



**COLORADO FOREST
RESTORATION INSTITUTE**

**Colorado Governor's Forest Health
Advisory Council**

**Lodgepole Pine Zone of Agreement
Working Group**

Report

April, 2010

Colorado Forest Restoration Institute
Department of Forest, Rangeland and Watershed Stewardship
Colorado State University
<http://warnercnr.colostate.edu/cfri-home/>

Colorado Governor's Forest Health Advisory Council Lodgepole Pine Zone of Agreement Working Group

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Executive Summary

The Lodgepole Pine Zone of Agreement (ZOA) working group was requested by the Governor's Forest Health Advisory Council (FHAC) in September 2009. Its purpose was to identify the zone of agreement (ZOA) for goals, objectives, and location of treatments in lodgepole pine (LPP) forests affected by the mountain pine beetle (MPB) outbreak and estimate wood quantity and characteristics from this ZOA. The work group was convened and facilitated by the Colorado Forest Restoration Institute at Colorado State University from October 2009 through April 2010.

Given everyone's time and resources, the ZOA working group has been able to generate a number of deliverables but not a quantitative number of acres or boardfeet that may be available over a precise time span for all lodgepole pine forests in Colorado in the future – this would require a more site and Forest-specific, collaborative approach. The working group used Summit County as a case study to develop a process framework for identifying the ZOA for lodgepole pine. The deliverables of this ZOA working group are:

1. Main findings that emerged from three meetings and three conference calls.
2. Philosophical Zone of Agreement: Main Findings and Statements.
3. Operational Zone of Agreement maps that show the process of elimination (or exclusion) used to define the ZOA on the landscape, as well as the inclusion of zones of agreement reached through collaborative discussions.
4. Process framework that can be used for further place-based forest discussions in Colorado and elsewhere.

The group concluded that the development of a Zone of Agreement is possible, and distinguishes between two complimentary types of zones, philosophical and operational. The development of a philosophical ZOA is best conducted at the place-based level with the broadest possible range of stakeholders and can benefit from a structured, facilitated process such as the values-interests matrix used in this case (see Table 1 and Appendix A). The development of the operational ZOA can benefit from a structured, facilitated process such as the iterative processes of exclusion and inclusion (see Appendix B maps). The values-interests matrix could be used by place-based collaboratives to efficiently identify overlaps in values and interests, and analyze trade-offs for proposed treatments in particular geographic areas. The report provides components to consider in each type of ZOA deliberation.

For next steps the report recommends a more structured process involving a broad range of stakeholders to learn about emerging research findings and other empirical evidence on post-MPB forest conditions and forecasts for the “future range of variability” of this ecosystem. The Colorado Forest Restoration Institute proposes two steps:

1. A conference (which is already planned) on April 19-21 in Steamboat Springs to assess the future range of variability of post-MPB forests by reviewing the current knowledge and range of economic, social and ecological desired conditions related to post-MPB forests.

2. Many members (not all) of this FHAC ZOA working group have expressed a desire to continue working on the Lodgepole Pine ZOA statements that Gary Severson originally proposed and were further refined by the group, and other subjects as defined by the working group. CFRI is willing to facilitate continued discussions and proposes to use a process that would be similar to the one used by the National Forest Foundation to explore Restoration Principles in the Montana Forest Restoration Committee. To this end CFRI is willing to commit some funding under its 2010 workplan.

Introduction

The Lodgepole Pine Zone of Agreement (ZOA) working group was requested by the Governor's Forest Health Advisory Council (FHAC) in September 2009 – to identify the zone of agreement (ZOA) for goals, objectives, and location of treatments in lodgepole pine (LPP) forests affected by the mountain pine beetle (MPB) infestation and estimate wood quantity and characteristics from this ZOA. The work group was convened and facilitated by the Colorado Forest Restoration Institute at Colorado State University.

The underlying purpose of the request is to help the FHAC better understand what wood supply would be available to sustain wood industries in the LPP zone over the long-term, not just during the period of salvaging standing dead trees.

Given everyone's time and resources, the ZOA working group has been able to generate a number of deliverables but not a quantitative number of acres or boardfeet that may be available over a precise time span for all lodgepole pine forests in Colorado in the future. ZOA is a nebulous concept which the working group had to define in order to be successful. This report will outline the parameters the working group decided on using Summit County as a case study and the process framework used for identifying the ZOA for lodgepole pine. The deliverables of this ZOA working group are:

1. Main findings that emerged from three meetings and three conference calls.
2. Philosophical Zone of Agreement
 - a. Main Findings
 - b. Statements.
3. Operational Zone of Agreement maps that show the process of elimination (or exclusion) used to define the ZOA on the landscape, as well as the inclusion of zones of agreement reached through collaborative discussions.
4. Process framework that can be used for further place-based forest discussions in Colorado and elsewhere.

ZOA Working Group Process Parameters

As a starting point, the working group concluded that there is a philosophical zone (page 3) encompassing the purposes and goals of why treatments are necessary, and an operational zone (page 9) specifying the geographic location and types of treatments. Both need to be further fleshed out in order to begin quantifying wood supply estimates.

The approach developed by the work group constitutes a process framework using Summit County as a case study. The work group did not feel it was in a position to fully develop the ZOA for the range of lodgepole pine forests in Colorado, as this requires a more concerted place-based collaboration for specific landscapes involving a broader range of interested and affected parties. Also, this type of deliberation already takes place within local CWPP and USFS planning efforts. Instead, the group used Summit County as a case study to develop a process framework that can be used by place-based collaboratives in the LPP zone and elsewhere in the state (see page 3). It is a framework in the sense that it specifies data, questions and topics for a collaborative group to work through, but does not define specific sequence of steps.

Coarse estimates of available operating land and wood supply from these lands in Summit County are presented in this report (see page 10); availability and supply will vary across the LPP forests as place-based collaborations delve deeper into the why, where, and how questions for specific landscapes.

The broader issue of long-term LPP management was not addressed by the working group at this time. A more structured process involving a broad range of interested and affected entities is recommended to learn about emerging research findings and other empirical evidence on post-MPB forest conditions and forecasts for the “future range of variability” of this ecosystem. It was noted at the outset by the working group that a scientific consensus is lacking for conducting restoration activities in LPP affected by the MPB. From a purely ecological standpoint, restoration is not warranted since the infestation is a natural process in LPP and did not degrade, damage, or destroy the natural ecological functioning of LPP forests.¹ It is an open question whether management action can accelerate desired vegetation conditions (i.e., species and age-class diversity). However, social and economic values affected by the infestation have warranted a management response.

¹ The Society of Ecological Restoration defines restoration as, “The process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed.” See further http://www.ser.org/content/ecological_restoration_primer.asp

Philosophical Zone of Agreement

Colorado Forest Restoration Institute proposed a ZOA process framework to assess the range of values and interests at stake, how different management options would affect these values/interests, and identify geographic areas where management maximizes multiple objectives and minimize negative impacts. This framework was proposed to allow other place-based collaboratives to explore similar questions in other areas.

- As a starting point, CFRI staff presented a structured values-interests matrix exercise (See Appendix A) to elicit perspectives from work group members and analyze how these values and interests would fare across three general management options: no action, mechanical treatments, and prescribed fire. An initial values typology was suggested and work group participants added to the list (see Table 1).
- The results of this values-interest exercise were used to identify geographical areas of agreement of where treatments should take place and for what purpose (see Maps Appendix B)
- Most participants considered the values-interest exercise an efficient way for the work group to identify what is important and what stake they have in lodgepole pine.
- This exercise mirrors the alternative effects analysis in an environmental assessment or impact statement process. Similar to an EA/EIS process, the “no action” option is a reference point to contrast the effects of doing nothing on values and interests compared to doing treatments. Obviously, land management agencies and landowners are conducting and will continue to conduct treatment.
- The group acknowledges that there are many details within each management option, but for the purposes of the exercise, the three options served as way to focus discussion.
- The work group’s matrix (see Appendix A) was not completed due to time constraints, but it already identifies areas of overlapping values and interests that would be both positively and negatively affected – in the short-term (while dead trees are standing) and long-term (after dead trees fall down) – under each option.
- It is recommended by the work group that the values-interest exercise provides a useful jumping-off point for place-based collaboration to identify desired conditions and treatment locations, size, and types of treatments that positively impact the largest combination of values and interests.

