Utah Forest Action Plan 2016

Cover Photos

Top to bottom, left to right:

- Limber Pine, photo by Meridith Perkins
- Southeast Area Prescribed Fire, photo by Natalie Conlin
- Mountain Lake Surrounded by Forest , photo by unknown
- Uintah Fall Colors, photo by Ben Bloodworth
- Brigham City, Utah, photo by Morgan Mendenhall

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Acknowledgements

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Forest Action Plan 2016 Five-Year Update

This Forest Action Plan (FAP) five-year update was required of all states that had significant changes to their priority areas. Although the update was due on November 20, 2015, it is intended to provide guidance through 2016 and beyond. The FAP was revised to include updating some of the GIS layers with newer information, adding a few more watersheds, and adding Sage Grouse Management Areas. The general approach used in 2010 was not changed. The Forest Stewardship Coordinating Committee, U.S. Forest Service, Natural Resource Conservation Service State Technical Advisory Committee, and Utah Division of Wildlife Resources were kept apprised throughout this update. We expect a similar update later in 2016 when Utah's Wildlife Action Plan is updated, and the new fire risk assessment is completed within Governor Herbert's Catastrophic Wildfire Reduction Strategy process.

Several of the original GIS data layers were replaced or updated with newer versions. These include:

- West-wide Fire Risk Assessment replaced the fuel model, fire return interval, fire regime condition class, and communities at risk layers used in the previous Wildland Fire section.
- National Land Cover Database replaced the regional gap analysis project in the forests layer.
- Sage Grouse Management Areas were added to the Wildlife section.
- Forests to Faucets data replaced the water to people layer.
- National Insect & Disease Risk Map was updated with newer data.
- Several local priority watersheds were added to distance to managed land.
- Population and Population Growth Rate were updated with new census data.
- Impervious Surfaces and Canopy Cover were updated with newer data.

The newly-added watersheds represent local priority areas, where previous experience has shown high resource value and substantial opportunities with private landowners. For example, the West Tavaputs Plateau has multiple Forest Stewardship Plans, Legacy easements, and many private landowners that represent future opportunities. It probably was not identified by the initial modeling since there are no U&CF opportunities, and distance to managed lands was high due to the prevalence of private lands (2 of the 8 data layers the model used).

Only the Grouse Habitat Management Areas (GHMA) and local priority watersheds had a significant effect on the original priority areas. For example, the NW corner of Utah is now included due to GHMA.

What is more useful is an interactive map that allows zooming into areas for more detail. Clicking the "layers" button in the upper left allows options such as a more transparent layer to see what is underneath, show SGMA's only, etc. See the following link. http://arcg.is/1OcZS7p

Forest Action Plan: National Priorities

The five-year update process required states to include a new section addressing National Priorities. Since these priorities are addressed throughout the entire Forest Action Plan (FAP), icons representing each of the priorities were placed by each of the FAP objectives. This avoided duplication of the FAP objectives into a separate section. These priorities include:

- Conserve and Manage Working Forest Landscapes for Multiple Values and Uses
- Protect Forests from Threats
- Enhance Public Benefits from Trees and Forests

Conserve and Manage Working Forest Landscapes for Multiple Values and Uses

Utah's Forest Stewardship and Forest Legacy are the main programs that address this priority. Forest Stewardship Plans promote sustainable planning and active management that support multiple landowner objectives. Forest Legacy conservation easements protect working forests from being converted into other uses such as housing development. Recent successes include maintaining 94 active forest stewardship plans (less than 10 years old) representing 283,072 acres, and 69,965 acres enrolled in Forest Legacy. The $30,826,871 total received in Legacy funding was matched with $35,750,234 in landowner donations and other sources.

Protect Forests from Threats

Utah's Wildland Fire and Forest Health programs work together to address this priority. Wildland fire efforts include not only fire suppression, but also a strong fire prevention program. Similarly, the Forest Health program includes a strong detection and monitoring component to help prevent epidemic outbreaks of insects and diseases. Recent successes include implementing Governor Herbert's Catastrophic Wildfire Reduction Strategy (CatFire), and securing significant funding from the U.S. Forest Service, Natural Resource Conservation Service, and the Utah Legislature.

Enhance Public Benefits from Trees and Forests

All of the themes of the Forest Action Plan contain a strong education and outreach component, but it is especially emphasized in the fire prevention and Urban & Community Forestry programs. Highlighting the importance of urban forests also helps to show the importance of wildland forests to a more available urban population that typically has a "nature disconnect". Recent successes include 68% of all Utahns living in a Tree City USA community, and Utah receiving the Growth Award for having the greatest increase in Tree City USA communities in the nation for 2014.

Executive Summary

The Division of Forestry, Fire and State Lands collaborated with numerous partner agencies and organizations, including the USDA Forest Service, Bureau of Land Management, Division of Wildlife Resources, the Utah Partners for Conservation and Development and numerous stakeholders to develop the Utah Forest Action Plan. This plan provides a comprehensive analysis of the forest-related conditions, trends, threats and opportunities within Utah and will be used to guide the Division's planning efforts and project work.

The Forestry Title of the 2008 Farm Bill required all states to produce a Forest Action Plan in order to more effectively focus management priorities and funding opportunities. The Utah Forest Action Plan will drive future grant requests from USDA Forest Service, State and Private Forestry and other funding sources. The purpose of the Plan is to ensure resources are being focused on important landscape areas with the greatest opportunity to address shared management priorities and achieve meaningful outcomes.

The Utah Forest Action Plan concentrated on eight key themes for the geospatial analysis portion of the Plan. These eight themes are Fire Risk, Forests, Wildlife Action Plan, Water Quality, Riparian Areas, Forest Health, Distance to Managed Lands and Urban and Community Forestry. These eight themes utilized 17 data layers to conduct the analysis and identify those areas of important forest resources for project work.

The analysis resulted in the development of five priority areas across the state. These priority areas are named for their geographic location. They are, from north to south, Wasatch, Uinta, Sevier-Skyline, La Sal and Cedar.

Each chapter of the Plan details the current condition, program overview, objectives and strategies for the themes used in the model. Additional chapters address the Forest Legacy Program, Climate Change and a Dynamic Modeling proposal.

The Plan is intended to be a living document that the Division can refer to for reference and guidance. The Dynamic Model allows the Division to be adaptable, responsive and proactive. This adaptability and responsiveness is key to keeping the Division ahead of changes in ecosystems, data and funding sources.

Overview of Utah's Forest Resources

The vegetation communities which characterize Utah's forests and woodlands vary widely according to soil, climate and topography, with availability of water being the primary determining factor. Utah woodlands generally begin at elevations of 4,500 feet where pinyon-juniper combinations join mountain mahogany, Gambel oak and sagebrush. As elevation and precipitation increase, the highly valued timber species of lodgepole and ponderosa pines begin to appear along the Uinta Mountains and in select areas of southern Utah, respectively.

Private landowners maintain stewardship over approximately 2.7 million acres or 17% of the state's total forested lands (Van Hooser and Green, 1991). Although relatively small in acreage, these private forest lands overlay many of the state's most valuable watershed, wildlife and recreation areas and form critical fringe and connectivity zones throughout larger tracts of public forest.

The State's greatest variety of traditional forest species flourishes in the Montane Zone which includes all landscapes from 7,500 to 9,500 feet and receives annual precipitation of 18 to 40 inches. Nearly pure stands of Douglas-fir dominate the cool north-facing slopes and canyon walls of this region with Englemann spruce, blue spruce and subalpine fir coming in at elevations generally above 9,000 feet. Other coniferous species found in Utah's subalpine zone include modest stands of limber and bristlecone pine and a concentrated band of white fir running south through the central portion of the state. Clustered stands of quaking aspen, second only to Douglas-fir in state-wide distribution, add deciduous texture and golden fall color to Utah's forest lands lying between 6,000 and 10,000 feet.

La Sal Mountains
Photo by Geoff McNaughton

For the purposes of inventory, forest management agencies traditionally classify forests and woodlands by their inherent ability to produce industrial wood products (Van Hooser and Green, 1991). According to a Utah State University survey, the majority of Utah's forest land consists of non-commercial species such as oak, maple, pinyon pine and Utah and Rocky Mountain juniper (Kuhns, 1996). These wooded communities cover more than nine million acres, are in 90% public ownership and hold tremendous value for non-timber uses such as wildlife habitat and livestock grazing, watershed protection, recreation and production of firewood, fence posts and Christmas trees. Private landholders own 1.3 million acres of forest woodland.

Approximately 3.4 million acres or 21% of Utah's forested lands are considered commercially viable "timberlands." This means they are producing, or are capable of producing, crops of industrial wood. Eighty-one percent of these commercial stands are managed by public agencies with approximately 594,000 acres under the administration of private landowners. The largest concentration of private timberland lies in the northern half of Utah where counties with over 50,000 acres of private timberland include Summit, Wasatch, Morgan, Duchesne and Cache. Aspen is by far the most prevalent commercial species in the state, comprising 62% of Utah's private timberlands. Douglas-fir, ponderosa pine, Englemann spruce, subalpine fir and lodgepole pine make up the remaining 38%.

Introduction to the Forest Action Plan

The Utah Forest Action Plan was developed by the Utah Division of Forestry, Fire and State Lands implementing direction contained in the Forestry Title of the 2008 Farm Bill (P.L. 110-234). Each State was required to complete a State Assessment and Resource Strategy within two years after enactment of the 2008 Farm Bill (June 18, 2008) in order to continue receiving funds under Cooperative Forestry Assistance Act (CFAA). CFAA provides resources to states for the management of state and private forests.

The Plan is an integral part of the new State and Private Forestry Redesign Program and is intended to provide a comprehensive analysis of the forest related conditions, trends, threats and opportunities within the state. Ultimately, this analysis delineates the priority forest landscape areas in Utah. These priority areas are intended to:

- Enable the efficient, strategic and focused use of limited program resources.
- Address current state and national management priorities.
- Produce the most benefit in terms of critical resource values and public benefits.

Delineating these priority areas will ensure that state and partner resources are focused on important landscape areas with the greatest opportunity to address shared management priorities and achieve meaningful outcomes. Additionally, these shared management opportunities also include indentifying multi-state priority areas with neighboring states. Finally, the Plan is consistent with the State and Private Forestry national themes:

- Conserve working forest landscapes;
- Protect forests from harm;
- Enhance public benefits.

Range Creek Forest Legacy Property
Photo by : Ann Price

There are three components to the Plan that identify priority forest landscape areas and highlight work needed to address national, regional and state forest management priorities:

- *Statewide Assessment of Forest Resources* —provides an analysis of forest conditions and trends in the state and delineates priority rural and urban forest landscape areas.
- *Statewide Forest Resource Strategy* —provides long-term strategies for investing state, federal and other resources to manage priority landscapes identified in the assessment, focusing where federal investment can most effectively stimulate or leverage desired action and engage multiple partners.
- *Annual Report on Use of Funds* —describes how S&PF funds were used to address the assessment and strategy, including the leveraging of funding and resources through partnerships, for any given fiscal year.

The Assessment of Forest Resources and Forest Resource Strategy have been combined in to this single report titled "*Utah Forest Action Plan*."

Forest Action Plan Process

The Plan was intended to be a collaborative process developed with the input of key partners and stakeholders. Stakeholders included federal and state agencies and non-governmental organizations. The Plan also included a Core Team, which produced the Plan products for review by the stakeholder group. The role of the stakeholders was to give valuable input at key stages of the Plan process. Although it is a collaborative process, it is important to remember that the Plan will be a guiding document for the Division.

Core Team

Laura Ault .....Utah Division of Forestry, Fire and State Lands, Sovereign Lands Program Manager
Jennifer Biggs .....Utah Division of Forestry, Fire and State Lands, IT Coordinator/Web Developer
Geoff McNaughton.....Division of Forestry, Fire and State Lands, Forestry Programs Administrator
Buck Ehler .....Utah Division of Forestry, Fire and State Lands, GIS Coordinator
Sean Edwards .....Utah Division of Forestry, Fire and State Lands, GIS

The Division held the first stakeholder meeting for the Plan on January 13, 2009. A list of participating stakeholders can be found on page 7. Individuals from a variety of Federal, State and non-governmental organizations. During the meeting, the forest related conditions, trends, threats and opportunities in Utah's forests were identified. These conditions, trends, threats and opportunities were summarized by the Core Team into the twenty-two issues listed below. A presentation was also given at a meeting with the U.S. Forest Service, Utah Forest Supervisors to brief them on the Forest Action Plan process.

A worksheet was e-mailed to all the stakeholders requesting they rank the issues summarized from the January 13, 2009 meeting in order of importance. The responses were used to identify the most important themes to be included in the Geographic Information System (GIS) portion of the Plan. These themes were used to identify the GIS data layers needed to create the Plan model. Eight themes were identified and are listed below. Each of the theme layers and the data layers used to create them will be described in detail in each chapter.

- Fire
- Forests
- Wildlife Action Plan
- Water Quality
- Riparian Areas
- Forest Health
- Distance to Managed Lands
- Urban & Community Forestry

Summarized Conditions, Trends, Threats and Opportunities

Listed Alphabetically

1. Air quality
2. Climate Change
3. Condition in Relation with Biological Potential
4. Damage from Acid Rain
5. Developed Recreation
6. Grazing - ungulate browsing on forest land
7. Habitat Fragmentation
8. Impacts from Mining Activity - roads, subsiding from coal mining
9. Insects and Disease
10. Invasive Species/Noxious Weeds
11. Lack of Recruitment/Conversion
12. Municipal Watersheds
13. Non-game Species
14. Off-Highway Vehicle Use
15. Open Space - loss and development of open space
16. Sensitive Species
17. Soil Erosion
18. Water Quality
19. Watershed Health
20. Wildfire - fuel load
21. Wildfire - Wildland Urban Interface
22. Wildlife - winter and summer range

The Draft Plan was presented at a meeting at the Utah State Capitol on March 25, 2010. The comments received at that meeting were incorporated into the Plan. The draft was also presented to the U.S. Forest Service, Utah Forest Supervisors as well as provided to members of the Natural Resource Conservation Service, State Technical Advisory Committee for review and comment.

Stakeholder Attendance

January 29, 2009

Federal

BLM
USDA Forest Service –State and Private Forestry
USDA - Forest Service - National Forest Service
National Parks

State of Utah

Division of Forestry, Fire and State Lands
School and Institutional Trust Lands
Governor's Office of Planning and Budget
Division of Wildlife Resources
Department of Environmental Quality
Governor's Office of Economic Development
Division of Parks and Recreation
Automated Geographic Reference Center
Department of Community & Culture

Organizations

Utah Partners for Conservation and Development

Non-Governmental Organizations

Utah Environmental Congress
The Nature Conservancy
Grand Canyon Trust
Wild Utah Project
Western Watersheds
Trust for Public Land
Red Rock Forests
Rocky Mt. Elk Foundation
Mule Deer Foundation - Utah

The Modeling Process

The Core Team followed these five steps to complete the GIS assessment:

1. Identify themes that represent issues important to the management of forest resources within the state.
2. Gather and combine spatial data to model each theme.
3. Combine each theme layer into one assessment layer.
4. Transfer the assessment to watershed boundaries by calculating the average assessment value within each watershed.
5. Use the watershed layer of average assessment value to designate priority areas.

The team used stakeholder input and the stated purposes of the Division to identify eight themes important to the management of forest resources within the state. The input layers for each of the eight themes identified by the Core Team were derived from 20 separate data layers. The themes included in the Plan are Fire, Forests, Wildlife Action Plan, Water Quality, Riparian Areas, Forest Health, Distance to Managed Lands, and Urban and Community Forestry.

The best available spatial data pertinent to each theme was gathered within a GIS, converted to raster data at a spatial scale of 30 meters per pixel, with data values scaled to a range of 0-3. The data layers related to each theme were combined with equal weight given to each data layer. This resulted in eight theme layers. The values within each theme layer were also scaled to the 0-3 integer range.

The theme layers were then combined into one assessment layer. Equal weight was given to each theme layer; resulting in the assessment layer containing integer values from 1 to 24. A higher assessment value mean a greater likelihood of potential benefits from forest management project work.

Assessment values within a watershed, 12 digit hydrological unit code (HUC), were averaged and assigned to the watershed. The team chose to tie priority areas to watershed boundaries because they represent natural boundaries on the landscape within which all forest management projects have the potential to impact.

Each watershed was assigned to one of three tiers of priority by the GIS, by separating the averaged assessment values into three groups and using the equal interval method. The Core Team then designated priority areas using the computer generated priority values as a base, adjusting to include municipality boundaries, areas of special concern to the Division and to block up priority areas. The result is a three tiered priority designation for the entire state as seen on page 12.

Priority Areas

The priority areas are the output of creating a model to reflect the current state and national management priorities. The priority areas designated by the Plan for the State were divided into five priority area regions and named for their geographic location. The priority area regions are shown on page 13 and are named:

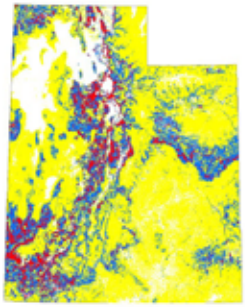
- Wasatch
- Uinta
- Sevier-Skyline
- La Sal
- Cedar

The delineation of these priority areas will ensure resources are focused on important landscape areas with the greatest opportunity to address shared management objectives and achieve meaningful outcomes. Utilizing the priority areas to identify project work will ensure efficient, strategic and focused use of limited program resources while producing the most benefit in terms of critical resource values.

The delineation of the priority areas has also created a number of multi-state project opportunities. These potential partnerships and project opportunities will be explored further through landscape, scale restoration, grant proposals and other planning processes.

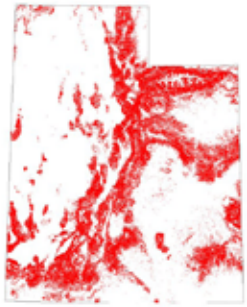
Utah's Forest Action Plan Model

8 Theme Layers from 17 Data Layers



Wildland Fire

- West Wide Fire Risk Assessment

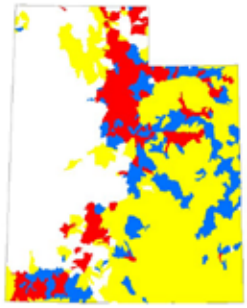


Forests

- NLCD Forests

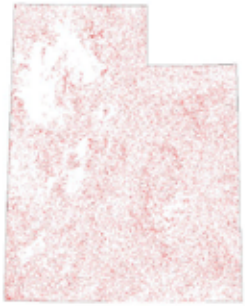
Wildlife Action Plan

- Wildlife Action Plan
- Sage Grouse Mgmt Areas (Not Modeled, included due to Governor's Executive Order)



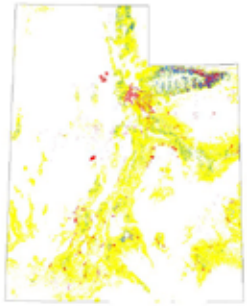
Water Quality

- Impaired Waters 303(d)
- Forests to Faucets



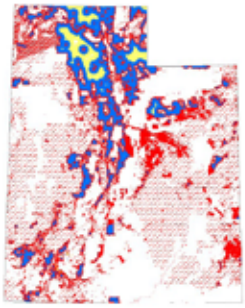
Riparian

- 30 m Waterbody Buffer
- 30 m Stream Buffer



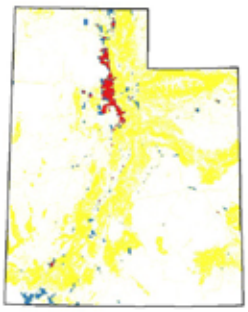
Forest Health

- Insects and Disease
- Invasive Species



Lands

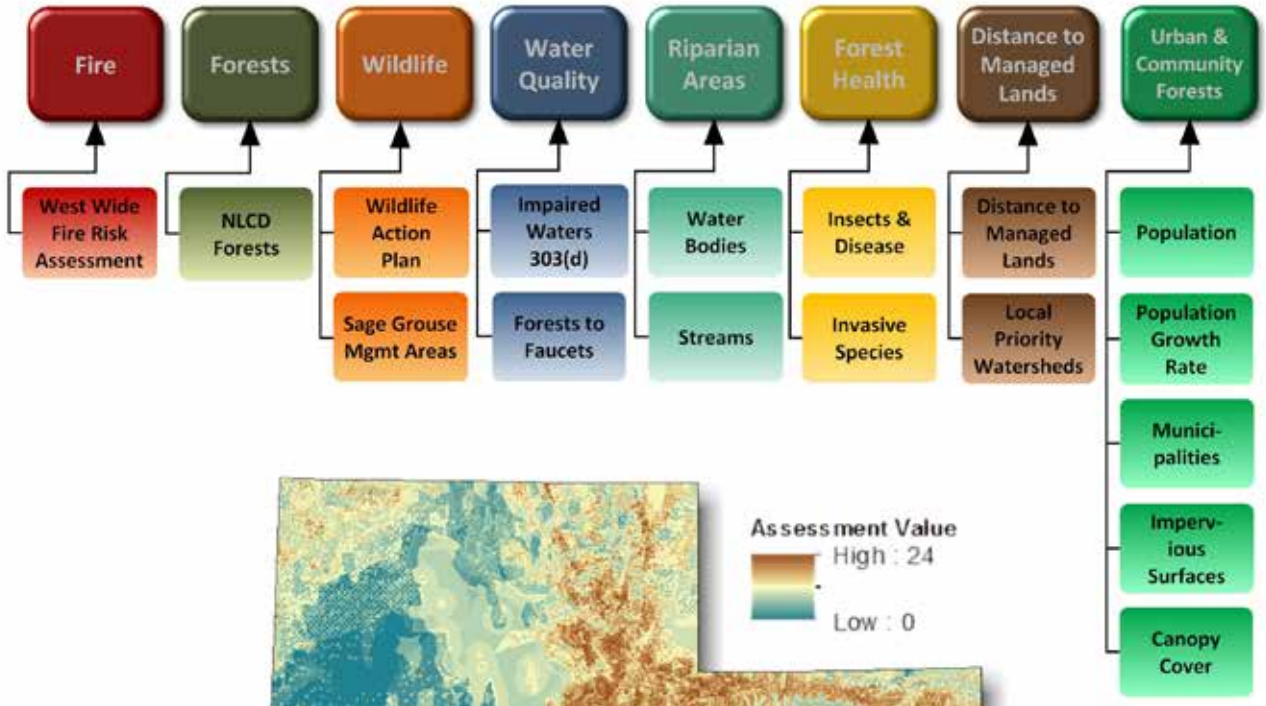
- Distance to Managed Lands
- Local Priority Watersheds

