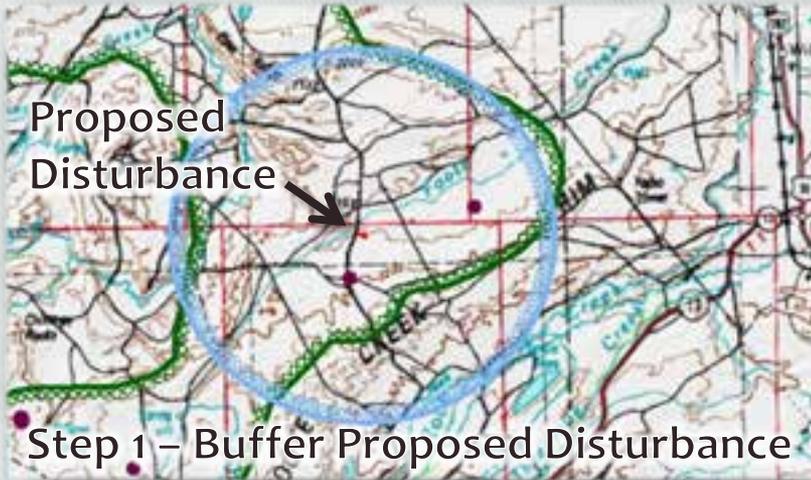
What is a “Core Area Strategy”?

- Establish core population areas
- Limit development in core population areas to defined thresholds
 - Establish Limits
 - 5% Disturbance averaged over the affected area
 - 1 disruption per 640 acres averaged over the affected area
- Determine and evaluate affected area for thresholds
 - Determine affected area
 - 4 mile buffer from proposed project perimeter
 - Subsequent 4 mile buffer around occupied core area leks within initial 4 mile buffer
 - Clip to core area

Core Area Strategy Background: Core Population Areas



Core Area Strategy Background: Create the Assessment Area



Use of GIS with the Core Area Strategy:

History of GIS use in the Core Area Strategy

- June 2010
 - Creation of Project Impact Analysis Area (PIAA)
 - ArcGIS 9.3 Model (BLM)
- June 2011
 - Creation of Desktop Density and Disturbance Calculation Tool (DDCT)
 - ArcGIS 10 Python Script (WyGISC)
- July 2012
 - Creation of an online DDCT web application
 - Creation of a DDCT Data and Application Steward position

Use of GIS with the Core Area Strategy: Challenges of Implementation

- Core Areas cover 25% of the state (25,000 sq. Miles or 63,300 sq. km)
- Every project in core areas are required to run a DDCT
- Complicated analysis
 - Boundary
 - Disturbance
 - Disruption
- No statewide disturbance layer
- No centralized QA/QC
- Each project is done individually