Table 1: Forest value definitions and other factors. Tthe values and interests all participants considered important are indicated with "x".

Aesthetic value (A) – I value these Forests because I enjoy the scenery, sights, sounds, smells, etc.

Biological diversity value (B) – I value these Forests because they provide a variety of fish, wildlife, plant life, etc.

Cultural value (C) – I value these Forests because they are a place for me to continue and pass down the wisdom and knowledge, traditions, and way of life of my ancestors.

Economic value (E) – I value these Forests because they provide timber, fisheries, minerals, and/or tourism opportunities such as outfitting and guiding.

Future value (F) – I value these Forests because they allow future generations to know and experience the Forests as they are now.

Historic value (H) – I value these Forests because they have places and things of natural and human history that matter to me, others, or the nation.

Intrinsic value (I) – I value these Forests in and of themselves, whether people are present or not.

Learning value (L) – I value these Forests because we can learn about the environment through scientific observation or experimentation.

Life Sustaining value (LS) – I value these Forests because they help produce, preserve, clean, and renew air, soil, and water.

Recreation value (R) – I value these Forests because they provide a place for my favorite outdoor recreation activities.

Spiritual value (S) – I value these Forests because they are a sacred, religious, or spiritually special place to me or because I feel reverence and respect for nature there.

Therapeutic value (T) – I value these Forests because they make me feel better, physically and/or mentally.

Added Interests:

Public Safety

Watersheds

Infrastructure

Main Discussion Findings with Recommended Principles

During the last meeting, the group went through the meeting notes to be able to provide FHAC with the main themes that resulted from their discussions. The working group considered it critical for FHAC and other interested parties to understand what had been discussed in the course of this ZOA working group's deliberations to help inform further collaborative discussions.

The main points that arose from these discussions were:

1. We agree on the prioritization of infrastructure, human lives and water supplies.
2. We encourage that the following interests continue exploring tradeoffs and opportunities:
 - Appropriately sized industries' sustainable supply
 - Critical wildlife habitat areas (migratory, severe winter range, calving)
 - Economic value of fish and wildlife related industry
 - Critical infrastructure
 - Transmission and distribution corridors
 - CWPPs
 - Create a ZOA that is compatible with budget
 - Wilderness/Roadless
 - Safety
 - Water (quality and quantity)
3. The ZOA is intended to work within the constraints of forest and resource management plans and advise and assist land managers in the establishment of treatment priorities.
4. Land Managers (USFS, BLM, CSFS) prefer broad flexibility within their management constraints to work on suitable acres and unsuitable acres if there is agreement e.g. WUI treatments.
5. Encourage local discussions/collaboration that weigh social, economic and ecological tradeoffs within legal and regulatory constraints.
6. The group encourages discussions on developing sustainable regional wood industries within economic, social, and ecological parameters. For example, on the UP Mesa in western Colorado solutions have been found based on scientific assessments that allowed economic benefits derived from one forest type to facilitate forest restoration work in another forest type. Creating economic and social benefits based on collaborative scientific assessments would benefit the lodgepole pine forests also.

Lodgepole Pine Zone of Agreement Statements

As a result of values and interests exercise, the group formulated statements that articulated more precisely the context within which agreement was found. The statements for formulated and discussed to help inform projects, planning and policy in the future. This exercise was initiated but not completed. The resulting preamble and principles below reflect the discussions so far and do not carry unanimous agreement yet. Time constraints have not always allowed all stakeholders to come to all meetings and more time is needed to complete this exercise. Most members of the group have agreed that generating agreement statements may be useful and are willing to continue the deliberations in May 2010. CFRI proposes to facilitate these continued discussions using a methodology that proved successful in Montana (see page 16).

Colorado Forest Health Advisory Council

DRAFT Lodgepole Pine Zones of Agreement Statements

This was last discussed by the ZOA group on March 16 in Golden, CO.

Whereas: The Colorado Forest Health Advisory Council (FHAC) was established by Executive Order of the Governor in 2008 *“for the purpose of bringing together relevant state and federal agencies, local government representatives, and key stakeholders to identify short term actions that will improve Colorado’s approach to forest health and to develop and implement a long term strategy for sustaining the state’s vital forest resources and associated public values.”*² And,

Whereas: The high elevation ecosystems are vital to the state’s ecological, social, and economic wellbeing as the headwaters of river systems, location of rights of ways for public utilities, critical habitat for wildlife, desired places of recreation, location of numerous Congressionally designated Wilderness areas, sources of harvestable fiber and biomass, and home to thousands of Coloradoans and their communities. And,

Whereas: Colorado’s lodgepole pine forests are disturbance driven ecosystems and are currently experiencing significant mortality. And,

Whereas: Insects have historically always been present in the state’s lodgepole pine forests, but the scale of the current event is of great concern, impacting all lodgepole pine forests in Colorado and the Coloradans who reside in them and/or derive benefits and value from them. And,

² Executive Order B 004 08, Creating the Colorado Forest Health Advisory Council

Whereas: The FHAC commissioned a multi-stakeholder working group to identify zones of agreement regarding the management of Colorado's lodgepole pine ecosystems, intended to be utilized to articulate Colorado's desired approach for the management of the current lodgepole pine ecosystem, which comprises seven percent of the state's forest resources, to Colorado citizens, the state legislature, Congress, and to all Americans. And,

Whereas: The FHAC embraces the concept of place based multi-stakeholder collaboratives working together from a diversity of viewpoints to determine how best to utilize the following statements in the ecological, social, cultural, and economic context of the geographic areas for which they are concerned. And,

Whereas: The FHAC ZOA Working Group counts among the top priorities for forest management 1) protection of human life, 2) public infrastructure and 3) water supplies.

Therefore:

The Colorado Forest Health Advisory Council recommends that:

1. Lodgepole pine management should incorporate adaptive management principles coupled with multi-party stakeholder monitoring over the lifespan of this species, addressing ecological, social/cultural and economic components.
2. Desired future conditions of forests should emphasize diversity of vegetative species and age considering multiple values of the area in question.
3. Treatment methods, both mechanical and non-mechanical, should be prescribed that are specific to the species in the context of location.
4. Fire should be allowed in the lodgepole pine ecosystem, in appropriate locations, in the form of:
 - a. Prescribed fire
 - b. Strategic response to lightning caused fires.
5. Discussions are encouraged regarding the development of sustainable regional wood industries within economic, social, and ecological parameters.

6. Communities, public utilities, and local governments are encouraged to develop ordinances, practices and policies that recognize the risk to the human built environment in a disturbance driven forest ecosystem.

7. Climate change should be considered as an important factor for future forests.

Operational Zone of Agreement

Work group participants strongly encourage the identification of treatment locations and types that maximize the combination of values and interests, since actions that achieve multiple objectives are likely to achieve “social license” and leverage resources from multiple entities benefiting from those actions.

The values-interests exercise used in this process included a geographic mapping activity to locate specific areas on the Summit County map where values and interests are at stake (Appendix B, Map 8). The mapping activity for the complete values-interests matrix was not completed due to time constraints, but the work group did identify some geographic areas.

The group found that there was considerable overlap between the areas identified by the work group for the Summit County case study and those identified by the Colorado Bark Beetle Cooperative in 2007 at its mapping workshop at the Winter Park YMCA (Appendix B, Map 9).

The work group further identified two additional and complimentary methods for identifying operational ZOA on the landscape:

1) Identify available operable acres through a *process of exclusion*, whereby lands would be taken out of consideration due to:

- Legal and policy constraints, such as designated or Wilderness and roadless areas
- Biophysical constraints, such as steep slopes, highly erodible soils, and road access

These constraints are examples developed by the work group and serve as coarse-scale limitations on treatment consideration. For the Summit County case study, looking only at federal lands managed by the US Forest Service, the process of exclusion generated the following acreages:

Table 2. Lodgepole Pine Zone of Agreement Acreages		
Level of Exclusion	Acres	Appendix B Map
Total White River National Forest lands in Summit County	308,643 acres	1
Treatable acres on National Forest lands in Summit County excluding designated Wilderness areas, roadless areas, private/state/county/local ownership and slopes greater than 40%:	73,172 acres	6
Treatable Acres of Lodgepole Pine	31,455 acres	7
Treatable Acres of Spruce Fir	34,001 acres	7
Treatable Acres of Aspen	7,716 acres	7

A word about the data in the maps of Appendix B: Volumes were not estimated since this would be decided at a project level and can be more accurately assessed in the areas that are deemed treatable through a collaborative process of inclusion/exclusion. Common Stand Exam data or Forest Inventory Assessment (FIA) data from the District level would need to be applied to the areas within the ZOA. Data related to CWPP's could not be obtained – this type of data is not available in each case. Treatments on private lands are specified in Community Wildfire Protection Plans. However, the specificity of treatment areas and spatial data vary greatly across CWPPs, making acreage and wood supply estimates difficult and coarse-scale.

