

Utah Statewide Forest Resource Assessment & Strategy Guide 2010



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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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 Statewide Forest Resource Assessment and Strategy Guide. This assessment 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 statewide forest resource assessment in order to more effectively focus management priorities and funding opportunities. The Utah Assessment will drive future grant requests from USDA Forest Service, State and Private Forestry and other funding sources. The purpose of the Assessment 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 Statewide Forest Resource Assessment and Strategy Guide concentrated on eight key themes for the geospatial analysis portion of the Assessment. 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 20 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 Assessment 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 Assessment 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, 2). 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.

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, 2). 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, 4). 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.



La Sal Mountains
Photo by Geoff McNaughton

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 Statewide Forest Resource Assessment

The Utah Statewide Forest Resource Assessment 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 Assessment 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 identifying multi-state priority areas with neighboring states. Finally, the Assessment is consistent with the State and Private Forestry national themes:

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

There are three components to the assessment 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.



Range Creek Forest Legacy Property
Photo by : Ann Price

The Assessment of Forest Resources and Forest Resource Strategy have been combined in to this single report titled “*Utah Statewide Forest Resource Assessment and Strategy Guide.*”

Statewide Forest Resource Assessment Process

The Assessment 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 Assessment also included a Core Team, comprised of a limited number of federal and state agency representatives with which the Division conducts day to day business. The Core Team produced the Assessment products for review by the stakeholder group. The role of the stakeholders was to give valuable input at key stages of the Assessment process. Although it is a collaborative process, it is important to remember that the Assessment will be a guiding document for the Division.

Core Team

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 Scott Bell..... US Forest Service, Wood Utilization Coordinator, Regions 1 & 4
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 Aaron Wilkerson Bureau of Land Management, Forestry Program Lead
 Steve Winward US Forest Service, GIS Specialist, Region 4

The Division held the first stakeholder meeting for the Assessment on January 13, 2009. A list of participating stakeholders can be found on page 6. 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 State Assessment process.

Summarized Conditions, Trends, Threats and Opportunities Listed Alphabetically

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

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 Assessment. These themes were used to identify the GIS data layers needed to create the Assessment 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

The Draft Assessment was presented at a meeting at the Utah State Capitol on March 25, 2010. The comments received at that meeting were incorporated into the Assessment. 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.

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 Assessment 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.

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 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 10.

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 Assessment for the State were divided into five priority area regions and named for their geographic location. The priority area regions are shown on page 11 and are named:

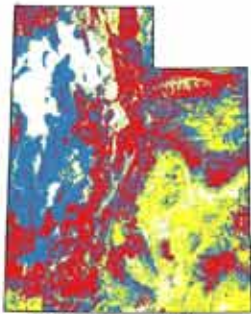
- Wasatch
- Uinta
- Sevier-Skyline
- La Sal
- Cedar

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 Redesign proposals and other planning processes.

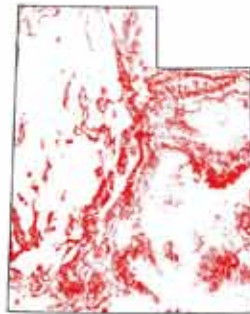
Utah's State Assessment Model

8 Theme Layers from 20 Data Layers



Wildland Fire

- Fuel Model
- Fire Return Interval
- Fire Regime Condition Class
- Communities at Risk



