Gunnison Sage-grouse Habitat Prioritization Tool			
Total Acres	>= 15 score area	>= 15 score % of total	Description
592,303	348,720	59%	Occupied habitat in Gun/Sag Counties minus City of Gunnison/landfill
416,881	257,443	62%	Public land (70% of total and 74% of >= 15 area)
132,208	66,403	50%	Private land in Gunnison County
41,835	24,268	58%	Private land in Saguache County
NA	56,405	NA	90% of all >= 15 area minus >= 15 area on public land
NA	41,308	NA	56,405 times proportional amount of >= 15 in Gunnison County
NA	15,097	NA	56,405 times proportional amount of >= 15 in Saguache County
99,479	47,130	47%	Gunnisn County private land without conservation easement
41,835	24,268	58%	Saguache County private land without conservation easement
30,037	17,339	58%	Private land with conservation easement in Gunnison County
2,031	492	24%	Private land with conservation easement in Saguache County
68,540	37,671	55%	Gunco private without CE, > 70 ac parcels assessed agr. or vacant
12,941	3,233	25%	Private land without CE within Gunnison 3 mile outside City limits

Gunnison Sage-grouse Habitat Prioritization
Analysis Details

The below listed information was incorporated into a spatial model to evaluate habitat within the Gunnsion Basin for Gunnison sage-grouse. The spatial model in itself can only be used on a broad scale for planning and rough habitat assessment. Projects and development will still need to be evaluated with an onsite assessment on a project-by-project basis. This model has been developed through collaborative efforts of Gunnison County, US Fish and Wildlife Service (FWS), Bureau of Land Management (BLM), US Forest Service (USFS), Colorado Parks and Wildlife (CPW), National Park Service (NPS), Natural Resources Conservation Service (NRCS), and interested stakeholders. This Tool/Model incorporates the most recent information as provided by agency input from those working on the ground through numerous meetings and hours of discussion about data layers that provide the best representation of current on the ground conditions in the Gunnison Basin.

High priority habitat consists of all habitat layers and all uncontrollable threat layers. Controllable and other impacts can be changed or adjusted to decrease the impact on grouse habitat.

HABITAT

Lek 0.6 mile buffer and average high male count for active leks: The official lek status and high male count are defined and reported from lekking data collected and published by CPW in their annual Gunnison Basin Lek Count Summary and Population Estimate. The Official Status of a lek is given as a cumulative status and designated as Active, Historic, Inactive, or Unknown. To be Officially Active, a lek only needs to be designated as Active in the current year. A lek is not considered Officially Inactive unless it has been seasonally Inactive for five consecutive years. Thus, a lek might not have any birds for a given season, but its official status may be Unknown because the lek had not been Inactive all of the past five years. Historical lek status is not given until a lek has been Inactive for 10 consecutive years. (Jackson and Seward, 2011)

- **Geospatial Data:** This layer is the CPW lek polygon layer and includes a 0.6 mile buffer from the outside edge of the lek polygon with spatial boundaries from the 2011 update as well as the Official Status from 2011. Buffering the lek polygons by 0.6 miles matches up with the disturbance guidelines in the Rangewide Conservation Plan. This 0.6 mile buffer serves as a measure of protection to insure that the entire lek polygon is captured within the buffer polygon and that potential direct or indirect impacts directly adjacent to a lek that could influence lekking behavior are evaluated.

- **Evaluation class breaks (weight) justification:** Leks are considered the most important habitat for the grouse. Habitat alteration on or near a lek has the potential to have the greatest impact to the population. There is a need to conserve all leks, regardless of the number of birds displaying on the lek. (Aldridge, 2011b; Phillips, 2011)

- Officially Active (15) *Active leks are those of greatest value to the grouse population. Birds are displaying regularly on an annual basis.*
- Officially Unknown (10) *These leks could have and Official Status of unknown for many reasons, including missing count data. Leks can fall into this category in a one year time frame.*
- Officially Inactive (8) *These leks should not be completely discounted. There is potential for the grouse to comeback and begin using these areas on a regular basis if numbers increase or surrounding habitat improves. It takes 5 years for a lek to move into this category.*
- Officially Historic (1) *The majority of these leks are close to high build-out densities and will probably never be able to recover to active status regularly.*