The maps are based on CO-Gap data and CoMap data. The Colorado Gap Analysis Project (CO-GAP) is a cooperative effort, led by the Colorado Division of Wildlife in collaboration with the Natural Resource Ecology Center (NERC/USFWS), and state, federal, and private natural resources groups in Colorado (<http://ndis1.nrel.colostate.edu/cogap/>). The Colorado Ownership, Management, and Protection (COMaP) project at the Natural Resource Ecology Lab (NREL) and the Human Dimensions of Natural Resources Department have built a statewide protected areas map for Colorado. This project is being undertaken with funding and technical assistance from Great Outdoors Colorado (GOCO) (<http://www.nrel.colostate.edu/projects/comap/>).

Further exclusions due to road access and cost vs. revenue criterion were not calculated due to data availability and time constraints. The process of exclusion method demonstrates that, for Summit County, only a very limited number of acres on national forest lands would be allowed for treatment. However, Summit County has one of the highest population numbers for counties containing lodgepole pine forests.

2) Identify potential treatment areas through a *process of inclusion*, whereby areas would be considered if treatments would benefit multiple values, interests, and objectives, regardless of whether those areas were considered unavailable under the process of exclusion method.

For example, powerline corridors run through forested areas, and cross steep slopes and highly erodible soils. Treatment costs vs. revenues are not a primary concern, as the public values at risk are sufficiently high that treatment is desired by powerline operators whether or not they generate revenue. If treatments can also benefit watershed, wildlife, and other values and interests, they would be considered regardless if they are not considered available under the process of exclusion. The Powerline Project on Bureau of Land Management lands on the Uncompahgre Plateau is an example whereby areas were identified for treatment through a collaborative process convened by the Public Lands Partnership and using fire science models developed by the US Forest Service to protect Western Area Power Administration and Tri-State powerlines and to improve vegetation diversity and understory production due to fire suppression. Ron Turley can speak more about this project in greater detail.

- The work group recommended that both methods work in tandem; it would be up to place-based collaborations to use both methods in an iterative process.
- The work group identified data sources that can contribute to this process, such as:
 - a) national forest plans land suitability assessments
 - b) past, current, and planned treatments
 - c) watershed risk assessments
 - d) critical wildlife habitat and use areas
 - e) utility corridors
 - f) roads
 - g) county emergency management plans
 - h) CWPPs
 - i) where private landowners voluntarily contribute or participate, private forest management plans.

Discussion

- The development of philosophical ZOA is best conducted at the place-based level with participation from the broadest possible range of interested and affected parties, and can benefit from a structured, facilitated process such as the values-interests matrix.
- The development of the operational ZOA can benefit from a structured, facilitated process such as the iterative processes of exclusion and inclusion. The values-interests matrix could be used by place-based collaboratives to efficiently identify overlaps in values and interests, and analyze trade-offs across values and interests for proposed treatments in particular geographic areas.
- Suggested data and information to help facilitate the ZOA process include existing national forest plans, watershed risk assessments, critical wildlife habitat and use areas, utility corridors, county emergency management plans, CWPPs, and, where private landowners voluntarily contribute or participate, private forest management plans.
- This process framework can assist place-based collaboratives in identifying their own set of criteria to arrive at ZOA.
- The work group determined that question of treatment costs vs. revenues is highly variable and is a criterion that needs to be defined by policy-makers and/or by place-based collaborations. In some cases, it may be desired that treatments pay for themselves or generate revenue to fund other projects. Given the realities of economic constraints, this is a matter worth serious consideration. The issue about the need for treatments in and around communities and infrastructure to be subsidized by treatments outside of these areas was discussed. But given the lack of scientific consensus about what actions are required in the “backcountry”, the problem is more complex and requires a more structured process.
- The work group concluded that the question of treatments over the long-term and outside of the “community protection zone” (CPZ), especially when dead trees fall down, requires a more structured process for examining the “future range of variability” of post-MPB forests. Evidence about post-MPB forest conditions are emerging from research and field assessments; preliminary indications from plot-level studies are that, in many areas, the next forest has increased diversity in tree species and age-class, with increased understory production. But it is not possible to generalize these results across the landscape with confidence. Potential fire risk and behavior are

being assessed by analyzing past fires and current fuel profiles in forests affected in the past by large insect infestations, such as in the 1970s and 1980s.

- A more structured process involving a broad range of interested and affected entities is recommended to learn about emerging research findings and other empirical evidence on post-MPB forest conditions and forecasts for the “future range of variability” of this ecosystem. The ZOA process framework could be applied by place-based collaboratives to assess the range of values and interests at stake, how different management options would affect these values/interests, and identify geographic areas where management maximizes multiple objectives and minimize negative impacts.

Next Steps

As a next steps, the Colorado Forest Restoration Institute proposes two steps:

1. CFRI will host a conference April 19-21 in Steamboat Springs to assess the future range of variability of post-MPB forests by reviewing the current state of knowledge about post-MPB forest development, identify what further information is needed to answer questions posed by a broad range of interested and affected entities, and define a general set of desired conditions and actionable items to achieve these conditions for the future forest and communities within these forests.

2. Many members of this FHAC ZOA working group have expressed a desire to continue working on the Lodgepole Pine Principles that Gary Severson originally proposed, and other related subjects. Some members feel that the Colorado Forest Health Advisory Council Vision and Guiding Principles already fulfill the need for this type of guidance. If so desired, CFRI is willing to facilitate continued discussions based on the work already achieved through this FHAC Lodgepole Pine Zone of Agreement process and the CFRI Conference. CFRI proposes in that case to use a process that would be similar to the one used by the National Forest Foundation to explore Restoration Principles in the Montana Forest Restoration Committee³. The Montana Forest Restoration Committee (MFRC) is primarily a volunteer consensus-based collaborative group, which was formed to help guide restoration of Montana’s National Forests. The MFRC articulated a collective vision of ecologically-appropriate, scientifically-supported forest restoration through a set of 13 principles. The Principles represent the “zone of agreement” where controversy, delays, appeals, and litigation

³ See <http://www.montanarestoration.org/home>

are significantly reduced. The group published a booklet outlining the process and the restoration principles. The MFRC set up restoration committees on three National Forests in Montana: Bitterroot, Helena and Lolo. These committees are utilizing the principles in on-the-ground projects on each forest. Their first project made it through the Record of Decision on the Lolo National Forest, and they have achieved consensus to work on two projects on the Bitterroot National Forest.

As part of its 2010 Workplan, CFRI can commit some funding, and would be eligible for additional NFF funding if necessary, to facilitate a similar process for a Lodgepole Pine Zone of Agreement that would have as deliverables Lodgepole Pine Forest Principles and other components that the group identified as beneficial. CFRI would facilitate the process according to a process and a deadline identified by the group to obtain these Principles and other outcomes.

Appendix A. FHAC Lodgepole Pine Zone of Agreement Working Group Zone of Agreement Values and Interests Exercise

Values and Interests Exercise Introduction

To establish the zone of agreement for management in lodgepole pine in Summit County, CFRI introduced a values and interests exercise that allows a group of stakeholders to identify the social values and other interests at stake and analyze what areas on a landscape the group agrees can be treated, how and for what reasons. The values and interests exercise facilitated the working group's discussions to establish a philosophical zone of agreement, in turn providing FHAC with a philosophical zone of agreement in Summit County in lodgepole pine forests, and a practical collaboration tool that can be beneficial to other groups.

