

***Western Governors' Wildlife Council
White Paper -Version II***

***Western Wildlife Crucial Habitat Assessment Tool (CHAT):
Vision, Definitions and Guidance for
State Systems and Regional Viewer***

Revised August 2011
Draft for Discussion

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Wildlife Council Vision Statement

The Wildlife Council works to identify key wildlife corridors and crucial wildlife habitats in the West, as well as to develop and coordinate policy options and tools for conserving those landscapes. With this aim, the Council strives to provide a public, user friendly online tool with consistent and region-wide information on crucial habitats for fish and wildlife, for all interested parties to use to assess landscapes and connectivity while better informing land use decisions.

Wildlife Council Objectives

- Improve analysis of landscape-scale energy, land use and transportation projects as well as land conservation and climate adaptation strategies by providing prioritized information through individual state-level tools and a regional-level Western Wildlife Crucial Habitat Assessment Tool (CHAT).
- Integrate customers and other stakeholders into the development, maintenance and roll out of the CHAT both at the state and regional level.
- Seek widespread use of CHAT so that decision makers at all levels rely on it to better inform planning, while providing healthy and productive landscapes.
- Ensure federal, state and local agencies consult CHAT and integrate its wildlife information early into land management, energy/transmission or transportation planning processes.
- Seek resources for internal and external state agency efforts to develop and maintain the CHAT and to support regional compatibility efforts.

Background

State wildlife agencies are among the preeminent and vested authority on wildlife in the United States. Federal agencies, other state agencies, local governments, tribes, conservation groups, businesses – even other countries – look to state fish and wildlife agencies for accurate data and information on fish and wildlife species and habitats. These customers often need to know which species are most important, where their habitat is located, what habitat is needed to maintain movement across the landscape, and how species should be managed and conserved. This information is vital to help communities grow, develop, live and recreate in accord with our environment.

To improve state wildlife agencies' capability to provide this information to their many customers, and strengthen their leadership position on wildlife matters, they need to innovate and refine how they do business. With the adoption of WGA's *Wildlife Corridors Initiative Report* in

June 2008¹, Western Governors created the Wildlife Council and provided direction on how to address these needs by working across political and legal boundaries and collaborating with other managers and the public. By putting these approaches into operation, states' important work to conserve the public's fish and wildlife resources will be enhanced, while at the same time facilitating necessary economic development in the region. Now guided by Western Governors' policy resolution 10-10², the Wildlife Council is working to make information on important fish and wildlife habitat compatible across the West and available to the public in 2013.

Utilization of Crucial Habitat and Corridor Information

In collaboration with governments and stakeholders that use fish and wildlife information, each Wildlife Council member state is developing an online, public system that houses landscape-level digitized maps identifying crucial wildlife habitat and corridors across the West. These tools are intended to allow easy access for state agency "customers" so that wildlife information is considered early in planning processes. While not intended for project-level assessment, CHAT will provide a greater level of certainty for pre-planning efforts, leading to fewer conflicts and surprises while improving outcomes to better incorporate fish and wildlife values into land use decision-making and large-scale conservation projects.

Wildlife agencies are working with their customers to develop, improve and maintain these tools so that they are the most accurate and credible source in the region for information on fish and wildlife and the habitats on which they depend. This includes the challenge to achieve landscape-scale conservation objectives, as well as incorporating information on key ecosystem change agents.

Both within wildlife agencies, across levels of government and with the public, the Wildlife Council aims to promote a regional approach to providing and displaying important fish and wildlife information. The Council will continue to share and learn with others as it develops and uses CHAT to best inform land use decisions and conservation planning and to identify wildlife connectivity needs. The intent of CHAT is to inform gross infrastructure planning efforts, wildlife corridor identification, and conservation planning. In most cases, CHAT will not support detailed assessment at the individual project scale but likely will contain relevant information to advise or guide individual project assessment.

¹ The Wildlife Council home page and the *Wildlife Corridors Initiative Report* can be found at: <http://www.westgov.org/initiatives/wildlife>.

² WGA policy resolution 10-10, *Conserving Wildlife Corridors and Crucial Wildlife Habitat in the West*, can be found at: <http://www.westgov.org/policies>.

CHAT will utilize landscape-level mapping to show crucial wildlife habitat and wildlife corridors, and will identify areas that warrant more fine scale analysis. CHAT will be non-regulatory, developed to promote the conservation objectives of each state wildlife agency, and will give the public access to important wildlife information for use in proactive planning and decision-making processes. The development of state-level CHATs and a regional-level CHAT will include on-going monitoring and updating of data to maintain relevancy.