- **Data for support:**
  - 2011 Gunnsion Basin Gunnison Sage-grouse Lek Count Summary and Population Estimate Final Report (Jackson and Seward 2011).
  - 2011. Seward, Nate. Lek Status Definitions.
  - 2011b. Aldridge, Cam. Public meeting information, December 1, 2011. Meeting to validate the priority tool model called by the Technical Subcommittee for the Gunnison Basin Strategic Committee for the Gunnison Sage-grouse.
  - 2011. Phillips, Mike. Public meeting information, December 1, 2011. Meeting to validate the priority tool model called by the Technical Subcommittee for the Gunnison Basin Strategic Committee for the Gunnison Sage-grouse.

- **Area for improvement:**
  - The Local Annual Report definitions do not align with the RCP or current Statewide definitions for Official Status as defined by Colorado Parks and Wildlife. Local CPW staff has maintained consistency in local definitions and is working to align them with the RCP and Statewide definitions.

- **Updated:** This layer will be updated on a yearly basis.

Brood rearing habitat: Brood rearing habitat is defined in the RCP. It includes mesic areas (swales, meadows, sagebrush near irrigation ditches and irrigated meadows) with lush vegetation. This layer is intended to capture priority habitat as defined in the RCP.

- **Geospatial Data:** Four spatial layers were combined to create this layer—NRCS mapped alluvial soils minus irrigated meadows, CPW streams, and wet meadow/sagebrush interface areas. A 50m buffer was placed around the streams and the wet meadow/sagebrush interface layer (RCP 2005). Areas were not double-counted where overlap occurred and areas where mesic sites were greater than 50m from the sagebrush.

- **Evaluation class breaks (weight) justification:**
  - Present (13)

- **Data for support:**
  - RCP

- **Area for improvement:**
    - Updated NRCS soils mapping and range site mapping for alluvial and riparian sites. *(Not possible in current timeframe, but progress has begun on this endeavor.)*
    - Removal of any brood rearing habitat from forested areas.
    - There is a need to add other features including springs and seeps that are not captured in the current data layers.

- **Updated:** This layer will be updated if new and better data becomes available.

Nesting/summer/late fall habitat: These habitats are defined in the RCP. It includes sagebrush dominated areas. This layer is trying to capture priority habitat as defined in the RCP.

- **Geospatial Data:** This data layer was compiled from NRCS soils data and includes all sagebrush dominated range sites (mountain loam, subalpine loam, mountain outwash, and deep clay loam). Soils included from the Gunnison Soil Survey (CO662) are: CeC, CoE, CuE, DeB, DoE, GeB, GeE, JeE, KvE, LeE, MoE, MrE, PwE, RcE, SuE, YgE, YlE, YpE, EvD and the NE (331 to 149 degrees) aspects of CrE, DrE, DsE, KcE, LhF, PhF, PmF, and MrE. Soils included from the Grand Mesa-West Elk Soil Survey (CO660) are: 107, 138, 139, 142, 165, 172, 191 and the NE aspects of 153. Soils included from the Cochetopa Area Soil Survey (CO663) are: 103, 104, 108, 111, 119, 121, 122, 131, 132, 133, 134, 141, 142 and the NE aspects of 110.

- **Evaluation class breaks (weight) justification:** As we looked at the map we decided to differentiate nesting habitats. We thought it would provide important additional information to give nesting habitat closer to the brood rearing habitat a higher score. Sage grouse hens have to be able to move their broods from the nests to brood rearing habitat by walking. All nesting habitat is of value, but nesting habitat closer to brood rearing habitat has potential to be of higher benefit. Disjunction of brood rearing habitat from nesting habitat results in habitat fragmentation and possibly the loss of usability. It is recognized that In order to capture most of the nesting locations, one would have to have to account for all nesting habitat within 4 miles of a lek (Connelly et al 2000, Aldridge 2011b)- which is all nesting habitat in the basin.
    - Present <1500 ft from brood rearing habitat (15)
    - Present >1500 ft from brood rearing habitat (10)

- **Data for support:**
    - RCP
    - NRCS Soil Survey
    - 2011b. Aldridge, Cam. Public meeting information, December 1, 2011. Meeting to validate the priority tool model called by the Technical Subcommittee for the Gunnison Basin Strategic Committee for the Gunnison Sage-grouse.
    - Connelly et. al 2000

- **Area for improvement:**
    - Updated NRCS soils mapping and range site mapping. *(Not possible in current timeframe, but progress has begun on this endeavor.)*

- **Updated:** This layer will be updated if new and better data becomes available.

