

Memo

To: Allan Belt
From: Amanda Clements
Date: November 22, 1999
Subject: Escalante Area Land Health Assessment

The attached report describes the findings of the Land Health Assessment for the Escalante Area. A rapid assessment process conducted in 1998 was used together with existing data to make determinations of whether the area was meeting or not meeting the Colorado Land Health Standards. The report contains acreages meeting and not meeting the standards, types and location of problems occurring on the land, analysis of causes, and recommendations for addressing the problems. This report should be used and referenced in the NEPA analysis of all subsequent actions occurring in the Escalante Area Landscape Unit.

I do X do not _____ concur that this report constitutes the Land Health Assessment for the Escalante Area and fulfills the requirements for an evaluation of the landscape unit relative to the Colorado Land Health Standards.


Allan Belt, Area Manager

*Land Health Assessment
Escalante Area, 1998*

SUMMARY

This land health assessment evaluated over 109,000 acres to determine what amount of acreage was meeting the Rangeland Health Standards, what was not meeting, and what and where the problems were. The following table shows the amount of land meeting or not meeting the Standards:

Acres Meeting Standards 1, 3,& 4	Acres Not Meeting Standards 1,3,&4	Acres Unknown 1,3,&4
71,110	32,297	5,669
Stream Miles Meeting Standards 2&5	Stream Miles Not Meeting Standards 2&5	Stream Miles Unknown 2&5
155.7	0	7.1

In order to make the above determination, the Escalante Area was first rated according to each of the five Rangeland Health Standards separately. The following table better indicates what the general problems are in the assessment area.

Standard	Meeting	Meeting but Problem Areas	Not Meeting	Unknown
Standard 1-Soils (acres)	62,461	25,047	15,899	5,669
Standard 2-Riparian (miles)	34.4	20.5	0	4.2
Standard 3-Healthy Communities (acres)	46,781	30,966	25,660	5,669
Standard 4-T&E Species (acres)	109,076	0	0	0
Standard 5-Water Quality (miles)	107.4	48.2	0	2.9

Major Land Health Problems

Standard 1: Most of the area was meeting this standard. Where there were problems, they were due to lack of protective cover on the soil surface and actual accelerated surface erosion, and these occurred primarily on mesa tops.

Standard 2: Most of the perennial or intermittent streams were found to meet this standard. Problem areas were isolated and included dominance by noxious species (Gunnison

River), channel braiding (Lower Cottonwood Creek), and livestock hedging of woody species (Dry Fork Escalante Cr.)

Standard 3: Most of the area was meeting this standard, or meeting with isolated problems. Where problems occurred, they were varied in nature and included lack of cool season grasses and forbs, invasion by pinyon and juniper, heavy wildlife use on shrubs, extensive invasions by nonnative species (mainly cheatgrass), noxious weed infestations, and problems with the vegetation age-class diversity, and landscape mosaic.

Standard 4: There is no data to indicate that the distribution or health of populations of listed or sensitive species are being impacted by BLM management, or that there are identifiable landscape health problems originating in this analysis area for any of these species. It is likely that there are areas where human activities have altered the plant communities to the detriment of the listed species, but there is insufficient data to make a definitive call on this situation. At worst, the area could be placed entirely in the unknown category. There is little good rationale for doing so, and therefore the entire area has been classed as meeting objectives.

Standard 5: Most of the streams meet the health standard. Problem areas resulted from accelerated erosion on uplands, gully erosion, road drainage problems, and unstable channels. Nutrient and biological pathogen loading of local waters has the greatest potential from late spring and early summer grazing, especially along intermittent and perennial channels

Recommendations

- 1) Convert more of landscape to an early seral stage by increasing use of prescribed and natural fire and mechanical treatments, especially in mule deer winter concentration areas and old treatment areas.
- 2) Improve herbaceous species and shrub component by interseeding depleted areas with native grasses and forbs, and deciduous shrubs on appropriate sites, such as mountain mahogany, winterfat, bitter brush, and 4-wing saltbush.
- 3) Manage livestock grazing for shorter duration spring grazing, avoiding both spring and fall use within a year, leaving more litter, avoiding fall grazing of woody riparian species, avoiding livestock use of treatment areas until regrowth is established, and thereafter avoiding livestock concentrations for extended periods in these areas.
- 4) Try innovative livestock grazing in areas: e.g. concentrate livestock to impact cheatgrass, periodically exchange cattle and sheep ranges, create emergency use pastures to provide for the option of rest for critical growth times and treated areas.
- 5) Minimize ground disturbances, and reseed following disturbance to reduce spread of cheatgrass, and other noxious weeds.
- 6) Undertake aggressive weed management effort to treat noxious weeds, especially Russian knapweed and tamarisk along Gunnison River.
- 7) Improve road maintenance and reduce road proliferation to cut back on road related erosion and weeds, and close and rehabilitate unneeded roads.