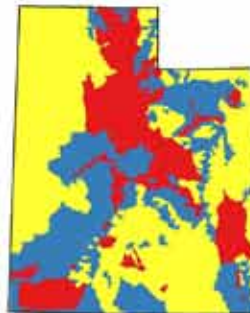
Forests

- All Forests



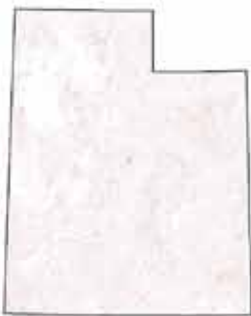
Wildlife Action Plan

- Designated Areas



Water Quality

- Impaired Waters
- Water for People



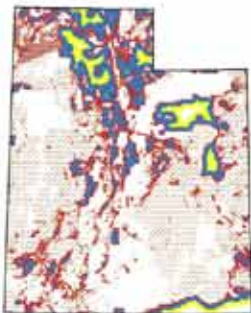
Riparian

- 30 m Waterbody Buffer
- 30 m Stream Buffer



Forest Health

- Insects and Disease
- Invasive Species



Lands

- Forest Stewardship Plans
- Conservation Easements
- Federal Lands

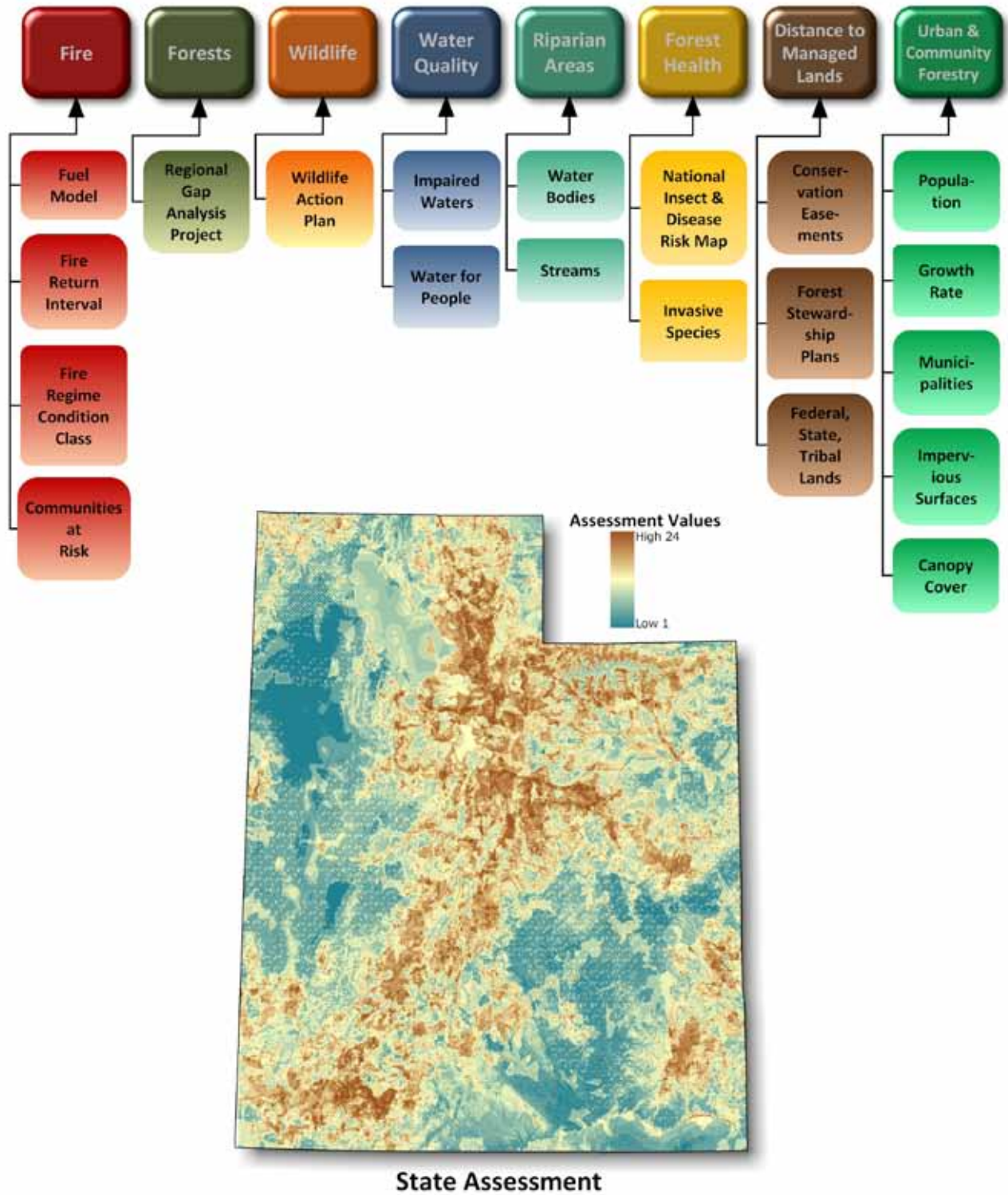


Urban & Community Forestry

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

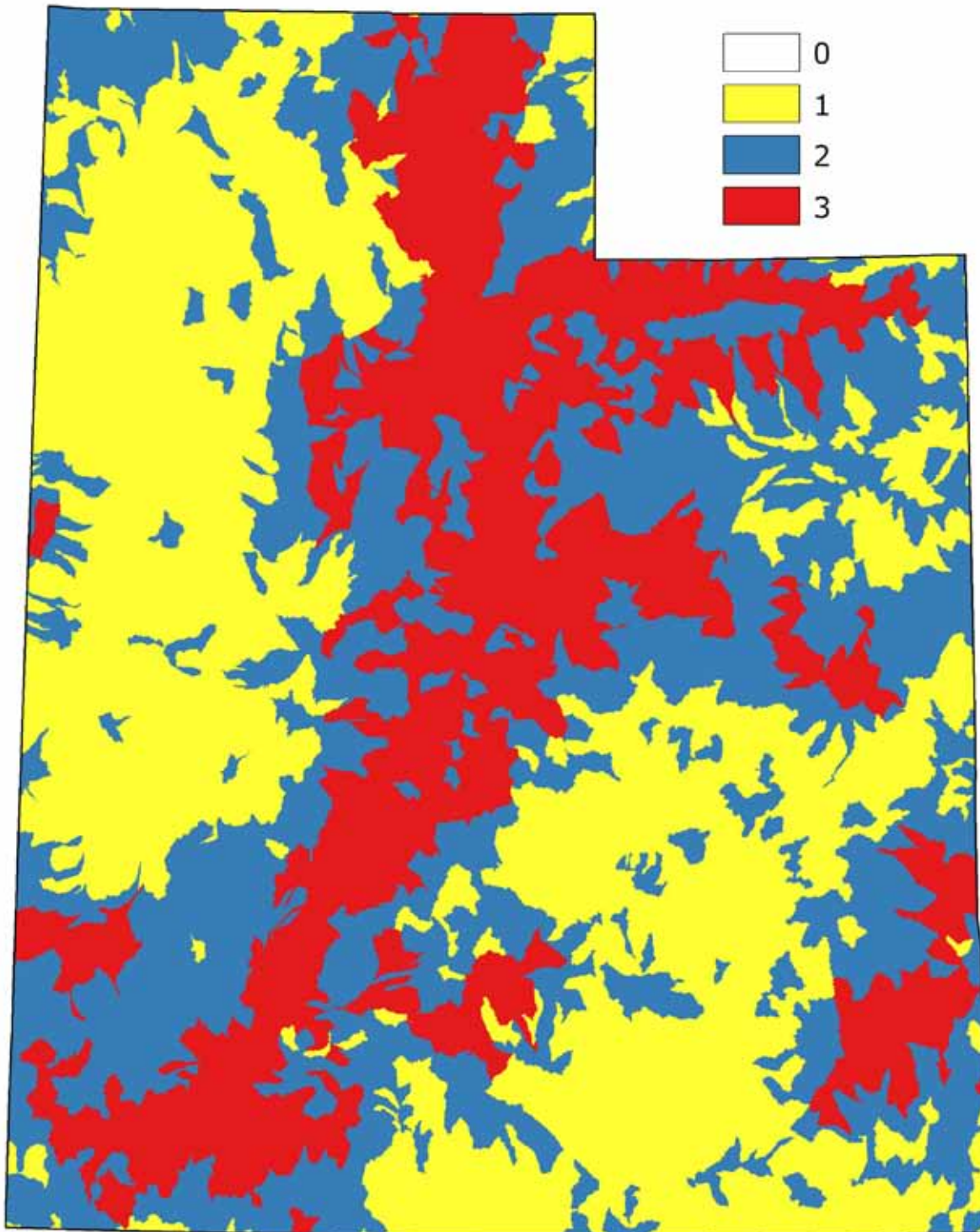
Input Values 0 1 2 3

Utah Methodology Matrix

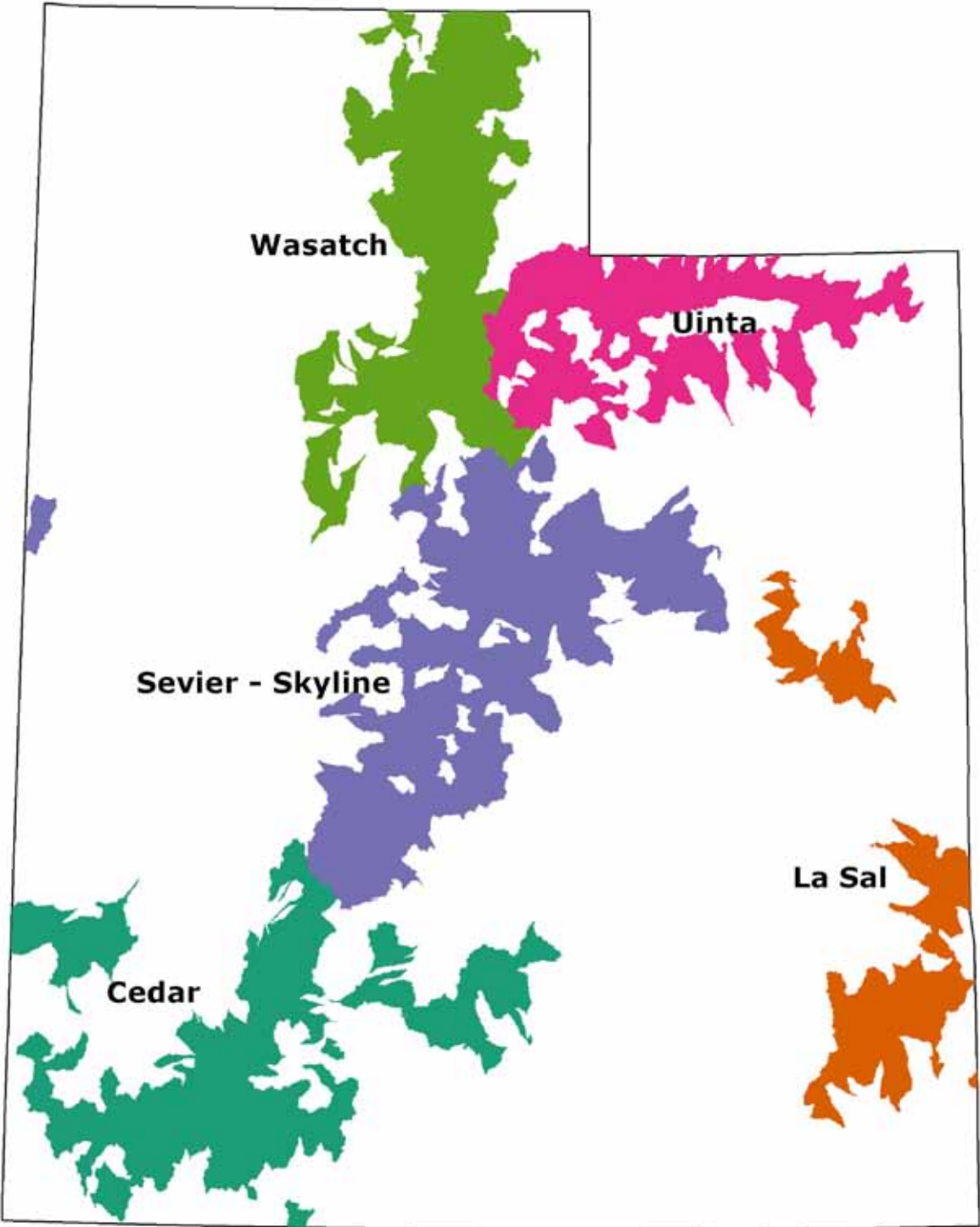


Priority Areas

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 Assessment for the State were divided into five priority area regions and named for their geographic location.



Priority Area Regions



Wildland Fire

Wildfire, wherever it occurs, is nature's way of cleaning landscapes and recycling resources. Fire has helped to create 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 fire to maintain the health and vigor of the many ecosystems within the state. With the advent of fire suppression, many of the ecosystems have departed from pre-suppression conditions. As a result, when fires occur they are often more damaging to ecosystems and have a greater 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.

For purposes of fuel typing, forests can be subdivided 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 fires otherwise known as stand replacing fires. Due to the elevation, fire occurrence can range from 300 to 700 years. These stands will more likely succumb to insect and disease infestations than fire.

Aspen is on a steady decline statewide for a variety of reasons, including the exclusion of wildfire. Low intensity fires 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 exclusion of fire, most of the ponderosa forest type is overstocked with multiple layers of understory. The fire 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 fire 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 fires 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 fires is considered to be high in both cases. Because of fire suppression, 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 rot before there are any appreciable effects from fire.

Shrub forests are predominantly composed of Gambel oak. Gambel oak is clonal, though if it is



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

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 fire that is of high intensity and severity.

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 is a 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, fire scarred landscapes. Because cheatgrass cures earlier in the year than other grasses it is available to burn earlier, 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.



Wildland Urban Interface in Timberlakes, Utah.

Photo by: Ken Ludwig

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.

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 fire effects.

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



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

Program Overview

The Division's fire management program is responsible for protecting state property by preventing the origin and spread of fire 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 three engines for fires that escape initial attack both within and out of the state.

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.

The fire program's prevention efforts are concentrated on the statewide *Living With Fire* campaign. This is an interagency effort to educate residents living in the wildland urban interface. Area fire staff assist with other prevention projects when available.

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 fuels and 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 developed. Once a plan is in place, 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.



Local, State and Federal Resources are utilized in fire suppression efforts throughout the State of Utah.

Photo by: Rudy Sandoval



A prescribed fire is used to remove encroaching conifers and stimulate aspen regeneration.

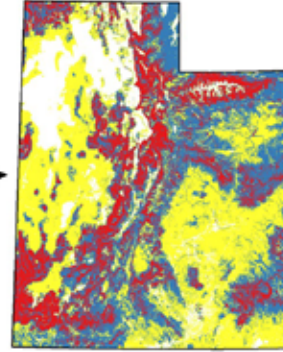
Photo by: Rudy Sandoval

Wildland Fire

The Wildland Fire theme shows potential threat to resources from wildland fire. It is composed of four data layers.

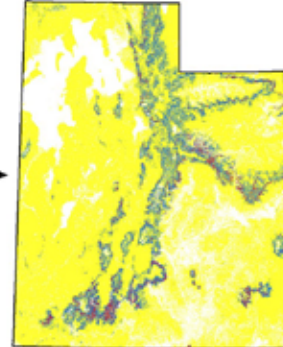
Fuel Model Data Layer
From: Landfire data

Value	Rothermel's Fuel Model
0	NB1, NB2, NB3, NB8, NB9
1	GR1, GR2, GS1, SH1, SH2, TU1
2	GR5, GR7, GS2, SH4, SH6, TU3, TL1, TL3, TL4, TL8
3	SH5, SH7, TU5



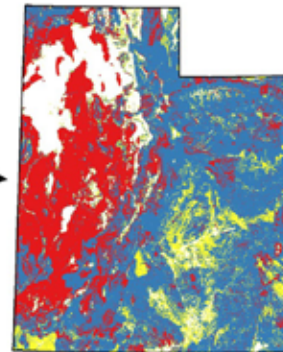
Fire Return Interval Data Layer
From: Landfire data

Value	Fire Return Interval
0	None (Water, Barren, etc.)
1	51 - 1,000 years
2	26 - 50 years
3	11 - 25 years



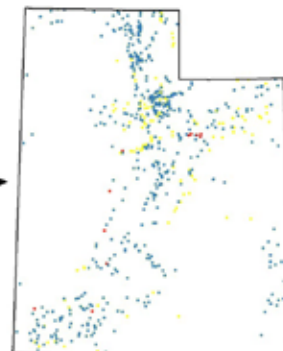
Fire Regime Condition Class Data Layer
From: Landfire data