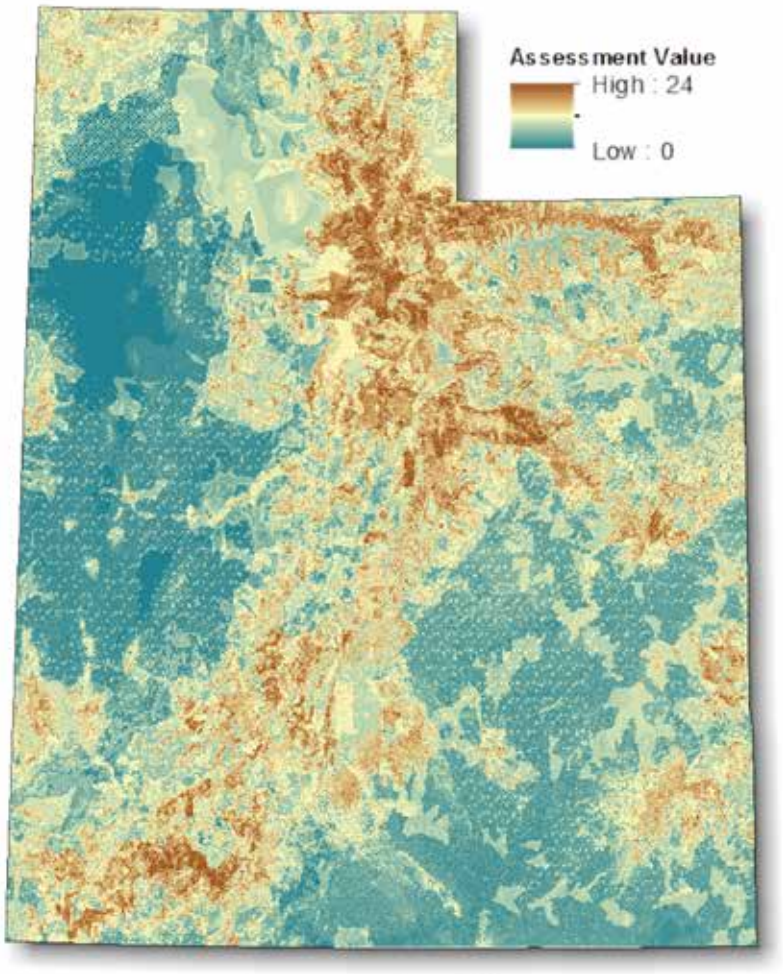


Urban & Community Forestry

- Population
- Growth Rate
- Municipalities
- Impervious Surfaces
- Canopy Cover

Utah Methodology Matrix





Forest Action Plan

Priority Areas

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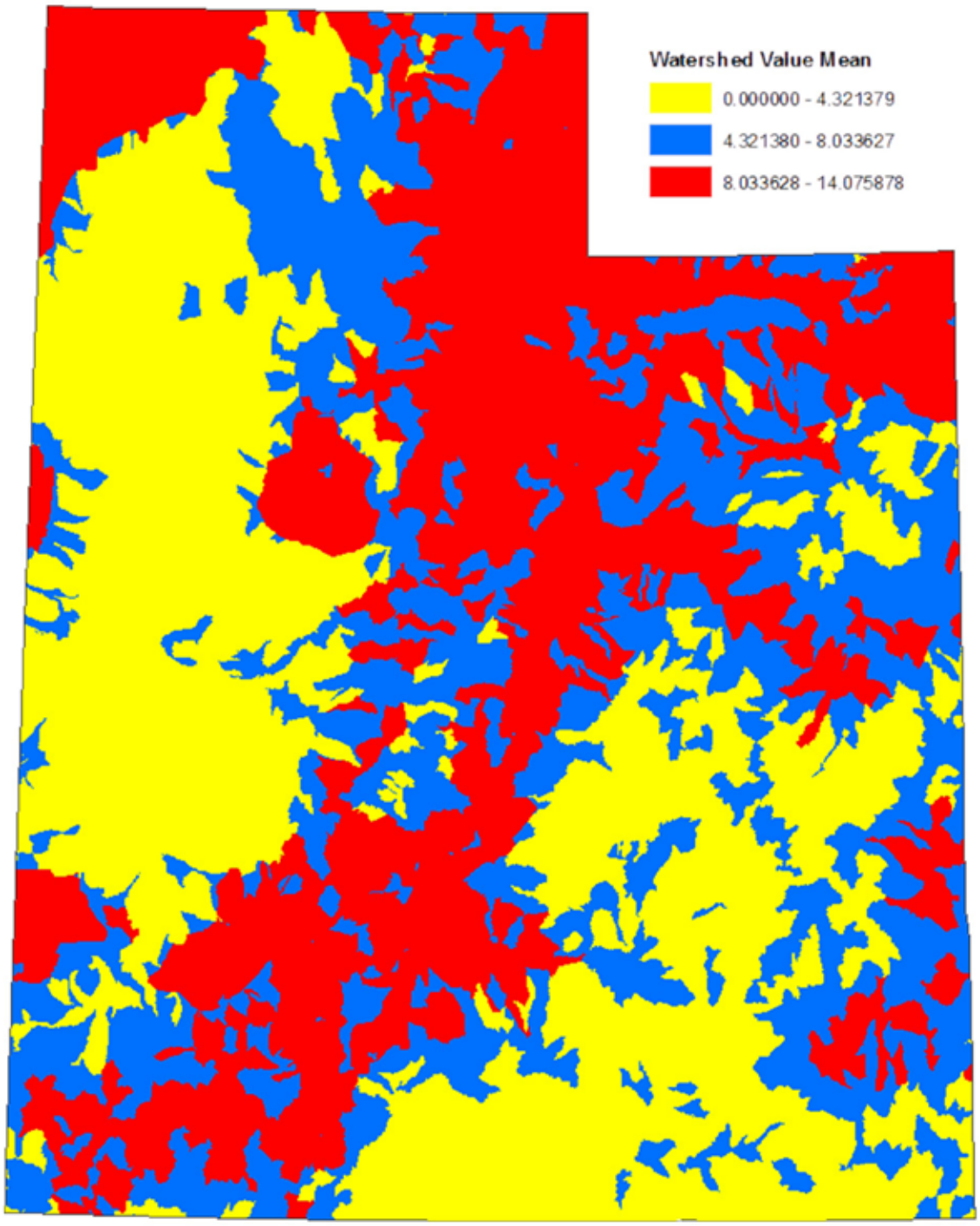
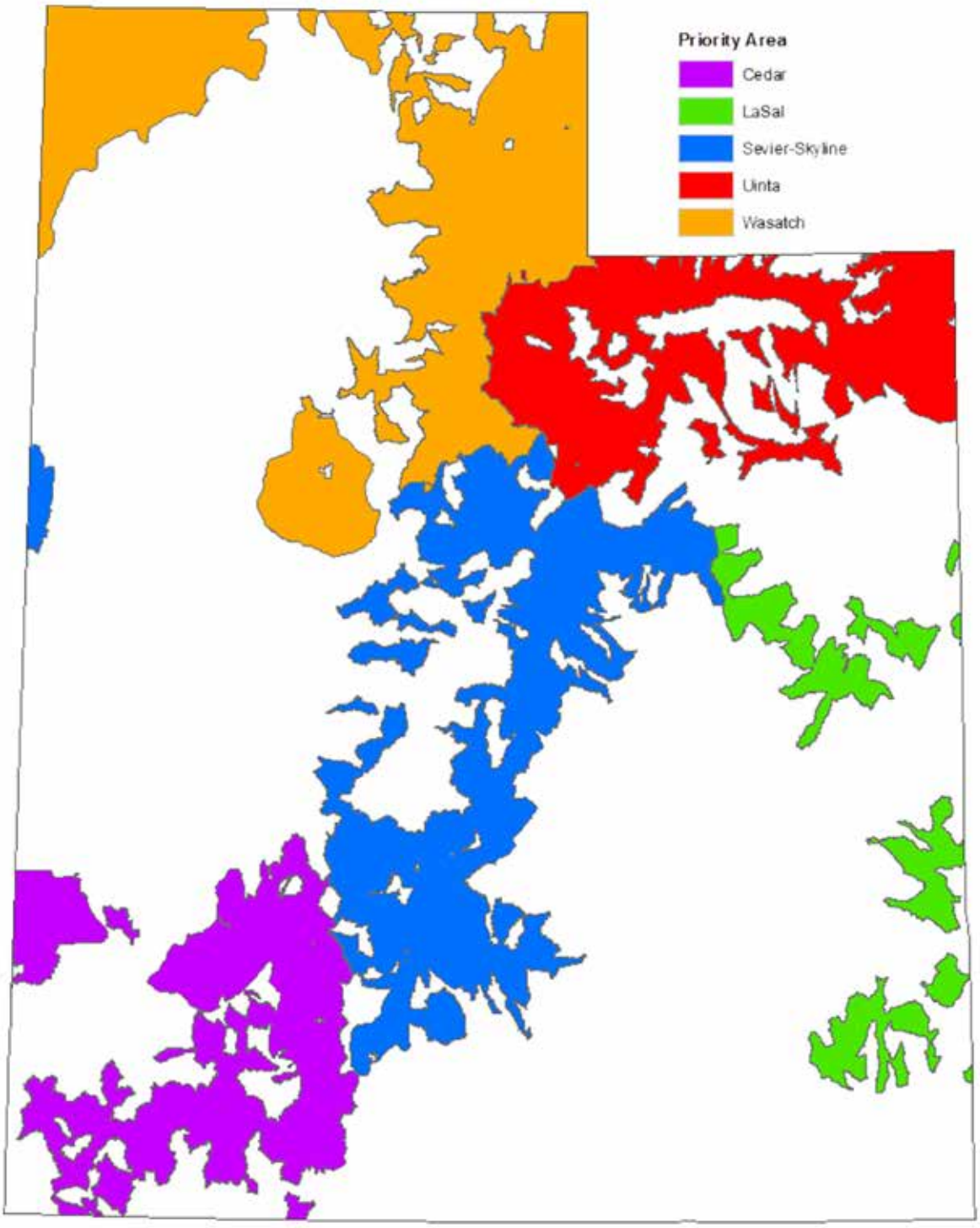


Priority Area Regions



Wildland Fire

Wildfire has always existed throughout history and is nature's way of cleaning landscapes and recycling resources. Wildfire has improved vegetative species abundance and diversity from the sage steppe of the western deserts to the high alpine peaks of the Rocky Mountains. Utah's landscapes have become dependent upon wildfire to maintain the health and vigor of the many ecosystems within the state. With the increase of fire suppression efforts and fire management objectives to keep all wildfires small, many of the ecosystems have departed from historic conditions. As a result when wildfires occur, they are often more damaging with catastrophic consequences to ecosystems and have a greater negative impact on communities.

Current Condition

Utah's varied vegetation is a function of precipitation and elevation. The landscapes of Utah can be categorized into three general types: forest, shrub and grass. Each of these types can be further broken down into several sub-categories.

Brian Head, Utah. Example of the Rural WUI found in Utah and how it varies from trees to grass and shrublands.
Photo by: Tyre Holfeltz

Forest

For purposes of fuel typing, forests can be sub-divided into the following: sub-alpine, aspen, ponderosa, pinyon-juniper and hardwoods.

Sub-alpine forests are currently showing an expansion in Utah, especially into once pure stands of aspen. The sub-alpine type is prone to high severity and high intensity wildfires otherwise known as stand replacing wildfires. Due to the elevation, wildfire occurrence can range from 300 to 700 years. These stands will more likely succumb to insect and disease infestations than wildfire.

Aspen is on a steady decline statewide for a variety of reasons, including the wildfire exclusion paradigm. Low intensity wildfires are common in this forest type and act primarily to thin and regenerate stands.

The ponderosa forest type is typically characterized by open growth with wide spaces between the trees and an understory of shrub patches and continuous mixed grasses. Due to the wildfire exclusion paradigm, most of the ponderosa forest type is overstocked with multiple layers of understory. The wildfire return interval is 5 to 10 years and is generally of low severity and intensity. Many stands are as much as six times removed from this interval. When wildfire does occur in these stands they are of high intensity and severity.

Pinyon-juniper forests in Utah are constantly fluctuating because of their natural tendency to encroach on sage-steppe and their resiliency to drought. The pinyon-juniper forests have increased across the state primarily due to fire suppression. Pinyon-juniper forests are now found in areas that they have not historically occupied. Because of this expansion the sage-steppe has decreased significantly across much of Utah creating negative impacts to plants and wildlife. The frequency of wildfires in the stage-steppe range from 5 to 35 years and in truly homogenous stands of pinyon-juniper can be 50 to 100 years. Severity and intensity of these wildfires is considered to be high in both cases. Most sage steppe

has been encroached on by pinyon-juniper and is becoming decedent with little recruitment.

Hardwood forests in Utah are very rare and occur primarily in riparian zones composed of species that are fast growing and tend to decay before there are any appreciable effects from wildfire.

Shrubs

Shrub forests are predominantly composed of Gambel oak. Gambel oak is clonal, though if it is undisturbed, will expand as even aged stands covering large expanses. The fire return interval is disrupted from its standard of 5 to 20 years and tends to produce wildfire that is of high intensity and severity.

Wildland Urban Interface in Timberlakes, Utah.
Photo by: Ken Ludwig

Grass

Grass fuel types are found throughout Utah and are primarily perennial. Of great concern is the non-native annual grass, Bromus tectorum or cheatgrass. Cheatgrass invades newly burned areas especially in the pinyon-juniper and shrub fuel types. The ability of cheatgrass to adapt to varying soil and moisture conditions has created a vast monoculture across many low elevation, wildfire scarred landscapes. Because cheatgrass cures earlier in the year than other grasses it is available to burn earlier in the wildfire season, changing the fire return interval in many areas from 5 to 35 years to annually. Due to the proliferation of cheatgrass there has been a significant decrease in the abundance of native grasses across Utah.

Over the last century people have spread further and in higher densities across the habitable areas of the state. As homes and communities continue to push further into the wildlands they have created a zone known as the wildland urban interface (WUI). This close interaction between structures and wildlands has increased the need for firefighting resources to protect lives and property. It has become necessary to employ other management techniques to deal with the increased threat of wildfire.

Black Ridge Area along I-15 corridor in Southwest Utah. Mosaic Fuels Breaks can be seen behind the community and a fire scar on the mountain from a recent fire.
Photo by: Tyre Holfeltz

To date, millions of dollars have been expended in modifying landscapes through the use of mechanical and labor intensive treatments of over-grown, dying and diseased forests and woodlands. The direct result of this work has reduced impacts from wildfire effects.

As work in the WUI continues to progress in Utah, it is anticipated that the long-term outcome will be an overall reduction in the resources needed to fight wildland fires and costs of wildland fire suppression.

Program Overview

Wildland Fire Suppression

The Division's fire management program is responsible for protecting state property by preventing the origin and spread of wildfire on 15 million acres of State and private lands. The Division has limited resources to carry out a very large task. Through cooperative agreements the Division provides a Fire Warden in each county. Wardens organize local fire departments into a safe and efficient wildland firefighting forces. There is heavy reliance on the local fire departments, especially for initial attack. The Division's Lone Peak Conservation Center provides three hand crews and two heavy engines for wildfires that escape initial attack both within and out of the state.

Local, State and Federal Resources are utilized in fire suppression efforts throughout the State of Utah.
Photo by: Rudy Sandoval

Because of land ownership patterns in Utah, wildland fires seldom involve a single jurisdiction. The vast majority of incidents involve multiple ownerships and agencies. The Division maintains cooperative agreements with all federal land management agencies and all 29 counties in the state. Through cooperative agreements, Utah counties can receive assistance from the state if they adopt a wildland urban interface ordinance, meet minimum wildland firefighting qualifications and adopt a wildland fire suppression budget.

The fire management program assists local fire departments by providing training and coordination through entities like the Utah Fire and Rescue Academy. The Utah Fire Service Certification Council certify (red card) over 1,500 fire department members every year in wildland fire. The Division also administers several federal and one non-federal source of funding for fire departments to assist with the purchase of personal protective equipment, suppression equipment, communications and apparatus. Additional equipment is made available to fire departments through the Federal Excess Personal Property program administered by the fire management program. This program has placed over 1,200 pieces of fire equipment with departments statewide.

Wildland Fire Prevention

Wildland fire prevention includes activities directed at reducing human caused ignitions. The fire program's prevention efforts are concentrated on the National Smokey Campaign and the State's "Do Your Part" Campaign that is supported with a very limited budget. Area fire staff assist with prevention projects when available.

Wildland Fire Preparedness

Utah has identified over 600 communities at risk to wildfire. The fire program assists these communities at risk through education, planning and hazardous fuels management. Area WUI specialists deliver educational programs and work with communities to develop Community Wildfire Protection Plans (CWPP). These plans identify hazards and develop the mitigation strategies to address them. Over 190

CWPPs have been completed. The fire program also supports the statewide Living With Fire campaign (this is an interagency effort to educate residents living in the wildland urban interface) along with the following national programs: Firewise Communities, Ready, Set, Go! and Fire Adapted Communities. A list of current CWPPs in Utah is included in the Appendix.

Wildland Fire Fuel Management

Fuel Management refers to the act or practice of controlling flammability and reducing resistance to control of wildland fuels through mechanical, chemical, biological, or manual means, or by fire in support of land management objectives. The Division area WUI and fuels specialists that assisted communities with the development of CWPP's will continue to aid with implementing mitigation strategies. Hazard fuel mitigation grant funds can be requested through several sources. Thousands of acres of defensible space and fuel breaks have been created through this program making communities and firefighters safer.

Objectives and Strategies

In 2013, the State of Utah developed the Catastrophic Wildfire Reduction Strategy (Catfire) in response to the severe 2012 fire season. Reducing the catastrophic wildfire requires attention to three interdependent goals identified in the National Cohesive Wildfire Management Strategy -- Restore and Maintain Landscapes, Fire Adapted Communities, and Wildfire Response. These goals have been embraced throughout the development of the state's Catfire strategy.

Mitigation of hazardous fuels can change fire behavior making it easier to suppress. The effects of the mitigation, however, are not limited to life and property safety but will also affect forest health, water quality, vegetative species abundance, etc. As we continue to implement projects across the landscapes in Utah, the only way to truly be successful is to integrate existing programs, utilize local and federal partners and continue to educate the general public to create the desired shift towards more resilient communities and ecosystems.

Icons next to objectives refer to the national priorities they address. (See the Five-Year Update Section on page 3.)

Reassess the existing education program to meet current and future needs

- Make sure literature is updated as necessary to incorporate current research information.
- Identify gaps in research and pursue funding to address research needs.
- Distribute materials to community members, individual landowners, public officials, interagency partners and media for further dissemination and outreach.
- Maintain collaborative efforts with interagency partners to deliver and update information.
- Increase participation in state and national programs including Utah Living With Fire, Ready, Set, Go!, Firewise USA and Fire-Adaptive Communities.

Resources required: State and Area WUI Coordinators, Catfire Prevention & Education Coordinator.

Expand planning opportunities

- Utilize existing tools to effectively and efficiently expand planning opportunities to the 625 identified Communities at Risk within the State of Utah.
- Train urban and volunteer fire departments to deliver the National Cohesive Strategy objectives

and strategies to more efficiently reach those in the Wildland Urban Interface.
- Update and modify as needed the planning documents to meet the needs of the State of Utah and intent of the Healthy Forest Restoration Act.

Resources required: State and Area WUI coordinators, Catfire Program Coordinator Catfire Fire Risk Assessment.

Organizational development 

- Provide technical and financial assistance to the 501c3, Utah Living with Fire.
- Standardize program delivery to improve consistency across the state.
- Provide cross discipline training to meet needs of individuals and other programs.
- Expand cross ownership contract sharing to reduce mitigation costs.

Resources required: Catfire Program Coordinator and Regional planning process.

Wildland Fire legislation 

- Update statues and codes to align more closely with current suppression management decision tools.
- Establish a reward system through tax relief for preparing for wildland fire.
- Provide increased funding to help communities prepare for wildfire.
- Create a funding mechanism which allows the participation for all interested entities for wildland fire suppression.

Resources required: Salt Lake City staff and Area office fire staff.

Program integration 

- Increase communication and cooperation among programs within the Department of Natural Resources and other State and Federal agencies.
- Utilize when appropriate other programs to meet the intent of the National Cohesive Strategy.
- Help to identify areas of potential integration through the Landscape Scale Restoration process.

Resources required: Catfire Program Coordinator and Catfire Fire Risk Assessment.

Project identification and implementation 

- Identify both federal and non-federal mitigation projects identified in the priority areas of the Forest Action Plan, through the Interagency Fuels Committees and/or through the Catastrophic Wildfire Reduction strategy process.
- Plan and complete projects that meet the needs of entire communities that focus on resilient landscapes and fire adaptive communities.
- Incorporate a maintenance schedule for communities that are achievable and effective.

Resources required: Catfire Program Coordinator, Catfire Fire Risk Assessment, Catfire funding, and State and Area WUI Coordinators

A prescribed fire is used to remove encroaching conifers and stimulate aspen regeneration.
Photo by: Rudy Sandoval

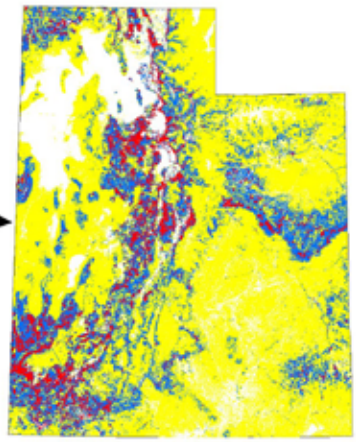
Wildland Fire

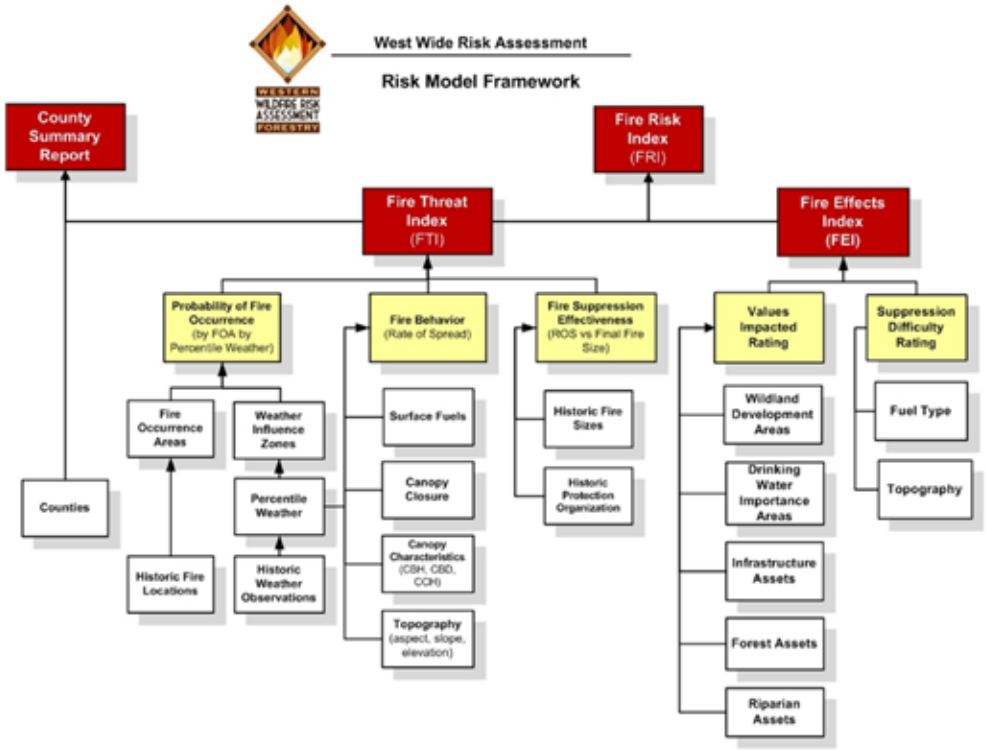
The Wildland Fire theme shows potential risk to resources from wildland fire. It is modeled from numerous data layers, as explained by the figure below.