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INTRODUCTION

Land Status

The Escalante Area comprises some of the most remote and roughest country managed by the Uncompahgre Field Office. Public land makes up the great majority of the unit-- approximately 109,076 acres. Substantial Colorado Division of Wildlife holdings in the area add additional public wildlands to the unit. Private land makes up the rest, and is located mainly along the Gunnison River, Escalante Creek, and the Forest Service boundary (see map). The Dominguez Wilderness Study Area is partially located in the Escalante Area.

Landform and Topography

The area lies on the east side of the Uncompahgre uplift which tips to the north and east, forming a large plateau with all of the drainages occupying deep canyons which cut down through the formations to the level of the Gunnison River. The resulting landscape is made up of a series of narrow, gently sloping mesas that are separated by deep canyons with steeply sloping to vertical walls. At the lower elevations are gentle foothills where the uplifting plateau meets the valley floor. Elevation ranges from 4,875 ft. at the confluence of Big Dominguez Cr. and the Gunnison River to 8,125 ft. on top of Brushy Ridge at the Forest Service boundary.

Soils and Geology

The mesa-top formation is made up of Dakota and Morrison sandstones. The Entrada forms vertical walls on many of the canyons with the deep red Chinle shales underneath.

In general, the canyons, outwashes, lower foothills and river bottoms exhibit finer textured soils, derived from sandstones and shales associated with the Morrison, Dakota and Mancos formations. Most of the mesa soils are shallow as the rock formations are extremely close to the surface. The fine sandy soils are highly susceptible to erosion and, in many places occupy barren talus slopes.

Seven soil mapping units from the Paonia and draft Ridgway Soil Surveys make up the majority of the Escalante Area, although there are many more that form a minor component. The most productive soils occur on the gentlest slopes, and include:

- 1) Progresso Loam 3-6% slopes on the mesa tops-- a moderately deep, well drained pinkish gray loam overlying Dakota Sandstone
- 2) Shavano Lazear Complex 3-12% slopes on the gently sloping lower foothills made up of moderately deep light brown fine sandy loams interspersed with shallow gray gravelly loams.

Other major but less productive soils in the unit are:

- 3) Kech-Rock Outcrop Complex 10-40% slopes on hills and ridges in the uplands (often supporting pinyon-juniper woodland). These are shallow, well drained moderately steep to hilly loams and clay loams intermixed with bedrock outcrops, that formed in place from underlying sandstones and shales.
- 4) Rock Outcrop made up of exposed bedrock (sandstones and shales)
- 5) Torriorthents-Rock Outcrop Sandstone Complex which are moderately steep to very steep well drained shallow to deep loamy soils that are very stony. These soils are mainly on

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Allotment Boundaries and Land Status



canyon sideslopes, and have sloughed off from the eroding escarpment above.

6) Torriorthents-Rock Outcrop Shale Complex is also moderately to very steep, well drained, shallow to deep silty clay loam or silty clay soils that are very stony. These soils are mainly on canyon sideslopes, and have sloughed off from the eroding escarpment above. Erosion is active most of the time on the steeper slopes, and areas of this complex produce a large amount of sediment.

7) Lazear-Rock Outcrop Complex 3-12% slopes on gently sloping, undulating and moderately steep slopes on uplands at lower elevations. These are shallow, well drained light brownish gray gravelly loams that have weathered on site from sandstone and interbedded shales.

Climate

The Escalante Area has a dry high valley/mountainous continental climate characterized by low humidity, sunny days, clear nights, and wide ranging diurnal temperature changes. Average annual precipitation ranges from about 8 inches at the lower elevations to 16 inches at the higher elevations of the unit. Precipitation is about equally divided between the winter and summer months. Temperatures range from an average high of about 90 F in July, to an average low of less than 13 F in January, as measured in Delta. The typical growing season is about 116 days long in Delta and declines with increasing elevation.