Identifying Crucial Habitat³ and Corridors

Providing a Regional View

The Governors have established a 2013 goal for publically available systems to display crucial wildlife habitat and corridor information in a consistent manner across the region. The Wildlife Council is working to establish individual CHATs in each state while also pursuing the development of a regional mapping viewer (the "regional CHAT"). While housed in each state, data utilized in the systems will be coordinated across all jurisdictions in the West so that a regional picture of crucial wildlife habitat and important wildlife corridors will be available through the regional CHAT. The regional CHAT will combine individual state crucial habitat layers together as derived, single regional layers. This regional view will be useful to inform large-scale planning spanning multiple jurisdictions, and it will be particularly useful for depicting important corridors for fish and wildlife across the region.

Regional Definitions

The Wildlife Council has agreed to common definitions of crucial habitat and corridors for fish and wildlife and put forth guidelines that states can use to identify crucial habitat in line with these definitions. The Council has refined those definitions included in the *Wildlife Corridors Initiative Report* to help states prioritize habitat and corridors within their boundaries in order to meet each state's conservation objectives. These refined definitions are significant because they are the process by which each state wildlife agency will identify and geographically represent their conservation priorities.

The West-wide definitions are also a necessary step to achieve compatibility and consistency across state boundaries. With this baseline, states are in the process of assembling important data and addressing data standardization issues, analyzing and prioritizing that data by category based on habitat conservation needs, and turning that data into a useful tool. A detailed approach to achieving these steps is outlined in this paper.

³ Crucial habitat as used by the Western Governors' Wildlife Council should not be confused with a legally defined "critical habitat" designation. Critical habitat is determined by the U.S. Fish and Wildlife Service or the NOAA Fisheries Service to be habitat necessary for conservation of a species listed under the provisions of the Endangered Species Act.

It should be understood that although Western states will make compatible many aspects of the data displayed in the regional viewer, how a state ultimately seeks to treat the different categories of habitat as development decisions are made will correspond to each state's own conservation objectives.

Crucial Habitat and Important Wildlife Corridors Definitions

The Wildlife Council definitions for Crucial Habitat and Important Wildlife Corridors are as follows:

Crucial Habitat are places containing the resources, including food, water, cover, shelter and “important wildlife corridors,” that are necessary for the survival and reproduction of aquatic and terrestrial wildlife and to prevent unacceptable declines, or facilitate future recovery of wildlife populations, or are important ecological systems with high biological diversity value.

Important Wildlife Corridors are crucial habitats that provide connectivity over different time scales (including seasonal or longer) among areas used by animal and plant species. Wildlife corridors can exist within unfragmented landscapes or join naturally or artificially fragmented habitats, and serve to maintain or increase essential genetic and demographic connection of aquatic and terrestrial populations.

More refined, actionable definitions for subsets of crucial habitat, including important wildlife corridors, are presented below.

Categories of Crucial Habitat Conservation, Including Important Wildlife Corridors

The conservation of crucial habitat, including important wildlife corridors, is recognized by the Western Governors as an important goal for state, local and federal governments that can benefit from the adoption of compatible and consistent conservation categories across state and other jurisdictional boundaries. The Western Governors' Wildlife Council has adopted the following categories of crucial habitat conservation. These categories will then be populated as determined by each state. Other habitat categories, besides crucial habitat, may be defined by states as resources are available.

Category 1: Aquatic or terrestrial habitats, including wildlife corridors, that are rare or fragile and are essential to achieving and/or maintaining wildlife species viability or exceptional diversity. The habitat contains a unique combination of location or composition or complexity of the habitat or corridor which cannot be duplicated, and is therefore considered irreplaceable.

Category 2: Habitat, including wildlife corridors, which is limiting to a fish or wildlife community, population, or metapopulation. Loss of any of this habitat or corridor could result in

a significant local or population-level decline in species distribution, abundance, or productivity. The habitat or corridor is essential to achieving and maintaining fish and wildlife target population or management objectives. Restoration or replacement is difficult, or may be possible only in the very long term.

Category 3: Habitat, including wildlife corridors, that contributes significantly to the maintenance of fish or wildlife communities, populations, or metapopulations. Loss of a significant portion of the habitat or corridor could result in local or population-level declines in species distribution, abundance, or productivity. Impacts can be minimized or reduced, and habitat or corridors restored or replaced by utilizing appropriate best management practices.