Value	Fire Regime Condition Class
0	None
1	1
2	2
3	3



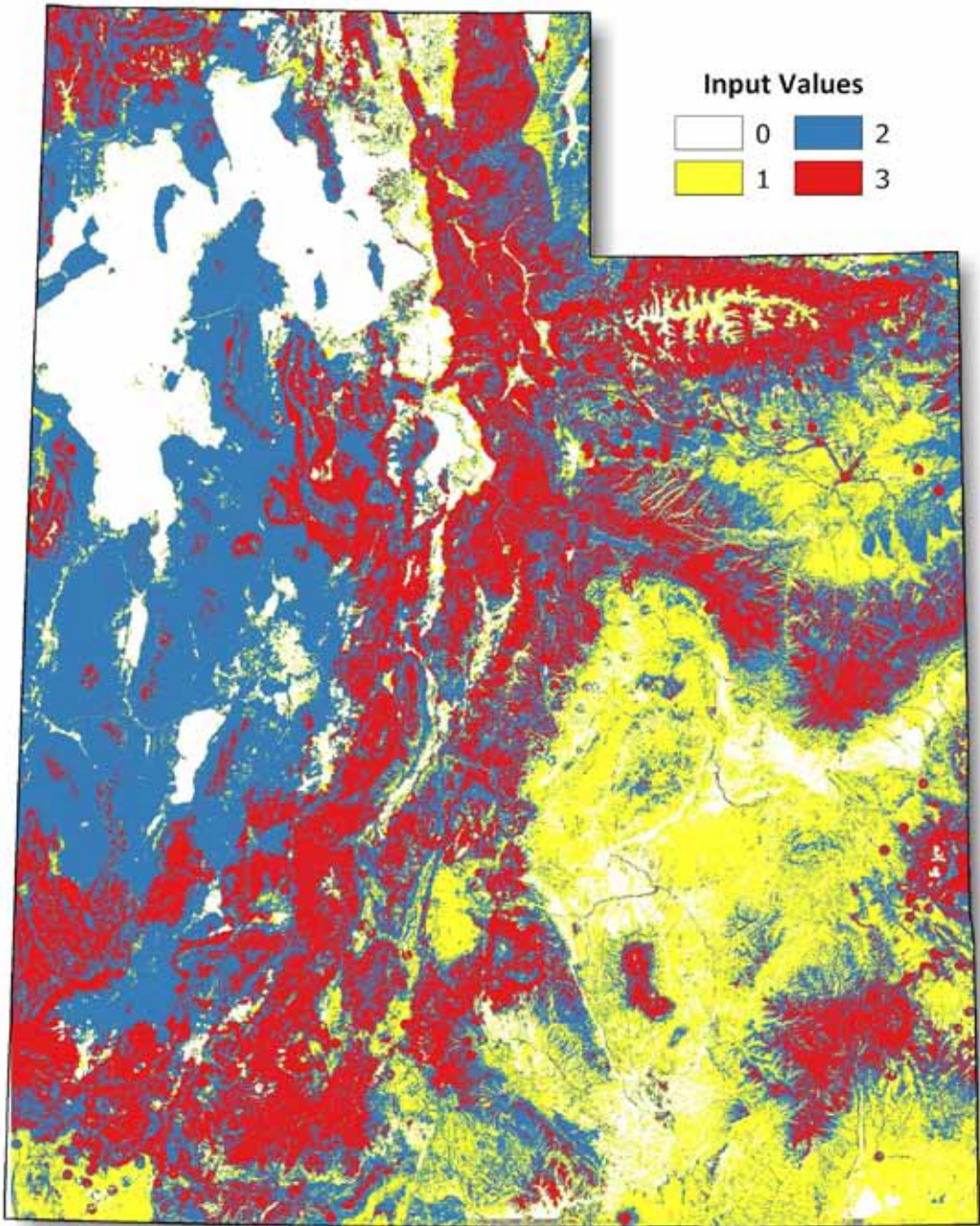
Communities at Risk Data Layer
From: FFSL data. A 1.5 mile buffer was placed around 2009 communities at risk points. The rating score considered fire occurrence, fuel hazard, values to be protected, and protection capabilities.

Value	Rating
0	0 (Non-community at risk)
1	4 - 7 (moderate)
2	8 - 11 (high)
3	12 (extreme)



Input Values 0 1 2 3

Wildland Fire



The values assigned to the Wildland Fire theme layer are:

Wildland Fire Value	Sum of four data layers
0	0 - 1
1	2 - 3
2	3 - 4
3	5 - 12



Objectives and Strategies

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.

Adapt and/or expand the existing education program to meet current and future needs.

- Update the existing literature by incorporating current research information.
- Make materials available to media for distribution to their audiences.
- Maintain collaborative efforts with interagency partners to deliver and update information.
- Increase participation in the National Firewise recognition program.

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 Fire Plan 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.

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 mitigative costs.

Wildland Fire legislation.

- Update statutes 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 of all interested entities for wildland fire suppression.

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 Fire Plan.
- Help to identify areas of potential integration through the Redesign process.

Project identification and implementation.

- Identify both federal and non-federal projects identified in the priority areas of the State Assessment.
- Help to facilitate projects that meet the needs of entire communities and not just individuals.
- Incorporate a maintenance schedule for communities that is achievable and effective.

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
<i>Comprehensive Inventory of Utah’s Forest Resources, O’Brien 1993</i>				

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
<i>Figures based on 1978 data</i>			

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).

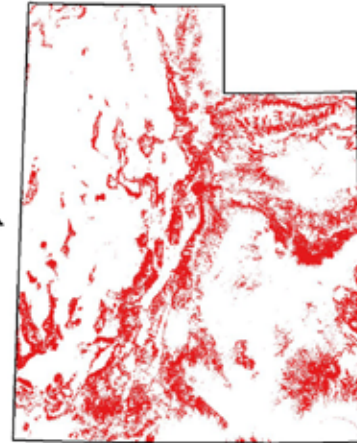
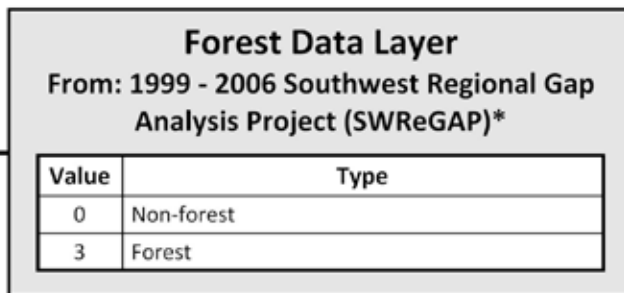
The National Fire Plan (NFP) also provided important one-time financial support, which increased technical assistance capability under the Multi-Resource Stewardship component. The Environmental Quality Incentives Program (EQIP) was reauthorized in the Farm Security and Rural Investment Act of 2002 (Farm 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

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.

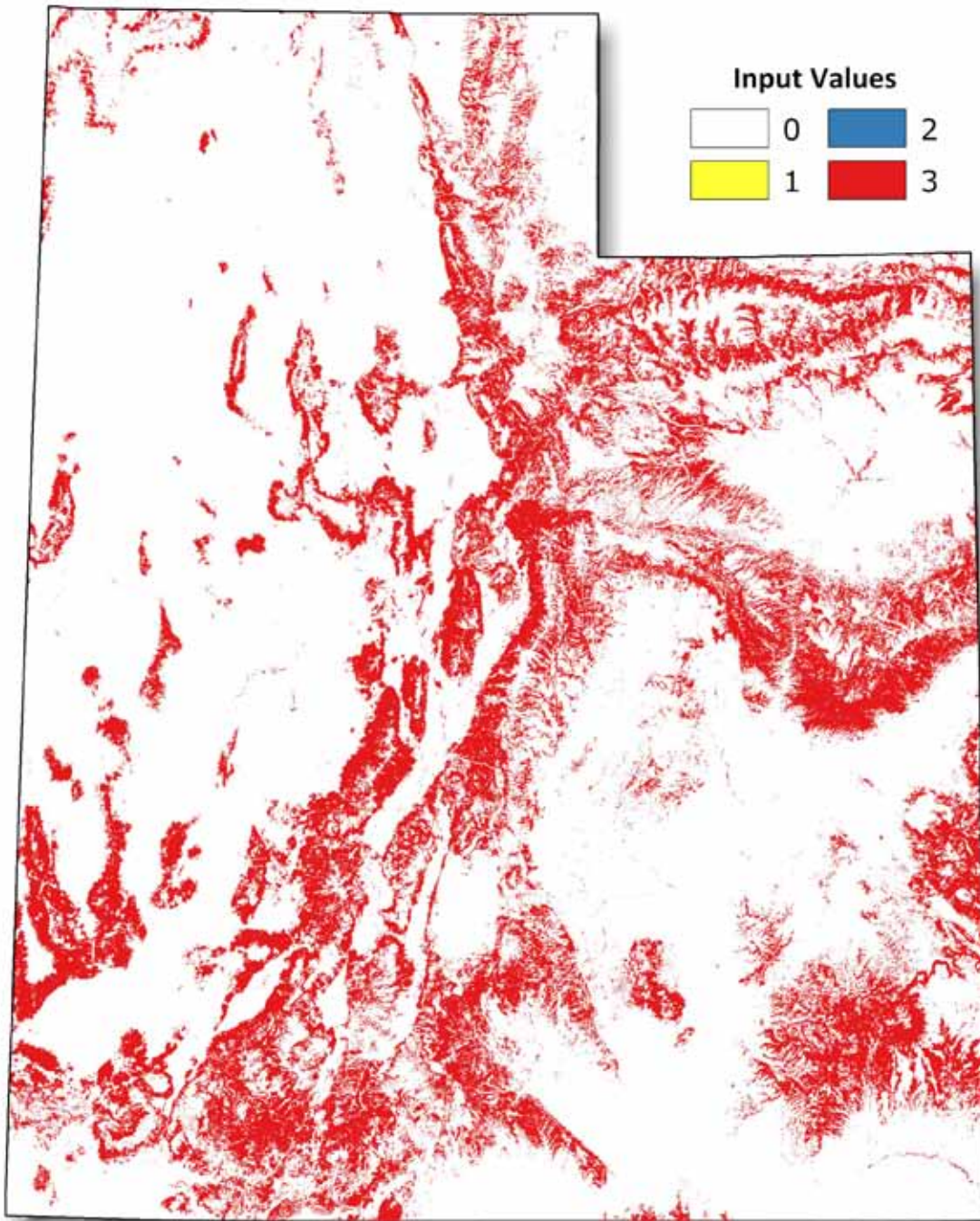


Input Values 0 1 2 3

*The following tree and woodland categories were included:

- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
- Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland
- Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland
- Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland
- Rocky Mountain Lodgepole Pine Forest
- Rocky Mountain Ponderosa Pine Woodland
- Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland
- Inter-Mountain Basins Subalpine Limber-Bristlecone Pine Woodland
- Colorado Plateau Pinyon-Juniper Woodland
- Great Basin Pinyon-Juniper Woodland
- Colorado Plateau Pinyon-Juniper Shrubland
- Rocky Mountain Aspen Forest and Woodland
- Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex
- Rocky Mountain Bigtooth Maple Ravine Woodland
- Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- Rocky Mountain Lower Montane-Foothill Shrubland
- Inter-Mountain Basins Mountain Mahogany Woodland and Shrubland
- Rocky Mountain Subalpine-Montane Riparian Woodland

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.). 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.