Winter habitat: This habitat is defined in the RCP. It includes sagebrush dominated areas with both thermal cover and exposed sagebrush for winter use. This layer is intended to capture priority habitat as defined in the RCP.

- **Geospatial Data:** Winter habitat was modeled using the dry mountain loam soils from NRCS Soil Survey mapping layers. Dry mountain loam sites are mapped on SE to NW (150-330 degrees) facing slopes. A 10m DEM was used in the slope analysis and boundaries were then smoothed to reduce the pixelation. Soils included from the Gunnison Soil Survey (CO662) are: CrE, DrE, DsE, KcE, LhF, PhF, PmF, and MrE. Soils included from the Grand Mesa-West Elk Soil Survey (CO660) are: 153. Soils included from the Cochetopa Area Soil Survey (CO663) are: 110, and 130.

- **Evaluation class breaks (weight) justification:** Winter habitat was considered to be of lesser importance than the other habitat types for the grouse. In general, winter mortality of the Gunnison sage-grouse is low (Phillips, 2011)
    - Present (10)

- **Data for support:**
    - RCP
    - NRCS Soil Survey/ Web Soil Survey
    - 2011. Phillips, Mike. Public meeting information, December 1, 2011. Meeting to validate the priority tool model called by the Technical Subcommittee for the Gunnison Basin Strategic Committee for the Gunnison Sage-grouse.

- **Area for improvement:**
    - Updated NRCS soils mapping and range site mapping. *(Not possible in current timeframe, but progress has begun on this endeavor.)*

- **Updated:** This layer will be updated if new and better data becomes available.

Habitat status: The habitat status has been defined from the RCP and incorporates many researchers' and managers' expert knowledge of the current and historic distribution of the grouse. The occupied habitat layer will serve as this tool's boundary for grouse habitat evaluation. Potential and vacant/unknown habitats are not included in scoring because of lack of habitat and geospatial data. Vacant/Unknown habitat is apparent high quality habitat without birds. Potential habitat would require a significant amount of time, energy and resources to create to a habitat of sufficient quality that could be colonized by grouse, due to the large amount of forested acres. There are areas within the CPW mapped occupied habitat layer that are unusable to grouse and have been removed. These areas include within the landfill boundary, the UMTRA site, open water areas, and some gravel pits.

- **Geospatial Data:** The original occupied habitat with polygons delineated by the CPW/USFWS is defined in the RCP. The current occupied habitat boundary is an updated version from May 2011 by CPW staff based on field observations. The 2011 spatial layer was incorporated into the tool.

- **Evaluation class breaks (weight) justification:**

- Occupied (0) *Occupied habitat was not actually scored. It was used as the outer boundary for the prioritization tool.*

- **Data for support:**
  - RCP (page 32-40)
  - Schroeder et al. 2004
  - CPW - Species Activity Mapping Data

- **Area for improvement:**
  - Potential and vacant/unknown habitats are not included in scoring because of lack of habitat and geospatial data.

- **Updated:** When revisions to the occupied habitat boundary occur, alterations and updates to this tool will be needed.

Land near active leks: Land near active leks is considered a higher priority for preservation. Leks are often in close proximity to quality nesting habitat. (Connelly et al. 2000; Aldridge et al. 2011) The Local Gunnison Sage Grouse Conservation Plan notes that these areas are priority areas used by nesting hens (1997).

- **Geospatial Data:** A two mile buffer was placed around the outer edge of the lek polygon layer. Both the area within the 2 mile buffer and the lek itself were included in this layer. The two mile buffer is from the Gunnison Sage Grouse Conservation Plan (1997).