In Table 1 is a list of values and their definitions. These values are known in social psychology as social values, and they are non-monetary values. They describe various reasons why human society finds a natural landscape or component important. Eventually society behaves according these values, e.g. through votes or through purchases and investments. For example, aesthetic values has been shown to consistently be very important to respondents in the U.S., and this becomes evident in U.S. citizen behavior, e.g. buying homes with views, in turn important to county income. This typology has been used in many research projects around the world, including in studies in Colorado and Wyoming. CFRI proposed using it to find out what values the ZOA Working Group attaches to the forests of Summit County, in order to explore value commonality and divergence. The group agreed that biological, economic, life sustaining recreational and therapeutic values were important to them, as defined in Table 1 and Table 3 below:

Instructions: The matrix below lists social values and other important factors such as watersheds in the left column. In the columns to the right CFRI listed several management options. Participants were asked to:

1. Put marks next to the values you find relevant to the forests of Summit County in Table 1.
2. For the values identified in Table 3, participants were asked to fill out whether they thought these values would be positively or negatively affected by implementing the management options listed in Table 3. Participants added more detail by identifying spatial and temporal considerations e.g. whether the management option was conducted in WUI or backcountry areas, or short term or long term effects.

Table 3: Values and interests exercise

Fill in: + Positive Effect - Negative Effect 0 Neutral DK Don't Know

Values and Other Interests	Description	Option 1: Mechanical	Option 2: Prescribed Burn	Option 3: No Treatment
Aesthetic	Viewshed, Lack of Traffic noise, Quiet, Fresh Air, Clean Water. Iconic Peak e.g. Ptarmigan Peak, Greenery (not red, grey) white mountains, aspen, wildflowers, wildlife, fish.	+ if getting rid of dead trees, no dead stems in viewsheds, see grasses and seedlings. E.g. Swan Mountain Road: aesthetically expanded viewsheds and promoted public safety. Short term: - Long term: + It depends on place – e.g. WUI or back country.	- Short term: smoke and air quality concerns – timing. Dead stand: initially -, intermediate DK, long term +. Black stumps -, Pleasing to clear out “mess” +. Back country +, WUI -.	Short term standing dead trees -. Intermediate maybe 0, Long term when red is gone, green shows through grey, trees fall, new greenery coming up + (allows natural processes to take their course).
Biodiversity	Wildlife populations and habitats native to those areas, migration corridors, breeding areas. Concerns re. fragmentation. Veg. spp. Age classes, diversity, patch sizes, structural diversity. Important ecological processes such as	DK – in relation to mechanical treatments a lot of uncertainty. DK – cumulative effects of treatments over large landscapes, tree removal beneficial to some spp., adverse for others. (and who are we to decide who benefits and who’s adversely effected?) - roads for mechanical treatments often become a burden and provide avenues for bike, off-road rec. and unmanaged recreation. !!!!! + can modify forest to increase flora and faunal diversity. (this assumes that natural regen won’t be	+ enhance plant diversity. + mimicking a natural process. DK timing of fire and effects and diversity. - possibility of escaped fire in young stand, loss of seed source. (DK - not sure I agree since we are dealing with a fire adapted spp. With serotiny. Perhaps conduct Rx fire where serotiny is confirmed.) - non-native spp.	- Forest will be reset in 120 years to what it is now. + Allows natural processes to occur normally. + Forest regen is already showing spp diversity, releasing site adapted non-LPP spp and breaking up LPP homogeneity. Given climate change and likely intense fire, there may be some places where no

Values and Other Interests	Description	Option 1: Mechanical	Option 2: Prescribed Burn	Option 3: No Treatment
Biodiversity cont.	fire, insect disease, wind throw, avalanches. Severe winter range. Riparian areas, wet lands.	diverse, an assumption often asserted but not supported by data. To the contrary there are indications that the natural regen is already creating a much more diverse forest than the one LPP homogeneity it's replacing) - non-native spp. Response. - We can't say with confidence what trajectory climate change will set for these forests and mechanical intervention and restocking may produce a significantly different outcome than allowing natural adaptation which is likely to be more appropriate and resilient	Response. <u>Wildland Fire Use:</u> + Less uncertainties because in the normal part of the year. + I agree with all comments above.	forest returns, where entirely different spp than LPP establishes, etc. and that is fine.
Economic	Timber, logging, jobs in the woods and in forest product companies. Secondary benefits related to e.g. gas and tire distributors, multi-plier effects. Wildlife related recreation: jobs, business revenue. Sales tax, property tax (highest) revenues, economic	+ Depends on land form, what could be physically operated on. - Short-term treatments around rec. facilities (as well as WUI, infrastructure, life saving) + Whether commercial logs or not, provides jobs. + Provides enhanced economic diversity. + May provide wildlife and aspen related tourism and hunting benefits. + done in the right place to ensure community resiliency (WUI,	- May burn up commercially viable logs. - Great cost. + Still relatively cheapest alternative due to trade-off with impacts. + Release of aspen (tourism). + Wildlife benefits (hunting, tourism). 0 National cost vs. local economic benefit. Longterm and short term	- Some rec. facilities closed. + or 0 Can be longer term cheaper. - Infrastructure: e.g. safe and open roads and trails. - Infrastructure: long term lost of forest industry infrastructure. - Risk exposure higher in relation to costs (cheaper to do treatments now than build neighborhoods later) and fire fighting

Values and Other Interests	Description	Option 1: Mechanical	Option 2: Prescribed Burn	Option 3: No Treatment
Economic cont.	<p>diversity. Non-consumptive outfitting, guiding, outdoor product industries, jobs, revenues. Educational Institutions. Ski Industry. Tourism. Direct and indirect economic effects. Short and long-term effects. Second home development. Humans dependent on quality and quantity of water. Gas, electric, communications. Range dependent economies.</p>	<p>infrastructure, water supply protection) local community economies will be able to survive this event and thrive in future.</p> <ul style="list-style-type: none"> - done wrong i.e. wholesale across the landscape with shortsighted focus on short term industry boost will cripple long term economy dependent on environmental values. - any industry creation will have to be right-sized to deal with quantity of wood supply variability over time. Short term pulse with long low level tail. Overbuilt capacity will cause economic disruption in future. <p>+ Emerging View Lots!</p>	<p>factors related.</p> <p>+ Emerging View Lots!</p>	<p>opportunities.</p> <ul style="list-style-type: none"> + likely great scientific value in hands off approach, making summit county a living lab, inviting the scrutiny of academics and throngs of public observation akin to Yellowstone post fires. + depends on where. Appropriate front country treatments leaving the backcountry alone will generate wood industry jobs while not destroying natural values in backcountry that undergird local economies in long term. <p>+ Emerging View Lots!</p>
Future		<p>- there are plenty of engineered forests for future public to visit and learn from</p>		<p>+ Restraint in the present will allow future observers to understand how forests change and respond to disturbances like this within the larger framework of climate change in particular locations.</p>

Values and Other Interests	Description	Option 1: Mechanical	Option 2: Prescribed Burn	Option 3: No Treatment
Intrinsic		- mech Tx impose anthropocentric values and prejudices, eradicating any intrinsic values		+ Ecosystems have inherent rights to evolve self-willed and we as humans must figure out how to function within that system. Restraint is fundamental to an ethical society and respecting intrinsic values in ecosystems will ultimately benefit society by living within in those limits. Ignoring those intrinsic values and superimposing our own will drain resources from society as artificial systems require constant inputs to sustain.
Learning	Learning value of seeing treatments and their results – interpretive.			
Public Safety	Protection of human life, infrastructure, and water supplies.	+ E.g. Swan Mountain Road: aesthetically expanded viewsheds and promoted public safety. + Hazardous tree and fuel removal in WUI (cannot do burns). + USFS burden on who pay to come. When	- if fire gets away. - Short term smoke effects. + provides fire fighters with more options. + opens up the landscape. + reduce hazardous fuels.	+ Operator safety. - Everything else. DK Hydrophobic soils. + no treatment in backcountry coupled with WUI and infrastructure treatments