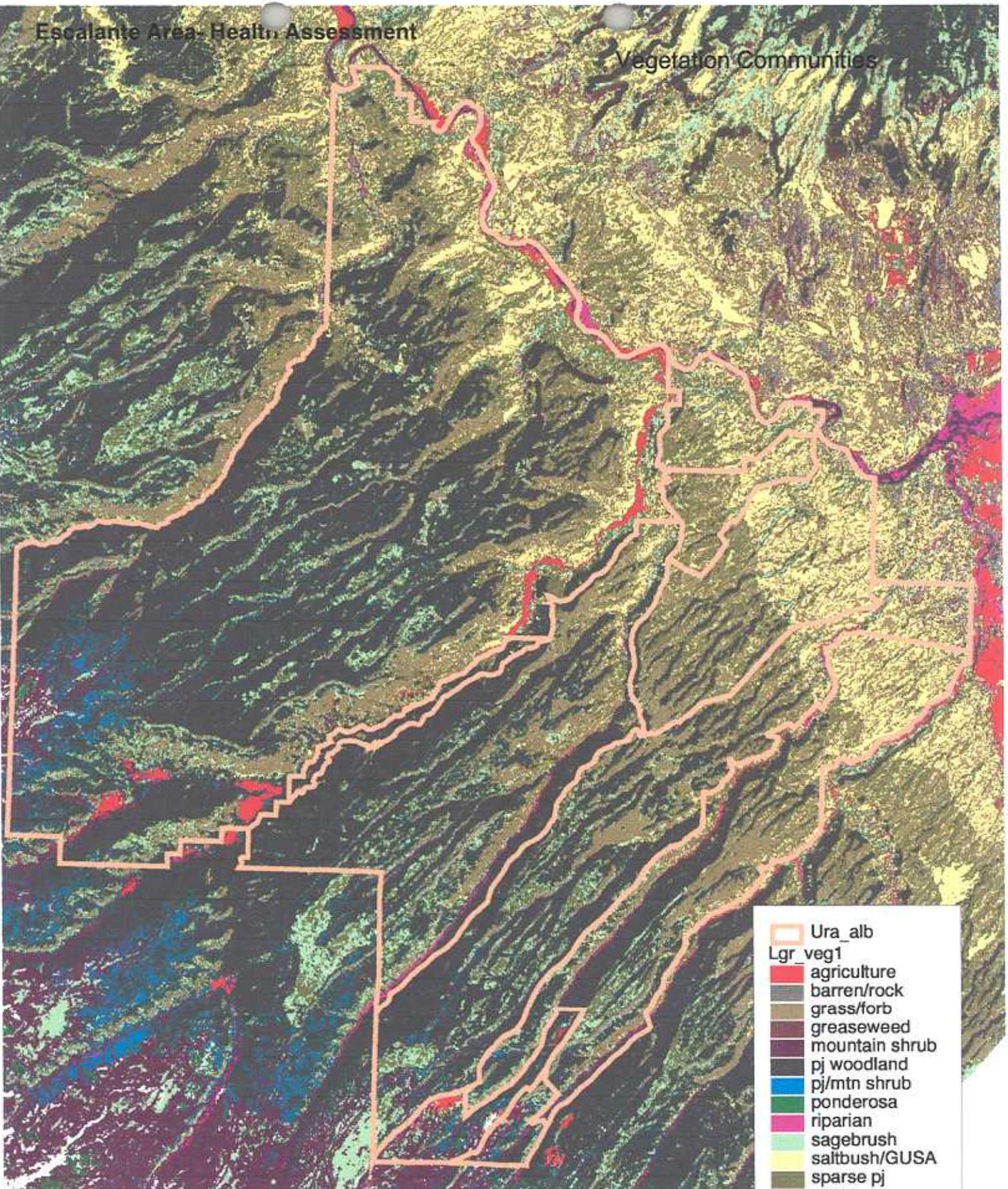
Vegetation

Vegetation in the unit varies with elevation, aspect, soils, and disturbance history (see Vegetation Communities map). At the lowest elevations galleta grass and blue grama dominate with a mix of shadscale, snakeweed, prickly pear cactus and Bigelow sagebrush forming the shrub component. Sites with difficult growing conditions such as saline, heavy clay soils support mat and Gardner's saltbush, Torrey mormontea, or black greasewood and suaeda. Steep sites with north aspects host stands of Salina wildrye.