Fuel Model Data Layer

From: Utah Division of Forestry, Fire and State Lands and the West Wide Wildfire Risk Assessment

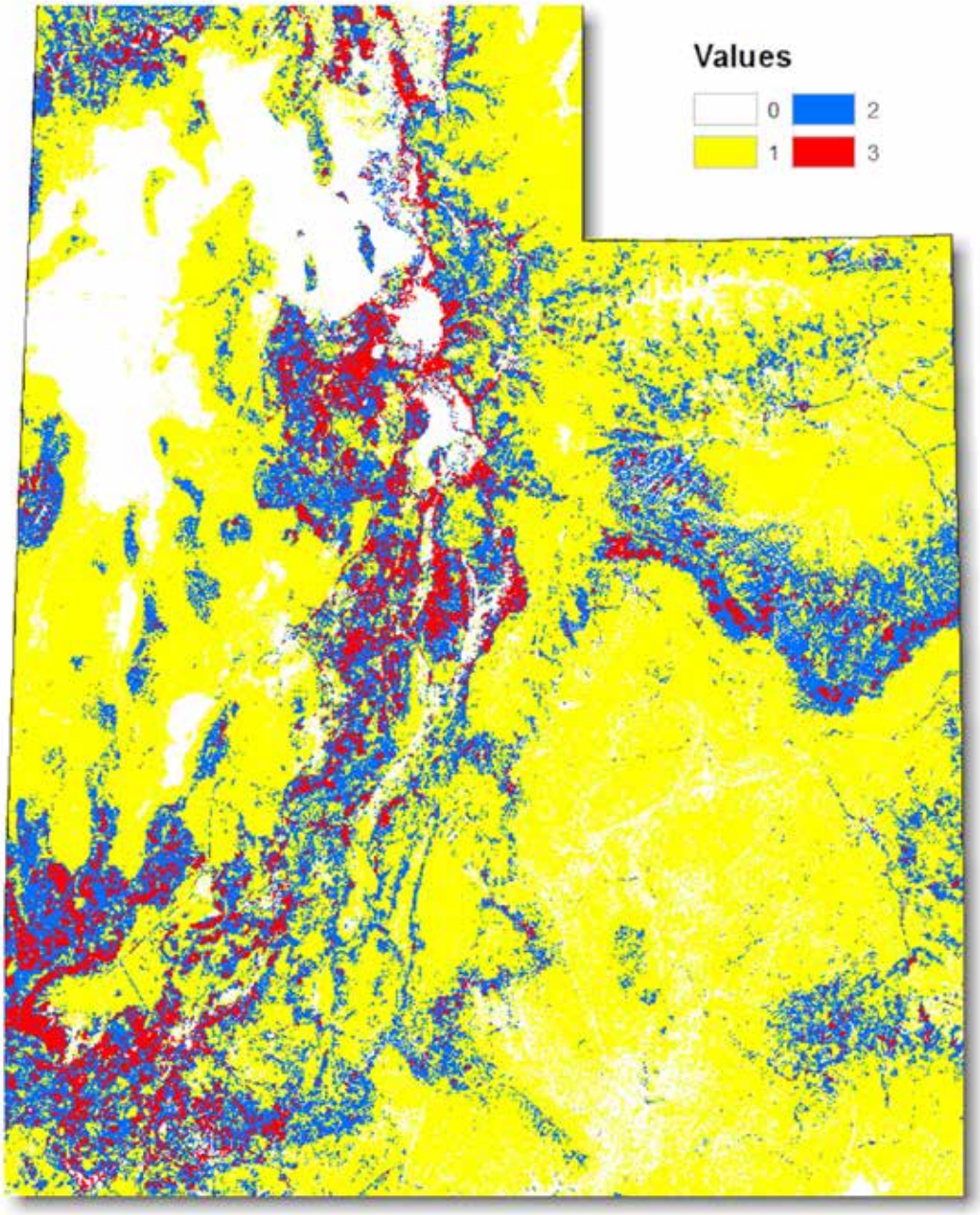
Value	Risk Category
0	Negligible
1	1 - 3
2	4 - 6
3	7 - 9





Beginning in 2016 the State of Utah will be utilizing optimized data sets associated with the West Wide Widlfire Risk Assessment (WWA) to determine wildfire risk across the state. Completed in 2012 the WWA was a regional effort aimed at identifying wildfire risk within all participating states.Utilizing funds from Utah?s Catastrophic Wildfire Reduction Strategy, the State of Utah has optimized the results of the regional analysis to accurately project wildfire risk at a local level throughout the state. Based on a scientific data analysis model that includes inputs such as fire history, infrastructure assets, watersheds, surface and canopy fuels, historical weather, suppression difficulty and numerous additional data sets, the WWA outputs offer the most scientifically based assessment of wildfire risk available to Utah to date. The figure above is a schematic of the data analysis model highlighting each of the inputs into the risk analysis.

Wildland Fire



The values assigned to the Wildland Fire theme layer are:

Wildland Fire Value	From Input Layer
0	0
1	1
2	2
3	3

Stewardship Forestry

Current Condition

With nearly 17.5 million acres of forested land, Utah's forests are an important natural resource. Significant contributions from Utah's forests provide for numerous social and economic benefits, including recreation, wildlife habitat, open space and forest products. Across Utah's landscape, approximately 2.7 million acres or 19% of Utah's forests are held in private ownership. Many of these private forests were originally acquired for cattle grazing, agriculture or mining development and are typically located near larger tracts of public forest where critical watershed areas exist. Although relatively small in acreage, these private forestlands overlay many of the state's most valuable watershed, wildlife and recreation areas and form critical fringe and connectivity zones throughout larger tracts of public forests (Utah Forest Legacy Program, Assessment of Need). Because of their location, these lands are capable of providing benefits as well as posing risks for nearby communities if not properly managed.

Utah's private forest landowners are a diverse group, consisting of corporate owners and private individuals, owners of large and small acreages, multi-generation owners and those who have only recently acquired forestland. Utah's non-industrial private forest (NIPF) landowners are distributed throughout all twenty-nine counties and own land for a variety of reasons.

An estimated 3,500 landowners control the management and land use activities on private forestlands greater than 10 acres in size. A recent national survey suggests there are about 11,000 forest landowners in Utah who own parcels smaller than 10 acres. Surveys conducted by the Division and Utah State University identified wood products, livestock and recreation as the three primary reasons for forestland ownership in Utah. Utah owners of commercial high elevation forestlands own an average of 6,300 acres. The average forest landowner holds 600 acres of forestland, ranging anywhere between 40 to 15,000 acres.

Utah has over 13,000 farms and ranches spread throughout the state. Rural forest landowners, ranchers and farmers can, through use of conservation plantings and other management practices, improve forest health and productivity, reduce soil erosion, improve riparian areas, improve crop and livestock productivity and improve wildlife habitat.

Forest Landowner Property
Photo by: Mike Eriksson

The following tables illustrate baseline data for Utah's forest resources:

Non-Industrial Private Forestry in Utah			
Total Land Area	54,310,546 ac.	**State Acres**	1,298,720 ac.
Forest Land Acres	16,234,000 ac.	**NIPF Acres**	2,745,967*
Federal Acres	12,175,500 ac.	**NIPF Landowners**	14,300

Ownership Category	Timberland	Woodland	Other Forest Land	Total Acres
NIPF - Private	961,384	1,735,965	48,616	2,745,967

Comprehensive Inventory of Utah's Forest Resources, O'Brien 1993

Utah's Forest Resources - Non-Industrial Private Forest Lands			
Administrative Area	**Forest Land**	**Woodland**	**Total Acres**
Bear River & Wasatch Front	511,638	206,317	717,955
Northeast	594,449	318,251	912,700
Central	191,105	147,051	338,156
Southeast	137,953	206,538	344,491
Southwest	228,970	176,069	405,039
Total Acres	**1,664,115**	**1,054,226**	**2,718,341**

Figures based on 1978 data

Program Overview

Providing technical assistance to NIPF landowners and rural agricultural landowners is not new to the Division. Chapter 65A_8_1 of the Utah State Code provides guidance to the Division which is responsible for *"protecting non-federal forest and watershed areas on conservation principles, and encouraging private landowners in preserving, protecting, and managing forest and other lands throughout the state."* From an historical perspective, however, Utah's service foresters have been challenged with efforts to advance forest stewardship and incentive-based programs to NIPF landowners, since most tend to be farmers and ranchers primarily interested in increasing forage production for livestock.

Recent trends and interest in Utah's timber resources indicate changes occurring in how private landowners view the resources on their property. Moreover, ownership patterns have changed dramatically over the last 10 years. The trend indicates increasing numbers of landowners with smaller land holdings further fragmenting the landscape from an ownership perspective. Forest sustainability, ecosystem process and function, thus becomes a larger challenge for the Division's service foresters.

Among private landowners, creating and maintaining awareness of existing service forestry programs in Utah is an ongoing challenge. Many landowners are not aware of the services the Division offers. This may in part be responsible for the poor response over the years to cost-share incentives programs. Other factors may include long harvest rotations, economic feasibility of forestry in the Great Basin and purpose of NIPF ownership.

Utah has seen slow, yet steady progress towards increasing interest in forest management. This is shown by the increased level of involvement of program delivery staff promoting forest stewardship and landowner education efforts.

The Forestry Title of the Food, Agriculture, Conservation and Trade Act of 1990 (also known as the Farm Bill of 1990 and 1995) established the Forest Stewardship Program, which allows states to provide much needed technical assistance to NIPF landowners through the development of Forest Stewardship Plans (FSP).

The National Fire Plan (NFP) also provided important one-time financial support, which increased technical assistance capability under the Multi-Resource Stewardship component. The Environmental Quality Incentives Program (EQIP) was reauthorized in the Farm Security and Rural Investment Act of 2002 (Farm Bill) to provide a voluntary conservation program for farmers and ranchers that promotes forestry production and environmental quality as compatible national goals. EQIP replaced the now defunct Forest Land Enhancement Program (FLEP) in providing a financial incentives element to NIPF landowners who desire to implement recommended practices identified in their Forest Stewardship Plans.

Utah Forest
Photo by: Unknown

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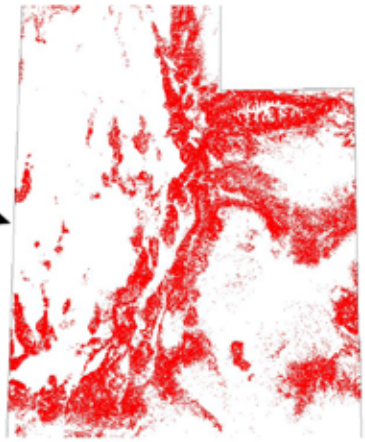
Forests

The forest theme shows the location of forests across the state. It is the basic resource layer of the Assessment from which opportunities related to forest management can be obtained. The theme is composed of one data layer.

Forest Data Layer

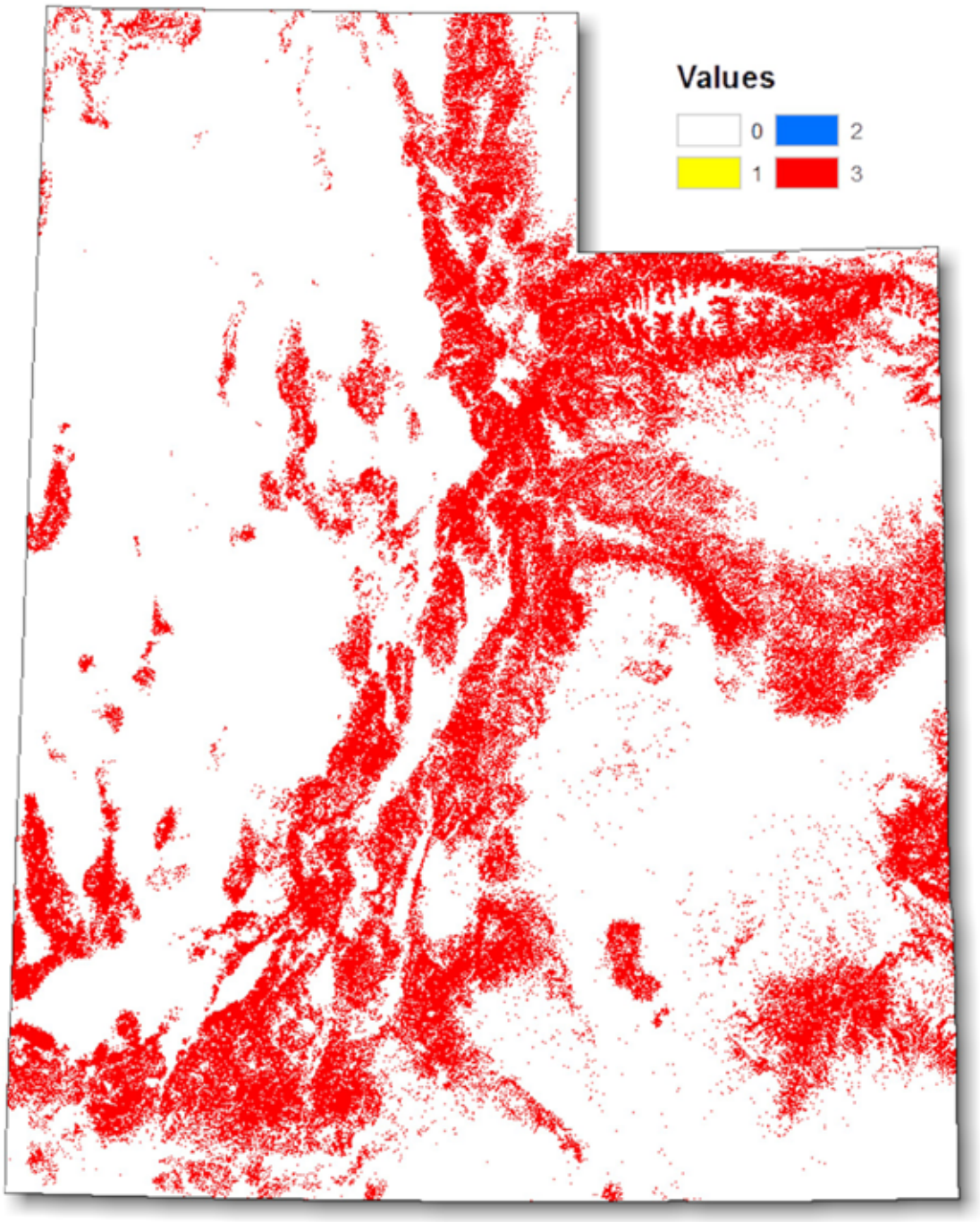
From: National Land Cover Database (2011)*

Value	Type
0	Non-forest
3	Forest



*The following categories were considered forested:
41: Deciduous Forest
42: Evergreen Forest
43: Mixed Forest

Forests



The values assigned to the Forest theme layer are:

Forest Value	Type
0	Non-forest
3	Forest

Strategy

Agro-Forestry

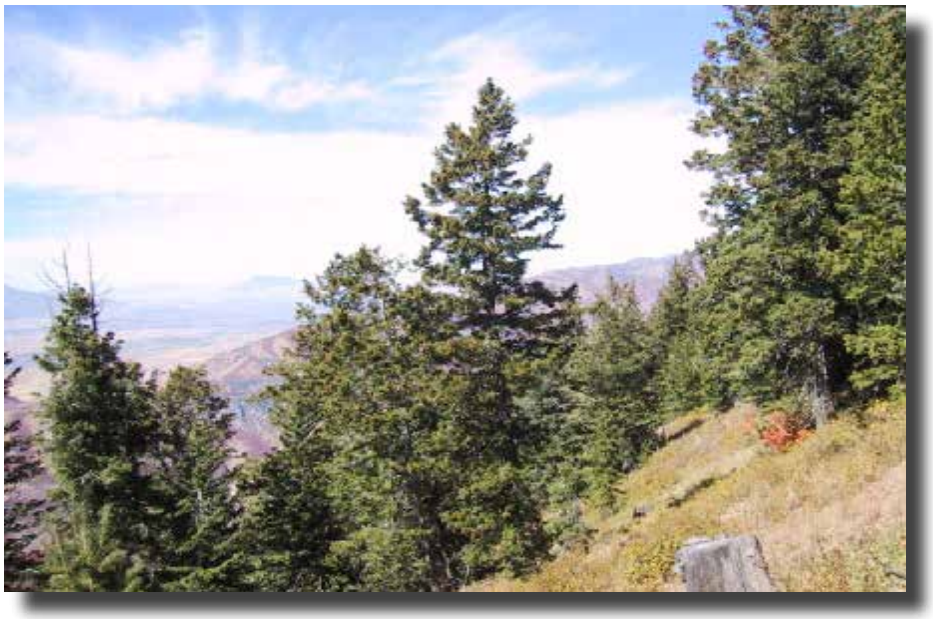
Agro-forestry opportunities in Utah are excellent. There is substantial agricultural acreage that can benefit from agro-forestry practices. Agro-Forestry is defined as the "appropriate use of trees and shrubs in support of agricultural production, resource conservation and human environments," and includes both conservation and economic measures that utilize forestry technology to sustain agricultural systems. With more landowners looking towards the principles of stewardship, the benefits agro-forestry practices offer are very attractive (i.e. monetary, aesthetics, protection of land, crop and livestock production).

Recognizing the need and benefits of improved management practices on rural agricultural lands landowners have become increasingly reliant upon cost-share programs to achieve their objectives. Likewise, delivery of technical assistance associated with agro-forestry applications contributes to the Division's program goals. As awareness among landowners grows, participation in cost-share incentives programs and delivery of technical assistance will grow as well.

It is important the Division continue to foster cooperative relationships with partner agencies such as the Natural Resources Conservation Service (NRCS), the Utah Association of Conservation Districts (UACD), Utah State University Extension and other state, federal and local entities that provide citizens of the state with agro-forestry assistance. The application of agro-forestry practices in Utah continues to be important, providing wildlife habitat, reducing soil erosion and protecting crop and livestock operations throughout the state.

Timber Harvesting

Perhaps the most immediate threat to Utah's private forestlands is the degradation of watersheds and potentially irreversible change in forest health that results from destructive management practices such as overgrazing, excessive timber harvest and surface mineral development. The decline in timber harvesting on federal lands combined with favorable timber prices has increased pressures to log private and state lands throughout the inter-mountain west.



Spring Creek, Bear River Area
Photo by: Blain Hamp

Douglas Fir Forest
Photo by: Unknown

In 1992, 17% of the timber harvested in Utah alone originated from private forestlands. During 2002, private and tribal landowners accounted for 39 percent of Utah's timber harvest, versus about 23 percent in 1992 (Morgan, et al., 2002). This trend is expected to increase as demand for goods and services from non-industrial private forestlands continue to increase. Coupled with shrinking timber supplies from federal land and rising fragmented ownership patterns, encouraging private forest landowners to actively manage their natural resources has never been more important.

Unfortunately, timber harvesting on non-federal lands in Utah as currently practiced often leads to degradation of the biological and physical condition of the land, compromises the regenerative capacity of timber resources and affects other resource values such as water quality, forest health, wildlife and fisheries. The consequences of poor harvesting practices may not be confined to the land on which those activities occur. Neighboring landowners may be affected through increased fire risk, soil erosion and the spread of insects, disease and noxious weeds. Nearby communities may be affected, particularly by poor harvesting practices in watersheds that they depend on for domestic and agricultural water supplies and by the loss of economic benefits when timber is harvested and processed by operators and mills from out-of-state locations.

Poor harvesting practices can also have a variety of consequences for private landowners: waste of wood and lack of compensation for the full value of the timber removed; potential liabilities for off-site impacts resulting from poor harvesting; degradation of the physical condition of the land that may reduce its economic value; and the foreclosing of future options in terms of alternative uses of the land, its sustainability, its marketability or its desirability as part of an inheritance. Regeneration is a particular concern on Utah's forestlands because tree stands are not very dense or uniform and the sites are generally dry. If logging is not done in the context of silvicultural prescriptions designed for site regeneration, the productive capacity, commercial value and alternative future use of a site may be compromised.

Ownership Fragmentation

The conversion of Utah's forest lands stems from a trend toward parcelization of forest ownerships into smaller and less manageable areas. In Utah, where forestland ownership is largely a family tradition, the transfer of land through inheritance or sale suggests dividing large acres into smaller areas is likely to occur. Increasing numbers of landowners along with decreasing tract size affects forest sustainability and production. In addition, population increases and development pressures are likely to shift more private forestland to non-forest uses.

Logging deck and slash pile.
Photo by: Mike Eriksson

The loss of large, contiguous tracts of forestland can have a devastating impact on traditional forest practices and the maintenance of forest values. The sustainability of rural timber operations is particularly at risk because loggers and sawmills face increased difficulties in obtaining timber from smaller parcels of land with proliferating numbers of landowners. Owners of small acreages also tend to be motivated more by recreation and scenic values and less inclined to actively manage or harvest their timber.

Forest Watershed
Photo by: Unknown

Forest Health

Several factors have contributed to the decline in forest health conditions, including past logging and livestock grazing practices and fire exclusion. Combined, these factors have resulted in forest conditions that are denser and less diverse, with a greater abundance of late successional species and have increased fuel loads.

Because of generally high stand densities, Utah's forests are at risk of catastrophic wildfire. Wildfires affecting mixed species stands and densely stocked sites tend to be severe, causing adverse impacts to soil, wildlife habitat, recreational resources and important watersheds.

Insects and disease also cause adverse impacts to numerous forest resource values. At endemic levels, insects and disease play an important role in the function of forest ecosystems removing weakened and stressed trees. However, dense forests are typically more susceptible to epidemics, which cause excessive tree mortality at the landscape level.

Wildland-Urban Interface

Wildland-Urban interface areas exist where human development meets or intermixes with surrounding forest conditions. In Utah, both residential and commercial developments on private forested lands are of primary concern to state resource managers because of their detrimental and long-lasting impacts on vital forest values. Developments of this intensity can lead to water degradation in important watershed drainage areas, stream impairment and groundwater contamination.

The forest stewardship strategies presented below will be implemented in the five priority areas throughout the state.

Objectives and Strategies

Develop management direction for non-federal land use activities, utilizing standards for stewardship and ecosystem management.

- Identify and target private forest landowners located in important forest resource areas for assistance with stewardship or other planning purposes.
- Develop forest stewardship management plans concurrent with Division standards for private forest landowners who demonstrate their commitment to proactive management.
- Include non-federal landowners in landscape-level, ecosystem-based planning where appropriate

and acceptable to the landowner.
- Encourage and promote the use of cooperative activities by other land management agencies (i.e., state, private and federal) employing ecosystem management, forest health and stewardship principles.
- Where appropriate, encourage commodity production from private lands within the context of multiple-use and sustained yield.

Resources required: Forest Stewardship Coordinator

Blue Lake in Chalk Creek Watershed
Photo by: Mike Eriksson

Plan, develop and implement new information and education programs to inform Utah citizens of the importance of balanced conservation.

- Develop and present workshops for private forest landowners.
- Participate in local community and agency planning processes.
- Demonstrate the concepts of ecosystem, stewardship, recycling and urban tree care through public presentations and interpretive sites.

Resources required: Forestry Program Administrator, Forest Stewardship Coordinator, Area Foresters

Maintain or expand existing information and education programs.

- Participate in youth-oriented education programs and activities (i.e. Natural Resource days)
- Cooperate and participate in ecosystem field days and career days.
- Have timely input into work planning of USU's Landowner Education.

Resources required: Forestry Program Administrator, Forest Stewardship Coordinator, Area Foresters

Develop partnerships and cooperative relationships with organizations and individuals who share our goals.

- Formalize current and future relationships with agreements that specify desired results.

Resources required: Forestry Program Administrator

Use all available management tools, including forest industry, to restore and maintain healthy ecosystems.

- Design and implement demonstration areas.
- Whenever possible, utilize local mills and forest industry professionals to implement forest stewardship projects.

Resources required: Forestry Program Administrator, Forest Stewardship Coordinator, Area Foresters

Develop and maintain appropriate natural resource databases.

- Inventory and catalog existing data on natural resources.
- Adopt training, facilities, hardware and staff for using GIS.
- Develop a process for acquiring and managing necessary resource data.
- Utilize current and emerging technologies to analyze natural resource data in support of the Division's annual plan of work.

Resources required: Forestry Program Administrator, Forest Stewardship Coordinator, Area Foresters, Salt Lake GIS Staff

Promote the professional development of Division employees. 

- Promote job-related training and education opportunities.

Resources required: Forestry Program Administrator, Forest Stewardship Coordinator, Area Foresters, Salt Lake GIS Staff

Wildlife

Current Condition

There are three general management classes of American wildlife that can be described: species that are hunted or fished, species that are at imminent risk of extinction (endangered) and all other species. The first class, species that are hunted or fished, has enjoyed the longest period, approximately 60 to 70 years, of professional management including dedicated federal funding programs. The second class, endangered species, has been intensively managed for a shorter but still substantial period, approximately 35 years. The last and by far largest class of wildlife, species that are neither hunted or fished, nor endangered, went largely unmanaged and unfunded until very recently. Consequently, the number of endangered species has continued to grow over the last few decades, to the detriment of the species and to society.