Use of GIS with the Core Area Strategy: Desktop Technology Challenges

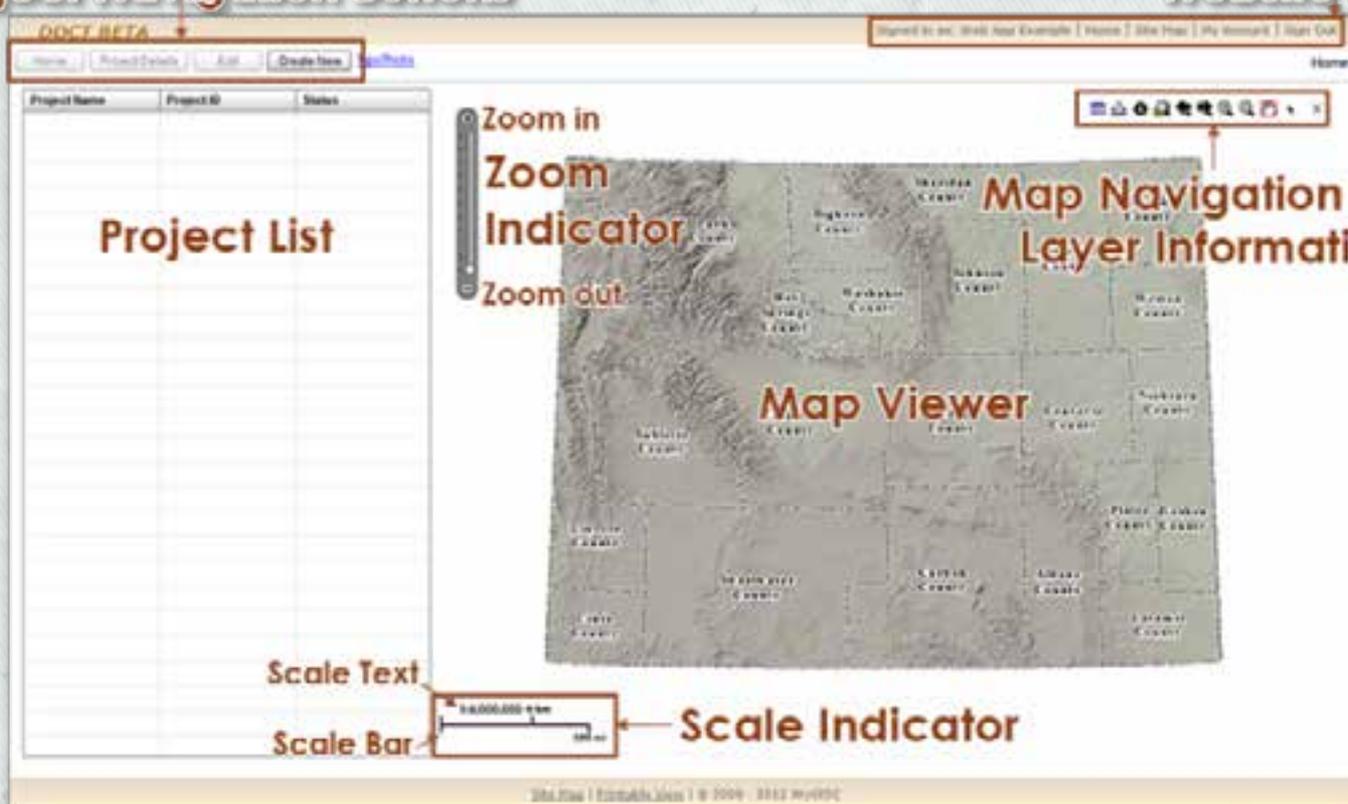
- Desktop Model Requires ArcInfo License Level to Run
 - High Learning Curve
 - High Cost
- Each User Creates Their Own Disturbance
 - Not Shared
 - No Centralized QA/QC

Streamlining the DDCT process

- Creation of an online DDCT web application
- Creation of a DDCT Data and Application Steward position