Other Habitat Categories

The following categories represent common habitat or otherwise insufficiently understood habitat that can be mapped to provide a full landscape perspective, but are not anticipated to be indicative of crucial habitat. The Wildlife Council recognizes that some states may, as resources allow, choose to analyze and map these other categories in a compatible manner with other states.

Common Habitat: Habitat which is relatively common, generally less limiting to fish and wildlife communities, populations, or metapopulations, and generally better suited for land use conversion. Large-scale or cumulative impacts to species or habitat could result in declines in species distribution or abundance, however, the loss may be difficult to measure. Impacts from individual projects or land use actions can be minimized, and habitat restored or replaced, so that effective habitat function or species distribution or abundance is maintained.

Habitat Significance Unknown: Lands likely to have significant wildlife values, but for which there is insufficient data or a lack of information about the importance of the habitat in meeting conservation objectives.

Guidance for Compiling Compatible Information for Analysis and Display

The Wildlife Council is using the steps below as they identify or assess crucial habitat and wildlife corridors, map those areas, and develop a system for displaying the information. Details for Step One, compiling raw information, have been substantially developed at this point. The Council has listed relevant information for states to include in the CHAT, highlighting the minimum data that should be analyzed to identify or reclassify crucial habitat, including wildlife corridors, in each state. Recommendations for a regional approach in Steps Two and Three have been refined over the last year, but continue to be developed.

Step One: Compile types and layers of information valuable in to identify crucial habitat, including important wildlife corridors (aquatic and terrestrial)

The list below describes information that each state should consider including in their CHAT. The list is separated into two tiers, the first tier being those data layers that are considered to be the foundation of any crucial habitat layers and which states commit to including, as a minimum, in their systems. Second tier data can be important to identifying crucial habitat and corridors and maintaining conservation objectives. A tiered approach allows individual states to prioritize their data collection and standardization efforts as they build their crucial habitat layer. Having all states working with the same base categories of data in tier one will allow the regional CHAT to function effectively across political boundaries.

This inventory will help develop the necessary technical components of a regionally compatible system, and will form the target information necessary for states to perform analyses in Step Two. It represents data categories, with multiple examples of data sources, which could be used to help delineate crucial habitats and corridors. The list includes both species and habitat data, understanding that in some instances known species occurrence data is used as a surrogate for identifying habitat. All five of these Tier 1 data categories will be evaluated in assessing crucial habitat, but any individual or combination of the data categories in Tier 1 is a sufficient basis for states to make their crucial habitat category determinations.

Tier 1 Data:

1. Habitat for “Species of Concern”

- Species of Greatest Conservation Need within State Wildlife Action Plans or similar assessments - The following data sets should be included:
 - Locations of Federally or State Listed Species (Threatened or Endangered)
 - Including Candidate Species
 - Species protected under a signed Conservation Agreement
 - Other species of special concern lists (county/state/federal)
 - Key or Priority Habitat boundary delineations from CWCS/SWAP
 - Plant and Animal species with special protective-rankings (e.g., NatureServe's Natural Heritage global ranks)

- Priority habitat areas based on species diversity, habitat intactness and overlap with other crucial habitats. These would be high priority areas for management of "core conservation populations."
2. Native and Unfragmented Habitat: Areas that are contiguous, possess a high degree of intact core areas or diversity of natural habitat, or supply ecological function to meet wildlife objectives. These areas are unfragmented, or relatively unfragmented, by transportation routes, human habitation, industrial infrastructure, or other human-caused disturbances.
 - Natural vegetation classification habitat maps
 - Ecological systems of concern
 - Plant communities of concern (Heritage Rankings)
 - Priority habitat areas identified in updated SWAPs
 3. Riparian and Wetland Habitat: Areas that represent unique environments and function to support animal and plant diversity with respect to wildlife objectives and connectivity.
 - Spring/Seep/Cienega Locations
 - National Wetlands Inventory
 - National Hydrologic Database
 - Wetland components from State Comprehensive Outdoor Recreation Plans
 - Priority wetland areas and priority riparian habitats identified in updated SWAPs
 4. Connectivity or Linkage Assessment: Areas described explicitly for aquatic or terrestrial wildlife habitat connectivity.
 - Major animal movement corridors or pathways (documented)
 - Landscape connectivity zones
 5. Quality Habitat for Species of Importance: This category provides for species consideration if not otherwise included as "Habitat for Species of Concern".
 - Sport Fish Quality Habitat: Areas recognized as important to meeting biological requirements and objectives of fish species whose harvest is regulated (i.e., blue ribbon streams).
 - Game Animal Quality Habitat: Areas recognized as important to meeting biological requirements and objectives of game species regulated by harvest, such as winter concentration areas or important breeding areas (i.e., crucial big game ranges, grouse lek locations or core grouse habitats if designated).

