

**Natural Resource Technical Advisory Board**  
**Focal Habitat Features Project**  
**Executive Summary**

## **Introduction**

The purpose of the Focal Habitat Feature (FHF) identification project is to develop data-driven, objectively derived Geographic Information System (GIS) based map products that will improve the existing planning tools used by Teton County and provide elected officials with factual information to inform their land use and natural resource decisions. This product is intended to inform and direct future development towards the vision of the 2012 Jackson/Teton County Comprehensive Plan to "Maintain healthy populations of all native species." In this case, the Natural Resources Technical Advisory Board (NRTAB) aided the Planning Department in the development of the Request for Proposals for this project and served as an advisory body facilitating review of the scientific and analytical approaches of the products developed by the project contractor (Biota).

The purpose of the FHF GIS map layer product is to identify habitats that best serve wildlife needs. The primary natural resources that County regulations can manage are the vegetation and hydrological habitats of private lands, whereas populations of wildlife species are managed by the State of Wyoming. Using the FHF product County land-use decisions can be based on habitat values rather than direct wildlife presence or absence. This is a paradigm shift from the 1994 Comprehensive Plan which protected 7 wildlife species. The FHF product protects wildlife through the protection of important habitat for multiple species wherever it is found as the foundation for successful conservation moving forward as called for in the 2012 Comprehensive Plan.

The product developed by Biota is a significant improvement to the existing Natural Resource Overlay approach (1994 Comprehensive Plan/Land Development Regulations). It informs Teton County of the relative ecological values and habitat characteristics of *all* areas in the County, including the Town of Jackson. Applying this information as part of the planning process will move the County toward achieving the stewardship goals of the 2012 Comprehensive Plan.

The product not only identifies areas of relative importance for habitat protection, but it also provides the planning department with the specific habitat characteristics that are important to conserve within each area and, as necessary, parcel by parcel.

The final map represents a tiered classification of habitat value: Tier I represents those areas that meet or surpass the highest thresholds of value to wildlife. Tier IV represents those areas that fall below the 3 higher thresholds of value for the species examined but is still used as habitat by wildlife. While the product advances the goals of the Comprehensive Plan, NRTAB feels strongly that the County should seek additional external, expert review. The purpose of such reviews should be oriented toward identifying additional information, if any, as well as processes that can strengthen this product prior to its use for informing amendments to the environmental regulations.

## **FHF Project Synopsis**

Below, we summarize the NRTAB's understanding and the outcomes of the steps taken by the contractor (Biota) to produce this product. We then outline some future actions that the NRTAB recommends to further improve this product and ensure the County's success in conserving our wildlife habitat.

### **Step I**

A precursor to the product provided in this report was the completion of the vegetation cover-type mapping of the private land within the County (Cogan and Johnson, 2013). In order to begin the FHF analysis, Biota cross-referenced the private land vegetation cover-types with the cover-types already mapped on the surrounding public lands to create a single combined vegetation cover-type map. This vegetation cover-type map coupled with wildlife datasets allows for the illustration of wildlife affinities for particular vegetation cover-types.

### **Step II**

On behalf of Teton County, Biota was to obtain permission to analyze wildlife information for the County's purposes from the data proprietors. As an agent of the County, Biota was able to procure permission to work with data for a total of 9 species. These became the new "species of special interest" for their analysis. Those datasets had been collected for a variety of purposes and hence varied in type, collection methods, and sources.

### **Step III**

Data from all appropriate sources about the frequency of where wildlife occurs were then overlaid on the vegetation map to derive habitat preferences for each species. Biota tested several ways to analyze the varied datasets in order to produce GIS modeled habitat preference maps for each species. The final method chosen by Biota was a generalized analysis process identifying various habitat characteristics (e.g., vegetation, aspect, slope, elevation, and distance to roads) that best described the frequency of the animal's occurrence within these habitat characteristics. This enabled the creation of GIS modeled habitat preference maps for specific species of wildlife, which are referred to in the report as Species Focal Habitat Features (FHF). The GIS modeled maps of the habitat preferences for each wildlife species illustrate the areas preferred by each

species based upon the frequency that the species has been observed within areas with certain characteristics. The habitat characteristics with the highest frequency of use by the wildlife species were identified over the entire county by extrapolation. Those areas and their characteristics represent aspects that are essential to conserve as development takes place.

#### Step IV

The next phase was to visually compare the GIS modeled habitat preference maps for each species (FHF<sub>s</sub>) with other accepted objective methods of determining the distribution of a species such as the raw datasets of wildlife locations, or Wyoming Game and Fish Department seasonal distribution maps, or 99% kernel density home range estimates. The GIS modeled wildlife habitat preference maps were then trimmed or augmented in accordance with the commensurate scientific, observational, or seasonal distribution data. These modifications were only made when they concurred with Biota's or the NRTAB members' knowledge of the known distribution of the species. This step resulted in final habitat preference maps covering the entire extent of Teton county private lands for each species. In total, 12 layers were created for 9 species (moose (2 layers), elk (2 layers), mule deer (2 layers), bighorn sheep, pronghorn, sage grouse, bald eagles, trumpeter swans, and cutthroat trout).