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.



Blue Lake in Chalk Creek Watershed
Photo by: Mike Eriksson

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.

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

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

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.

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.

Promote the professional development of Division employees.

- Promote job-related training and education opportunities.

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

Wildlife Action Plan

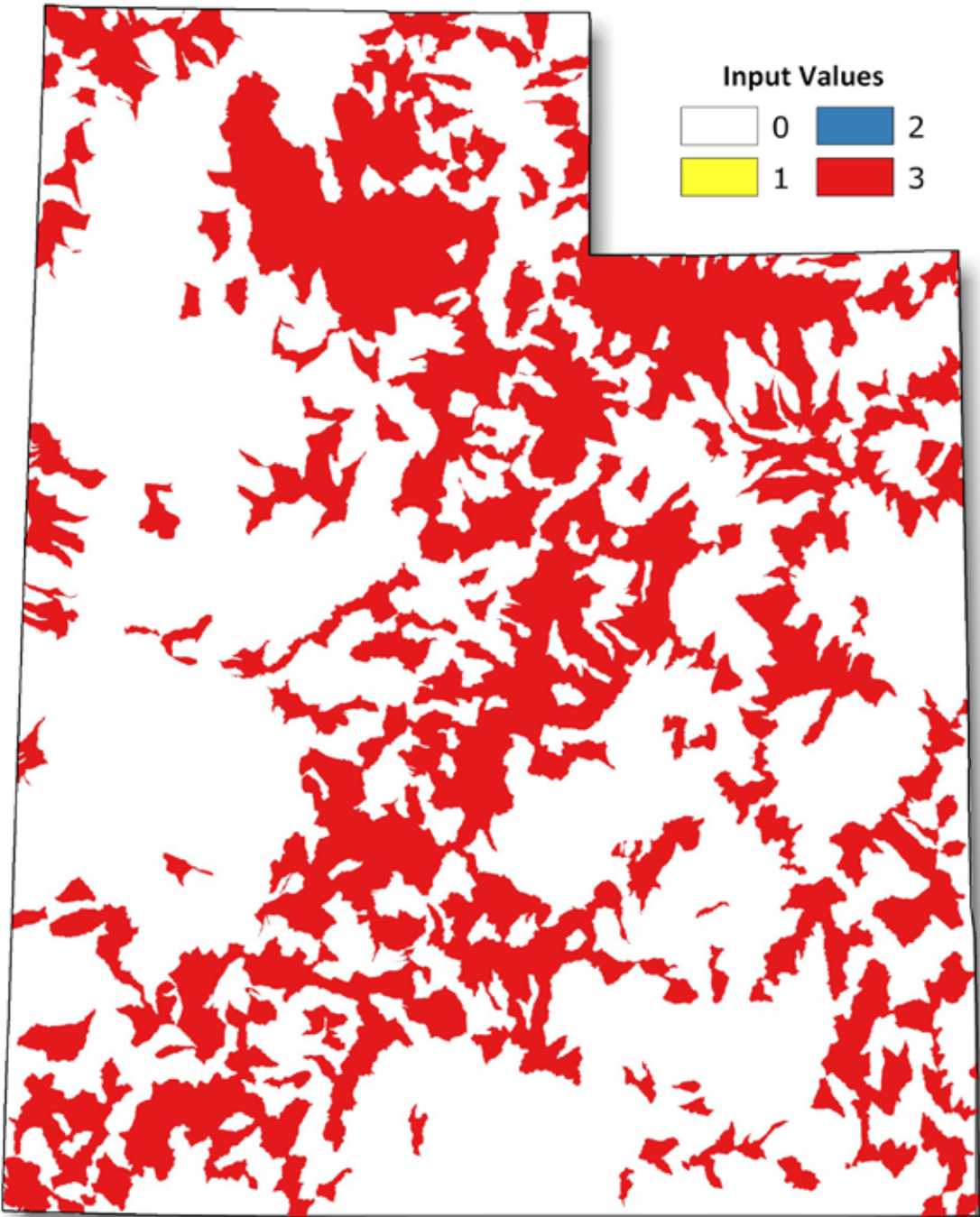
The Wildlife Action Plan (WAP) theme shows the location of areas designated in the plan as valuable for habitat conservation or restoration efforts. It is composed of one data layer.

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



Input Values 0 1 2 3

Wildlife Action Plan



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

Wildlife Action Plan Value	Area of Concern
0	Not an area of concern
3	Area of concern



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 Statewide Forest Resource Assessment with new DWR and WAP data as it is developed.

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 State Assessment 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.



Stream on a Forest Legacy Easement.

Photo by: Unknown

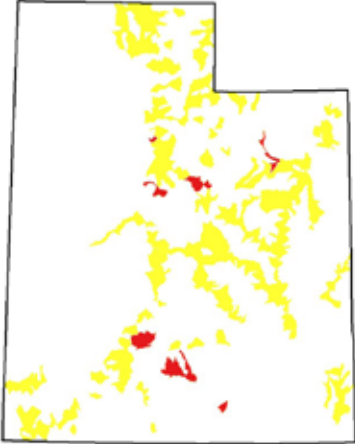
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Water Quality

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.

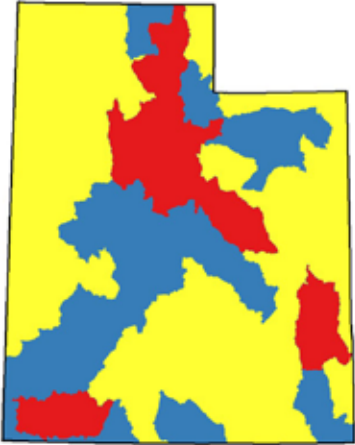
Impaired Waters Data Layer
From: Environmental Protection Agency (EPA)

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



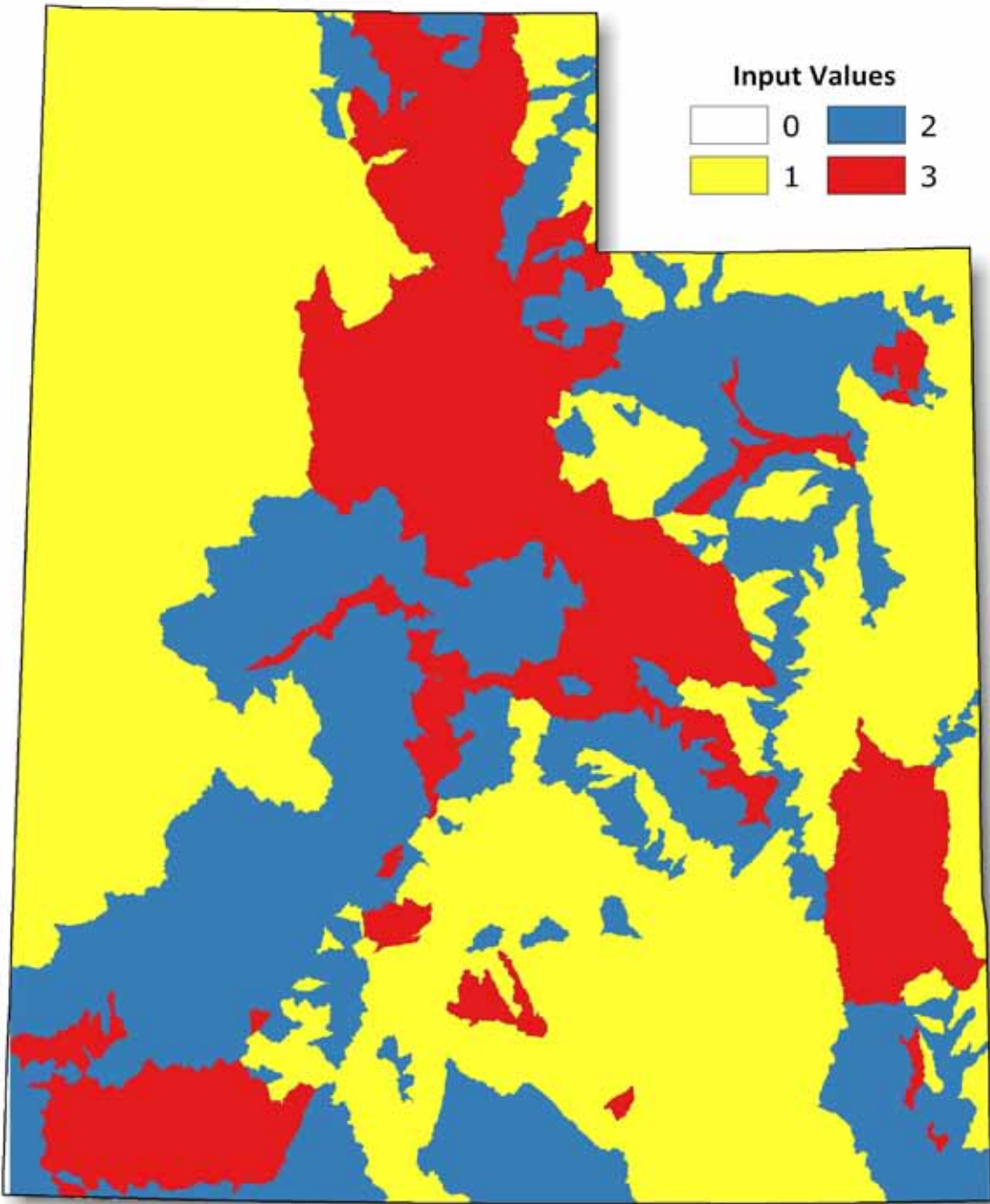
Water for People Data Layer
Created by FFSL. Contains number of municipal water sources and the number of people served by a watershed.