Tier 2 Data:

6. Terrestrial or Aquatic Native Species Richness: Areas where species composition represents a native, intact community and where habitats are associated with a relatively high and distinctively described species assemblage.
 - Aquatic species distribution maps
 - Ecoregional Assessments – Biodiversity Areas
 - Audubon Important Bird Areas
 - Gap-ReGap species composite maps
 - Christmas bird count and breeding bird survey data
7. Valued Lands: Lands that are protected or designated for their wildlife or aquatic values.
 - Protected Areas Database (PAD)
 - Priority areas identified from ecoregional analyses
 - Dedicated conservation lands locations
 - Outdoor recreation priority/favored areas
8. Important Restoration Habitat: Lands that are proximate to other important habitats and have the potential to restore function or resiliency to target populations of fish and wildlife.
 - Spawning or rearing habitat for fishes that are isolated from current populations
 - Habitat that was historically in one of the crucial habitat categories (2 or 3) and could provide fish or wildlife benefits with restoration

Step Two: States undertake analysis of compiled information (methodology, modeling, and prioritization) to rank areas as crucial habitat and wildlife corridors.

The Wildlife Council is continuing to develop an approach to the state analysis or ranking processes. The Council and individual states are grappling with a number of challenges as they develop the analytical (and spatial) maps for crucial habitat, including wildlife corridors.

Appendix A to this paper includes a number of technical papers that begin to address these issues that otherwise include:

- Prioritization or ranking models that can be utilized to assist the analysis;
- Appropriate scale of mapping;
- Data compatibility with neighboring jurisdictions;
- Use of best available science in GIS format;
- Development of consistent protocols (e.g., standards for defining and collecting data for shared use); and,
- Identification of state-specific targets for spatially explicit analytical outcomes.

Completion of Step 2 will allow each state to produce a state-wide map that depicts crucial habitats split by aquatic and terrestrial habitats, including connectivity, using at a minimum Tier 1 data that defines a spectrum of crucial habitat categories as defined in this paper. Crucial habitat identification will be based on the application of a consistent prioritization approach to input datasets listed under Tier 1 using both a coarse filter and fine filter approach. In the system that displays these layers (Step 3) users will have the ability to interact with a variety of data layers allowing them to understand the underlying information and the biological rationale that is used to identify the crucial habitat areas. Users who wish to understand information about an individual species, highlight specific development issues, or otherwise identify habitat conservation priorities will be able to do so, but within the context of a set of consistently-defined “crucial” areas and data security parameters that users will not be able to modify (i.e., the system will be able to generate a text list of the specific layers aggregated to depict crucial habitat in a specific area). Appendix B is a general visual representation of how GIS layers would be used to depict crucial habitat.

Additionally, states may develop management recommendations to accompany their crucial habitat analysis as a parallel effort or separately once the identification and mapping steps have been completed.

Step Three: States develop the Crucial Habitat Assessment Tool to deliver information to customers.

There are many technical considerations involved in developing a tool that is user-friendly and transparent. Emphasis should be placed on an information delivery system that promotes easy access and stimulates early consideration in planning by users, without the initial need for direct agency staff contact at a coarse scale. States are addressing the following challenges when working to develop a platform by 2013 that can be compatible across the region:

- System must be capable of displaying crucial habitat in a compatible way across jurisdictions;
- Data quality must be assured;
- Data, models and analyses must be built at useful scales to provide relevance to land use planning;
- Transparency and public input must be accommodated; and,
- Evaluation is needed on an ongoing basis to ensure efficacy of the system to meet conservation objectives.

As mentioned earlier in this paper, although Western states will make compatible their crucial habitat layers, how a state ultimately seeks to treat the different categories of habitat, within their management authorities, will correspond to each state’s individual conservation objectives.

A key element of regional compatibility will be achieved through the development of the regional CHAT that will serve as a public regional viewer for all crucial habitat and wildlife corridors as determined by individual states. Conceptually, the regional CHAT will display aggregated crucial habitat data layers based on the common definitions outlined in this paper. The priority data layers articulated in Step 1 of this paper will be combined together as single regional layers for each category.