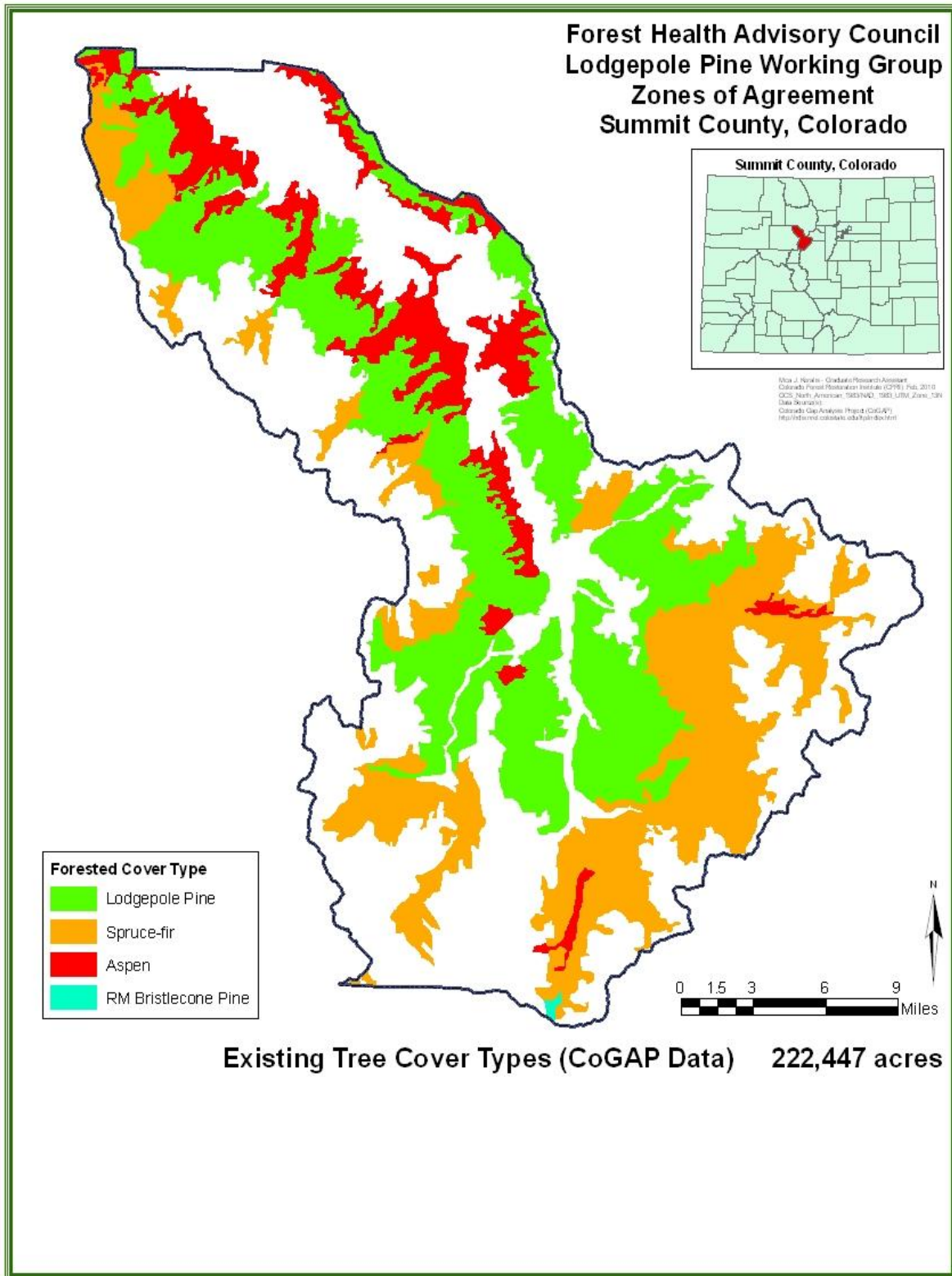
Values and Other Interests	Description	Option 1: Mechanical	Option 2: Prescribed Burn	Option 3: No Treatment
Public Safety cont.		<p>people allowed, less burden.</p> <ul style="list-style-type: none"> - More risk for operators. + aspen release, act as fire break. - treatments can cause the soil movement problems they are intended to avoid +WUI treatments increase community fire survivability, ensuring resilient and sustainable communities adapted to disturbance driven ecosystems. 	<ul style="list-style-type: none"> - doesn't reduce hazard trees. + benefits for power line protection in some places. + aspen release, act as fire break. 	<p>where needed will optimize safety by prioritizing resources where they provide the most safety benefit and not siphon resources away into backcountry where hazards are low, depriving high hazard front country of resources needed to protect public.</p>
Watersheds		<ul style="list-style-type: none"> - landscape watershed treatments are likely to have unintended effect of land wasting from soils disturbance and increasing opportunity for unmanaged recreation impairing watershed values. 	<ul style="list-style-type: none"> + well timed and placed Rx fire can reduce fuel build up thereby making eventual fire less severe yielding more beneficial effects of wildfire. 	<ul style="list-style-type: none"> + no treatment coupled with strategic treatments to prevent worst case soil movements can help watersheds have healthy and normal fire cycles without impairing water supplies
Infrastructure		<ul style="list-style-type: none"> + must be protected 		

APPENDIX B: Lodgepole Pine Zone of Agreement Maps of Exclusion and Inclusion.

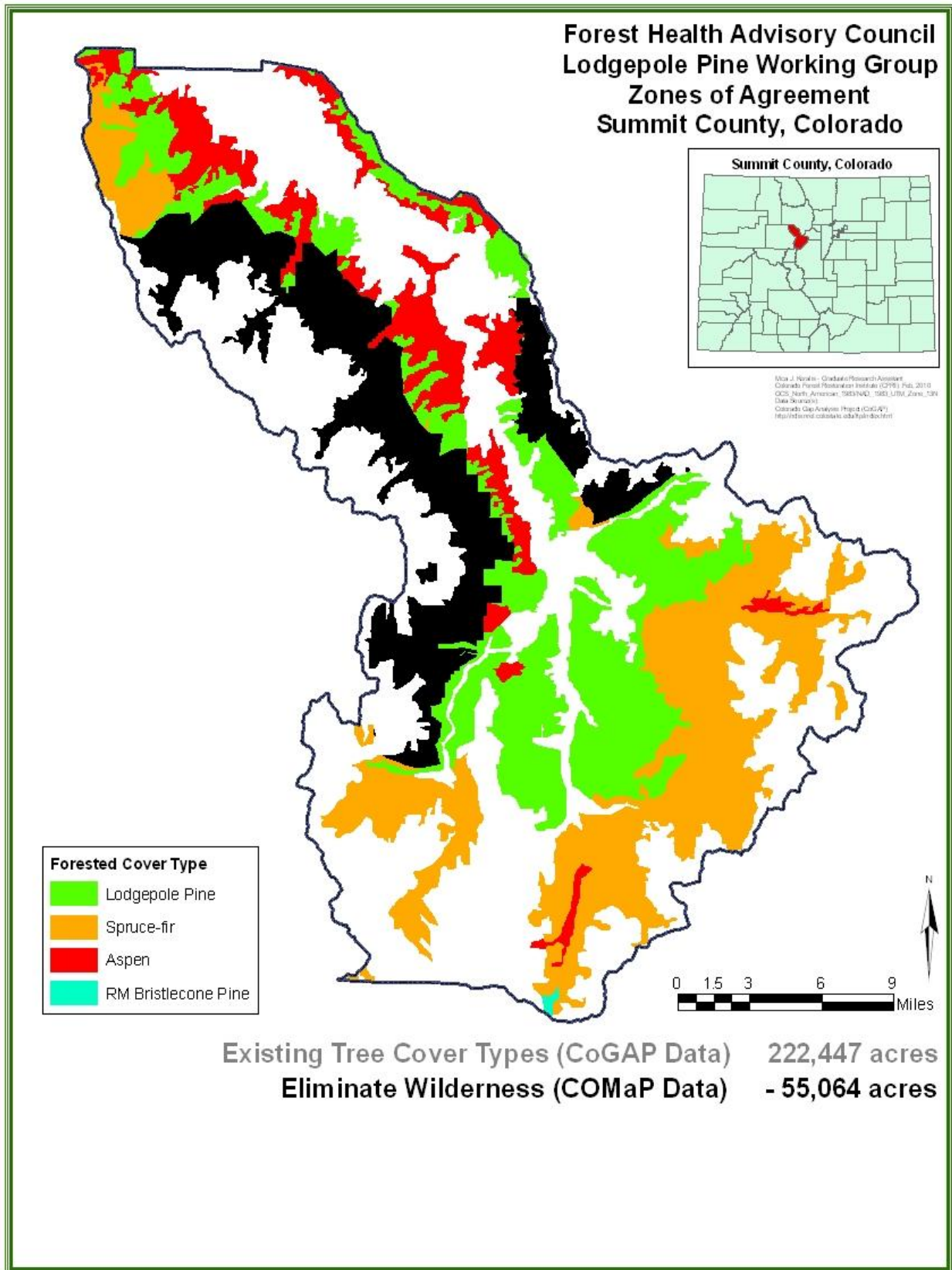
Note:

In the following maps "Roadless CRA – 2007, USFS Data" refers to Colorado Roadless Areas under the 2007 Proposed Roadless Area Conservation Rule for Colorado (see 36 CFR Part 294 Special Areas; Roadless Area Conservation; Applicability to the National Forests in Colorado; Proposed Rule)

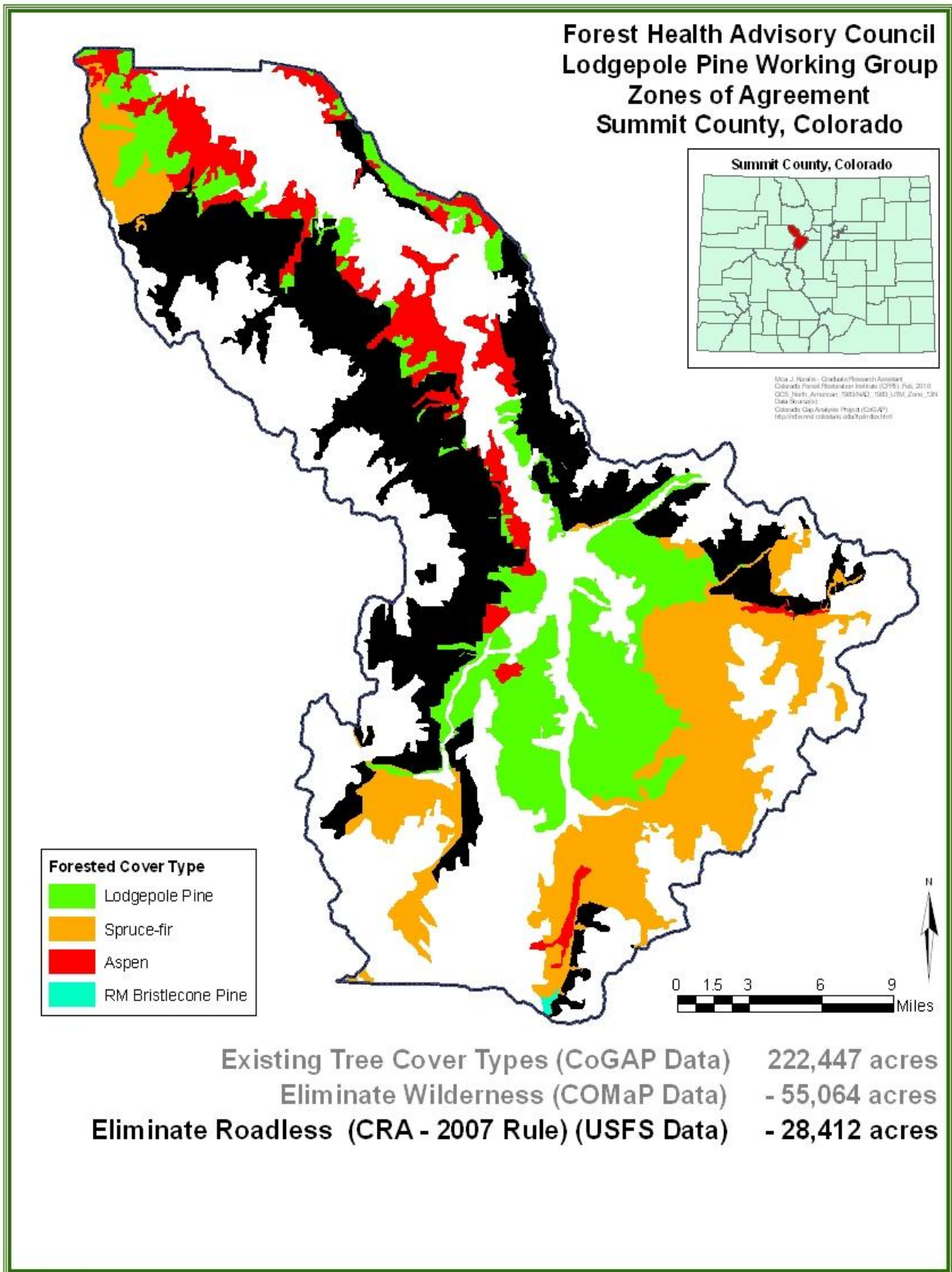
Map 1: Total Forested Acres in Summit County



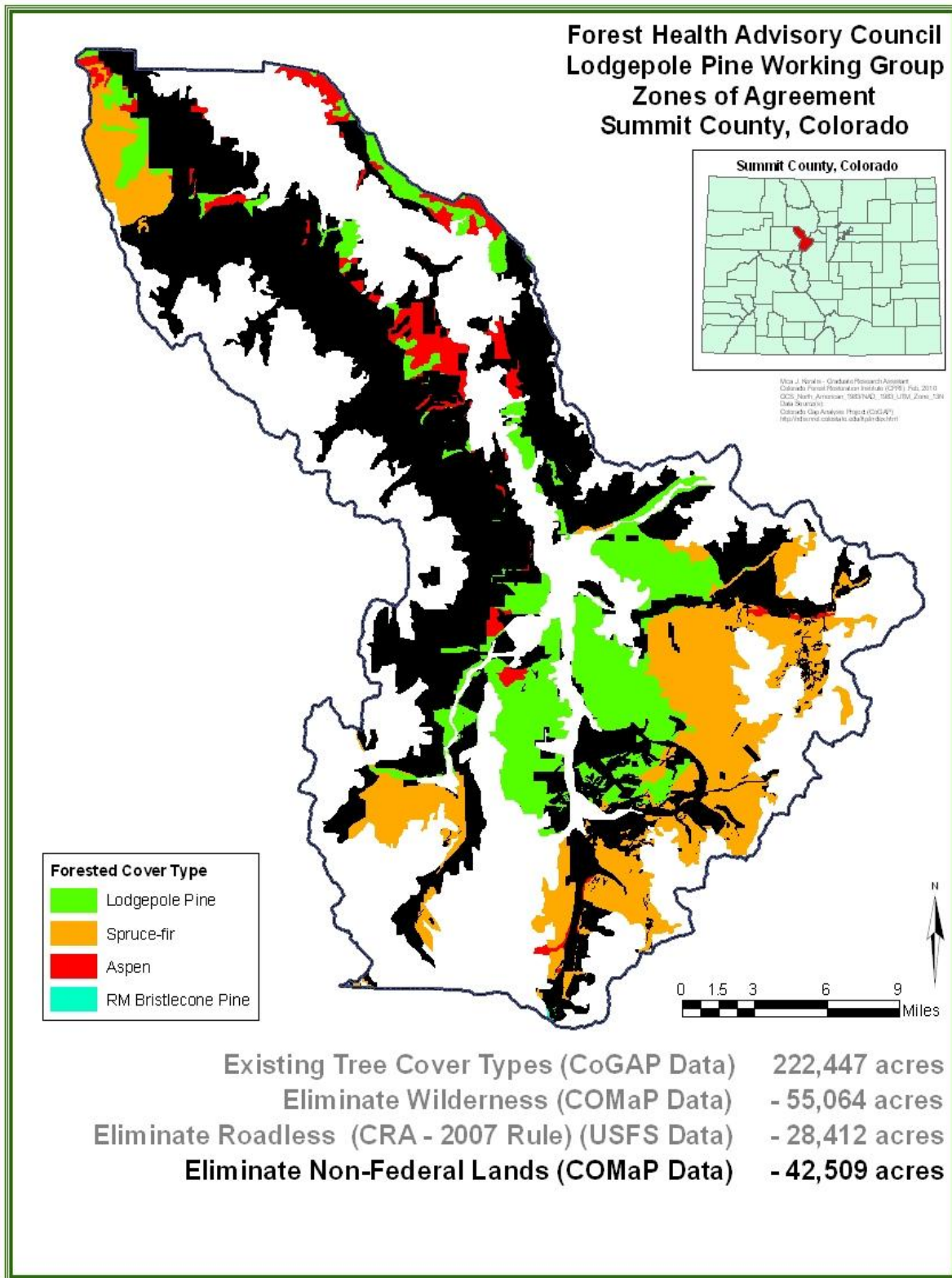
Map 2: Forested Acres in Summit County: Wilderness Excluded