Moving up in elevation, needleandthread grass and Indian ricegrass grow together with galleta grass and blue grama, and Basin big sagebrush, black sagebrush, four wing saltbush and low rabbitbrush become the dominant shrubs. Colorado pinyon and Utah juniper grow in the drainages at these elevations, but are a dominant vegetation type on the uplands above 6,000' in elevation. Deeper soil pockets and old treatment or burn scars are generally dominated by thick stands of big sage and black sage, or by introduced grasses, but young pinyon and juniper trees are starting to grow in many of these openings. With increasing elevation, the deciduous shrubs including mountain mahogany, Utah serviceberry and Gambel's oakbrush become increasingly common in the woodland until they become the dominant vegetation on many slopes at around 7,500'. A few of the high mesas provide adequate growing conditions for ponderosa pine, with deeper soil pockets occupied by mountain big sage.

Riparian areas at lower elevations typically include Rio Grande cottonwood, sandbar willow, salt cedar, skunkbush, canary reedgrass, and alkali sacaton. At higher elevations, narrowleaf cottonwood becomes the dominant cottonwood, and wood rose, sandbar willow, red osier, and clematis are the dominant shrubs.

There are several special status plants and plant communities within the assessment area. An 1,895 acre BLM Area of Critical Environmental Concern that was designated to protect rare



- Ura_alb
- Lgr_veg1
- agriculture
- barren/rock
- grass/forb
- greasewood
- mountain shrub
- pj woodland
- pj/mtn shrub
- ponderosa
- riparian
- sagebrush
- saltbush/GUSA
- sparse pj
- water



plants and unique plant associations is located along Escalante Creek. The same site was also designated as a Colorado Natural Area by the Colorado Natural Areas Program. A single listed plant species, the Uinta Basin hookless cactus (*Sclerocactus glaucus*), is found within the assessment area. Species present in the ACEC include the Uinta Basin hookless cactus, Grand Junction milkvetch (*Astragalus linifolius*), and Eastwood's monkey flower (*Mimulus Eastwoodii*). Rare plant associations in the ACEC include alkali cordgrass (*Spartina gracilis*), hanging garden plant associations (*Aquilegia micrantha* and *Mimulus Eastwoodii*), shadscale/galleta grass association, Utah juniper/galleta grass association, and needle-and-thread/westslope grassland association. The three grassland associations are not uncommon, but the sites selected are believed to be in nearly pre-settlement condition and devoid of non-native species.

Watersheds and Drainages and Water Quality

The Escalante Area is drained by several perennial stream systems (97 miles), which all flow in a northeasterly direction to the Gunnison River, these include: Monitor and Cottonwood Creeks which drain the southeastern portion of the area; Escalante Creek and its major tributaries, the Dry Fork and North Fork, that drain the mid-section of the area; and Big and Little Domenguez Creeks, draining the northwestern portion of the area. These stream systems and their intermittent (25 miles) and ephemeral tributaries (165 miles) flow in response to snowmelt in the spring season and from high intensity precipitation events typically in the July, August and September. Base flow on the perennial reaches is a result of groundwater discharge.

The water quality in all the drainages on the area has been designated by the Colorado State, Water Quality Control Division (Colorado Department of Health) as "Use Protected", and are use classified as "Aquatic Life Warm 2", "Recreation 2", and "Agriculture". The numeric standards on these drainages include: Dissolved Oxygen = 5.0 mg/l, pH = 6.5 - 9.0, and Fecal Coliform = 2,000 colonies/100 ml. The Colorado Water Quality Control Commission designates waters of the state, "Use Protected" if they do not warrant special protection provided by the outstanding waters designation or the antidegradation review process. Basically, the "Use Protection" designation allows for some water quality degradation, as long as the use classifications are protected (see Colorado Water Quality Control Commission).