Importantly, the regional CHAT does not replace any individual state or sub-regional viewers deemed necessary for providing important fish and wildlife information at a finer scale. The regional CHAT could conveniently link to individual state CHATs or sub-regional CHATs, and individual state systems could also consume and display the regional crucial habitat layer.

Looking Ahead

The Wildlife Council is aggressively pursuing the Governors' goal of publicly available maps of crucial wildlife habitat and corridors in 2013.⁴ Building from lessons learned and progress in the last year of implementing version I of the white paper, the Council and their state wildlife agencies are expecting to progress rapidly in Phase 2 of their work. Phase 2 of this effort will be considered approximately August 2011 – October 2012. In those 14 months the following activities are expected to be completed:

- WGA will develop options for constructing and maintaining a regional CHAT. Technical experts and other analogous efforts will be consulted to help understand the level of effort and actions necessary. WGA will seek to generate a preliminary mock up to serve as a visual example of the final product and to assess efficiency, cost and effectiveness.
- States will undertake the following tasks:
 - Complete development of Tier 1 data and edge matching (at the species level where possible with current project partners, and at the aggregated crucial habitat level where possible with other neighboring states);
 - Apply crucial habitat definitions to data in a compatible manner;
 - Continue to build and improve upon individual state CHATs; and,
 - Provide assistance to WGA in conjunction with development of the regional CHAT.

⁴ WGA policy resolution 10-10, *Conserving Wildlife Corridors and Crucial Wildlife Habitat in the West*: <http://www.westgov.org/policies>.

The expectation is that from November 2012 to December 2013 (generally Phase 3 of this effort) the focus of activity will be to knit each state's crucial habitat layers together in the regional CHAT and continue state efforts to improve upon their data in order to develop and make available individual state CHATs.

Additional Background Information

Development of this Paper and Ongoing Revisions

This paper was initially developed by the Wildlife Council in 2009 and the first version was released in February 2010. This second version was released in August 2010. Revisions to this paper by the Wildlife Council will be ongoing, and recent revisions have been made to account for lessons learned from the first year of piloting the development of systems in every state. The Wildlife Council has also worked to incorporate comment from partners, and will continue to do so in future revisions.

Ongoing Stakeholder Input

To coordinate with non-governmental representatives, industry and other stakeholders going forward, the Council established a [Stakeholder Advisory Group](#) to serve as a longer-term sounding board for the Council on the white paper and other issues related to CHAT development in Western states. The Council is committed to a strong and enduring collaboration with the Stakeholder Advisory Group and other partners and looks forward to their ongoing feedback on this version of this paper.

Coordination with Federal Agencies

This White Paper was also developed specifically to assist with coordination efforts with federal land management agencies that undertake extensive wildlife mapping efforts and seek to utilize landscape-level wildlife information in their planning processes. To truly develop a regionally consistent picture of important areas for fish and wildlife in western states will require ongoing collaboration with the Fish and Wildlife Service, the Bureau of Land Management and the Forest Service, among others. The Western Governors' Association signed a [Memorandum of Understanding](#) with the Secretaries of Agriculture, Energy and the Interior in June 2009 that calls for the establishment of state-based decision support systems and for cooperation among state and federal agencies in the identification and uniform mapping of habitat and corridors.

To undertake the longer term coordination envisioned under the MOU, the Wildlife Council established a [State-Federal Implementation Group](#) (SFIG) for the purpose of providing ongoing collaboration and communications to develop, coordinate and make data more consistent between state wildlife agencies and federal natural resource management agencies for resource management purposes. In June 2011, SFIG representatives from the Department of the Interior (DOI) and the Department of Agriculture (USDA) signed an [agreement](#) with the Wildlife Council to take specific actions to implement the 2009 MOU. The agreement seeks to improve

efficiency and enhance opportunities for mutual support between federal landscape conservation initiatives and the work of the Council. The agreement also confirms the intent of DOI and USDA agencies to utilize prioritized fish and wildlife data from state wildlife agencies as a principle source of information to inform federal land use, land planning and related natural resource decisions. The Council will be considering the potential to expand this type of agreement to the Department of Defense and the Department of Transportation.

Department of Energy Funding of CHAT

In accord with the MOU signed in June 2009, the Department of Energy made electricity transmission planning resources available for state-based wildlife information efforts that would help to develop CHATs in individual states and as a regional information source. In 2010, \$3 million was awarded to WGA as seed funding to aid CHAT development by each western state that would be capable of compiling all data on wildlife relevant to the development of renewable and other generation capacity and associated transmission facilities. WGA and the WGWC granted \$1.7 million of these DOE funds directly out to state wildlife agencies in 2010. Funding for Phase 2 activities (referenced above) will be awarded to states in fall 2011.