Value	Number of People Receiving Water from Watershed
1	Municipal Water Sources < 100 and Population < 5,000
2	Municipal Water Sources < 500 and Population 5,000 - 50,000
3	Municipal Water Sources > 500 and Population > 50,000



Input Values 0 1 2 3

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



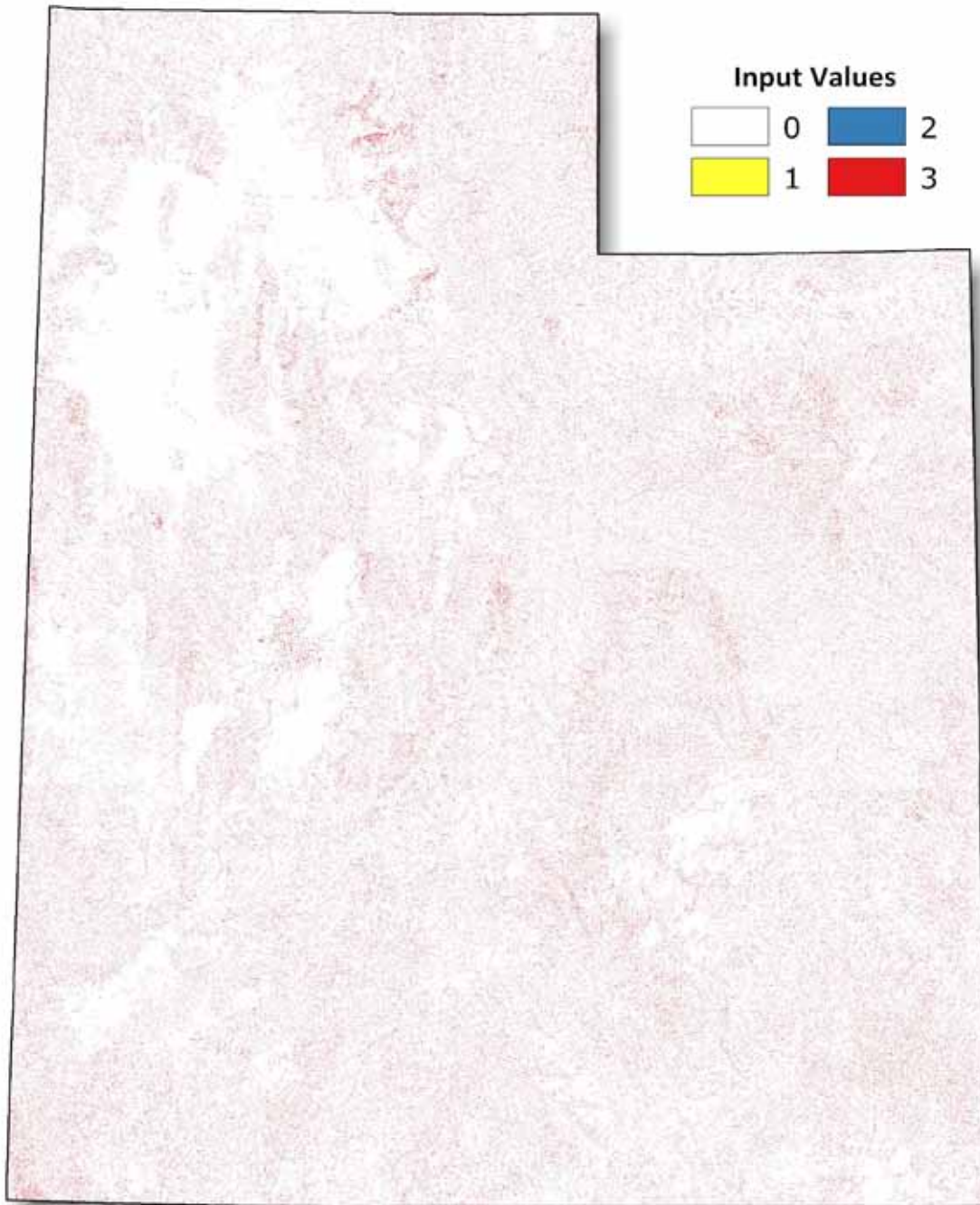
30 Meter Buffer Along Streams Data Layer
From: National Hydrological Dataset, flowline data (FType = 460 or 336)

Value	Distance
0	> 30 meters
3	<= 30 meters



Input Values 0 1 2 3

Riparian Areas



The values assigned to the Riparian theme layer are:

Riparian Value	Distance
0	> 30 meters
3	<= 30 meters



Priority Areas

The State Assessment 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.

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

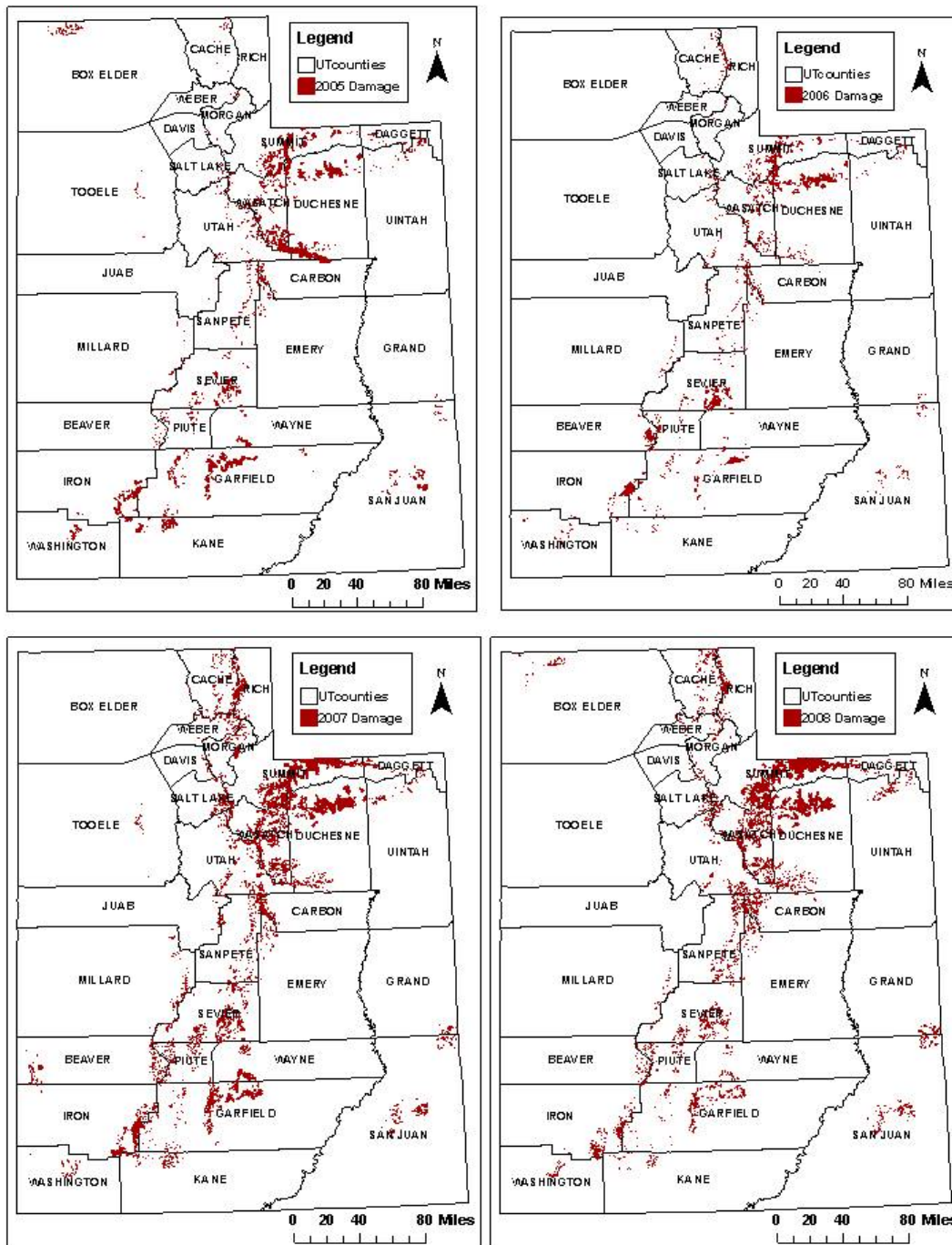


Figure 1: The maps above show the yearly damages and are not cumulative. Each year is shown as a separate snapshot in time. What we notice is that insect damage is seen throughout the state each year and if you did add them together we would notice that much of our forests are having insect induced mortality.

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.

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.

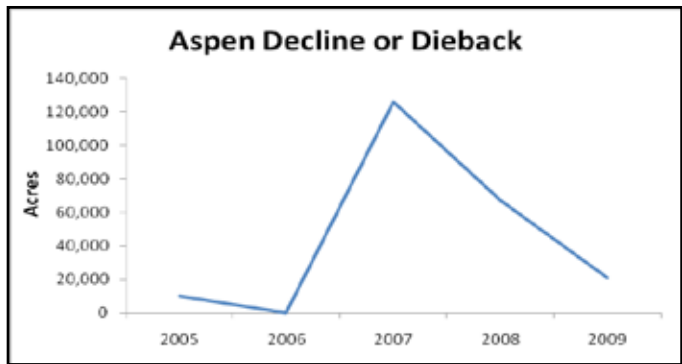


Figure 2



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.