There are no inorganic or metals, numeric standards on the area's streams. However, all surface waters of the State are subject to the Basic Standards (Colorado Water Quality Control Commission), which in part read: state surface waters shall be free from substances attributable to human-caused point or nonpoint source discharge in amounts, concentrations or combinations that:

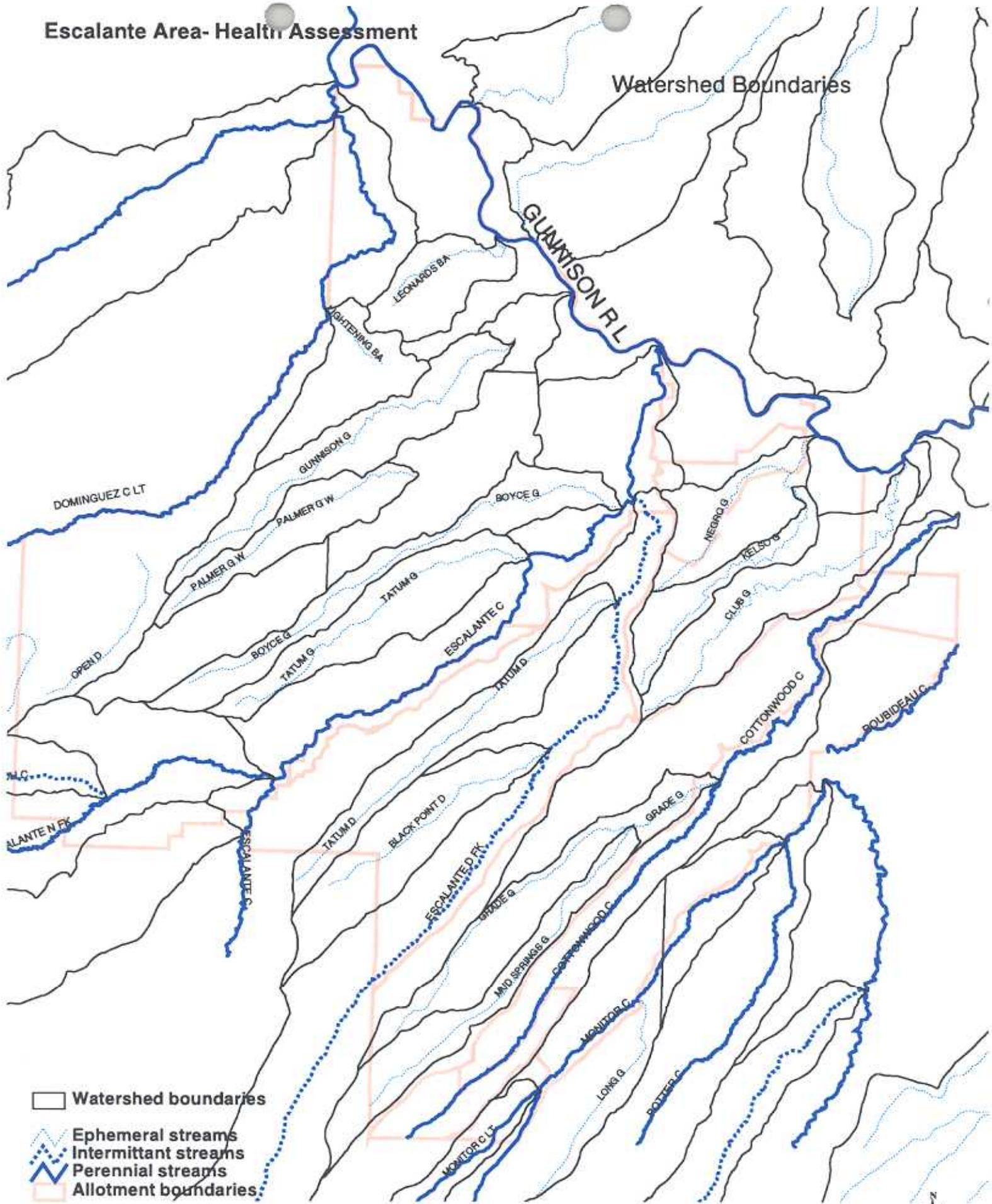
1. Can settle to form bottom deposits detrimental to the beneficial uses (e.g. silt and mud).
2. Are harmful to the beneficial uses or toxic to humans, animals, plants, or aquatic life.
3. Produce a predominance of aquatic life.