- **Evaluation class breaks (weight) justification:**
  - Areas within active leks and <2 miles from the edge of the active leks (5)

- **Data for support:**
  - Connelly, J.W., M.A. Schroeder, A.R. Sands and C.E. Braun. 2000. Guidelines to manage sage grouse populations and their habitat. Wildlife Society Bulletin 28:967-985.
  - Aldridge et al. 2011
  - Gunnsion Sage Grouse Conservation Plan; Gunnsion Basin- Colorado. 1997. Local species management plan.

- **Area for improvement:**

- **Updated**: This layer will be updated if new and better data becomes available.

Irrigated lands: Irrigated areas greater than 50m from the sagebrush interface and outside CPW lek polygons are not considered as suitable grouse habitat.

- **Geospatial Data:** This layer was created by the Division of Water Resources using Landsat TM imagery. It is a spatial layer of irrigated meadows.

- **Evaluation class break (weight) justification**:

- Present (-8)

- **Data for support:**
  - RCP
  - Federal Register
  - 2011. Phillips, Mike. Public meeting information, December 1, 2011. Meeting to validate the priority tool model called by the Technical Subcommittee for the Gunnison Basin Strategic Committee for the Gunnison Sage-grouse.

- **Area for improvement:**

- **Updated**: This layer will be updated if new and better data becomes available.

Non-Habitat:

- Areas of no habitat such as open water and gravel pits are overlaid on top of the scoring polygons to show that these areas are not habitat. More areas, such as building footprints, could be added to this layer in the future when available.

Uncontrollable Threats

High density subdivisions: A highly divided subdivision has a greater impact on grouse habitat than an individual home.

- **Geospatial Data:** Gunnison and Saguache County's parcel layers, as well as their 9-1-1 house point layers, have been combined to determine development potential/impact. Development was defined as home, barn, or any improvement valued at more than $30,000 on a parcel. At each house point, there was a 300 foot radius buffer added to the known structure. House points that where within 1000ft of another two house points location were then buffered by 1000ft due to the increased impact on the grouse. (Cochran, 2011) The 300ft buffered housing points buffer was clipped and removed from the 1000 ft buffer so that points did not receive a negative score for both the buffers.

- **Evaluation class break (weight) justification:**
    - Areas within 300ft of a house point (-5) *Areas adjacent to houses are not suited for grouse habitation.*
    - Areas where a housing point is within 1000ft of another 2 house points (-20) *Areas where more house points are located closer together (subdivisions) will have an even greater negative impact on the grouse habitat.*
    - <70 acre parcels with development (-7) *Smaller developed parcels have a greater impact on both degradation and fragmentation of surrounding habitats than larger developed parcels, in most circumstances. They are given a negative score as a result of these negative impacts.*

- **Data for support:**
    - Cochran, Jim. 2011. Personal communication.
    - Phillips, Mike. 2011. Personal communication.

- **Area for improvement:**

- **Updated**: This layer will be updated on a yearly basis to track changes in development and subdivision.

Roads/Trails: All roads and improved trails were evaluated for their impact to the habitat from fragmentation and predator corridors. ***Use and recreation impacts from disturbance are considered under the recreation layer, not in this layer. This is a habitat impact evaluation of the roads themselves.*** Improved roads are considered all roads bigger than all season, 2-wheel drive roads. Improved roads are defined as passenger car roads, highways, and improved county roads. Double track roads are considered unimproved roads and include: admin routes, jeep trails, primitive roads, high clearance roads, private roads, and ATV routes. Single track routes are considered trails (mechanized and motorized are included). Closed routes are routes that are permanently closed (not seasonally) that have not been reclaimed.

- **Geospatial Data:** Road data from the county, CPW, BLM and USFS were used to create this layer.