#### Step V

The last foundational GIS layer used to generate the final tiered map of habitat values was formed by broadly dividing the vegetation cover-types used by Cogan and Johnson (2013) into two types: "ranked" and "unranked." Ranked vegetation are those containing native cover types, for example aspen forest, sagebrush dry shrubland, etc. Unranked vegetation cover-types are those containing human-dominated and/or dependent cover-types, for example: developed surfaces, landscaping, etc. The species habitat preference maps and the underlying ranked and unranked vegetation map layers were then combined together to create tiers of habitat values.

#### Step VI

The final tiered map of habitat values, which is intended to be the working product that will assist the Teton County Planning Department, was created as follows:

1. Areas with habitat characteristics preferred by multiple species in combination with ranked (naturally occurring) vegetation cover-types were assigned the highest ecological importance to conserve (Tier I or Tier II). Any area that contained habitat preferred by more than 4 species was classified as Tier I. Any area preferred by 2-4 species that also was comprised of ranked vegetation cover-types was also classified as Tier I.
2. Areas where at least one species had preferred habitat that were also comprised of ranked vegetation were assigned to Tier II. Any area where 3-4 species had preferred habitat but was comprised of an unranked (human derived) vegetation cover-type was also classified as Tier II.
3. Areas where 1-2 species have preferred habitat that were comprised of unranked vegetation or any remaining ranked vegetation in areas where the mapped habitat preferences of the 9 wildlife species did not occur were assigned to Tier III.
4. Finally, Tier IV are those areas of unranked vegetation where none of the examined species have preferred habitat. This does not indicate that Tier IV areas do not have any habitat value. Rather, that they did not fall into the highest frequency of wildlife observations for the examined species and therefore were below the selected habitat value use thresholds for those species.

#### Literature Cited

Cogan, D. and S. Johnson 2013. Final Report: Vegetation and Non-Vegetation Cover Type Mapping for Teton County. Jackson, Wyoming.

## **Future Natural Resource Protection Steps**

The ultimate success of the tiered model depends upon the continued ecological continuity and connectivity within and between each tier of importance. Without ecological connectivity, the health and ecological function of the habitat characteristics identified cannot be sustained. Maintaining habitat connectivity is consistently shown to be an action of high priority for conservation of wildlife.

Wildlife movement and migration was not captured by the current product. Therefore further access to datasets and permission to analyze data on wildlife migration is necessary. Such analyses and oversight of contracts to produce appropriate and meaningful illustration of animal migration and movement functions across the Teton County landscape will require further funding and staff capacity.

Currently, the only completed and appropriate illustrations of migration that have been made available to this project are 1) the Teton Science Schools/Wyoming Department of Transportation study (completed in 2013) for a subset of the Teton County mule deer and 2) pronghorn migration locations from the Wildlife Conservation Society. These data were not incorporated into the analysis. The proprietors of such data or other researchers with dataset ownership should be funded to complete such migration analyses.

With the current tiered habitat product as the foundation, continuing evaluations of habitat alterations and changes in wildlife movement over time will be needed to determine whether habitat characteristics and connectivity are being conserved and in what manner and to what degree. This analysis of change over time could also take advantage of certain historical aerial photo imagery that is available. This would represent an “assessment of cumulative effects.”

Other focused dataset analysis and new research are needed to strengthen the usefulness of this product and determine if sufficient species have been accounted for. This FHF and tiered habitat analysis includes 9 species. The specific habitat preferences of other species or groups of species such as other raptors, song birds, amphibians, etc. are important to research and incorporate into the established model. For example, the cutthroat trout spawning and nursery habitat preference layer was severely clipped due to limited data available from Wyoming Game and Fish Department on private lands. Additional occurrence information is needed.

Such actions will serve to better inform and guide county planning as time and human activities move forward. This might best be addressed through a series of graduate students or other researchers analyzing existing datasets for County purposes and applications. New research and data collection targeted specifically to the needs of Teton County may provide the strongest information to the Planning Department. These endeavors will require County funding, grants or support from cooperating agencies such as the Teton Conservation District, the Haub School of Natural Resources or the University of Wyoming Cooperative Fish and Wildlife ResearchUnit, the Wyoming Migration Initiative, etc..

The Natural Resource Technical Advisory Board also suggests that plans for more appropriate landscape-scale and strategic mitigation, restoration and enhancement be undertaken. Tackling those challenges can broaden the effectiveness of such tools to realistically off-set ecological degradation that will inevitably occur as development takes place. This will require identifying areas where habitat has been degraded relative to a reference condition, but where actions can reasonably be expected to restore or measurably improve ecological function relative to reference conditions.

Finally, in order to enable all of the further needs listed above it is recommended that, as time allows, the County continue to pursue independent reviews of the soundness of the methods developed for this product. Thoroughly understanding the accuracy, transparency and resiliency of the current product is necessary in order to effectively upgrade the product with additional or new information into the future.