In 2001, Congress noted this problem and created the State Wildlife Grants (SWG) program to provide states and territories with federal dollars to support conservation aimed at preventing wildlife from becoming endangered. A key provision of the SWG program is that, in order to continue participating in the program, every state and territory must have a 10-year Wildlife Action Plan (WAP) to ensure that SWG funds are effectively spent. Utah's Division of Wildlife Resources (UDWR) led the development of a WAP for species and habitats in Utah, which was approved in 2005. Page 1-1 of Utah's WAP states:

> "The purpose of the Utah WAP is to direct the integration and implementation of ongoing and planned management actions that will conserve native species and thereby prevent the need for additional endangered species listings."

Utah's 2005-2015 WAP adopted a three-tiered system that categorizes Utah's native wildlife species according to their legal management status. Tier I includes federally-listed or candidate species, and those species for which a Conservation Agreement and Strategy has been completed and signed. Tier II species include those listed on the Utah Species of Concern List. Collectively, Tier I and II species comprise the Utah Sensitive Species List. Tier III includes species that are thought to be of conservation concern because they are linked to an at-risk habitat or are believed to have suffered marked population declines, but for which there generally is inadequate information for effective or intensive management.

Pika from Albion Basin.
Photo by: Kent Keller

A parallel process to identify the most valuable habitat types for sensitive species statewide was developed through dialog between UDWR and the WAP Partner Advisory Group. As a result, the WAP describes the ten most at-risk habitat types out of the 24 found in Utah, specifying their relative priority based on the degree of threat faced by each habitat type and their degree of utilization by species of greatest conservation need.

After identifying species and habitats of greatest conservation need, UDWR wildlife and habitat

managers identified the general and specific threats associated with priority species and habitats. These threats were reviewed and revised by members of the Partner Advisory Group. The Partner group also identified and prioritized general and specific conservation actions to manage these threats so that the WAP will be more useful in directing on-the-ground conservation activities for priority species and habitats.

While the WAP provides a framework for conservation, actual implementation of conservation actions will require the cooperation and coordination of affected stakeholders and resource managers. At an organization or agency level, actions recommended in the WAP can be incorporated into planning efforts and management practices. The complete WAP justification and Implementation Plan can be obtained through the Utah Division of Wildlife Resources at http://wildlife.utah.gov/cwcs.

Broad-tailed Hummingbird from Albion Basin.
Photo by: Kent Keller

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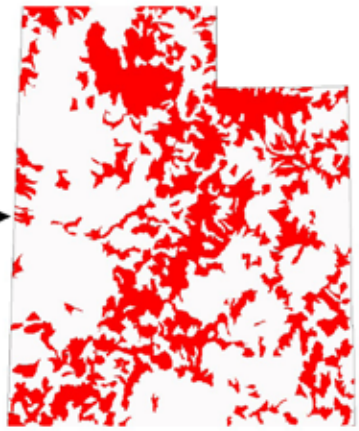
Wildlife Action Plan

The Wildlife Action Plan (WAP) theme shows the location of areas designated in the plan as valuable for habitat conservation or restoration efforts. It is composed of two data layers.

Wildlife Action Plan Data Layer
From: Utah Division of Wildlife Resources Wildlife Action Plan

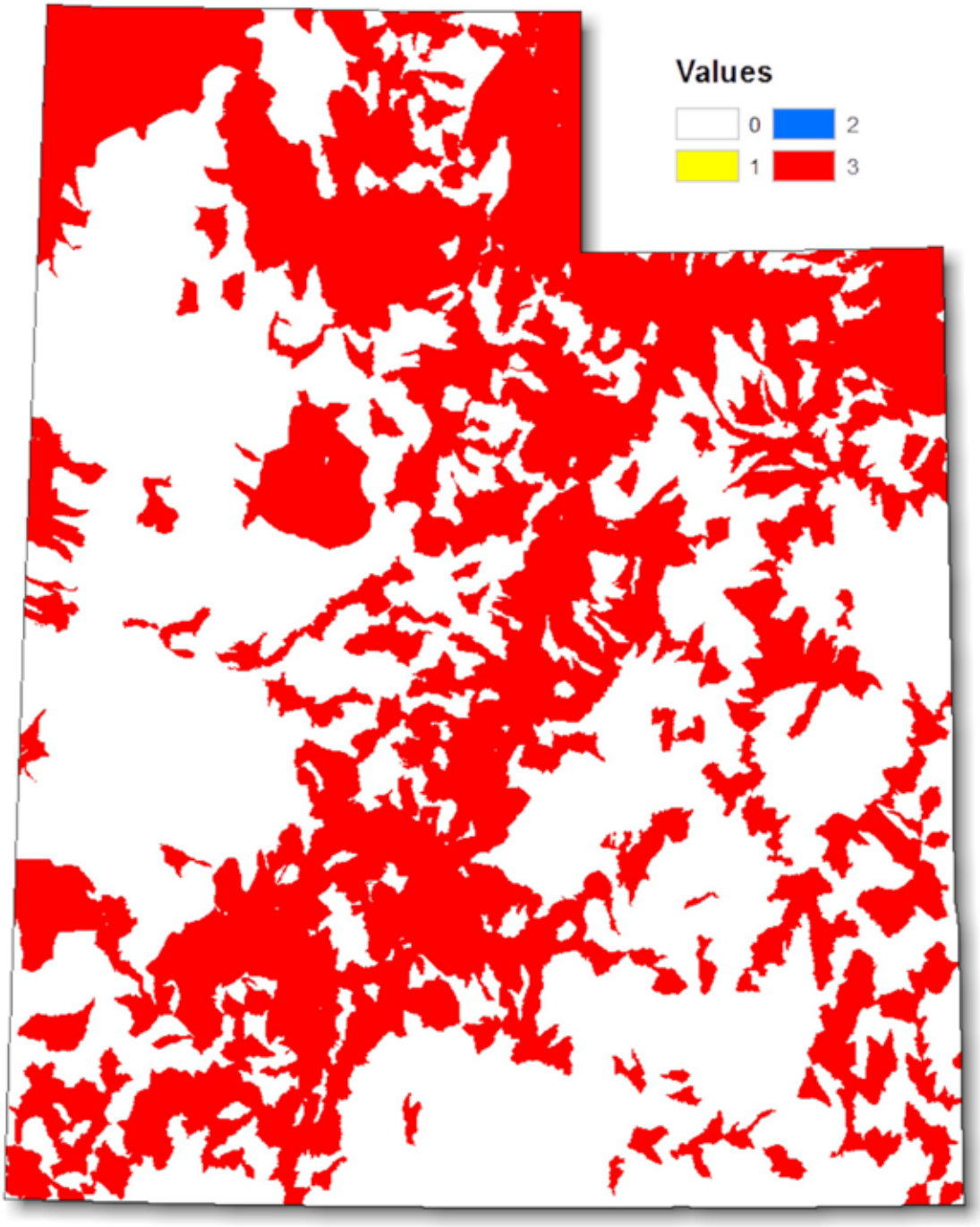
Value	Area of Concern
0	Not an area of concern
3	Area of concern



Sage Grouse Management Data Layer
From: Utah Division of Wildlife Resources Sage-Grouse Management Plan

Value	Area of Concern
0	Not an area of concern
3	Area of concern

Wildlife Action Plan



The values assigned to the Wildlife Action Plan theme layer are:

Wildlife Action Plan Value	Sum of Input layers
0	0
3	1 - 6

Utah Division of Wildlife Resources – Wildfire Plan Summary
Greater Sage-grouse Management Areas
2/5/2015

**Please see the "Wildfire Management" document on the DWR site: wildlife.utah.gov/sage-grouse for the complete report*

Wildfires:

Wildfire is a top threat to sage-grouse in the Great Basin. Careful monitoring and assessment of wildfires in Utah SGMAs are contributing to comprehensive strategies for protecting sage- grouse habitat. Here is a quick overview:

- Over 93% of fires in SGMAs are suppressed within 100 acres.
- 4.5% within 1,000 acres, while
- 2% are within 1,000 and 10,000 acres.

The western portion of Utah (Great Basin Region) is much more prone to wildfires. Five SGMAs have been prioritized and are being added to the Utah Forest Action Plan as high priorities into the wildfire risk assessment and as part of the Governor's Catastrophic Wildfire Reduction Strategy. Box Elder, Bald Hills, Sheep Rock Mountains, Hamlin Valley and Ibapah are the priority SGMAs.

Further, the use of a multitier priority system within the priority SGMAs will enhance protection schemes during severe fire conditions. Soil temperature regimes, seasonal habitat, historical fire data, cheatgrass dominance and sage-grouse population data were analyzed to create the tiered fire priority areas.
By utilizing specific criteria and the best-available science, Utah has developed a comprehensive strategy and detailed plan to address threats presented from wildfire and post-wildfire effects. Utah's approach not only addresses threats to habitat from wildfire, but utilizes methodology which ensure these habitats work for Greater Sage-grouse. This methodology is explained by the Sage-grouse National Technical Team's publication "A Report on National Greater Sage-grouse Conservation Measures" dated December 21, 2011:

"These programs address the threats resulting from wildfires and post-wildfire effects along with a program (fuels management) designed to try to reduce these impacts. Together these programs provide a significant opportunity to influence sagebrush habitats that benefit Sage-grouse…it is critical not only to conduct management actions that reduce the long-term loss of sagebrush but also to restore and recover burned areas to habitats that will be used by Sage-grouse (Pyke, 2011)."

Utah's Conservation Plan focuses on a three pronged approach for addressing the threat of wildfire.

1. Prevention, including:
    a. Fuels management/reduction strategies and
    b. Fire-zone buffers such as green stripping and fire breaks.
2. Suppression strategies, including:
    a. Prioritizing at-risk habitats,
    b. Providing rapid response strategies and
    c. Fire control resource allocation.
3. Post-fire habitat restoration and rehabilitation efforts to:
    a. Restore desirable vegetation and
    b. Control undesirable species such as cheatgrass

Suppression

Utah has a strong-track record of wildfire suppression. Utah's fire suppression strategy objective is to suppress all wildfire within Sage-grouse management areas with the goal of restricting or containing wildfires in these areas to the normal range of fire activity. Sage-grouse is prioritized below human life and protecting infrastructure and communities. Utah's response strategies are evolving as additional information is learned about wildfire within key Sage-grouse habitats.

Utah's rapid response strategy not only involves cooperation between federal, state and county and fire suppression entities, but also prioritizing resource allocation based on threat potential within and outside at-risk SGMAs.

Where resources are limited, Utah's wildfire suppression strategy provides a stepped prioritization:

1. Highest priority areas within highest priority SGMAs
    a. 1=highest priority in a high priority SGMA
    b. 4=lower priority in a high priority SGMA
2. Prioritization amongst at-risk SGMAs
    a. Highest:
        i. Box Elder
        ii. Bald Hills
    b. Elevated:
        i. Sheep Rock Mountains
        ii. Hamlin Valley
        iii. Ibapah
3. All SGMAs
4. Any identified connectivity corridors between SGMAs
5. All sagebrush habitats.

The state of Utah has a track record not only of investing in prevention, suppression and rehabilitation, but also ensuring treatment areas work for Greater Sage-grouse. Since the year 2006, Utah has treated 560,000 acres of habitat through its watershed restoration initiative and in cooperation with other partners. A large percentage of these projects directly address threats of wildfire to Sage-grouse habitats Utah's strategies utilize the best available science on the relationship of a number of factors, including:

1. Sagebrush habitats
2. Sage-grouse utilization of those habitats
3. Soil temperature and moisture regimes
4. Likelihood of rehabilitation/restoration success

Using these and other criteria, experts in the state of Utah are able to assess areas where additional pre-suppression projects would provide the most benefit. This information also helps inform prioritization suppression and rehabilitation efforts.

Utah's systematic approach follows the suggested management practices of the Natural Resource Conservation Service's Sage-grouse team which encourages criteria-based methodology, "Natural Resource managers are seeking coordinated approaches that focus appropriate management actions in the right places to maximize conservation effectiveness (Wisdom and Chambers 2009; Murphy et al. 2013)."

The state of Utah has systematically identified the Sage-grouse Management Areas where there is heightened risk of wildfire and post-wildfire affects. Many of Utah's SGMAs are not at heightened risk of wildfire and post-wildfire effects. A comparatively small percentage of these areas have been burned by wildfire during the last 20 years.

Other SGMAs not only are impacted by wildfire, but are also at a heightened risk of post-wildfire effects. These areas have a higher overall percentage which have been burned by wildfire. Additionally, these SGMAs have large areas with soil temperature and moisture regimes that are more susceptible to cheatgrass proliferation. These areas are also contain areas that are more difficult to successfully reseed for native forbs, grasses and brush. This is particularly true of the five SGMAs that lie within Utah's Great Basin.

Language in the 2010 "Warranted but Precluded" finding confirms that areas within the great basin are at the greatest risk of wildfire, "Although fire alters sagebrush habitats throughout the greater Sage-grouse range, fire disproportionately affects the Great Basin (Baker et al. in press, p. 20)…and will likely influence the persistence of Greater Sage-grouse populations in the area."

Utah's five SGMAs which lie within the Great Basin include Box Elder, Bald Hills, Sheep Rock Mountains, Hamlin Valley and Ibapah. These five SGMAs hold 26% of the Sage-grouse in the state of Utah. A comparison of these five SGMAs with the 6 SGMAs outside of the Great Basin is helpful. Accumulated acreage affected by wildfire in Utah's SGMAs was closely tracked from 1995-2012.

The five Great Basin SGMAs average 10% of sagebrush habitat being burned since 1995. Utah's six SGMAs outside the Great Basin averaged 1.8% of sagebrush habitat being burned in the aggregate since 1995. Not only are the Great Basin SGMAs more prone to large acreage wildfires, they also include large areas with soil types which are more prone to infiltration and persistence of cheatgrass and other exotic annual grasses.

Utah proactive strategies are addressing the threat of wildfire to Greater Sage-grouse habitats. In particular, prioritization of prevention, suppression and rehabilitation efforts are directly addressing challenges presented by wildfire, conifers and cheatgrass. Multiple reseeding of these areas is often beneficial to take advantage of intermittent years where soil temperatures and moisture are favorable for sagebrush restoration.

Objectives and Strategies

The Division of Forestry, Fire and State Lands intends to support the Division of Wildlife Resources in the WAP strategies. 

Broadly stated, the goal of Utah's Wildlife Action Plan is to maintain or restore healthy populations of native wildlife, thereby preventing the need for federal Endangered Species Act protection. It cannot be disputed that achieving this goal will deliver better outcomes for the people of Utah and for the wildlife held in perpetual trust for them. The strategy being employed to achieve this goal is to: (a) clarify and communicate WAP implementation goals, objectives and priorities in order to, (b) align capacity with needs in order to maximize efficiency, (c) in a coordinated, voluntary fashion.

The WAP Internal Team, a DWR working group tasked with developing WAP implementation guidance for DWR and partners, is presently completing a 2010-2015 WAP Implementation Plan. This Implementation Plan lays out goals, objectives and priorities for the species and habitats featured in the WAP-map, as well as for the Tier III species that were not included. The anticipated completion date for the 2010-2015 WAP Implementation Plan is October 1, 2010. This plan, combined with the WAP-map, will provide the first comprehensive "roadmap" of what needs to be done, by whom, where, when, at what cost and in an integrated way among the relevant partners to achieve the WAP's purpose.

With the methodology now developed and in place, DWR will be able to refine the map of Action Areas periodically as new data becomes available and especially as better "abundance goal" numbers are developed and agreed upon by DWR and its WAP partners. The Division of Forestry, Fire & State Lands will update the Utah Forest Action Plan with new DWR and WAP data as it is developed.

Resources required: Salt Lake GIS Staff, DWR Wildlife Action Plan Program Manager

Water Quality and Riparian Areas

Current Condition

Water quality in Utah, the second driest state in the nation, is vital when considering water is a limited resource. Nearly all freshwater sources originate in our high elevation forests, making protection of these critical headwaters a priority. Due to the large population increase over the past 15 years, strains are being placed on water resources. Additionally invasive species along rivers, lakes and streams continue to reduce available water resources.

Under the direction of the Department of Environmental Quality, Division of Water Quality (DWQ), Utah uses an integrated watershed management approach to manage the quality of water resources and surrounding ecosystems. The essence of Utah's watershed approach is better coordination and integration of the state's existing management programs to improve protection measures for surface and ground water resources and their surrounding environments. Coordination and integration extend beyond local, state and federal agencies to include all stakeholders in the water quality management process. This approach fosters more innovative, responsive and cost-effective solutions to water quality problems. The statewide watershed approach in conjunction with the Division's Forest Action Plan is anticipated to accelerate improvements in Utah's water quality as a result of increased coordination and sharing of resources.

The 1987 amendment to the Clean Water Act of 1972 recognized the need for control strategies for nonpoint source (NPS) pollution of U.S. waters. The act directed the states to identify land use categories that contribute nonpoint source pollution and adopt measures to control those sources. Silviculture or forest management was identified as a possible source of this type of water quality impairment.

Beaver Ponds
Photo by: Mike Eriksson

The effects of timber harvesting and silvicultural treatments (thinning, burning, mechanical site preparation, application of chemicals, planting) on stream ecosystems are complex (Meehan). The effects of a given activity on the stream area can be both positive and negative, thus decisions of land treatments must be made with care. The effects on small headwater streams, where most of Utah's forest resources are found, are especially important for two reasons: 1) it is estimated that headwater streams make up 85% of the total length of running waters; and 2) these small streams are most easily altered by human activities. These small streams are vital conduits to pass clean, good quality water to our lower watersheds. They also act as a passageway for the nutrient or energy base that drives the stream system from the smallest aquatic insects to a healthy fish population. In many areas, these streams play an important role in providing spawning and rearing habitat for fish.

The Utah Forest Water Quality Guidelines support the overall objective of the Division of Forestry, Fire, and State Lands by providing Best Management Practices (BMPs) to assure that the state's forest related natural resources, primarily soil and water, are protected and sustained during forest practice operations for the benefit of all. This objective will be accomplished through the implementation of science-based, non-regulatory conservation measures, an aggressive education and technical assistance outreach program and a monitoring program designed to measure the implementation and effectiveness of these practices. Improperly conducted forest practices have the potential of impacting water quality in a negative manner. Monitoring of forest practice operations in Utah has concluded that 81% of operations conducted across the state are implementing Utah's Forest Water Quality Guidelines (Gropp et al.). With the recent passage of amendments to Utah's Forest Practices Act it is anticipated that increased compliance will be achieved with these voluntary measures.

Resources required: Forest Stewardship Coordinator, Area Foresters

Stream on a Forest Legacy Easement.
Photo by: Unknown

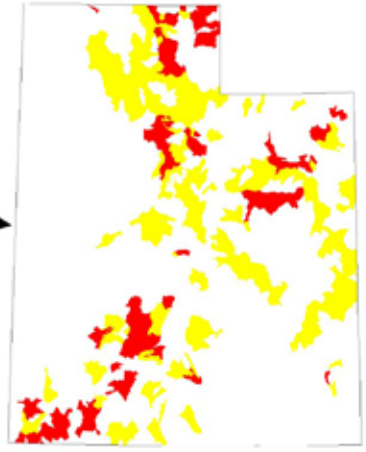
Water Quality

The Water Quality theme shows the location of areas that are important to either maintain or improve water quality. It is composed of two data layers.

Impaired Waters Data Layer

From: Environmental Protection Agency (EPA) 303(d) Impaired Waters

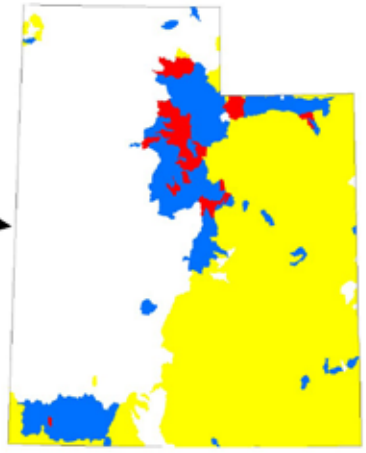
Value	Condition
0	No impaired waters in watershed
1	Watershed contains impaired water
3	Watershed contains impaired water because of sediment and/or temperature



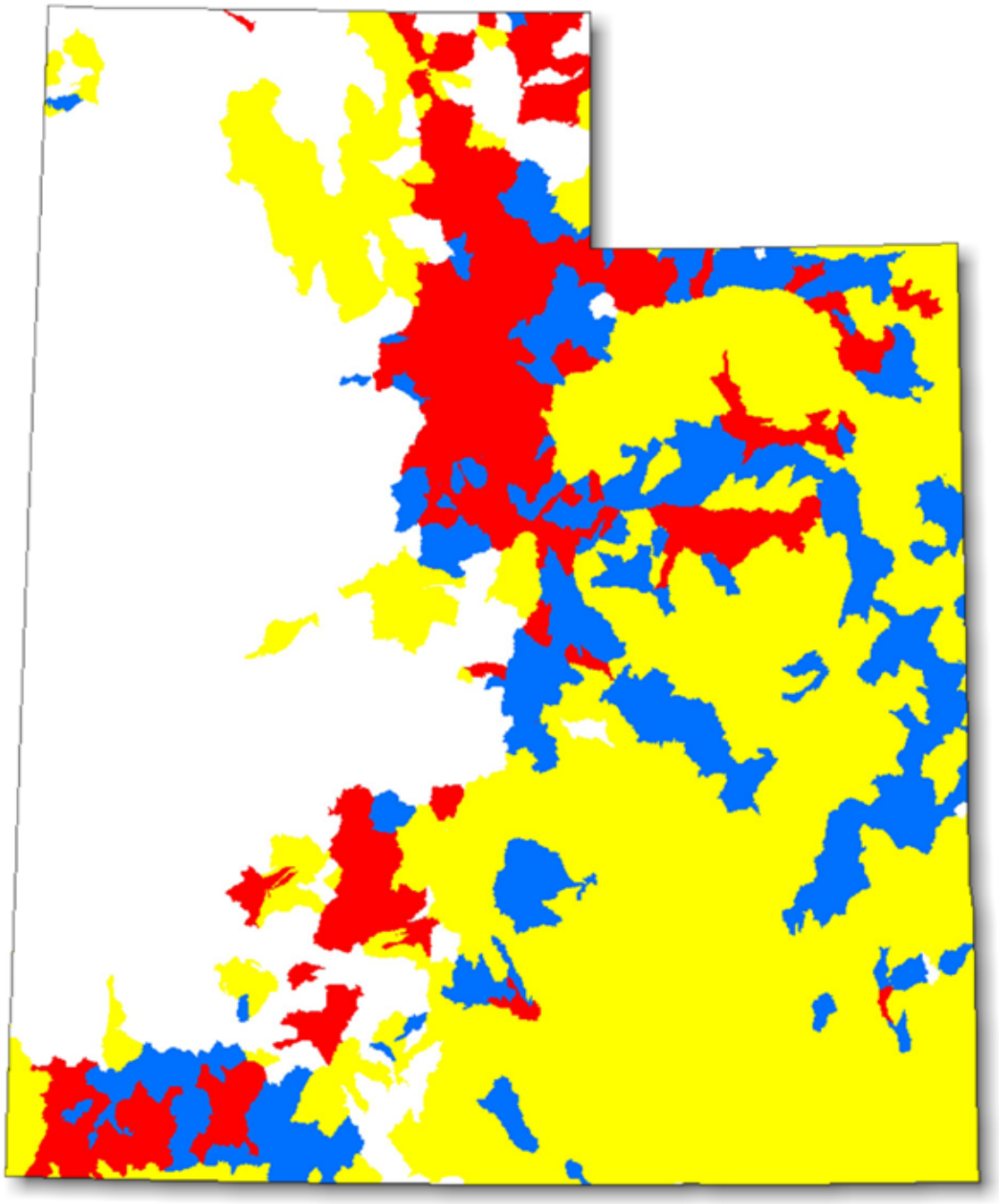
Forests to Faucets Data Layer

From: Environmental Protection Agency (EPA) 303(d) Impaired Waters Surface Drinking Water Importance Index

Value	Surface Drinking Water Importance Index
0	0%
1	1 - 33%
2	34 - 66%
3	67 - 100%



Water Quality



The values assigned to the Water Quality theme layer are:

Water Quality Value	Sum of Input layers
1	1
2	2
3	3 - 6

Riparian Areas

The Riparian theme shows the location of riparian areas.
It is composed of two data layers.