Estimated Cost of Establishing State-Based CHATs

Congressional testimony from WGWC members in early 2009 estimated a cost of \$1million per state over three years to establish CHAT in Western states. This was a general cost estimate based on work to date in some states. Generous support from the U.S. Department of Energy in 2010 has allowed the states to make significant progress in establishing CHATs. Progress has also been enhanced by the ability of many states to leverage those federal funds with other funding sources, and by the regional coordination support provided by WGA. Once systems have been established, however, maintenance and updates will be essential to ensuring their long-term value. Additional and on-going costs will also vary among the states and cannot be further estimated at this time.

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Lessons Learned from CHAT Projects Phase I - June 2010-July 2011

Identifying Desirable Mapping Scale Criteria

Issue Framing

Mapping scale determines the amount of detail that can be represented on or extrapolated from maps. Individual states and groups of states have many considerations regarding mapping scale when choosing which data to include in the process for creating maps for CHAT that meet the criteria of the Council's white paper.

Challenges to Regional Compatibility

Scale considerations in developing regionally compatible CHATs are critical because of the need to produce defensible data that are also useful. Primary considerations include:

- Decisions made about map scale should largely consider the utility of the information to the CHAT user,
- Map scale should not create “false confidence” that the derived products can be used for project review (site-specific evaluation),
- The appropriate scale and purposes for using derived products should be made very clear to the user,
- Data may need to be generalized to protect locations of sensitive species or other sensitive information (e.g., rare plants subject to collecting or rare species located on private land). Generalization might be accomplished for example by aggregating information to a larger effective mapping unit,
- Map scale chosen must not be so gross that it promotes “over-generalization” in derived projects.

The technical subgroup recognizes that the biological community uses the word “scale” differently than the mapping/GIS community’s use of the word “scale.” Both uses of the word are valid. In general, “scale” refers to Vector data and “resolution” refers to Raster data. To minimize confusion, terminology documentation should be as explicit as possible, and metadata fields should be used as much as possible to help people understand and use the data appropriately.

Status

States agree to evaluate the use of a region-wide reference grid at the 1 square mile to aggregate their data for presentation. This should support regional compatibility and to address many of the challenges mentioned above. This resolution is large enough to allow the presentation of sensitive data and to not create “false confidence” for project review, but is also small enough to ensure heterogeneity across the region.

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Additional aspects of scale and resolution will be important to determine. The CHAT technical subgroup will continue to determine those standards required for consistency across the region.

- a) Modeling Scale – This will be relative to species under consideration and quality of the data.
- b) Display Resolution – This is the spatial unit of presentation of the final model results which may or may not be the same as the aggregate resolution. Display resolution is the resolution at which the public will view data. This resolution may be more coarse than aggregate resolution and may vary from state CHAT to CHAT. Aggregate resolution refers to the development of base data that will be aggregated in a standard fashion across states to ensure regional compatibility. Decisions in determining display resolution should emphasize end-user considerations.
- c) Caveats/Fitness of Use Statements – The implications of scale and resolution on the use of the data in decision-making should be appropriately communicated (e.g., maps are for regional planning, or state-level assessment, or “not for site-specific evaluation”) to all users.

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Lessons Learned from CHAT Projects Phase I - June 2010-July 2011

Cross Jurisdictional Data Challenges to Regional Compatibility

Issue Framing

Digital wildlife mapping is usually accomplished using a combination of vector data (points, lines, polygons) and raster data (a grid of cells of regular size and shape). If two organizations were to map the same landscape features along a shared boundary – without coordination – it is almost certain that their line-work and attribution schemes would not be the same and may prevent combining the data to create a seamless map without “edge matching”.

Edge matching is the procedure to adjust the position of [features](#) that extend across a [mapped](#) boundary. Past efforts to line up individual state maps have illustrated serious discrepancies at state borders, but addressing the issue of edge matching has been a challenge for many previous efforts as they attempt to build regional maps of important habitat.