- **Evaluation class break (weight) justification:**
  - <150ft from the centerline of an improved road (-4) *These roads are defined as passenger car roads, highways, and county roads.*
  - <50ft from centerline of a double track(-3) *These roads are defined as roads with vegetation growing between the tracks and include admin routes, jeep trails, primitive roads, private roads (driveways), unmaintained roads, and ATV routes.*
  - <25ft from that center line of a single track *(-2) These are defined as smaller disturbances that include trails, including both mechanized and motorized uses.*
  - <25ft from that center line of a closed route *(-1) These are defined as routes that are permanently closed (not seasonally) that have not been reclaimed.*
  - <1000ft from a recreational use point (0) *This includes known access points, shooting areas, and more.*
  - <100ft from trails in Curecanti National Recreation Area (0)
  - Curecanti National Recreation Area recreation polygons (0)

- **Data for support:**
  - Aldridge et al. 2010- Aldridge does not agree with the 150ft buffer. He feels that improved roads can impact nesting habitat up to 8km away. Double track roads can have an impact to over 6 km away. He feels that there is not a non-linear response as you move away from the road and that a regression model needs to be used to depict this.
  - *Gunnison Basin USFS and BLM Federal Travel Management Plan*

- **Area for improvement:**

- **Updated:** This layer will be updated on a yearly basis, if possible.

Power lines: Power lines pose a potential risk for habitat degradation due to predation and fragmentation. There is a significant distinction between WAPA lines and the GCEA lines. WAPA lines do have large structures, high lines, and improved roads associated with them. GCEA lines are smaller primary and secondary lines that usually do not have roads associated with them.

- **Geospatial Data:** There is a data layer available with large, above ground, WAPA transmission lines mapped.

- **Evaluation class break (weight) justification:**
  - <450 feet from a WAPA above ground power line (-3)

- **Data for support:**
  - 2011. Phillips, Mike. Public meeting information, December 1, 2011. Meeting to validate the priority tool model called by the Technical Subcommittee for the Gunnison Basin Strategic Committee for the Gunnison Sage-grouse. Mike feels that an impact from power lines is for direct mortality (2 birds within the scope of his study).

- 2011b. Aldridge, Cam. Public meeting information, December 1, 2011. Meeting to validate the priority tool model called by the Technical Subcommittee for the Gunnison Basin Strategic Committee for the Gunnison Sage-grouse.

- **Area for improvement:**
  - Small power lines are not available and may need to be incorporated. GCEA will not make this information publicly available through this mapping tool for safety/protection reasons.
  - Exponential decay out to about 2.5 km is more probably the direct influence of the power lines. This would reflect the impact of predation on the grouse from perching predators. (Aldridge 2011b.)

- **Updated:** This layer will be updated when needed.

Controllable Threats – (No Weights Applied)

Attempts to combine controllable threats with the habitat map (which includes uncontrollable threats) were not successful. In order to allow future work on this issue, controllable threats were included in the scoring query but were assigned a zero (0) weight. Currently, it appears that the best way to approach the scoring issues associated with controllable threats is to overlay a "controllable threat layer" of interest over the habitat map for visual analysis.

Development potential: Areas that are currently developed pose risks to habitat degradation and fragmentation for the sage grouse. The hope would be to update this layer on a yearly basis.

- **Geospatial Data**: Gunnison and Saguache Countys' parcel layers were used to assess parcel size and development status. Seventy acres was chosen as a break point for this analysis because of the state law that allows for minimal restriction for subdivision of parcels as long as the final parcels are greater than 35 acres. Development was defined as home, barn, anything >$30,000 worth of improvements on a parcel.

- **Evaluation class break (weight) justification**:
    - >70 acre parcels (0) *Parcels greater than 70 acres, even undeveloped, can represent a large risk for subdivision and development. Colorado State law allows the subdivision of private property into parcels equal to or greater than 35 acres with minimal restriction or regulation by local government. This poses a significant risk to habitat degradation and fragmentation and therefore receives a high score for needed habitat protection.*
    - <70 acre parcels without development (0) *Undeveloped parcels of this size have to go through a county review process to be further subdivided, in which a species conservation planner is consulted for risk to sage grouse and mitigation opportunities to decrease the developmental impact. The risk for habitat degradation is decreased with this consultation and although there is a potential for fragmentation there is a lower, but still positive, score given for needed habitat protection. This also means that this property has a conservation potential.*

- **Data for support:**

- **Area for improvement:**
    - There is a need for more support data for acreages and impact area sizes used in the model. Is there good development impact data available that could inform this process?
    - There is a need for future analysis to be able to relate development densities to the RCP. It would be beneficial to complete this exercise using the acres from Appendix F in the RCP.