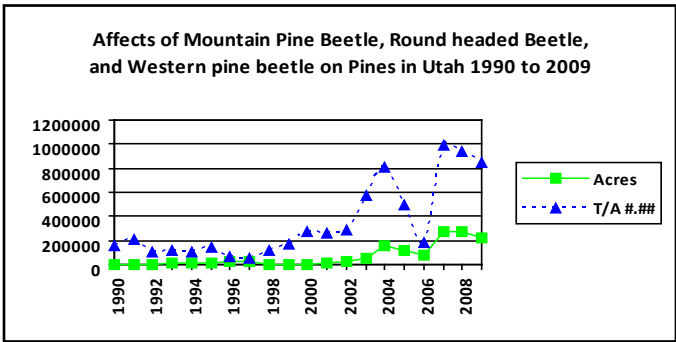
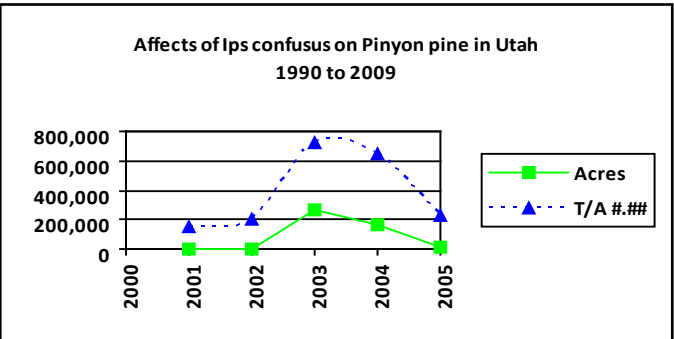
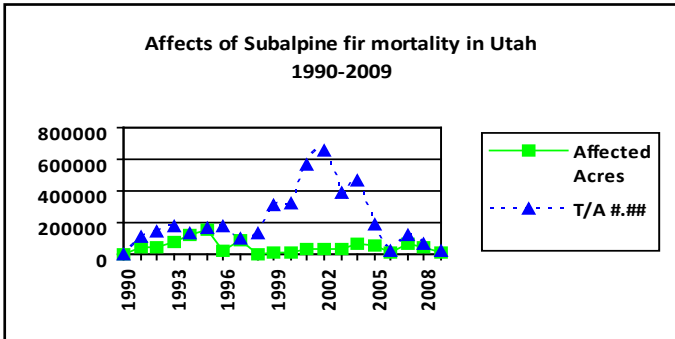
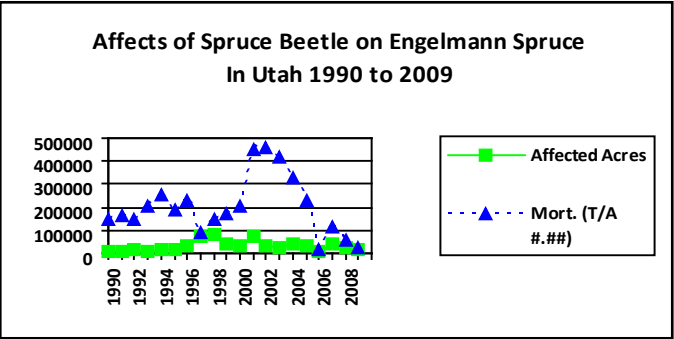
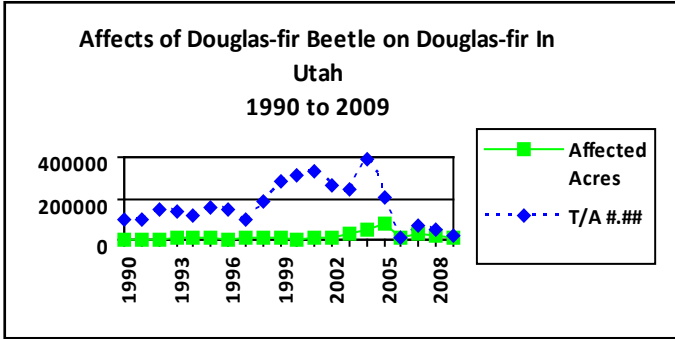


Figure 4

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	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	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	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		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	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	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	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 proactive 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.

Information for all forested lands in Utah is available to the State Forester, State and Federal Legislators, other decision makers and land managers; 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.

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.



Spraying for insect control.

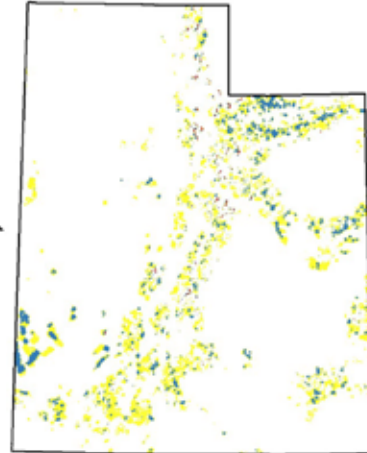
Photo by: Colleen Keyes

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: 2006 National Insect and Disease Risk Map (NIDRM)

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



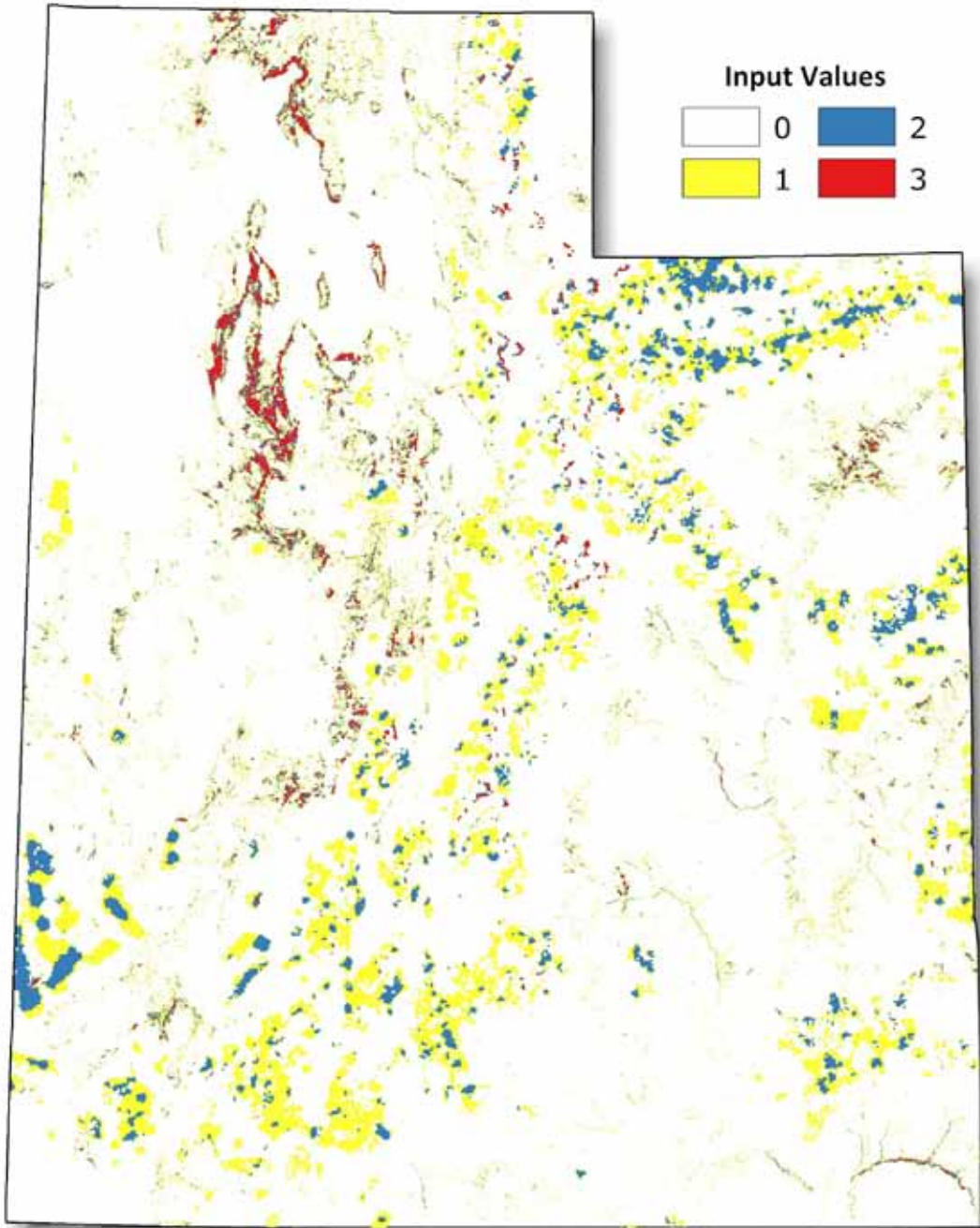
Invasive Species Data Layer
 From: 1999 - 2006 Southwest Regional Gap Analysis Project and State of Utah (AGRC) Noxious weeds layer with a 100 foot buffer around point.

Value	Species
0	Non-invasive
3	Invasive



Input Values 0 1 2 3

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.

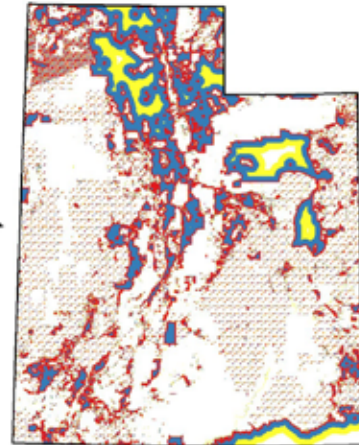
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Distance to Managed Lands

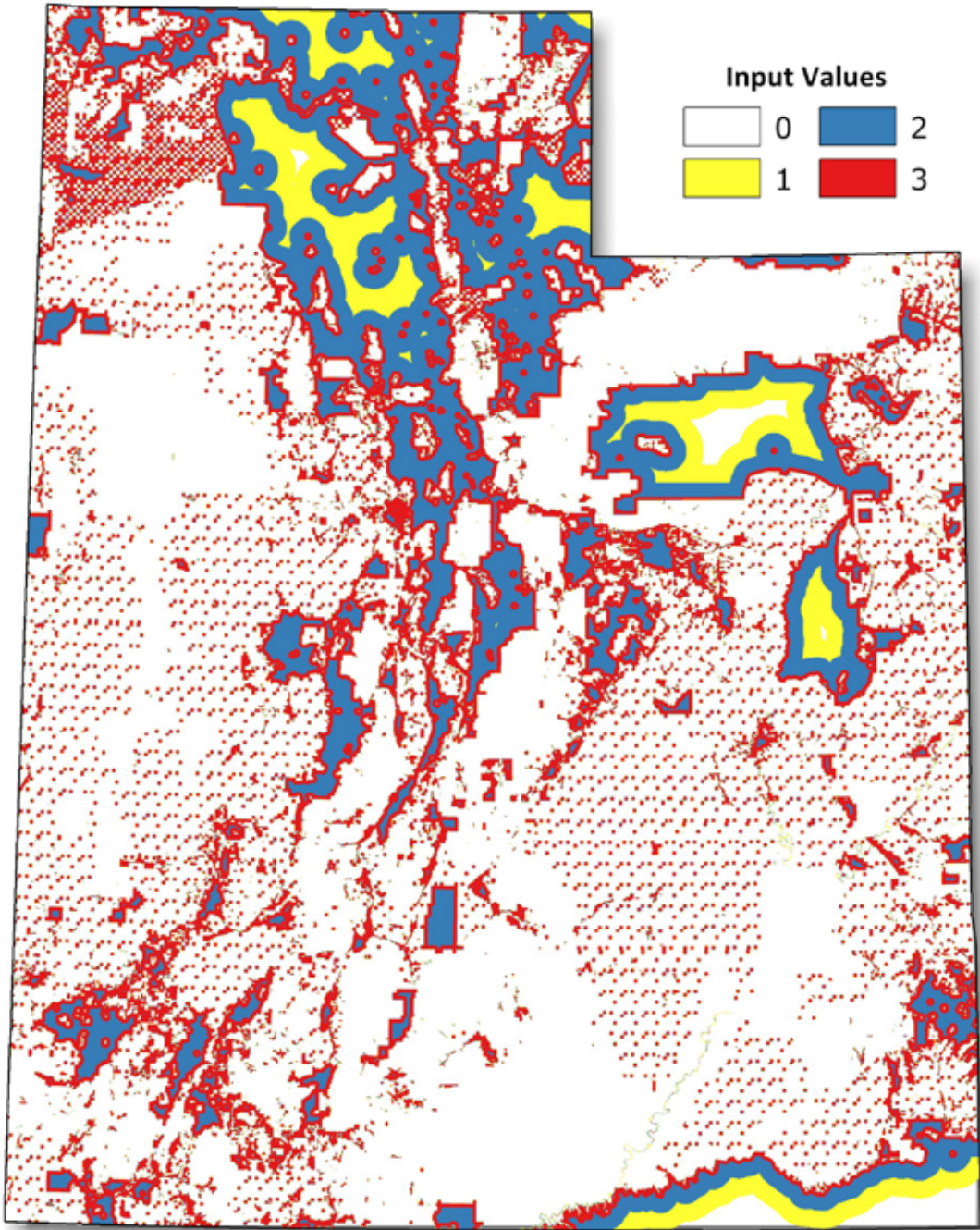
The Distance to Managed Lands theme shows areas that project benefits may increase because of nearness to existing Forest Stewardship Plans, Conservation Easements, Tribal lands and Federal (public) lands. It was created by combining three data layers into one layer and buffering it to the distances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