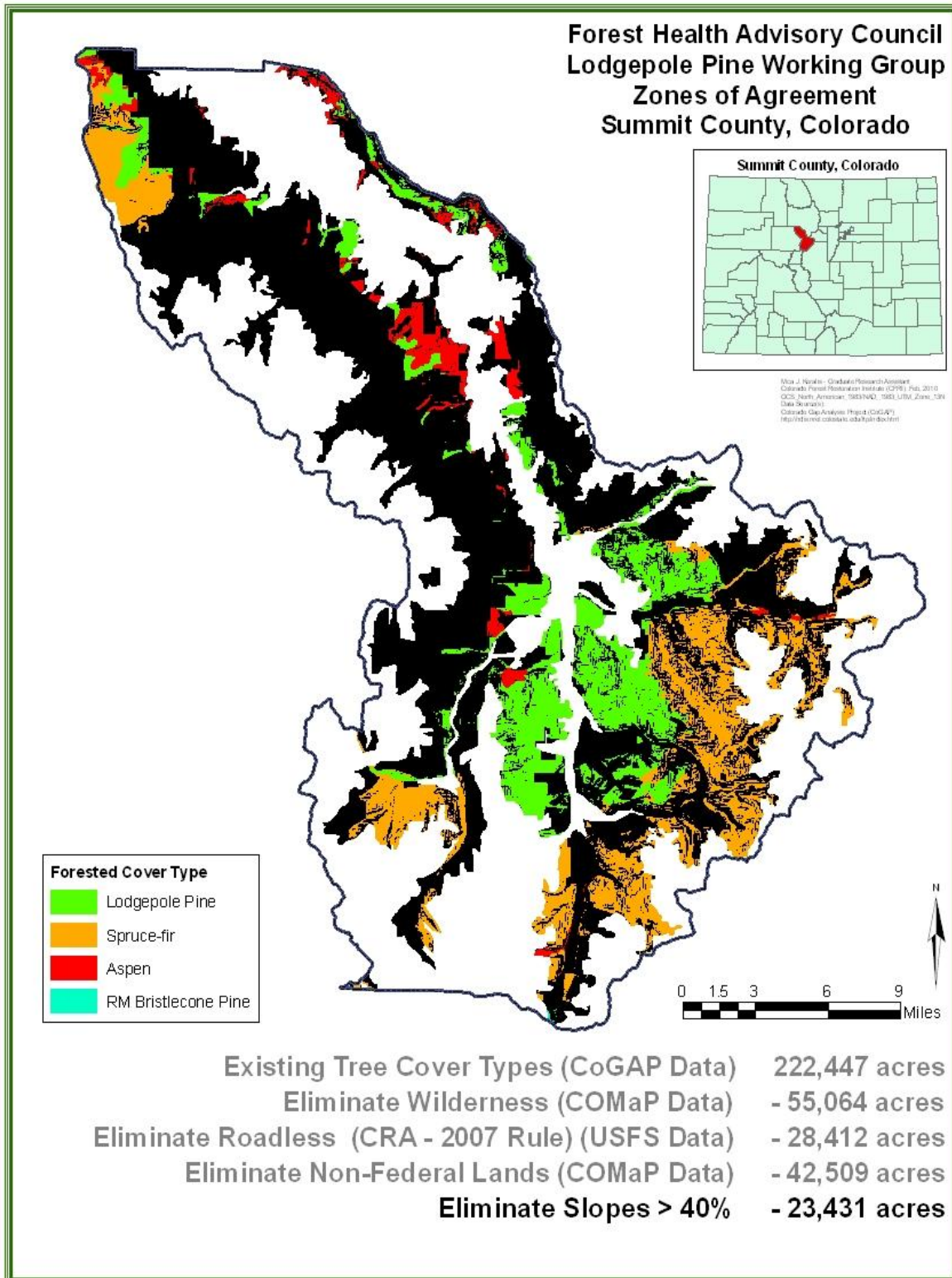
Map 3: Forested Acres in Summit County: Wilderness and Roadless Acres Excluded



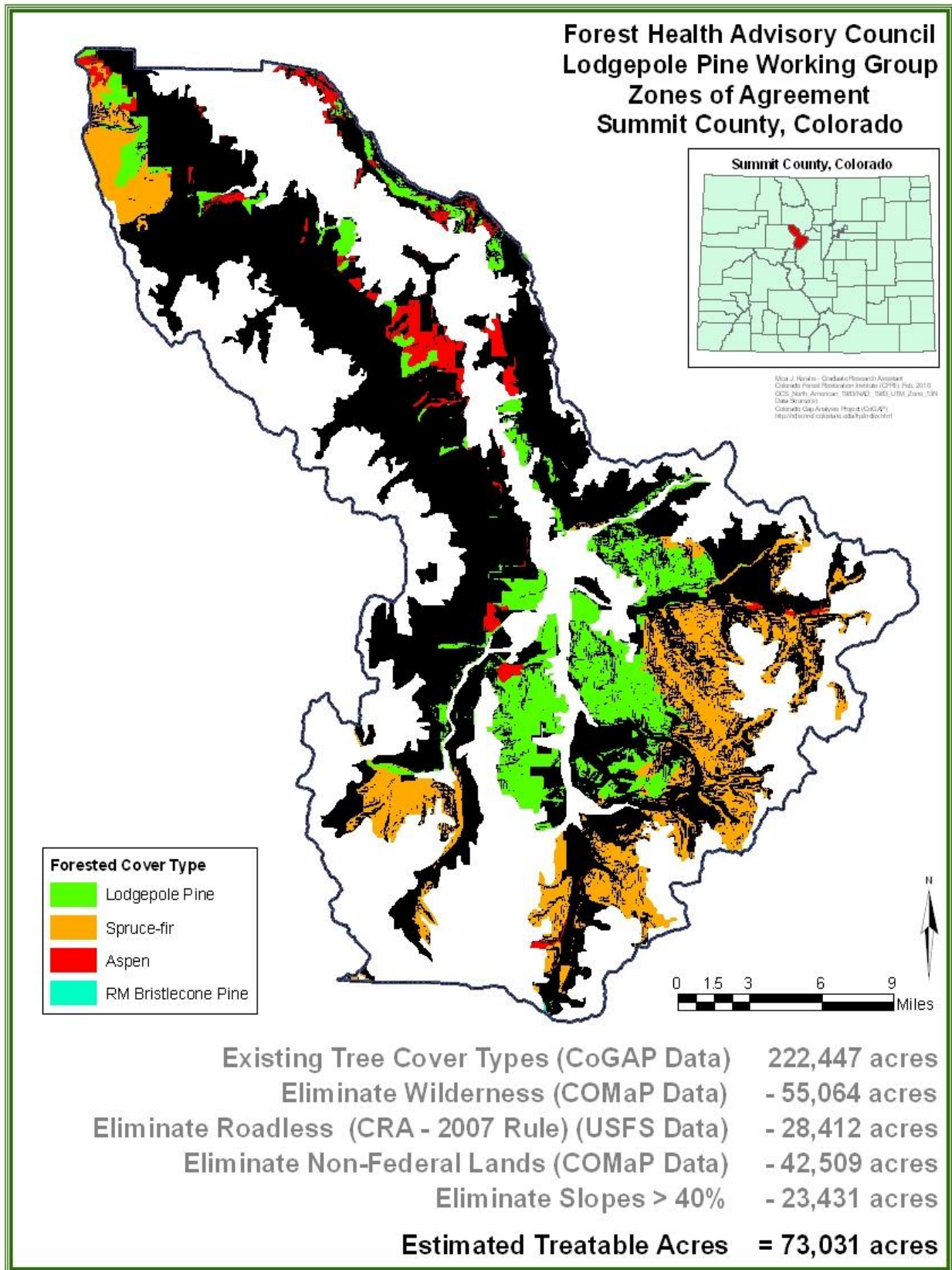
Map 4: Forested Acres in Summit County: Wilderness, Roadless and Non-Federal Acres Excluded