- **Updated:** This layer will be updated on a yearly basis to track changes in development and subdivision.

Invasive Species: Invasive species alter and degrade sage grouse habitat. Different plant species have different potentials to impact the habitat.

- **Geospatial Data:** Data from the BLM, USFS, NPS and Gunnison County are utilized in this layer.

- **Evaluation class break (weight) justification:**
    - Cheatgrass (0)
    - Other weed species (0)

- **Data for support:**
    - Cheatgrass research

- **Area for improvement:**
    - There are no comprehensive records for private land.
    - The data collected is sometimes incomplete and species at each point/line/polygon is not documented.

- **Updated:** This layer will be updated on a yearly basis to track changes in infestations. This layer should be a cumulative layer where previous year's data is incorporated with each year's new data.

Recreation: All recreational uses of the landscape have potential to impact the sage grouse through habitat fragmentation, habitat degradation, and direct threat to individuals' survival.

- **Geospatial Data:** Large recreational area polygons have been drawn across the basin and have been rated with a seasonality and level of use. The BLM and recreational stakeholders have worked together to create this very broad layer which reflects the diffuse use that may occur in these areas. Impacts are not directly tied to specific routes, trails and points of interest.

- **Evaluation class break (weight) justification:**
    - Spring Use
        - Low (0)
        - Medium/Low (0)
        - Medium (0)
        - Medium/High (0)
        - High (0)
    - Summer Use
        - Low (0)
        - Medium/Low (0)
        - Medium (0)
        - Medium/High (0)
        - High (0)
    - Fall Use
        - Low (0)
        - Medium/Low (0)
        - Medium (0)
        - Medium/High (0)
        - High (0)
    - Winter Use
        - Low (0)
        - Medium/Low (0)
        - Medium (0)

        - Medium/High (0)
        - High (0)

- **Data for support:**

- **Area for improvement:**
    - This layer should be further refined.
    - Spatial data layers will need to be collected for all recreational trails, fishing areas, parking areas, camp grounds, and boat launch areas from the BLM, USFS, CDOW, NPS, Gunnison County, and Saguache County. These are available, but not currently incorporated into the Tool.

- **Updated**: This layer will be updated on a yearly basis to track changes in development and subdivision.

Landfill: The Gunnsion County landfill serves as a feeding/harboring location for sage grouse predators. The landfill's influence on the surrounding area is considered controllable because active measures can be taken to reduce the sage grouse predator populations.

- **Geospatial Data:** This is a simple spatial layer that delineates a polygon around the landfill area as seen through ortho imagery.

- **Evaluation class break (weight) justification:**
    - Areas within ½ mile of the landfill (0)
    - Area >½ mile and <1 mile of the landfill (0)

- **Data for support:**

- **Area for improvement:**
    - Data to supporting the evaluation classes and impact from predators will need to be documented.

- **Updated**: This layer will be updated as needed or when better information becomes available.

Other Impacts – (No Weights Applied)

Landownership - Protections: Areas that are currently developed pose risks to habitat degradation and fragmentation for the sage grouse. Areas with easements specifically for sage grouse habitat protection or with non-development agreements are considered beneficial to the grouse.

- **Geospatial Data:** Gunnison County has a database and a spatial layer with all qualified conservation easements. The CPW has also provided a layer of participating CCAA parcels (signed Certificate of Inclusion) which has been included in this layer. Public land boundaries are also available and can be incorporated.

- **Evaluation class break (weight) justification:**
    - Conservation Easements (0) - *These are voluntary agreements that protects the land in perpetuity. All of these easements have grouse mentioned in the documentation, whether management actually occurs to benefit the grouse is a different issue.*
    - CCAA (0) - *These are voluntary agreements that all have an endpoint of 2026 which can be renewed. These agreements can be terminated with 30-60 days notice.*
    - Public lands (0) - *These are mostly undevelopable.*

- **Area for improvement:**
    - This layer has not been totally fleshed out at this point. Instead of being incorporated into the tool, it could be used as a layer for evaluation when looking at proximity to priority habitat.

- **Updated**: This layer will be updated on a yearly basis.