30 Meter Buffer Around Water Bodies Data Layer

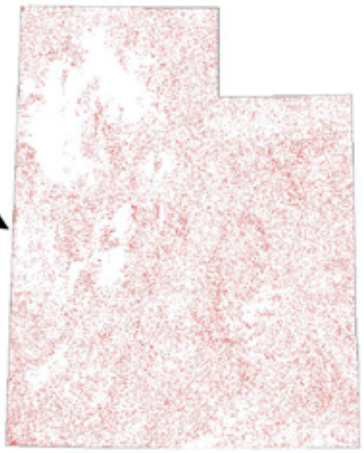
From: National Hydrological Dataset, waterbody data

Value	Distance
0	> 30 meters
3	<= 30 meters

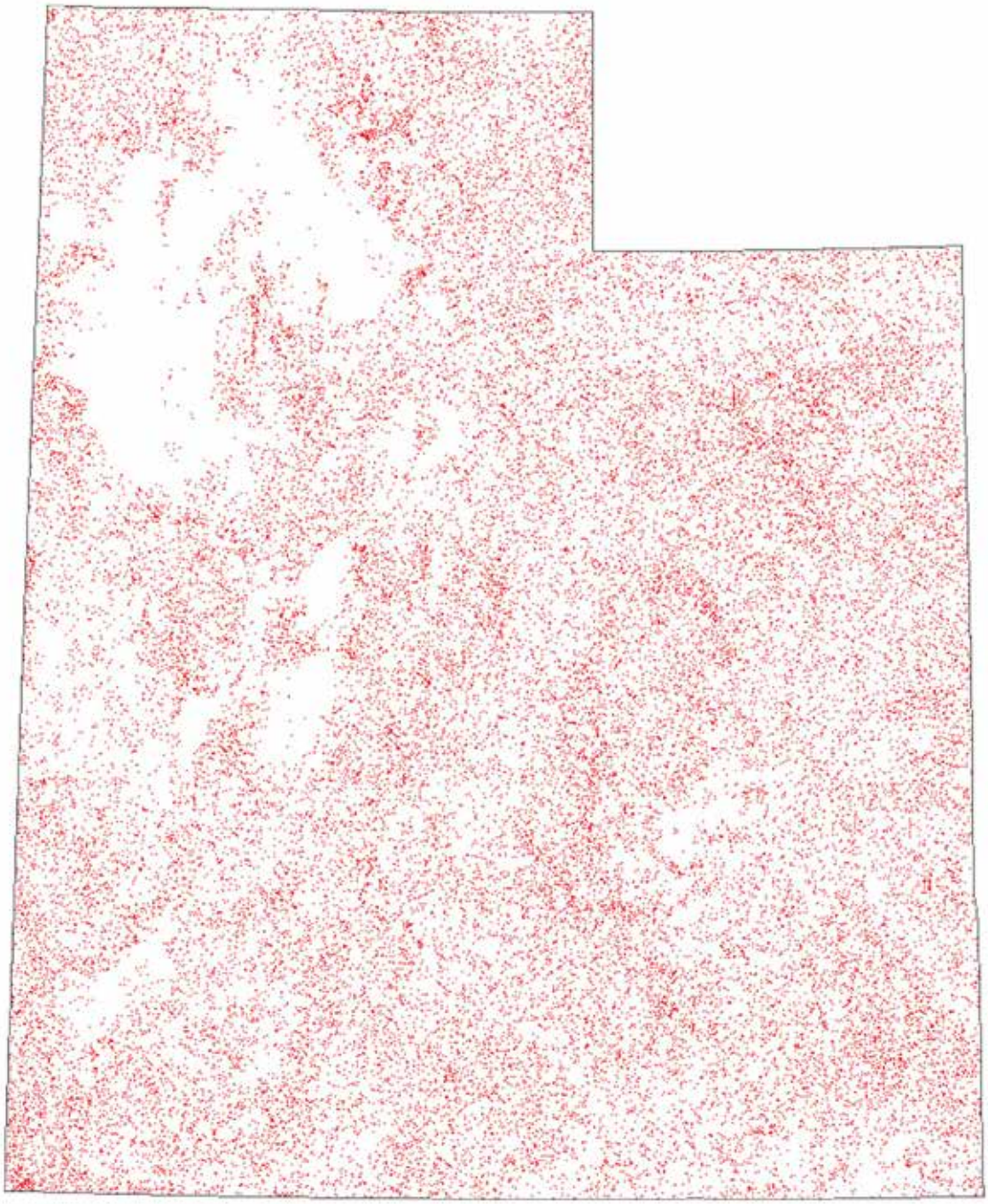
30 Meter Buffer Around Streams Data Layer

From: National Hydrological Dataset, flowline data (FType = 460 or 336)

Value	Distance
0	> 30 meters
3	<= 30 meters



Riparian Areas



The values assigned to the Riparian theme layer are:

Riparian Areas Value	Sum of Input Layers
0	0
3	1 - 6

Priority Areas

The Forest Action Plan identified five priority areas throughout the state. The Division can achieve positive changes in water quality and quantity in these areas through:

1. Continued education of loggers and landowners with regards to Best Management Practices (BMP's);
2. Providing leadership and implementing strategies that will reduce invasive species in riparian corridors; and
3. Assisting communities with urban tree projects adjacent to rivers and streams.

Objectives and Strategies

The water quality strategies presented below will be implemented in all five priority areas throughout the state.

Develop management direction for non-federal land use activities, utilizing standards for stewardship and ecosystem management. 

- Continue the development of educational publications for landowners regarding silvicultural practices, Forest Water Quality Guidelines (FWQG) and forest health issues.
- Pursue opportunities for application and adoption of FWQG and encourage landowners and industry to include FWQG in all silvicultural activities.
- Continue to implement monitoring programs to determine effectiveness of the Forest Practices Act, FWQG and Forest Stewardship Management Plans.
- Pursue opportunities to develop watershed assistance programs for Utah's non-federal forested lands through available funding sources.
- Utilize grants to support native tree planting efforts along riparian areas within municipalities.
- Provide technical assistance to developers and city planners to help reduce impervious surfaces and utilize trees and other plant materials for water filtration and to slow run off rates.

Resources required: Forestry Program Administrator, Forest Stewardship Coordinator, Urban and Community Forestry Coordinator

Forest Health

Current Condition

A healthy forest displays resilience to disturbance by maintaining a diverse set of structures, compositions and functions across the landscape. A healthy forest should also meet the current and future needs of people in terms of values, products and services. These two elements of a healthy forest are interrelated, but may oppose each other. A healthy forest may be able to meet societal needs indefinitely, but only with sustained ecological capacity to recover from human or natural disturbance.

Fire, insects, disease and weeds all act as important disturbance agents in Utah forest ecosystems. Fire suppression has altered the occurrence, severity and intensity of fire. This may have contributed to increased insect and disease activity in certain forest types. Noxious and invasive weeds in Utah are spreading at an alarming rate, displacing native species and disrupting the normal function of ecosystems.

Insect damage is a concern in Utah forests. The most serious forest insects are bark beetles. Other damaging insects include a few defoliators. Insects can adversely affect the visual quality and recreational opportunities of places we value. These agents, however, also play an important role in the function of forest ecosystems. They kill trees, creating snags that provide habitat for a variety of wildlife species. Raptors use dead trees for perches and decayed trees provide homes for cavity nesting birds. Insects and disease also serve an integral role in nutrient cycling of forests.

The vigor of trees is an important factor in determining their susceptibility to attack by insects or disease. In a healthy forest, endemic levels of insects and disease serve to remove weakened and stressed trees, thus thinning the forest and reducing competition for light, water and nutrients. Forests that are over-mature or over-dense often become susceptible to insect and disease outbreaks, creating considerable fuel and increasing susceptibility of stands to fire.

Bark Beetle

For many years, aerial detection surveys (ADS) have been conducted annually by the USDA Forest Service, Forest Health Protection group. General damage maps of the state of Utah from 2005 to 2009 show the most recent damage trends (*Figure 1*).

Graphs from 1990 to 2009 follow specific damaging agents (bark beetles) and associated species of trees affected (Figure 3). These graphs show both the number of trees killed by each specific bark beetle and the number of acres affected. Acres affected are not the same as acres killed, but show how many acres have some level of bark beetle induced mortality.

Beetle Kill
Photo by: Unknown

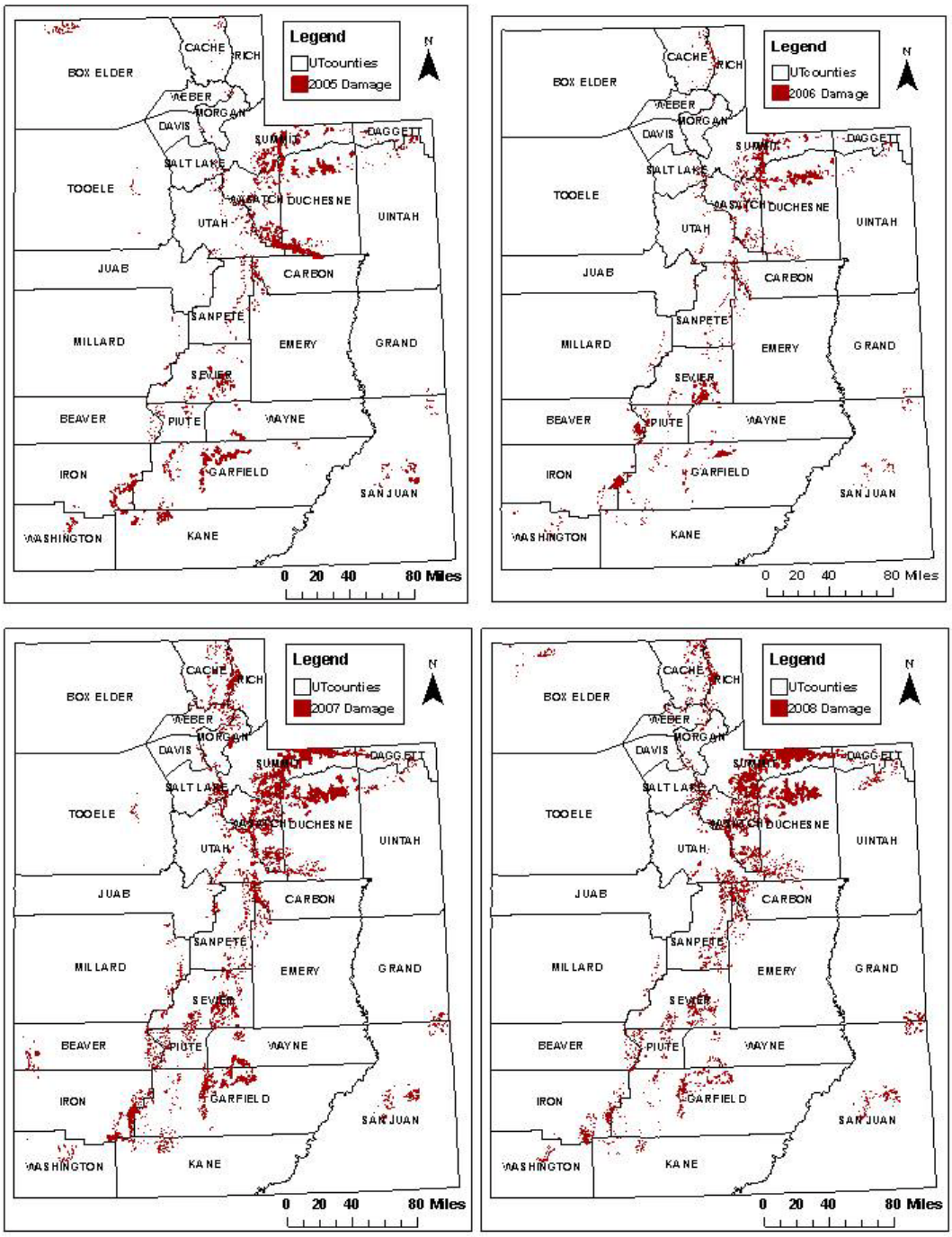


Figure 1: The maps above show the yearly damages and are not cumulative. Each year is shown as a separate snapshot in time. What we notice is that insect damage is seen throughout the state each year and if you did add them together we would notice that much of our forests are having insect induced mortality.

Maps courtesy of USDA, Forest Service, Forest Health Protection, Regions 1 and 4.

Aspen

Researchers agree that increased browsing of aspen shoots by wildlife and livestock, coupled with significant decreases in natural fire spread and human fire use, have resulted in a net change favoring conifer species. This change in forest type may have a considerable impact on water yield because the transpiration rate of conifers such as spruce and fir may be twice that of aspen.

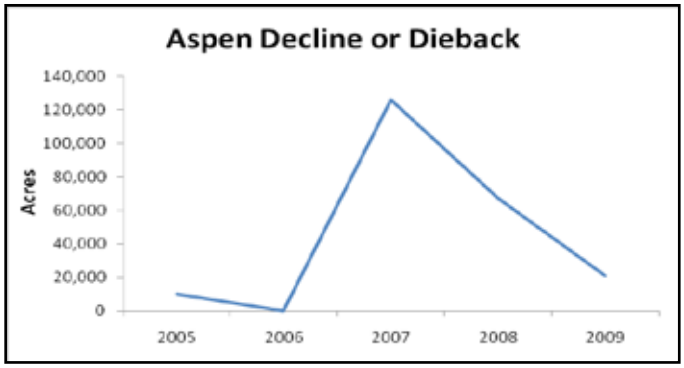


Figure 2

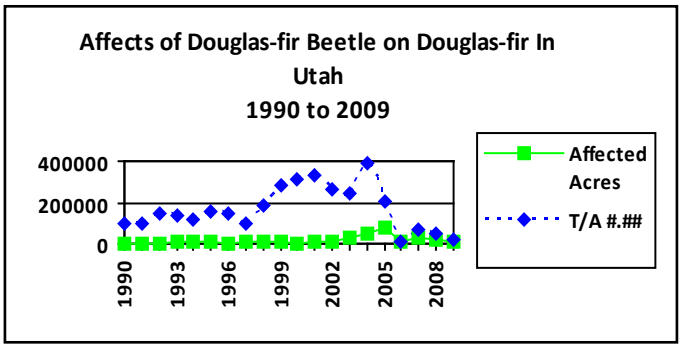
Aspen trees are relatively short-lived, commonly surviving less than 150 years. Beyond 80 years aspen trees become more susceptible to a variety of forest pathogens. Without major disturbance, aspen stands often become heavily diseased and decadent. In Utah aspen have a high rate of canker, decay, and root rot fungi.

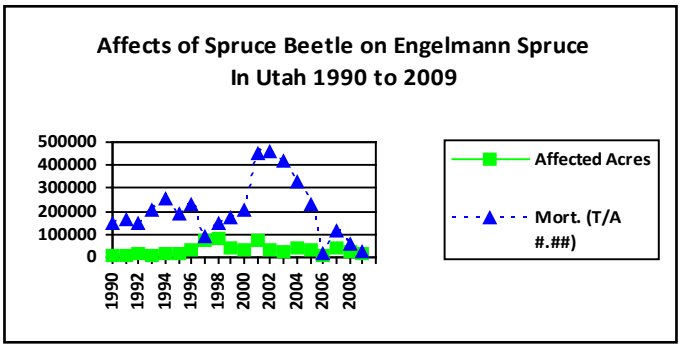
Exotics

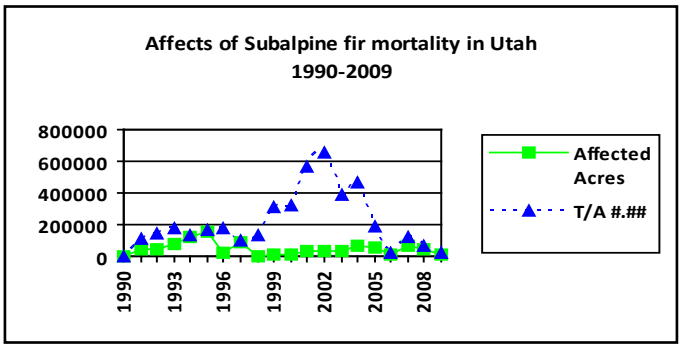
As the wildland urban interface and forest recreational activities increase, Utah experienced more instances of introduction of exotics, such as the gypsy moth and increases in noxious and invasive weeds (Figure 4). Exotics are introduced agents from other countries and in general do not have natural enemies or controls in place as do native agents. Some exotic insects and disease are not a major problem, but those that are have the potential to induce massive damage to forest vegetation. Some examples include: White pine blister rust has decreased the white pine component in Idaho by 90%; Dutch elm disease has all but eliminated its use as an ornamental street tree; and the gypsy moth has cost eastern states millions of dollars for suppression. Therefore, introductions of this type require swift and active management to prevent outbreak situations which are often devastating and uncontrollable if left unchecked.

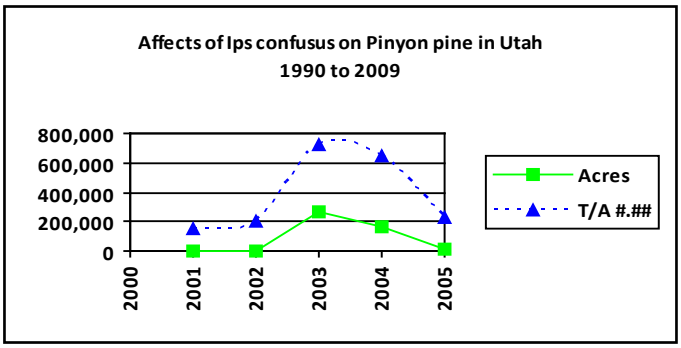
Aspen Stand
Photo by: Mike Eriksson

Figure 3: These five graphs show species specific bark beetle trends using acres affected and number of trees killed from 1990 to 2009. Graphs courtesy of USDA, Forest Service, Forest Health Protection, Regions 1 and 4.









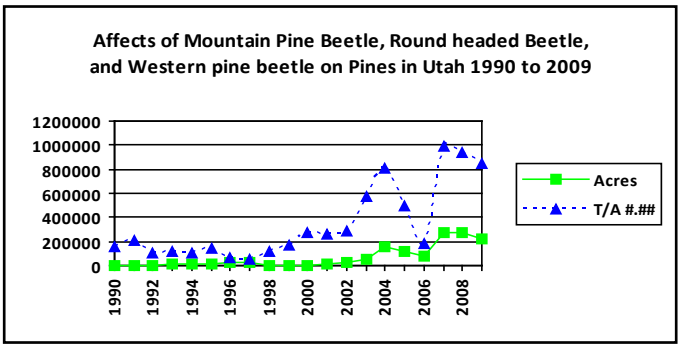


Figure 4

State Declared Noxious Weeds	Utah Counties																												
	Beaver	Box Elder	Cache	Carbon	Daggett	Davis	Duchesne	Emery	Garfield	Grand	Iron	Juab	Kane	Millard	Morgan	Piute	Rich	Salt Lake	San Juan	Sanpete	Sevier	Summit	Tooele	Uintah	Utah	Wasatch	Washington	Wayne	Weber
Bermuda-grass	X	X	X			X		X		X		X	X	X	X			X	X				X		X		X		X
Black Henbane	X	X	X	X	X		X			X					X		X			X		X							X
Blue Lettuce	X	X	X	X	X		X		X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X		X	X	X
Buffalobur			X			X			X	X		X	X	X		X	X	X	X		X		X	X	X		X		
Bull Thistle	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Canada Thistle	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X
Camel-thorn																			X										
Common Burdock		X	X	X		X			X			X		X	X	X	X	X	X		X	X	X	X	X	X	X	X	X
Dalmatian Toadflax	X	X	X					X	X	X							X	X	X			X	X	X	X	X			X
Diffuse Knapweed		X	X			X			X	X	X	X		X	X			X	X					X	X		X		X
Dyer's Woad		X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X
Field Bindweed	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Goat's Rue			X			X																							
Hoary Cress/ Whitetop	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hounds-tongue	X	X	X	X		X	X	X				X		X	X		X	X		X	X	X	X	X	X	X	X		X
Johnson-grass	X	X	X			X						X	X			X		X	X			X		X	X		X	X	X
Jointed Goatgrass		X	X			X	X		X	X	X	X	X	X				X	X	X	X		X	X	X	X	X		X
Leafy Spurge		X	X	X		X	X	X				X		X	X		X	X	X	X	X	X	X	X	X	X		X	X
Medusa-head Grass		X	X										X																X
Musk Thistle	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
Perennial Pepper-weed	X	X	X	X	X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X		X
Poison Hemlock	X	X	X			X	X					X			X		X	X		X	X	X	X	X	X		X		X
Puncture-vine			X			X	X	X	X	X			X	X	X			X	X						X		X		X
Purple Loosetrife		X	X	X		X	X	X		X	X	X	X	X	X			X				X		X	X				X
Quack-grass	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
Russian Olive	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Russian Knapweed	X	X	X	X		X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
St. John's Wort		X																											
Salt Cedar (Tamarisk)	X	X	X	X	X	X	X	X	X	X		X	X	X		X		X	X	X	X		X	X	X	X	X	X	X
Scotch Thistle	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
Silverleaf Night-shade										X			X						X								X	X	
Spotted Knapweed	X	X	X	X	X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X		X
Squarrose Knapweed	X	X	X									X	X	X	X			X	X	X	X		X		X	X	X		
Velvetleaf						X														X			X		X		X		
Water Hemlock	X		X		X		X		X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X
Western Whorled Milkweed	X	X						X	X	X	X		X	X					X	X							X		
Yellow Nutsedge						X				X																			
Yellow Starthistle		X	X			X							X				X	X					X		X	X	X		X
Yellow Toadflax	X			X			X		X					X		X		X		X	X	X	X			X	X		X

Program Overview

The purpose of the Forest Health Program is to provide the necessary technical and financial assistance for the detection and evaluation of forest insect or disease problems and to assist Division service foresters, community foresters and other partners by providing information, education, technical assistance and appropriate management strategies to achieve healthy forest conditions and to prevent, manage or control significant insect or disease outbreaks on non-federal lands.

Priority Areas

State priority areas and forest health issues are congruent with each other. Nearly all forests in Utah have health issues. Spatially, priority areas for forest health fit within State priority areas.

Insects and disease are oblivious to landownership boundaries and therefore, need to be evaluated on a landscape scale. A coalition between all landownership must be made before effective, comprehensive plans to improve forest health can be made. During outbreak conditions, forest health treatments made on some lands at risk and not others often are ineffective.

Insect suppression strategies are often specific to insect and tree species whether forest insects or urban. However, these strategies should be included in stewardship plans and urban planning efforts. Forest health is an important and integral component of the Forest Stewardship program which maintains the long-term goal of placing non-industrial private forest lands under active management through a pro-active approach involving information, education, technical assistance and partnerships. Forest health issues must be taken into account as forest health assessments and stewardship plans are developed for forest landowners. Forest health assessments attempt to characterize potential forest stressors and their capacity to affect the condition of forest stands. As activities prescribed in management plans are implemented, forest health must be monitored on a continuous basis.

In agro-forestry and urban forestry, as with forest land applications, forest health must consider the function of the planting, not just the survival of the individuals in the stand. A windbreak planting composed of trees that are alive, but with poor form or density, defeats the purpose of the planting.

Stand structure and composition often determine whether an insect population will reach epidemic levels. Specific attributes of inventory data collected may be used to rate stands according to bark beetle hazard potential. Hazard ratings help identify stands where substantial losses can be expected if an outbreak occurs.

USDA Forest Service regional and national program data will be used as is appropriate for planning purposes. Coordination and cooperation with federal, state and local municipalities will remain key to project planning and implementation.