A major purpose of the CHAT development effort is to address the reality that states do not necessarily map the same information for the same species. Additionally, there will likely be discrepancies at state borders when crucial habitat layers are identified and displayed. It is anticipated that customers of the CHATs will see value in a “regionally compatible” set of mapped crucial habitat across state boundaries, but it is unclear what that should look like since the Wildlife Council's white paper does not call for a seamless map of crucial habitat. Some challenges exist for developing “seamless” data; many may be impossible to overcome, but many will be dealt with and worked out within the phases of the CHAT projects and beyond.

Challenges to Regional Compatibility

There are two levels where discrepancies can occur:

1. Input/base layers - States differ in how they map the same variable:
 - Species/habitat/base layers may not match across state boundaries because states map the same variable differently (i.e., big game winter range), and some states place higher priorities on developing some mapped information over others. These decisions result in disparate mapping definitions, such as scale, feature representation and attribution.
2. Product/presentation layers - States differ in how they identify crucial habitat:
 - States have the responsibility/authority to manage fish & wildlife resources based on their own priorities and management objectives, and they also manage different types of habitat and species given the diversity across the region. Therefore, the categorization of and criteria used for crucial habitat may be different from state to

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state. Any differences in how states categorize crucial habitat will cause discrepancies in how crucial habitat data layers “match up” at state boundaries.

- The multistep process for building the CHATs may move states toward developing a regional map of crucial habitat that is more seamless across political jurisdictions than past efforts. Since states do not manage wildlife resources the same way in every state, there will be some discrepancies in how crucial habitat data layers match from state to state across the region. Discrepancies may not be as important if species information is aggregated, but efforts through the CHAT projects will be necessary to test this concept.

Status

- To attempt to overcome differences in input/base layer data, biologists from adjoining states should review mapped information in areas where it doesn’t match (i.e. edge matching). Edge matching individual species and habitat information at state borders is an important exercise that will occur during the CHAT projects and beyond. But it is also a time and resource intensive effort and therefore CHAT projects will look to the Wildlife Council for assistance in prioritizing where/what species habitat should be focused on if resources are limited.

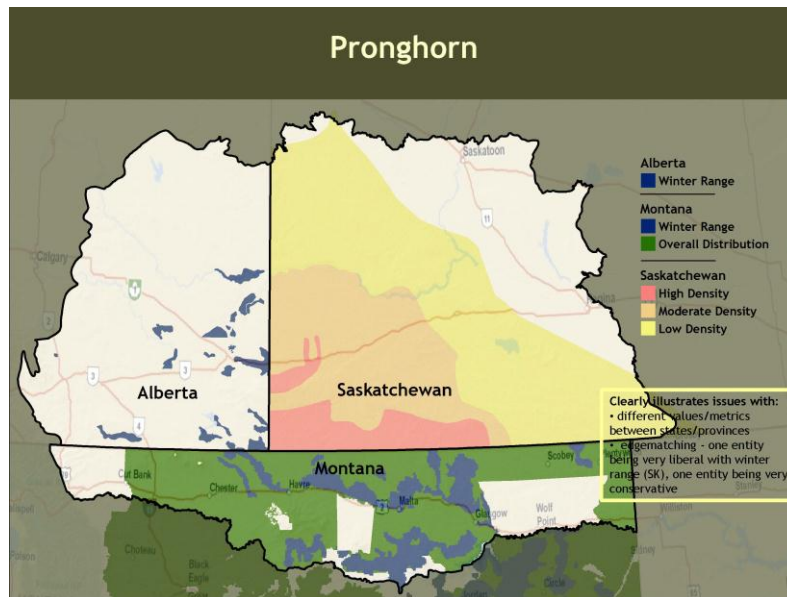
In regards to wildlife corridors, edge matching will be very important for displaying regional corridors on a map. This is an outstanding issue that needs to be developed further. The Columbia Plateau project is trying to develop a coarse scale connectivity layer, and information gleaned from this effort can be utilized to inform the rest of the region.

- An overall goal of producing regional and user-relevant crucial habitat layers will continue to drive efforts at the technical level. However, users of the CHATs should expect that crucial habitat data layers will not match in every instance across state boundaries because crucial habitat is being identified by each state based on their own conservation objectives (data and management priorities).