Distance to Managed Lands Data Layer
Created by FFSL

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



Distance to Managed Lands



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

Distance to Lands Value	Distance
0	> 10 miles
1	5 - 10 miles
2	1 - 5 miles
3	< 1 mile



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: Meredith 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 (2007-2009) 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 diameter size classes and relatively good tree

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.

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 health..."* 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

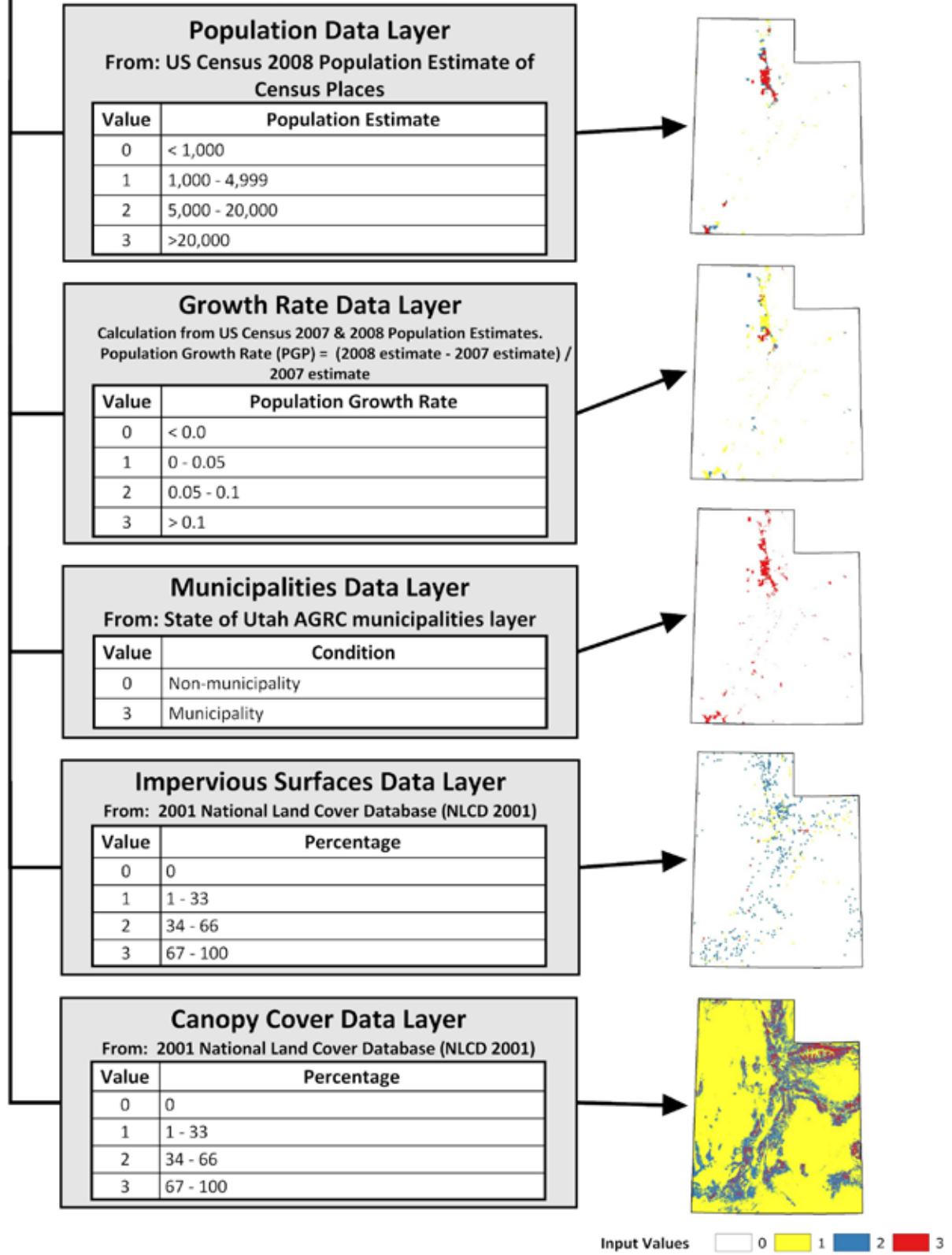


The UCF Program promotes arborist education and development. Here Max Darrington teaches new arborists climbing techniques.

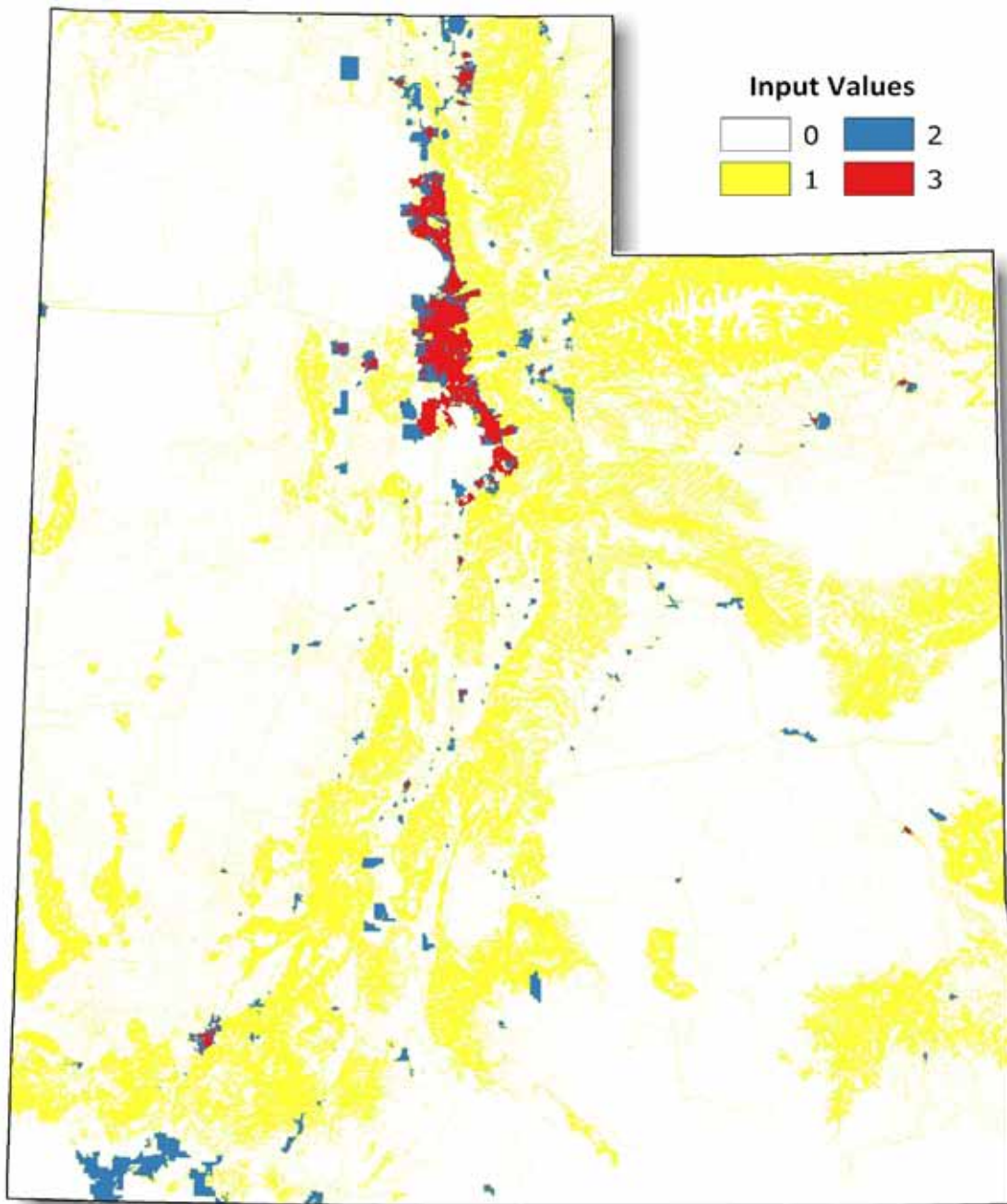
Photo by: Meridith Perkins

Urban & Community Forestry

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



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 State Assessment 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.

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.



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

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.

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.

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.

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.

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.

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.

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.

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.

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.



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 *State Assessment and Strategy Guide* 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*.

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



Aspen stand on the Six Feathers Ranch Forest Legacy Easement, Summit County, Utah.

Photo by: Ann Price

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 65.

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.

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.

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.

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.