Objectives and Strategies

Utah's forested resources are used to meet public needs while being appropriately managed to provide sustainability for future generations. 

- Provide sufficient technical assistance, training, information, databases and publications to allow land managers and/or private landowners to effectively deal with insect and disease issues using integrated pest management techniques.

Resources required: Forest Health Coordinator, Area Foresters

Information for all forested lands in Utah is available to the State Forester, State and Federal Legislators, other decision makers and land mangers; allowing appropriate actions in high-priority areas to enhance the health of Utah natural resources.

- Coordinate detection efforts with cooperators for significant forest insects and disease and monitor trends in forest health conditions on non-industrial private and state forest lands.
- Collaborate with partners to participate in the national Forest Health Monitoring Program (FHM).
- Provide input in the development of the national Forest Inventory and Analysis Core Field Guide.

Resources required: Forest Health Coordinator

Utah natural resources are minimally affected by introduced, exotic species due to aggressive interagency cooperation to prevent introduction and quick action to reduce populations if introduced.

- Collaborate with partners to minimize the impacts of introduced pests.

Resources required: Forest Health Coordinator, Forest Stewardship Coordinator, Area Foresters

Spraying for insect control.
Photo by: Colleen Keyes

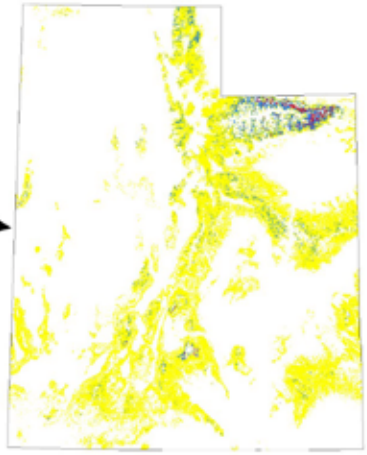
Forest Health

The Forest Health theme shows areas of potential threat to resources from insects, disease, and invasive species. It is composed of two data layers.

Insects and Disease Data Layer

From: 2012 National Insect and Disease Risk Map (NIDRM)

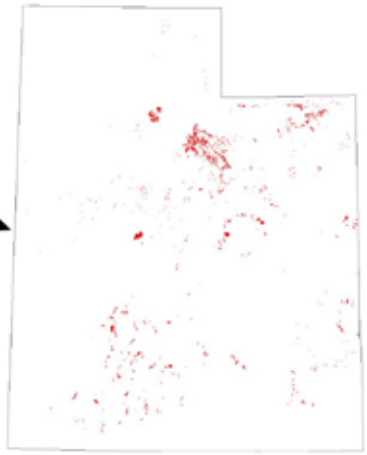
Value	Total Basal Loss Percentage
0	0
1	1 - 33
2	34 - 66
3	67 - 100



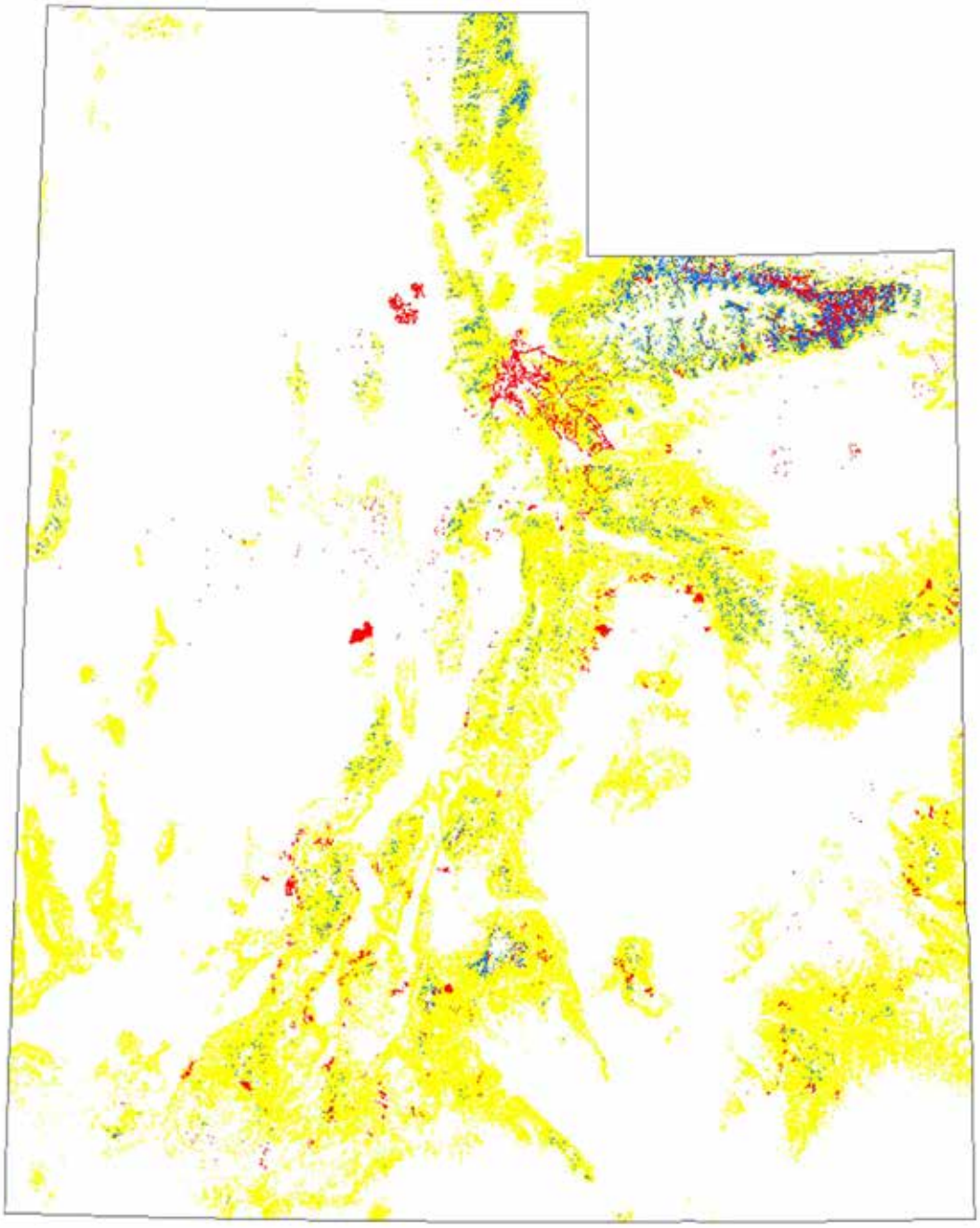
Invasive Species Data Layer

From: National Land Cover Database (2011) and the State of Utah AGRC Noxious Weeds layers (union analysis)

Value	Species
0	Non-invasive
3	Invasive



Forest Health



The values assigned to the Forest Health theme layer are:

Forest Health Value	Sum of Input layers
0	0
1	1
2	2
3	3 - 6

Distance to Managed Lands

Current Condition

The 54.3 million acres of land that comprise the State of Utah is owned and managed by a number of State, Federal, Tribal and private entities (listed in acres):

Federal Government	**34.6 million**	**63.7%**
Bureau of Land Management	22.6 million	1.6%
U.S. Forest Service	7.3 million	3.4%
National Park Service	1.9 million	3.4%
Department of Defense	1.8 million	3.3%
Other	2.0 million	3.7%
State	**5.8 million**	**10.7%**
State Trust Lands	3.4 million	6.4%
State Parks	99,000	0.1%
Other	2.2 million	4.0%
Tribal	**2.4 million**	**4.4%**
Private	**11.5 million**	**21.2%**

Much of the project work and planning efforts undertaken by the Division may see increased benefits in relation to their proximity to other managed lands. It is less likely that these managed lands will lose their conservation values to development which in turn makes adjacent WUI work, conservation easements, planning efforts, etc. more valuable. Also, the collaboration between Federal, State and Tribal agencies enables the efficient, strategic and focused use of limited program resources as well as producing the most benefit in terms of critical resource values and public benefits.

The Division has worked with landowners to provide Forest Stewardship Plans on more than 295,000 acres of the 2.8 million acres of private forest land in the state. The Division also holds conservation easements on more than 67,000 acres of private forest land. It is also important to consider these managed lands when considering project work and planning efforts.

Objectives and Strategies

Increase project benefits through proximity to managed lands. 

- Coordinate with other State, Federal, Tribal and private entities to identify project work in proximity to existing management plans and/or conserved lands.
- Give priority to projects and planning efforts adjacent to or in close proximity to existing Federal and Tribal lands and to private lands with existing Forest Stewardship Plans and/or conservation easements.
- Maintain and update existing Division Forest Stewardship Plan and conservation easement databases yearly to ensure current information is being utilized.

Resources required: Forestry Program Administrator, Area Managers, Salt Lake City GIS Staff

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Distance to Managed Lands

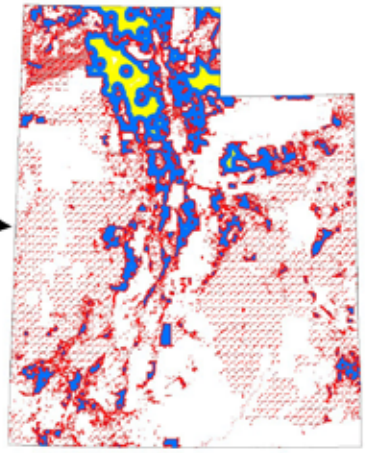
The Distance to Managed Lands theme shows areas that project benefits may increase because of nearness to existing Forest Stewardship Plans, Conservation Easements, Tribal lands and Federal (public) lands. It was created by combining three data layers into one layer and buffering it to the distances listed below.

These watersheds represent local priority areas. For example, the West Tavaputs Plateau has multiple Forest Stewardship Plans, Legacy easements, and many private landowners that represent future opportunities.

Distance to Managed Lands Data Layer

From: Utah Division of Forestry, Fire and State Lands (union analysis)

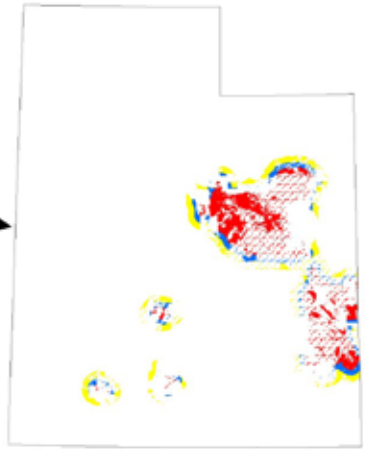
Value	Distance (miles)
0	>10
1	5 - 10
2	1 - 5
3	<1



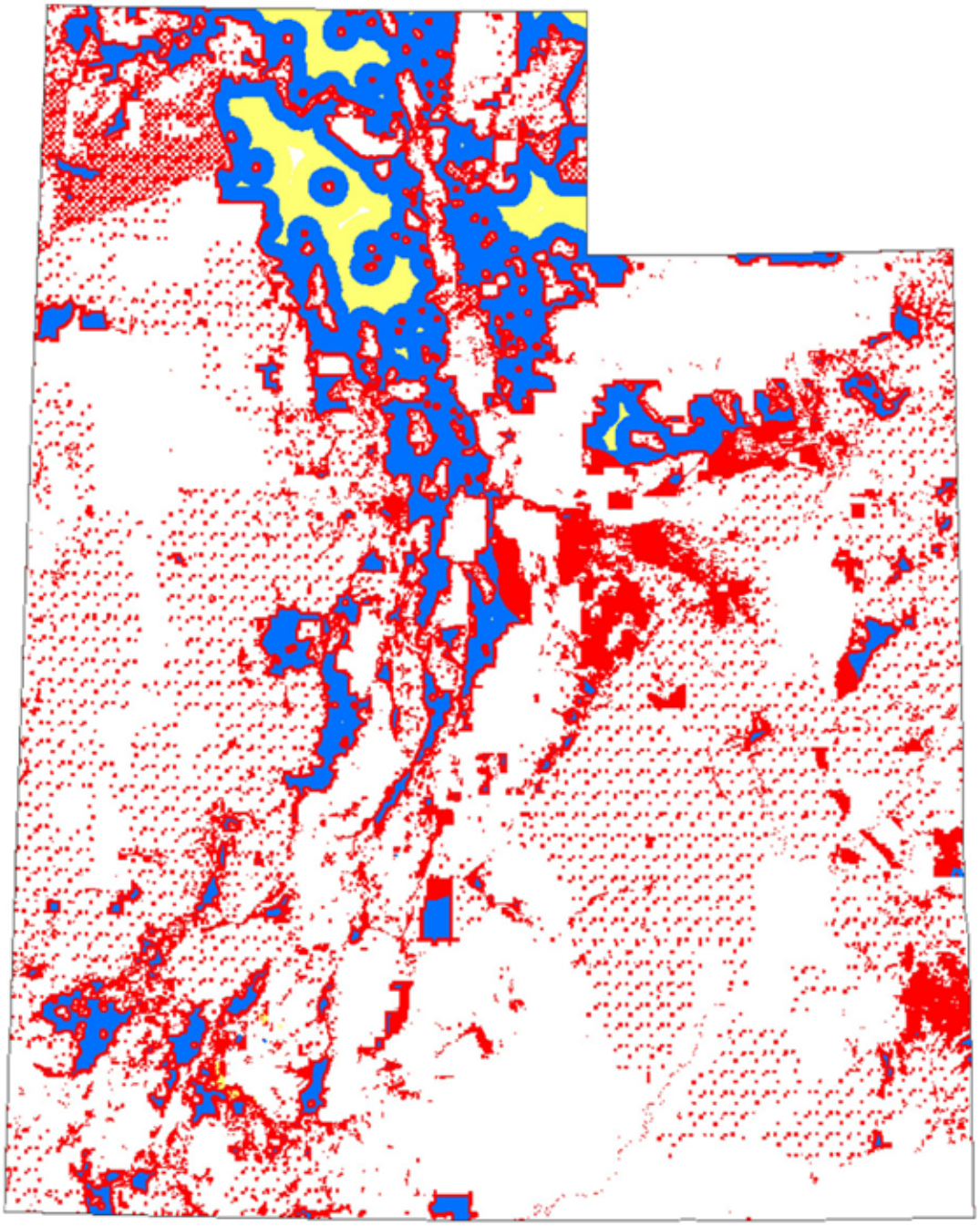
Local Priority Watersheds Data Layer

From: Utah Division of Forestry, Fire and State Lands

Value	Distance (miles)
0	>10
1	5 - 10
2	1 - 5
3	<1



Distance to Managed Lands



The values assigned to the Distance to Lands theme layer are:

Values	Sum of Input Layers
0	0
1	1
2	2
3	3 - 6

Urban & Community Forestry

Current Condition

The current population of Utah is estimated at 2.8 million and the Governor's Office of Planning and Budget projects this number to rise to 3.7 million by 2020. Utah's 1.9% per year growth rate is equal to adding a new person every six minutes or 80,000 people a year. This rapid growth, over twice the national average, made Utah the second fastest growing state in 2008-2009 according to the Census Bureau. As population increases land use patterns will change. Agricultural and open lands will continue to be converted to residential use as the demand for homes increases. It is estimated that 32,000 new homes will need to be built every year to accommodate the growing population. This concentration and growth of population is leading to compact cities and towns with inadequate green space and low numbers of urban trees.

Most of the urban tree resource across the State has been manually established. The pioneers that settled Utah had strong environmental stewardship values. They prioritized the planting of trees and considered them part of the critical infrastructure in a community. This trend is in jeopardy now that there are higher demands for larger homes, more parking lots and other built environments. However, with current research pointing to trees as a way to solve problems relating to air quality, water management, energy, etc., trees are again gaining support.

Looking down into the Wasatch Valley, trees stand out as a major part of the city's infrastructure.
Photo by: Meridith Perkins

In the winter months, inversions and poor air quality plague many parts of Utah. In the summer months high energy use from air conditioning systems drain resources. Trees can help combat these high profile issues, as well as promote overall community betterment. Recognizing that trees play a critical role in improved social, economic and environmental benefits, Utah communities have increasingly been investing in their urban forests. For the past three years (2011-2014) Utah has had more new Tree City USA communities recognized by the Arbor Day Foundation than any other state. Increasingly, more cities are hiring urban foresters to manage tree resources and are committing to tree inventories, management plans and tree planting. With strong support from nonprofit organizations, educational institutions and industry, urban forestry in Utah has great momentum. It is important for the state Urban and Community Forestry (UFC) programs to keep pace with the growing demands.

To date there is no comprehensive canopy analysis of the Utah urban forest, but individual city tree inventories paint a picture about the condition of urban forests. Typically within a city there is limited

tree species diversity, primarily small to medium diamet conditions. There are currently no broad sweeping insect and disease epidemics, however, forest health remains a constant concern and monitoring for future problems is always important. More tree inventories and analysis are needed to describe the current condition of the urban forest resource across the state. These inventories could also begin to quantify the ecosystem services such as clean air, clean water, etc. that trees provide to Utah communities.

The UCF Program promotes arborist education and development. Here Max Darrington teaches new arborists climbing techniques.
Photo by: Meridith Perkins

Program Overview

The purpose of Utah's State UCF program is to promote and provide for the initiation, establishment and management of sustainable trees throughout Utah's cities and towns. Utah's UCF program also provides advice and assistance to homeowners, businesses and tree care professionals on the establishment, maintenance and care of trees in communities. Guiding the program is FFSL's strategic goal to "*Foster self sustaining community forestry programs"* as well as the Utah Tomorrow Strategic Plan adopted by the Utah Legislature in 2003, to "*Enhance our local and global environment through prudent development, conservation and preservation of our natural resources, while protecting public heath… "* and to *"Prepare ourselves, or state, and our children for the challenges of tomorrow, today."*

The State's UCF program is delivered through the Utah Division of Forestry, Fire and State Lands (FFSL) in cooperation with the US Forest Service, Utah Community Forest Council (UCFC/ISA Utah Chapter), TreeUtah, USU Extension and other partners. Federal assistance currently provides funding for a full time urban and community forestry coordinator and the equivalent of a full time community forester for the Wasatch Front, volunteer coordination through a non-profit 501(c)(3) organization (TreeUtah) and a state advisory council (UCFC). State funds provide a full time community forester in the Southwest portion of the state and community cost-share grants.

Various federal and state agencies, local governments, educational institutions, corporations, professional associations and individuals have a direct or indirect interest in management of the urban and community forests. Some of the cooperators and partners active in this regard are as follows:

- USDA Forest Service, State and Private Forestry
- Utah Division of Forestry, Fire and State Lands
- Utah State University, Cooperative Extension Service
- Utah Community Forest Council (UCFC/ISA-Utah Chapter)
- Utah Power & Light (Rocky Mountain Power)
- Red Butte Garden & Arboretum
- TreeUtah
- National Arbor Day Foundation
- International Society of Arboriculture
- American Forests
- Utah Nursery and Landscape Association
- City Foresters
- Community Shade Tree Commissions
- Concerned Citizens

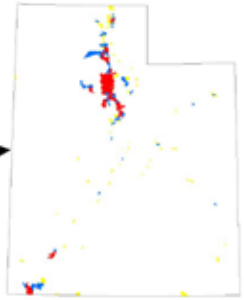
Urban & Community Forests

The Urban and Community Forests theme shows areas of opportunities for urban forest management. It is composed of five data layers.

Population Data Layer

From: U.S. Census American Community Survey (2013) Estimate of Places

Value	Population Estimate
0	< 1,000
1	1,000 - 4,999
2	5,000 - 20,000
3	>20,000



Growth Rate Data Layer

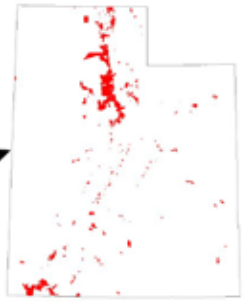
From: U.S. Census American Community Survey (2013 & 2012) Estimate of Places ((ACS 2013 - ACS 2012)/ACS 2012)

Value	Population Growth Rate
0	< 0.0
1	0.0 - 0.05
2	0.05 - 0.1
3	> 0.1

Municipalities Data Layer

From: State of Utah AGRC Municipalities Layer

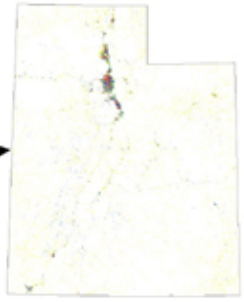
Value	Condition
0	Non-municipality
3	Municipality



Impervious Surfaces Data Layer

From: National Land Cover Database (2011)

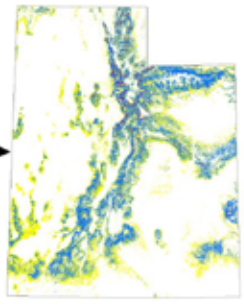
Value	Impervious Surfaces Percentage
0	0 %
1	1 - 33%
2	34 - 66%
3	67 - 100%



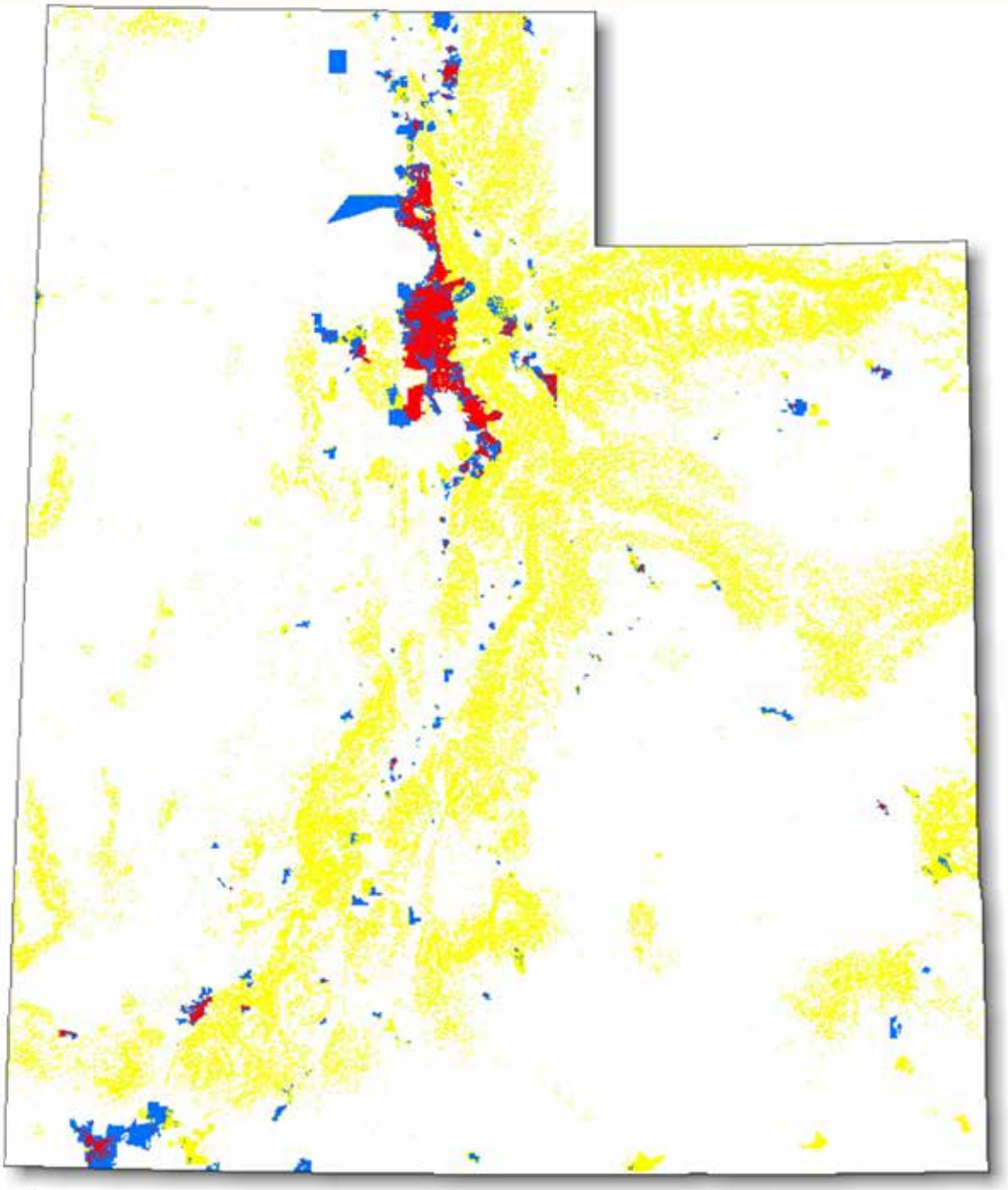
Canopy Cover Data Layer

From: National Land Cover Database (2011)

Value	Canopy Cover Percentage
0	0%
1	1 - 33%
2	34 - 66%
3	67 - 100%



Urban & Community Forestry



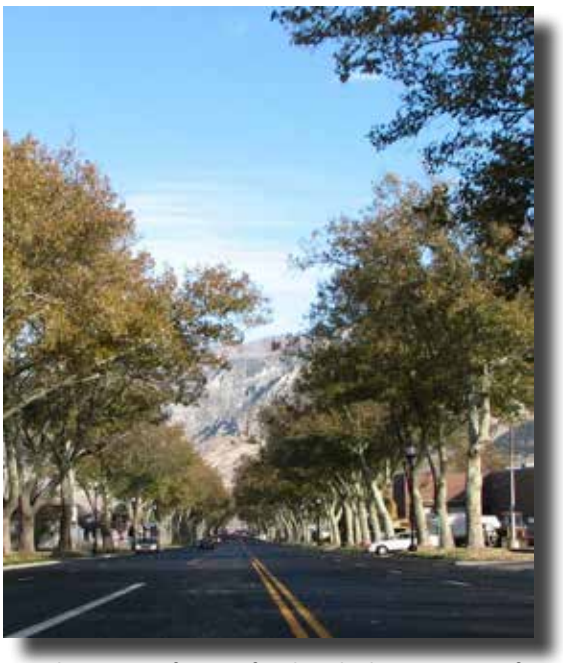
The values assigned to the Urban & Community Forestry theme layer are:

Urban & Community Forestry Value	Sum of Input Layers
0	0 - 1
1	2 - 4
2	5 - 7
3	8 - 15

Priority Areas

The overall Forest Action Plan and the UCF Assessment identify two priority areas to focus UCF efforts: the Wasatch and Cedar areas. Population density served as the main factor in selecting these two priority areas. By focusing in urban areas along the Wasatch Front and Southwestern Utah, the UCF program can positively impact the largest number of citizens. There are, however, unique challenges to each geographic location.