Project Navigation Buttons

Website Links

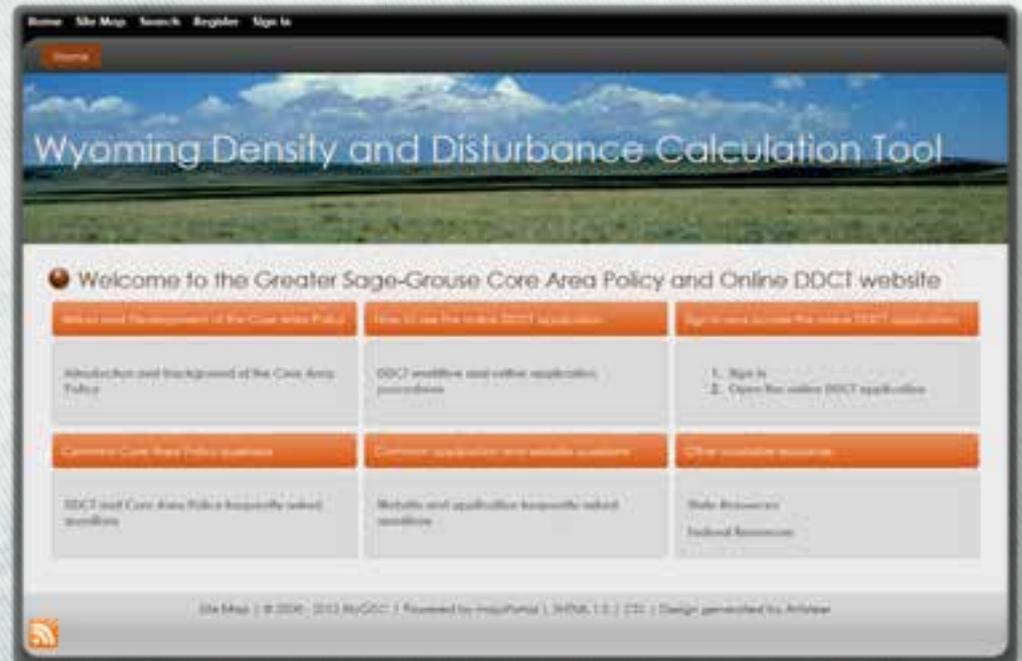


Streamlining the DDCT process: Web Application System Characteristics

- Website
 - Hosted by the University of Wyoming
 - Free Content Management System
 - User Registration and Login
- Web Application
 - Built with Adobe Flash Builder 4.5
 - Using ArcGIS API for Flex 2.5
 - Running on ArcGIS Server 10.0

Streamlining the DDCT process: Advantages of a Web Based Application

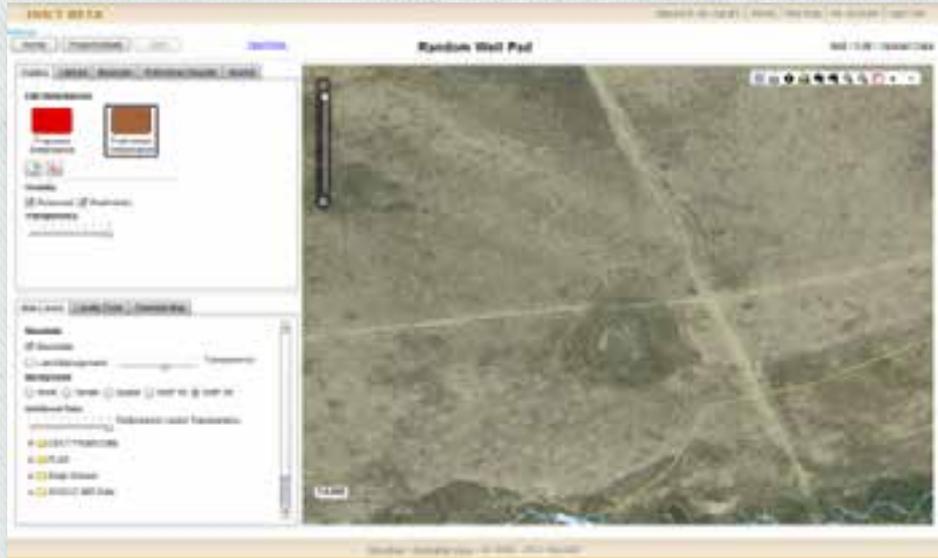
- Centralized Location and QA/QC
- Free / Reduced Cost
- Reduced Data Requirements / Common Base Data
- Statewide Disturbance and Disruption Layer
- Wider User Base



Streamlining Challenge: Data Confidentiality

- Proponents need confidentiality for proposed projects
 - Website requires registration
 - Application data filtering
 - User Roles
 - Proponent
 - Technical Review – Assigned by the Data and Application Steward
 - Policy Review – Assigned by the Data and Application Steward

Streamlining Challenge: Web Editing



Streamlining Challenge: Integrating Existing GIS Data

- Upload Shapefile
 - Large data transfers
 - Attributes vary
 - Feature integrity
 - Consistent accuracy scale
- Uploading AutoCAD
 - Integrate AutoCAD into Geodatabase
 - Projection
- Documentation
 - Provide more information about needed inputs

Streamlining Challenge: Web Services and Performance

- Limiting factors
 - Large amounts of data
 - Return time for results
- Increasing the limits
 - Speeding up analysis
 - Scaling ArcGIS Server Services

Streamlining Advantage and Challenge: Wider User Base

- Bringing GIS to new people
- Reduce software and data cost
 - Advantage
 - Disadvantage
- Reduce cost of training (simple)
 - Allows less technical knowledge
 - More time helping
- Statewide layer will reduce time for proponent
- Consistent model

Future Development

- Continue to add data to review process
- Refine documentation and provide further training
- Add new and historic imagery
- New and enhanced features on the web application
- Keep application current with evolving software
- Work with the Wyoming Sage-Grouse Implementation Team to keep up with new scientific developments

Wyoming Density and Disturbance Calculation Tool

Thank you.
Questions?

DDCT.WyGISC.org