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

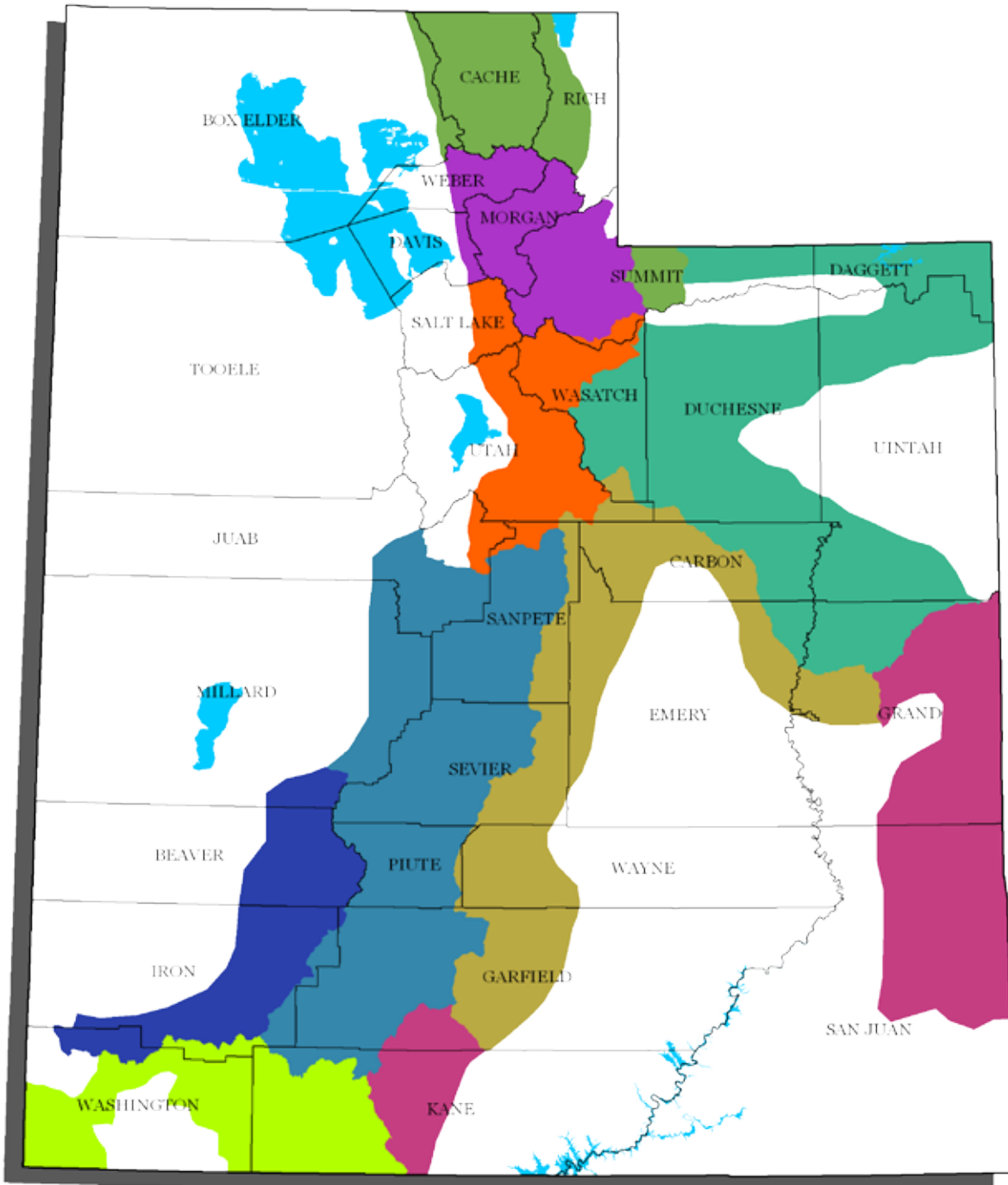
- Parcels which include healthy forests, including a natural species mix and a genetically sound mix of trees within the species represented on the parcel.
- Parcels owned by landowners who will manage the parcel or key portions of it to restore a natural mix of forest species, structure and stages across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

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.



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



Utah's Forest Legacy Areas

- | | | | |
|--|----------------------|--|--------------------------|
| | Lakes | | Sevier River Basin |
| | Bear River Basin | | Southeast Colorado Basin |
| | Cedar - Beaver Basin | | Uinta Basin |
| | Jordan River Basin | | Weber River Basin |
| | Lower Colorado Basin | | Western Colorado Basin |



February 2009

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 State Assessment 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 State Assessment, 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 State Assessment updates.

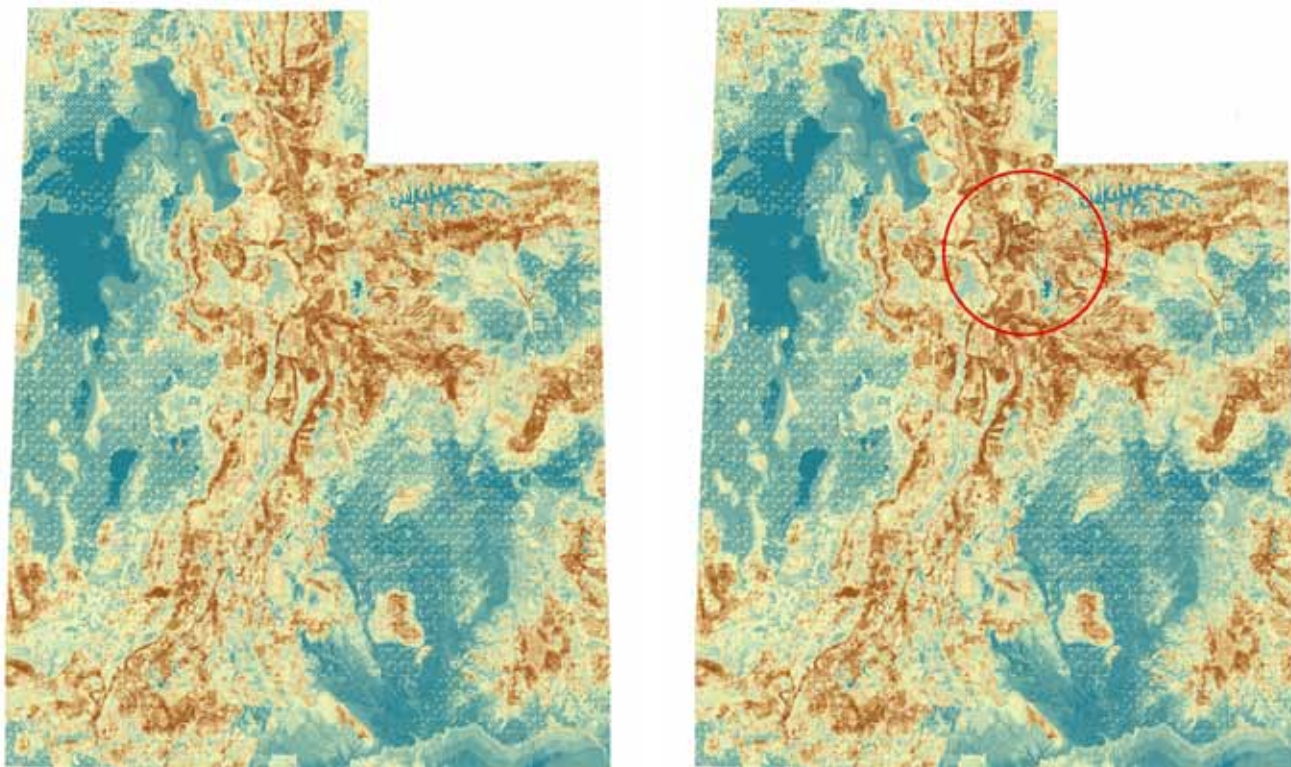
Objectives and Strategies

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:

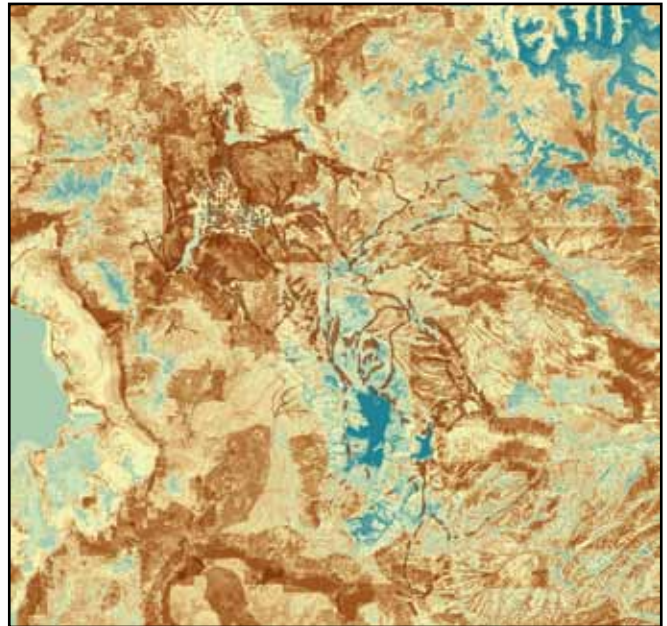
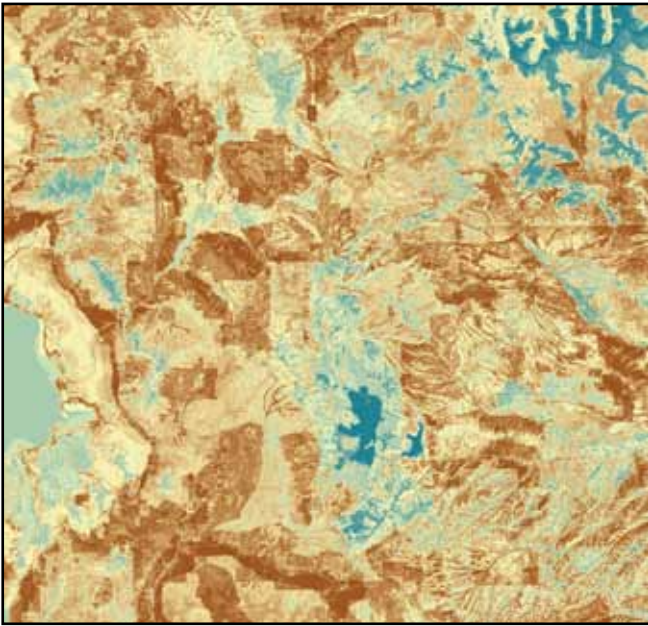
- Conduct education & outreach on the importance of healthy forests in mitigating climate change.
- Develop projects and policies that promote healthy forests and reduce catastrophic wildfire, thereby maintaining forests as a carbon sinks and not carbon sources.
- Promote the increased use of woody biomass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

Dynamic Model

The Division plans to go beyond the model created for Statewide Forest Resource Assessment and create a “Dynamic Model.” The model created for the Assessment is a snapshot in time. The Assessment 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 State Assessment model. The map on the right is the State Assessment 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 State Assessment 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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