The Wasatch Front is a collective term for the cities and towns located along the Wasatch Range including those in the four most populated counties: Salt Lake County, Utah County, Davis County and Weber County. There are many established communities in this area with mature urban trees. In this case, tree management and preservation are major priorities. However, population growth has encouraged sprawl and new developments continue to emerge. In these areas, proper tree selection, tree planting and education are the primary focus. Many cities along the Wasatch Front have city foresters and access to resources, partners and budget dollars, making program efforts more effective and easier to implement.



Brigham City is famous for this ideal streetscape of arching London plane trees. Big trees, like these that shade the street and sidewalks, provide numerous benefits to communities.
Photo by: Morgan Mendenhall

Communities in the Cedar priority area do not have the same level of support as their northern counterparts and struggle with funding and resource availability. According to the US Census Bureau, Washington and Iron Counties in the Cedar priority area are currently in the top ten most populous of the 29 counties in Utah and they continue to grow at a rapid pace. The biggest needs in this area are technical assistance, grant funding and program development support. The communities are anxious to implement quality urban forestry programs and look to the Division of Forestry, Fire and State Lands for support.

Objectives and Strategies

In 2002, FFSL agreed to fund Utah State University to develop and administer a survey to assess the strengths, limitations, and capabilities of community forestry programs in Utah. The findings were published in a report in February 2003 and again in the Journal of Arboriculture's November 2005 issue. The survey asked for community forestry strengths and weaknesses. Overall, about one-third of the respondents scored urban and community forestry in their town as very weak/poor with the average score of all respondents at 2.4 on a scale of one to six, with one indicating very weak and six indicating very strong. Another important finding was related to training needs. More specifically, 77% said they felt the need for additional urban forestry training. Following the expressed need for training for arboriculture, comments indicated the need to train city employees and others in program building and the maintenance end of urban forestry. Additional comments expressed a desire for any and all training. It is clear that all aspects of urban forestry need to be covered. Several communities indicated a need to train citizens about the care of trees, but also to educate them about the importance of trees and the need to manage them. Such education could build program support and improve citizen involvement. The lack of budget, personnel or any community forestry program was noted as a common weakness for all communities.

Issues facing Utah's Urban & Community Forests are:

- Minimal public awareness of community forestry including the values and benefits of community trees.
- Majority of the communities are unaware of how to plan, organize and manage local community forestry programs and uneducated on proper tree selection, regulation and maintenance of trees in the community environment.
- Majority of the communities have not established a budget for the management of public trees.
- Many communities do not have a tree inventory or tree management plan in place.
- Most of tree maintenance personnel, both public and commercial, are inadequately trained and equipped to provide proper tree maintenance.
- Wood waste from urban trees is underutilized.
- Trees are often in conflict with overhead power transmission lines.
- Increasing development of communities in wildland-urban interface zone.
- Increasing urban infrastructure without consideration for public trees.

Resources required: Urban and Community Forestry Coordinator, UCF Program Specialist, Area Foresters

All UCF strategies are consistent across both priority areas, as well as the rest of the state. However more emphasis will be placed on delivering the UCF program in the Wasatch front and southwest corner priority areas. The 2007-2012 Urban and Community Forestry Strategic Plan further describes objectives and actions for each strategic goal listed here:

Develop and maintain community forests and management plans.

- Establish and maintain effective contacts with each community.
- Foster self-sustaining municipal community forestry programs.
- Provide cost-share incentives for UCF development to communities.
- Create innovative approaches to tree inventories that will work for Utah communities.
- Strive to achieve healthy urban forests.

Resources required: Urban and Community Forestry Coordinator, UCF Program Specialist, Area Foresters

Coordinate government, citizens, corporations, institutions and non-profit organizations through partnerships to maximize efforts to improve the condition of the urban and community forests.

- Establish and maintain a common forum for all partners
- Foster private support of community forestry programs.
- Provide educational outreach.

Resources required: Urban and Community Forestry Coordinator, UCF Program Specialist, Area Foresters

Connect urban forestry benefits to diverse environmental issues.

- Demonstrate city trees relevance in air and water quality.
- Explore urban forests impact on climate change and heat island effects.

Resources required: Urban and Community Forestry Coordinator, UCF Program Specialist, Area Foresters

Cultivate an appreciation and understanding for the social, economic, environmental and aesthetic values of trees, forests and related resources in cities and communities.

- Develop information programs for the public.
- Promote Arbor Day.
- Conduct or participate in mass public events.
- Develop Urban & Community Forestry information for youth audiences.

Resources required: Urban and Community Forestry Coordinator, UCF Program Specialist, Area Foresters

Develop and encourage the profession of urban forestry among partners through technology transfer, education and training.

- Analyze training needs of the urban forestry profession.
- Develop and promote training and education program for urban forestry professionals.
- Support research in Urban and Community Forestry.

Resources required: Urban and Community Forestry Coordinator, UCF Program Specialist, Area Foresters

Seek support from all levels of government for the Urban and Community Forestry Program.

- Maintain state funds for the UCF program.
- Engage and educate state legislators.
- Support local and regional legislation that promotes urban trees.

Resources required: Urban and Community Forestry Coordinator, UCF Program Specialist, Area Foresters

Coordinate with other State and Private Forestry Programs.

- Identify unique UCF projects that would lend themselves to the competitive grant process.
- Explore forest health issues in urban environments.
- Work with WUI communities on firewise landscapes.
- Tie community water quality issues to urban and wildland forests.
- Assist with public education on Forest Legacy easements.
- Combat invasive species along urban river ways and natural areas.

Resources required: Urban and Community Forestry Coordinator, UCF Program Specialist, Area Foresters

Periodic assessment of program initiatives and activities to monitor and evaluate the effectiveness of program directions.

- Establish and maintain monitoring system and/or adapt federal performance measures system to monitor program.
- Evaluate program effectiveness.

Resources required: Urban and Community Forestry Coordinator, UCF Program Specialist, Area Foresters

Utah has 70 Tree City USA communities as of 2009. The Division recognizes these cities and towns for their efforts in working toward a sustainable urban forestry program.
Photo by: Meridith Perkins

Volunteers support many of the tree planting projects in Utah. School groups, Boy Scouts and citizens all donate their time to improve local urban forests.
Photo by: Meridith Perkins

Forest Legacy Program

Current Condition

Utah's forest lands embrace many of the state's most vital natural, economic and social resources. Whether it is clean, abundant water, year-round recreational opportunities or forage and cover for wildlife and domestic livestock, virtually every Utah citizen enjoys significant benefits from the rich storehouse contained in these wooded areas. Privately-owned forests play an important role in maintaining the overall integrity of these forest resources and the diverse opportunities they provide. As Utah's population continues its rapid growth, private forest landowners face tremendous pressure to convert their lands to non-forest uses, namely residential subdivision and commercial development. Although many of these landowners wish to retain the traditional landscape and uses of their forests, these pressures, combined with current tax structures, often make it economically difficult for them to do so.

Program Overview

Utah's Forest Legacy Program is designed to facilitate state, local and private open space and resource conservation initiatives by assisting with the purchase of conservation easements or fee title on non-industrial private forest lands and by aiding private forest landowners with the development of long-term Forest Stewardship Plans. The Forest Legacy Program fulfills both of these directives by providing the vital educational, technical and financial tools needed by private landowners and local governments to accomplish their goals with regard to conservation and sustainable forestry.

Because the Forest Legacy Program was created through a 1990 amendment of the *Cooperative Forestry Assistance Act of 1978*, many aspects of Utah's program follow national requirements and criteria. The remaining elements specifically reflect the state's unique resource needs, political climate and public attitudes. Valuable input from private landowners, public citizens and several resource management agencies played a primary role in the development of these components. The following explains Utah's Forest Legacy Program functions and provides detail on the national program, the eligibility criteria for lands to be included in the program, the selection of Utah's Forest Legacy Areas and the process through which willing forest landowners can benefit from the program's many opportunities. The *Forest Action Plan* is not intended to replace *Utah's Forest Legacy Assessment of Need*. For more detailed information about the Forest Legacy Program refer to the *Utah's Forest Legacy Assessment of Need*.

Aspen stand on the Six Feathers Ranch Forest Legacy Easement, Summit County, Utah.
Photo by: Ann Price

The National Program

The United States Congress created the national Forest Legacy Program (FLP) recognizing that the majority of the nation's productive forest lands are in private ownership and that private landowners are facing growing pressures to convert their lands to non-forest uses, namely residential subdivisions and

commercial development. Greater population density and user needs are increasing this pressure by demanding that private lands not only compensate for the current timber shortfalls on federal lands but that they also provide a wider variety of products and services, from fish and wildlife habitat to aesthetic and recreational opportunities. The FLP mitigates the negative effects of these pressures and facilitates long-term resource management partnerships between local, state and federal governments. Authorization for the FLP was granted through Section 1217 of Title XII of the *Food, Agriculture, Conservation and Trade Act of 1990*, also referred to as the 1990 Farm Bill. This law amended the *Cooperative Forestry Assistance Act* (CFAA) *of 1978* in order to allow the Secretary of Agriculture to establish the FLP for the protection of environmentally important forest areas that are threatened by conversion to non-forest uses. This authority continues indefinitely. Currently, the USDA Forest Service serves as the lead federal agency for the FLP. The Forest Service implements the Program through close cooperation with a lead state agency as designated by the Governor. In 1996, Utah's then Governor, Michael Leavitt, designated the Division of Forestry, Fire and State Lands as the state's lead agency.

The establishment of a state FLP includes several steps that are specified by the *Forest Legacy Program Implementation Guidelines*. The first step in these guidelines is the completion of a state-wide Assessment of Need (AON) which documents the demand for a FLP in the state; identifies and delineates the boundaries of eligible forest areas; and recommends to the Forest Service areas which should be included in the FLP. At a minimum, the AON must address the following as they relate to the purpose of the FLP:

1. Forested areas threatened by conversion to nonforest uses;
2. Forest resources including:
    a. Aesthetic and scenic values,
    b. Fish and wildlife habitat, including threatened and endangered species,
    c. Mineral resource potential,
    d. Public recreation opportunities,
    e. Soil productivity,
    f. Timber management opportunities and
    g. Watershed values;
3. Historic uses of forest areas and trends and projected future uses of forest resources;
4. Current ownership patterns and size of tracts, and trends and projected future ownership patterns;
5. Cultural resources on forested lands;
6. Outstanding geological features;
7. Demographic trends as they relate to conversion of forest areas; and
8. Other ecological values.

Based on the AON, the state lead agency identifies specific geographic Forest Legacy Areas (FLA) that meet both national and state eligibility requirements. It then recommends these areas to the Forest Service for inclusion in a state FLP. Once designated, FLAs and resulting maps of FLAs may be modified and amended upon recommendation by the state lead agency if future conditions make changes necessary. Following completion, the AON and identification of proposed FLAs must be submitted by the state to the Forest Service for review. The Secretary of Agriculture provides final approval for establishing the state's FLP. A map of Utah's Forest Legacy Areas are on page 75.

Selection of Forest Legacy Areas

National Eligibility Criteria

Forest Legacy Area boundaries must encompass forest lands with significant environmental and other resource-based values. These areas may also include nonforested areas such as farms and villages if they are an integral part of the landscape and are within the logical boundaries. In order to ensure that all lands nominated for FLA designation meet the minimum goals and intent of the program, the *Implementation Guidelines* specify the following eligibility criteria:

1. Proposed Forest Legacy Areas must represent an important forest area that is threatened by conversion to nonforest uses.
2. Proposed Forest Legacy Areas must contain one or more of the following important public values: scenic resources; public recreation opportunities; riparian areas; fish and wildlife habitat; known threatened and endangered species; known cultural resources; and/or other ecological values.
3. Proposed Forest Legacy Areas should provide opportunities for the continuation of traditional forest uses, such as timber harvesting, forest management and outdoor recreation.

State Evaluation Process

The delineation of boundaries for Utah's FLAs stemmed from a multi-level review involving public attitudes and input from local, state and federal resource managers. The Division began this review by generating a map of the state's public and private forest lands using information contained on Geographic Information Systems (GIS) data layers. For the purposes of analysis, these forested areas were then divided according to critical hydrologic basins as established by the Utah Division of Water Resources. The use of these regional boundaries reflects the Division's concern for landscape level management of forest resources and its commitment to working with local and regional entities in facilitating their existing plans for land conservation. Due to the limited private forest ownership on tribal lands within the state, tribal lands were not considered as part of the Assessment of Need process.

The Division's second phase of review entailed soliciting input from various resource managers and considering a wide array of printed and computerized data regarding Utah's forest resources. This data included information on water quality and quantity, critical wildlife habitat, high density recreation areas, demographic and economic factors affecting forest conversion, regional activity of private land trusts, opportunities for the continuation or development of wood products industries, existing open space plans and public attitudes regarding land conservation. A report regarding this information was presented to Utah's Forest Stewardship Coordinating Committee which subsequently established the following resource priorities for the selection of Utah's

Wild flowers on the Chalk Creek Forest Legacy Easement, Summit County, Utah.
Photo by: Ann Price

Forest Legacy Areas:

1. Protection and enhancement of water quality;
2. Protection of wildlife/fish habitat and maintenance of habitat connectivity;
3. Protection of riparian areas and restoration of natural ecosystem functions;
4. Maintenance of traditional forest uses; and
5. Contribution to rural economies.

After comparing all these factors to the national eligibility criteria, the Division designated nine FLAs with boundaries corresponding to established state hydrologic basins. Two of the state's eleven basins were not designated as FLAs at this time because of limited forest resources or Legacy-related opportunities in those areas. The widespread nature of these Areas reflects the dispersed distribution of Utah's forest resources and the close proximity of nearly all significant forest stands to rapidly developing urban locations. Detailed descriptions and maps of each of Utah's FLAs are contained in the *Assessment of Need*.

Landowner Participation and Parcel Acquisition

All owners of private forest land within a designated FLA are eligible to apply for enrollment of interests in their lands in the state's FLP. It is important to note, however, that participation of any landowner in Utah's Forest Legacy Program is entirely voluntary. Under no circumstances will the right of eminent domain be used for the unwilling "taking" of any private property rights. Participation also requires preparation of a Forest Stewardship Plan for the forest resources located on a proposed parcel. Eligible landowners who want to participate in the Program may submit a letter of interest to the Division of Forestry, Fire and State Lands at any time. After receiving this letter, the Division will provide the landowner with an application form which requests information regarding the parcel's environmental values and the landowner's conservation and management objectives. A subcommittee of the Forest Stewardship Coordination Committee reviews and prioritizes the applications for acquisition each year based on the program goals. The top three applications are submitted to the National Review Panel for review and prioritization.

Program Goals:

- Prevent future conversions of forest land and forest resources;
- Protect and enhance water quality and water supplies;
- Protect wildlife habitat and maintain habitat connectivity and related values needed to ensure biodiversity;
- Protect riparian areas;
- Maintain and restore natural ecosystem functions; and
- Maintain forest sustainability and the cultural and economic vitality of rural communities.

Objectives and Strategies

Utah's Forest Legacy Program's Forest Legacy Areas (FLAs) are very similar to the priority areas identified in the Assessment. The Forest Legacy Program will maintain the existing FLAs identified in the *Assessment of Need* and also work to identify and prioritize projects in the Assessment priority areas.

In order to protect and enhance water quality and water supplies, priority will be given to: 

- Parcels on which land management directly affects streams and other waterways that support domestic and agricultural water supplies.

- Parcels owned by landowners who will identify and seek to minimize past and potential sources of non-point source pollution, including erosion potential and sedimentation resulting from road construction.

Resources required: Forest Legacy Program Coordinator

In order to prevent future conversion of forest land and forest resources, priority will be given: 

- Parcels in danger of conversion to non-forest uses within five years.
- Parcels for which there is a cost share match available.
- Parcels in danger of being over-harvested or degraded through surface mineral development.
- Parcels containing 100 or more available acres.
- Parcels held by owners who will preclude parcel divisions and non-forest development projects on parcels included in the Program. Appropriate exemptions may be negotiated for maintaining compatible development.

Resources required: Forest Legacy Program Coordinator

In order to protect wildlife habitat and maintain habitat connectivity and related values needed to ensure biodiversity, priority will be given to: 

- Parcels located adjacent to public lands managed for wildlife habitat.
- Parcels which currently exhibit connective habitats, migratory corridors, habitat linkages and areas that reduce biological isolation or could be managed to do so.
- Parcels held by owners who will identify and protect areas with species or communities of concern and seek to manage for key habitats.
- Parcels held by landowners who will maintain and/or restore forest cover and structure to provide habitat connectivity for the range of wildlife species which would normally populate the area.

Resources required: Forest Legacy Program Coordinator

In order to protect riparian areas, priority will be given to: 

- Parcels owned by landowners who will encourage regeneration of healthy stands of native species in riparian areas where they are/were naturally occurring.
- Parcels owned by landowners who will identify and protect sensitive riparian habitats, including stream banks.
- Parcels including over 300 feet of river or wetland shoreline.
- Parcels including a minimum 80 foot strip of native trees and shrubs as a natural buffer and sediment filter.

Resources required: Forest Legacy Program Coordinator

In order to maintain and restore natural ecosystem functions, priority will be given to: 

- Parcels which include healthy forests, including a natural species mix and a genetically sound mix of trees within the species represented on the parcel.
- Parcels owned by landowners who will manage the parcel or key portions of it to restore a natural mix of forest species, structure and stages across the landscape.
- Parcels owned by landowners who will utilize prescribed fire or other practices to restore more naturally functioning landscapes.

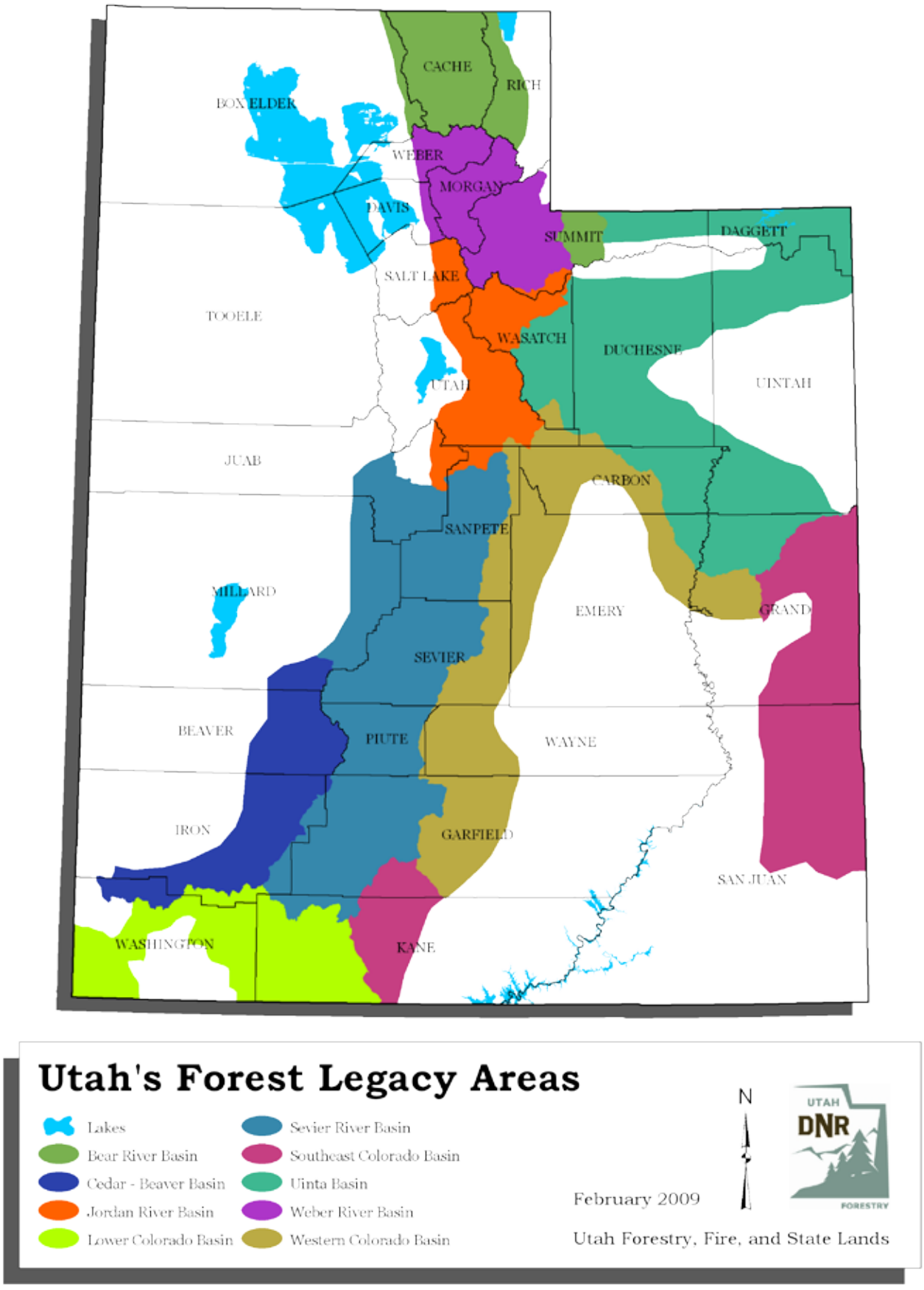
Resources required: Forest Legacy Program Coordinator

In order to maintain forest sustainability and the cultural and economic vitality of rural communities, priority will be given to:

- Parcels which could contribute to the development or sustainability of local and regional wood products industries.
- Parcels owned by landowners who will work cooperatively to develop a long-term forest stewardship plan for their property.
- Parcels which could contribute to the continuance of wildlife production and livestock grazing on forested lands.