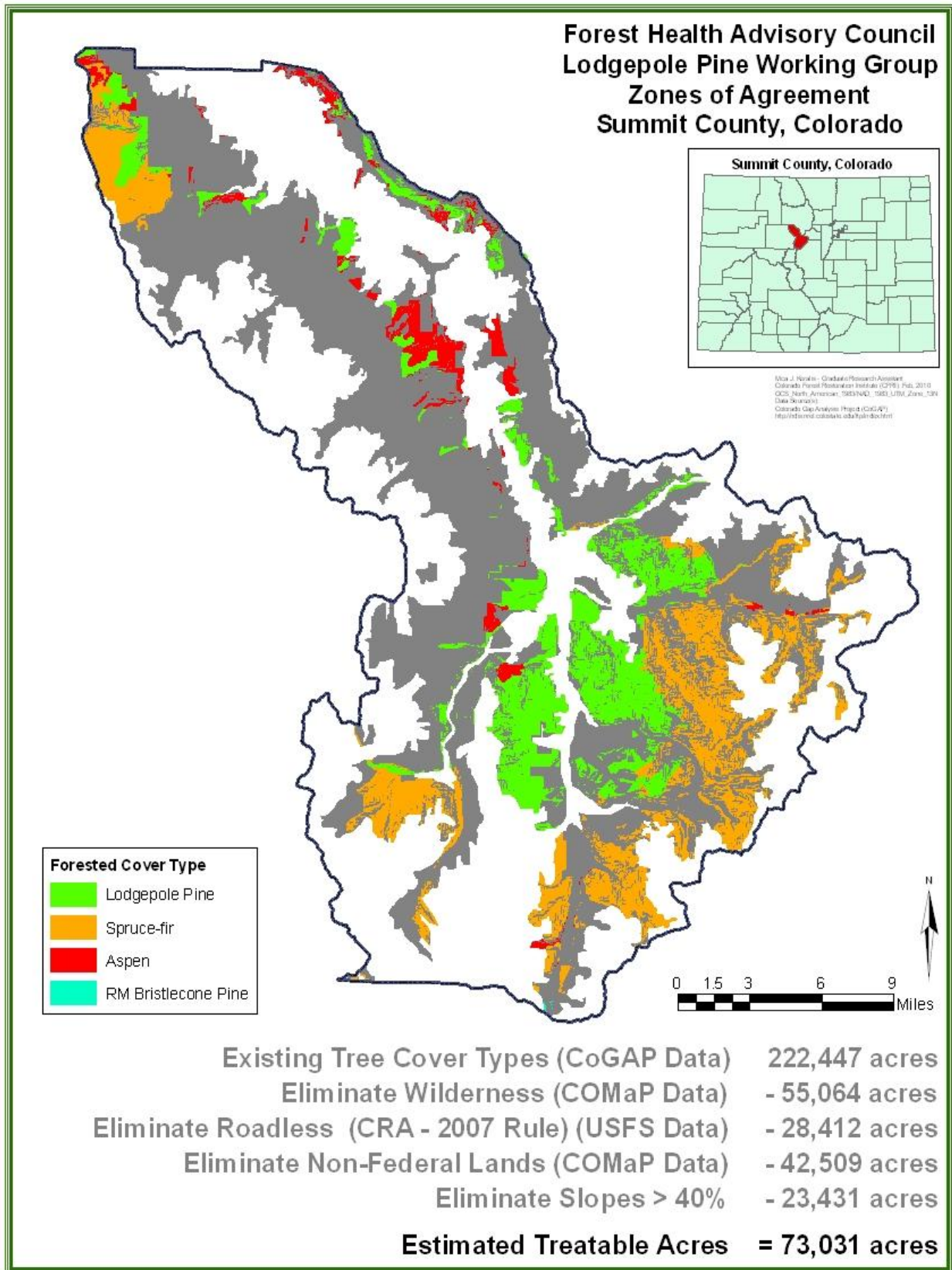
Map 5: Forested Acres in Summit County: Wilderness, Roadless, Non-Federal Acres and slopes > 40% Excluded



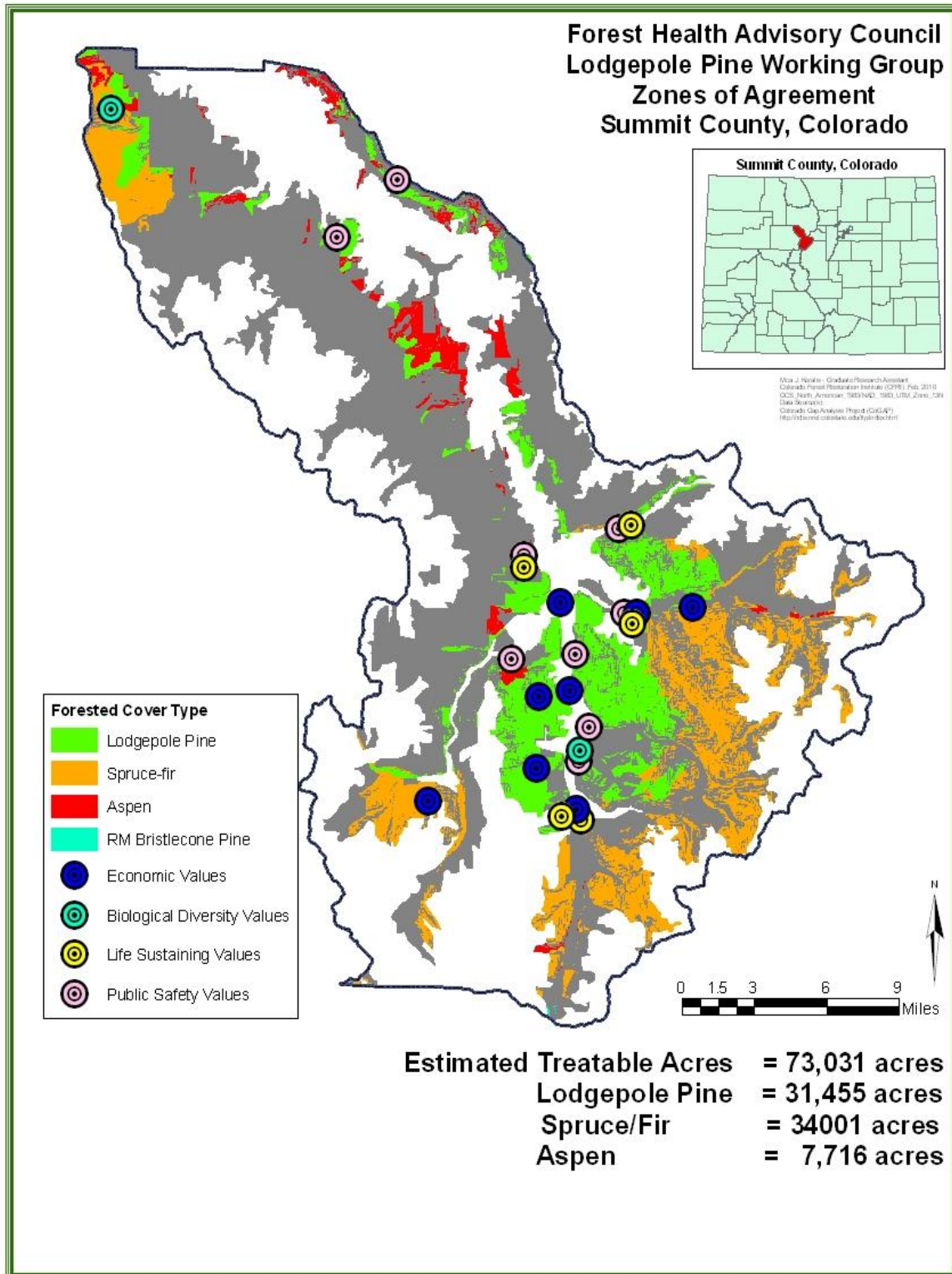
Map 6: Treatable Acres after all Exclusions



Map 7: Forest Types within Treatable Acres



Map 8: Treatable Acres after Exclusions, Zones of Agreement based on Values Included



Map 9: Treatable Acres after Exclusions, Zones of Agreement based on Values, and CBBC 2007 Priority Zones Included