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Figure 1: Example of issues requiring edge matching. *Provided by Montana Fish, Wildlife and Parks presentation on “Northern Sagebrush Steppe Initiative Transboundary GIS Data Update – 2010.”*



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Lessons Learned from CHAT Projects Phase I - June 2010-July 2011

Filling Data Gaps in CHATs

Issue Framing

States acknowledge that there will be gaps in data necessary to populate a robust CHAT, and all efforts will be made to incorporate the best available science, as the legitimacy of the CHATs will depend largely on data used to support decision making. Each state is beginning the CHAT development process with different quality and quantity of data, so the challenges for each state will be unique. Some states will need to focus on modeling approaches to overcome data gaps, others will focus on addressing cross-state disparities in data type and quality, still others are able to explore what auxiliary data (i.e., wildlife corridor data, anthropogenic activities and climate models) are available that can be incorporated into regional CHAT development. The technical subgroup hopes that one result of this effort will be the prioritization of future data collection needs in each state and for the region.

Challenges to Regional Compatibility

Specific to regional compatibility, states would like to develop a level of consistency in how non-state data are reviewed and considered for incorporation into CHATs. Consistency in how states develop new biological data will also be valuable in filling data gaps. The State of Oregon, and potentially others, seeks in the near term to develop criteria and/or best practices with regard to collecting new biological data. These efforts will be looked to by the entire technical subgroup for a potential future recommendation to the Wildlife Council.

Status

Evaluation of Biological and Non-Biological Data

To enhance regional compatibility, the technical subgroup believes all states need to be as discriminating as possible when evaluating data provided by all governmental agencies, regulated communities, academia, non-governmental organizations and citizen scientists. The following factors should be used to evaluate all occurrence data or GIS layers proposed for CHAT inclusion. (These factors are in no particular order of priority and although all factors should be assessed, a single one may be sufficient to preclude the use of certain data.)

- Scale of the data
- Age of the data
- Expertise of the provider
- Quality of the metadata
- Methodology/Repeatability
- Already commonly accepted data
- Constraints on the use of or access to the data
- Positional accuracy

Appendix A - Technical Papers

Lessons Learned from CHAT Projects Phase I - June 2010-July 2011

The technical subgroup will continue to consider whether explicit data evaluation criteria can be agreed to and used on a regional basis. There are a number of outside groups looking at developing these criteria and the technical subgroup is eager to learn from these efforts.

Methods for Developing Biological Data Layers

Should existing biological data not be available from agency or other sources, the technical subgroup believes that states should agree on approaches to develop these layers for use in the CHAT.

In listing these approaches, it should be understood by state agency personnel and by the public that any effort to develop biological data is considered an evolving and ongoing effort. State agencies welcome outside data (that meets certain guidelines) that can help to validate the state agency approach or further refine it for accuracy. Finally, current resource constraints may also be a factor in determining capacity and priority to create new biological layers.

With these and any additional caveats, the following approaches are proposed as acceptable by the technical subgroup for western state wildlife agencies to develop biological data layers:

- a) Predictive Models
- b) Expert Knowledge
- c) Habitat/Species Association
- d) Spatial Processing (e.g., buffering)

The below approach to habitat suitability modeling is in draft form, developed by staff at Montana Fish, Wildlife and Parks, and identifies current needs and future work for developing consistency between states in modeling species habitat suitability.

Tribal Lands Data

While the governors have called for the development of state-wide and all-lands decision support systems, the technical subgroup recognizes the jurisdictional limitations and challenges to collecting or developing data on tribal lands. The subgroup therefore proposes to the Wildlife Council that state wildlife agencies should explicitly recognize that tribal lands may not be covered in the first iteration of the CHAT, but that there should at some point be an effort to work with the tribes to include tribal wildlife data.

Appendix A - Technical Papers

Lessons Learned from CHAT Projects Phase I - June 2010-July 2011

Species Habitat Suitability Inductive Modeling – Creating a consistent approach to developing new models and participating in ongoing modeling efforts

Draft As of January 28, 2011

Developed by Montana Department of Fish, Wildlife and Parks

Creating New Predictive Species/Habitat Models

The following items need a standard approach developed in order to provide consistency between states in modeling species habitat suitability.

- Determine approach for modeling
 - Inductive: MaxEnt (presence only data) vs Regression (presence/absence data)
- Use Ecoregional boundaries (suggest Omernick)
- Determine standard environmental features to be used (need to flesh out)
- Determine what target attributes will be modeled (overall, breeding, winter, etc.)
- Determine the tolerance for locational uncertainty
- Determine Model validations procedures
- Determine Model Review Process
- Determine Coordinate system/datum

Participating in ongoing modeling efforts

- Encourage use of WGA standards (above)
- Insure state agency review of modeling approach
- Insure thoroughness of occurrence records being used
- Insure model output review by appropriate state staff

Appendix B

Model Depicting Crucial Habitat Identification Product