Resources required: Forest Legacy Program Coordinator

Locomotive Rock, Range Creek Forest Legacy Easement, Carbon County, Utah.
Photo by: Ann Price


CACHE
RICH
BOX ELDER
WEBER
MORGAN
DAVIS
SUMMIT
DAGGETT
SALT LAKE
TOOELE
WASATCH
DUCHESNE
UTAH
UINTAH
JUAB
CARBON
SANPETE
MILLARD
EMERY
GRAND
SEVIER
BEAVER
PIUTE
WAYNE
IRON
GARFIELD
SAN JUAN
WASHINGTON
KANE
Utah's Forest Legacy Areas
Lakes
Bear River Basin
Cedar - Beaver Basin
Jordan River Basin
Lower Colorado Basin
Sevier River Basin
Southeast Colorado Basin
Uinta Basin
Weber River Basin
Western Colorado Basin
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Utah Forestry, Fire, and State Lands

Climate Change

Current Condition

The Division is working cooperatively with several agencies and organizations to develop policies and strategies for addressing climate change. These include the Western Forestry Leadership Coalition, the Council of Western State Foresters and the Western Governor's Association Forest Health Advisory Committee (Climate Change Subcommittee). All recommendations, guidance and policy resolutions from these groups focus on ensuring that the role of forests are recognized in the development of national climate policy.

Forests are key to state, regional, national and international efforts to reduce atmospheric carbon. Healthy, growing forests are essential for removing and storing carbon from the atmosphere ("carbon sinks"), but this carbon storage is vulnerable to the risks of climate change through large-scale disturbances such as epidemic bark beetle outbreaks and increased severity and extent of wildfire. These disturbances can release very large amounts of stored carbon during short periods of time ("carbon sources").

Successful climate change policies must address both mitigation and adaptation. Effects of climate change can be mitigated through:

- reductions in forestland conversion to other uses;
- increased carbon sequestration and storage in forests and wood products;
- substituting wood products for non-renewable building materials;
- substituting woody biomass for fossil fuels.

Our forests can best adapt to climate change when they are actively managed to increase resistance to catastrophic disturbances (wildfire, insects) and by ensuring forest species biodiversity. Maintaining diverse forest stands will ensure that with climate change (either warmer or colder) there will be some species that can remain and thrive in the new conditions, while allowing other species to move either geographically or elevationally over time.

Climate change was identified as a threat during Utah's initial Forest Action Plan stakeholder meeting, but stakeholders subsequently ranked it relatively low (19 out of 22 issues). However, despite climate change not being directly carried forward as a theme (input) in this Forest Action Plan, it is indirectly incorporated into other themes such as forest health and wildfire where it may act as a contributing factor. The Nature Conservancy and others have recently initiated a state-wide vulnerability assessment which, after completion, will be reviewed for possible inclusion into Forest Action Plan updates.

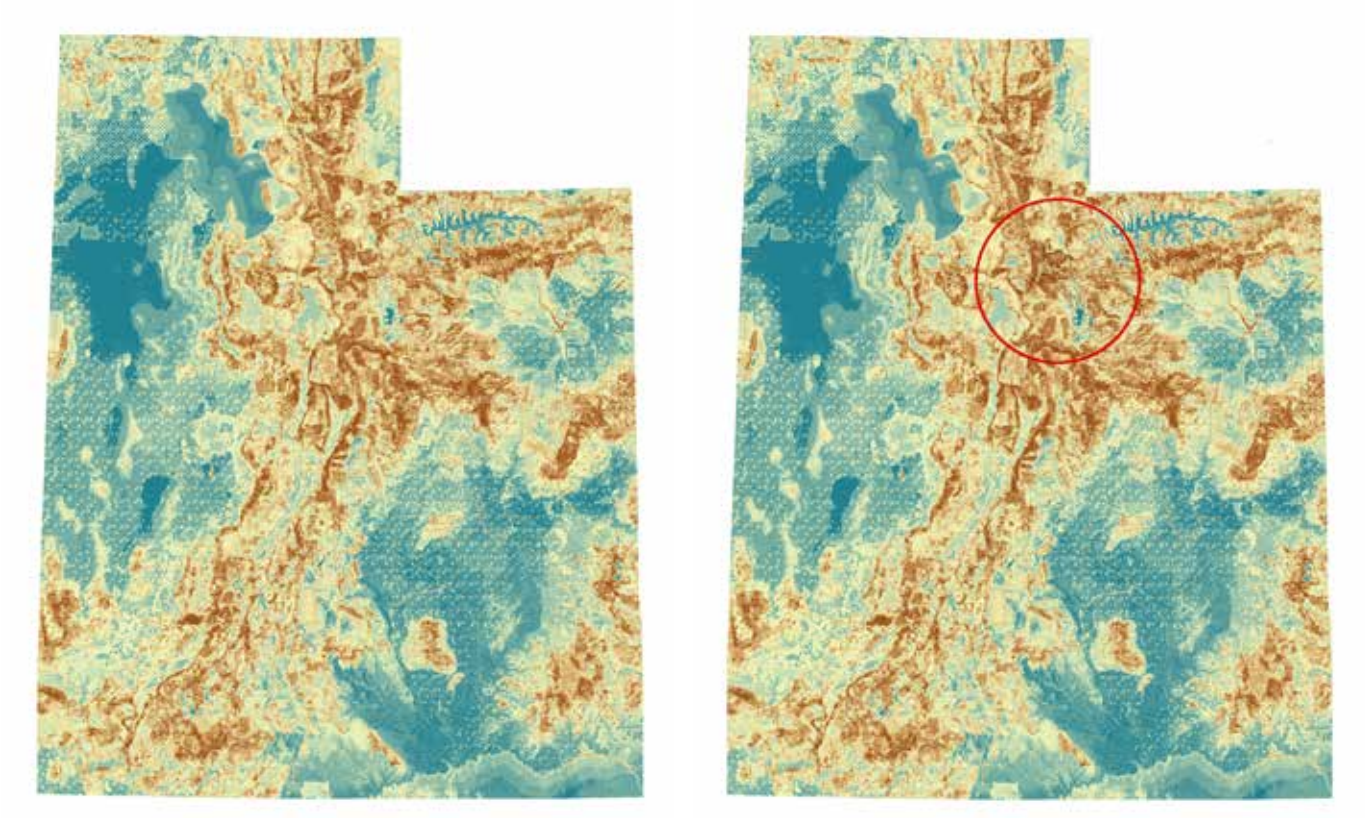
Objectives and Strategies

While most of the nation's forests are in private ownership, Utah's forests are mostly managed by federal agencies. This limits how much direct impact state agencies can have on managing forests for climate change. However, broader efforts can include: 

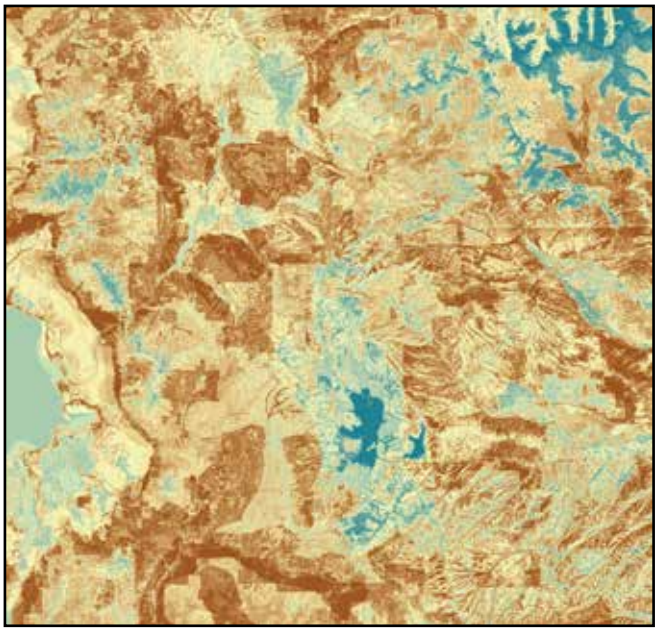
- Conduct education & outreach on the importance of healthy forests in mitigating climate change.
- Develop projects and policies that promote healthy forests and reduce catastrophic wildfire, thereby maintaining forests as a carbon sinks and not carbon sources.
- Promote the increased use of woody biomass as a renewable and carbon neutral energy source.
- Develop a funding mechanism to achieve these goals, including a Wood Utilization Coordinator position within the Division of Forestry, Fire & State Lands.

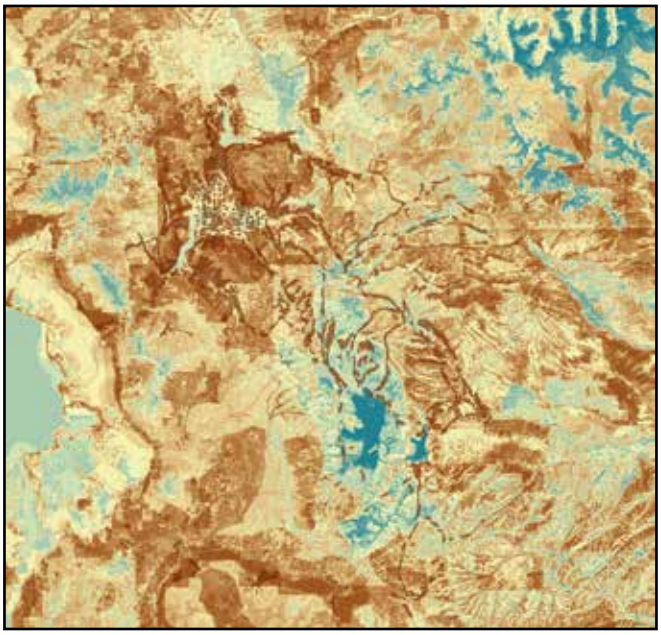
Dynamic Model

The Division plans to go beyond the model created for the Forest Action Plan and create a "Dynamic Model." The model created for the Plan is a snapshot in time. The Plan used the best available statewide data at the time to create the model. One of the short comings of this type of process is the model becomes stagnant quite quickly. The concept of a dynamic model allows the Division to be adaptable, responsive and proactive. A dynamic model can easily adapt to additions or changes in data, respond to ecosystem change (i.e. catastrophic wildland fire), respond to changing funding sources or strategies and keep the Division ahead of the curve as change occurs. The Division has a number of data sets and layers that are not on a statewide scale. This data is not used, as it would skew the output of the model to be more favorable to the areas where the data existed. A dynamic model would allow this data to be used on a project level scale. An illustrated example of the usefulness of the Dynamic Model is below.



In the example above, the map on the left is the existing Forest Action Plan model. The map on the right is the Forest Action Plan model with the addition of a noxious weed data layer. The data is not statewide which can cause the model output to be skewed. Additionally, the small data set is difficult to see on the statewide scale. The noxious weed data set is contained within the red circle.





In the example of a dynamic model above, the map on the left is the Forest Action Plan model at project level scale. The map on the right shows the addition of the same noxious weed data layer as the statewide example on the previous page. The addition of the noxious weed data layer is much more apparent and changes the model output on a project level scale, thereby informing the decisions for on-the-ground acres for project work.

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Appendix

Community Wildfire Protection Plans

Community Name	County	Date Signed	Lat	Long
Hi-Low / Arrowhead	Beaver	May-03	38.254511	-112.483929
Manderfield CWPP (Manderfield, Last Chance, Indian Creek, North Creek)	Beaver	Oct-05	38.33719	-112.577994
Mt. Holly/Elk Meadows	Beaver	?-2008	38.32112	-112.384739
The Grove	Beaver	Oct-05	38.2788158	-112.5917858
Cedar Ridge	Box Elder	Jul-05	41.828	-111.737
Dove Creek	Box Elder	Jan-06	41.7866667	-113.5227781
Portage	Box Elder		41.979	-112.217
Tremonton/Garland	Box Elder	DRAFT	41.73	-112.176
Bierdnau/Valhalla	Cache	Aug-05	41.7641961	-111.6939352
Birch Glen	Cache	Sep-04	41.7648183	-111.6857119
Logan/Providence/River Heights	Cache	DRAFT	41.71	-111.716
Scare Canyon Ranch Association	Cache	Jun-08	41.49	-111.617501
Beaver Creek	Carbon	Jan-14		
Clear Creek	Carbon	Jun-04	39.64419	-111.154017
East Carbon/Columbia	Carbon	Mar-07	39.546668	-110.413334
Kenilworth	Carbon	Apr-07	39.758608	-111.175354
Price	Carbon	Jul-07	39.596717	-110.806967
Scofield Mt. Homes	Carbon	Jun-04	39.688258	-110.805214
Spring Glen	Carbon	May-07	39.658006	-110.850386
Tavaputs	Carbon	Aug-07	39.50366	-110.198717
Taylors Flat	Daggett	Oct-03	40.893888	-109.163059
Bountiful	Davis			
Farmington	Davis	Jun-09	40.973943	-111.87197
Layton	Davis			
North Salt Lake	Davis			
Argyle/Reservation Ridge	Duchesne	Apr-06	39.881944	-110.700833
East Fruitland CWPP (E. Fruitland, Pinyon Ridge)	Duchesne	Apr-04	40.167414	-110.645692
Fruitland CWPP (Fruitland, Bandanna Ranch, Clark Estates, Lower Red Creek, Sundowner Ridge)	Duchesne	Jul-02	40.206936	-110.824202
Golden Eagle Ranch	Duchesne			
Moondance Ranch	Duchesne	Aug-07		
Neola	Duchesne	Oct-06	40.433	-110.03
Tabby Springs	Duchesne	Dec-05	40.357243	-110.745126

Community Name	County	Date Signed	Lat	Long
Green River	Emery	May-07	38.992836	-110.160884
Joe's Valley	Emery	Mar-08	39.339075	-111.282356
Boulder	Garfield	Oct-05	37.908318	-111.422951
Panguitch Lake	Garfield	Sep-05	37.70744	-112.641807
Ruby's Inn	Garfield	Sep-05	37.635068	-112.641807
Castle Valley	Grand	May-13	38.635167	-109.398333
Moab/Spanish Valley	Grand	Jan-08	38.543334	-109.501001
Thompson	Grand	Oct-09	38.968167	-109.715502
Willow Basin	Grand	Feb-10	38.588	-109.208
Brian Head	Iron	Jul-03	37.692754	-112.850775
Cedar Highlands	Iron	Aug-03	37.636673	-113.041798
Far West/Comstock CWPP (Diamond Z Ranch, Comstock Corridor)	Iron	Jul-03	37.611502	-113.352467
Iron Town	Iron	Jun-04	37.601328	-113.45287
Newcastle	Iron	Aug-04	37.666148	-113.548828
Quichipa	Iron	Jun-03	37.644549	-113.687423
Rainbow/Ireland Meadows	Iron	Aug-05	37.662159	-112.808122
Eureka CWPP (Eureka, Mammoth, Silver City)	Juab	Apr-03	39.955554	-112.116678
Rocky Ridge	Juab	Jun-05	39.933488	-111.824581
Bryce Woodlands	Kane	Aug-03	37.565193	-112.414125
Duck Creek CWPP (Duck Creek, South Zion Estates)	Kane	Sep-02	37.526661	-112.671831
East Zion CWPP (E. Zion, Zion Ponderosa)	Kane	Jun-04	37.305905	-112.862178
Glendale	Kane	Sep-05	37.317766	-112.597158
Zion View	Kane	Sep-05	37.499967	-112.710436
Kanosh	Millard	Feb-08	38.799439	-112.435628
Mountain Green	Morgan	Jun-14		
Bullion Canyon/Marysville	Piute	Jun-05	38.418618	-112.264114
Fish Lake	Piute			
Monroe Mountain (Monroe, Manning Meadows, Cove)	Piute/ Sevier	Aug-13	38.504979	-112.046622
Deseret Land and Livestock (Home Ranch)	Rich	Feb-06	41.598539	-111.168524
Laketown	Rich	Jul-08	41.820341	-111.323524
Sweetwater	Rich	Oct-07	41.862819	-111.4152
Big Cotton Wood Canyon CWPP (Brighton, Cardiff Fork, Evergreen, Giles Flat, Mill D, Mt. Haven, Pinetree, Silver Fork)	Salt Lake	Dec-13	40.63442	-111.708382
Cottonwood Heights	Salt Lake	Jan-14	40.609186	-111.832996

Community Name	County	Date Signed	Lat	Long
Emigration Canyon	Salt Lake	Mar-04	40.77	-111.759167
Forest Home at Lambs Canyon	Salt Lake	Dec-03	40.708475	-111.615861
Hi-Country Estates I	Salt Lake	Mar-04	40.5006122	-112.0924144
Hi-Country Estates II	Salt Lake	Aug-07	40.480135	-112.0772094
Mountair	Salt Lake	Sep-03	40.725834	-111.716944
Sandy/Draper/Cottonwood Heights	Salt Lake	Feb-10	40.570331	-111.807713
Suncrest/Travers Mountain	SaltLake/ Utah	Mar-14	40.47927	-111.837678
Blanding	San Juan	Jun-13	37.616501	-109.481167
Blue Mt. Guest Ranch	San Juan	Sep-04	37.787333	-109.4155
Bluff	San Juan	Sep-08	37.283041	-109.555672
Canyon Terrace	San Juan	Sep-04	37.735175	-109.373768
Eastland	San Juan	May-11	37.803231	-109.13623
Montezuma Canyon	San Juan	?-2004	37.712335	-109.263834
Pack Creek	San Juan	Nov-07	38.439443	-109.364163
Wray Mesa	San Juan	Jan-14	38.340335	-109.160169
Aspen Hills	Sanpete	Jun-05	39.571667	-111.370003
Birch Creek	Sanpete	Mar-13		
Ephraim	Sanpete	Nov-11		
Fairview/Milburn	Sanpete	Mar-13		
Fountain Green	Sanpete	Sep-13		
Gooseberry Estates	Sanpete	Sep-12	39.695002	-111.273333
Hideaway Valley	Sanpete	Mar-13		
Holiday Oaks	Sanpete	Mar-13		
Manti	Sanpete	Mar-13		
Mayfield	Sanpete	Mar-13		
Mountain Dell BSA	Sanpete	Aug-08		
Mt. Baldy	Sanpete	Nov-11		
Northern Sanpete County CWPP (Hideaway Valley, Indian Ridge, Blackhawk Estates, Panorama Woods, Indianola)	Sanpete	Jun-05	39.758189	-111.447962
Panorama Woods	Sanpete	Aug-12		
Pine Creek Ranch	Sanpete	Jun-05	39.491667	-111.396668
Pine Mountain	Sanpete	Mar-13		
Skyhaven	Sanpete	Jul-12		
Skyline Mtn. Resort CWPP (SMR, Willow Glen)	Sanpete	Mar-13	39.604715	-111.387461
Spring City/ Twin Creek	Sanpete	Aug-08		

Community Name	County	Date Signed	Lat	Long
Sterling	Sanpete	Mar-13		
Twelve Mile/ Ferron	Sanpete	Mar-13		
Whispering Pines	Sanpete	Sep-04	39.478034	-111.38084
Accord Lake	Sevier	Mar-13		
Clear Creek/Sevier	Sevier	Aug-13	38.5862333	-112.25965
Sevier Clear Creek/Pahvant	Sevier	Mar-13		
Alpine Acres	Summit	Sep-06	40.784133	-110.993533
Aspen Mountain/Aspen Acres	Summit	Aug-05	40.793851	-111.135922
Beaver Creek Ranch	Summit	Aug-07	40.785001	-111.16111
Canyon Rim	Summit	Aug-03	40.790223	-111.182494
Cherry Canyon	Summit	Jun-08	40.814212	-111.37637
Colony at White Pine Canyon	Summit	Sep-03	40.666361	-111.568215
Echo Creek Ranches	Summit	Aug-03	41.031945	-111.301946
Hidden Lake	Summit	Aug-03	40.765	-111.204999
Holiday Park	Summit	Aug-04	40.790891	-110.997438
Manorlands	Summit	Sep-02	40.954999	-110.813892
Monviso	Summit		40.874003	-110.849119
Moose Hollow	Summit	Sep-06	40.7663333	-111.5948611
Park City	Summit	Oct-12	40.659	-111.036
Pine Mtn.	Summit	Sep-03	40.780831	-111.156943
Pine Plateau	Summit	Sep-07	40.92525	-110.8309166
Pinebrook Master HOA	Summit	Oct-02	40.743056	-111.585003
Pines Ranch	Summit	Jul-05	40.7874722	-111.4884444
Rockport	Summit	Jul-04	40.765183	-111.415443
Samak	Summit	Aug-04	40.625833	-111.236111
Silver Creek	Summit	Aug-06	40.739698	-111.497704
South Fork	Summit	May-07	40.750001	-111.190835
Stagecoach Estates	Summit	Aug-07	40.800383	-111.506334
Summit Park	Summit	Aug-02	40.745964	-111.610864
Tollgate Canyon CWPP (Pine Meadows, Forest Meadows)	Summit	Jul-06	40.821864	-111.488392
Uintalands	Summit	Sep-04	40.9710152	-110.8492211
Terra	Tooele	Feb-05	40.319723	-112.628056
Deep Creek Mini Ranches	Uintah		40.525835	-109.762999
Dry Fork	Uintah	Jun-04	40.55855	-109.666014
Cedar Fort	Utah	Dec-07	40.328112	-112.109018
Covered Bridge	Utah	2002	40.030833	-111.556944
Eagle Mountain	Utah	2014		
Santaquin	Utah	Jul-14		
Saratoga Springs	Utah	Dec-03	40.371277	-111.987529

Community Name	County	Date Signed	Lat	Long
Sundance	Utah	Apr-99	40.397715	-111.593018
Woodland Hills	Utah	Mar-11	40.015277	-111.649444
Brighton Estates POA, Inc.	Wasatch	Aug-10	40.553485	-111.524244
Bryant's Fork	Wasatch	Jul-05	40.179254	-111.174568
Deer Crest	Wasatch	Aug-05	40.636155	-111.463813
Diamond Hills	Wasatch	Nov-03	40.5048822	-111.3150855
Interlaken	Wasatch	Jul-02	40.542137	-111.476254
Lake Creek	Wasatch		40.492778	-111.330279
Oak Haven	Wasatch	Aug-07	40.530159	-111.508864
Timberlakes	Wasatch	Jul-04	40.476944	-111.253055
Wolf Creek Ranch HOA	Wasatch	Jul-10	40.54	-111.271944
Apple Valley	Washington	Jul-03	37.109773	-113.125861
Camp Kolob	Washington	Aug-03	37.3731416	-112.9830311
Central CWPP (Central, Dixie Deer, Brookside, Mountain Meadows)	Washington	Oct-02	37.423702	-113.625698
Dammeron Valley	Washington	Sep-04	37.313483	-113.670675
Diamond Valley	Washington	Sep-04	37.256169	-113.606367
Gunlock	Washington	Sep-05	37.286483	-113.763384
Ivins City CWPP (Ivins, Kayenta)	Washington	Feb-08	37.163165	-113.667504
Kolob CFP	Washington	May-08	37.578921	-113.037488
Lower Virgin River	Washington	Nov-05	37.0709036	-113.5819633
New Harmony	Washington	Jun-04	37.478007	-113.30717
Veyo	Washington	Sep-04	37.338271	-113.689011
Causey Estate	Weber	Feb-13	41.270917	-111.577086
Green Hills	Weber	Jul-07	41.26312	-111.692216
Nordic Valley/Moose Mtn./Wolf Mtn.	Weber	Nov-07	41.310277	-111.865
Sourdough Wilderness Ranch	Weber	Oct-04	41.322147	-111.617808
Strongs Peak	Weber	Jun-08	41.187338	-111.9348247
Sunridge	Weber		41.31	-11.638
Unitah Highlands	Weber	Nov-04	41.1572169	-111.9153477

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