Concentrations of both sediment and nutrients have exceeded the standard in some of the tributaries to the Gunnison River in the reach from Crystal Reservoir to the Gunnison's confluence with the Colorado River (Colorado Department of Public Health and Environment).

The reach of the Gunnison River that receives drainage from the area is on the Colorado

Escalante Area- Health Assessment

Watershed Boundaries



1998 Monitoring and Evaluation List for suspected impairment from excessive sediment loading (Colorado Water Quality Control Division). Additionally, the Gunnison River is listed in the state's 319 report as affected by high levels of sediment and salinity (Colorado Nonpoint Assessment Report).

Wildlife

The Escalante Area supports an undetermined variety of upland, riparian, and aquatic wildlife species. Habitat variety is great, and is created by diversity in topography, slope, aspect, vegetation, soils, and climate. Some species are year-long residents, while others are migrant. A variety of small mammal, bird, and herptile species are scattered throughout the unit where their specific habitats are present.

Riparian habitat is present along the perennial streams listed above, and is extremely important for a number of wildlife species, especially small birds, mammals, reptiles, and raptors. The status of most of these species is unknown.

A small population of Pronghorn antelope use, and are confined to the open grass and shrub lands at lower elevations on the northeast side of the area in analysis units D1, D3, D6, D12, D13, and D21. Antelope numbers are 40-60 and appear to be static.

Mule deer and elk use the area primarily as winter range (see Desired Landscape Objectives map), occurring mostly on the mesa tops and benches in the larger canyons. Their summer range is located mostly on Forest Service lands at higher elevations on the Uncompahgre Plateau. Much of the area is classified by the Colorado Division of Wildlife as severe winter range, and winter concentration areas. During most winters there is a high degree of overlap in mule deer and elk use on winter ranges. The extent of competition is unknown. Both the quantity and quality of winter range is declining for mule deer and elk, more quickly for mule deer. The long-term mule deer population trend is down, while elk are increasing slightly. In 1999 the Colorado Division of Wildlife (CDOW) estimated winter mule deer densities north of Escalante Canyon to be < 5 deer per section and south of Escalante Canyon to be 18 deer per section. Elk densities are not estimated specifically for this area.

A small population of desert bighorn sheep, introduced in the early 80's, use the lower elevations of Escalante, Dry Fork of Escalante, Dominguez, and Little Dominguez Canyons. Desert sheep numbers, and their range in this area are steadily increasing.

Merriam's turkey are present and use the larger canyon bottoms at lower elevations as winter range and the Ponderosa/oak/aspen areas at higher elevations for breeding, nesting, and brood rearing. Turkey numbers are slowly increasing following a severe die-off in the late 70's and early 80's from severe winter conditions and an outbreak of mycoplasma, a bacterial disease probably contracted from domestic fowl. During the 80's some transplants of uninfected birds were made to rebuild the population.

Large predators, such as coyotes, cougars, and black bears use the area regularly as parts of their larger overall ranges. Of the predators, coyotes are the most numerous and wide spread. Black bear primarily use the major drainages with well developed riparian vegetation, and the higher elevation oak and aspen areas, especially during spring and late summer and fall for feeding. Cougars probably use almost all of this area at some time or another while hunting, or raising young. The number of cougars present is probably very low, limited mostly to the ones who have established their territories, or parts of their territories in this area. There appears to

be some suitable denning habitat in the bluffly areas along the major canyon rims. While the exact status of these predators are undetermined, they are all believed to be doing well.

Aquatic wildlife species and their habitats are limited to major streams and their associated riparian vegetation. Some trout species, brook, rainbow, and cutthroat, may be found in small numbers at the higher elevations of the perennial streams. Some frogs, toads, and water snakes are known to be present, but their status is unknown.

The assessment area provides habitat for several animal species listed, or proposed for listing, under the Endangered Species Act. A complete list of species considered for this analysis is contained in the Uncompahgre Field Office 6840 file. Of the species on that list, the bald eagle, peregrine falcon, Colorado squawfish, razorback sucker, and bonytail chub are known to exist within the assessment area. Other species with some potential to occur include the boreal toad and Canada lynx. Habitat for either of these last two species is very limited in the project area, and probably was limited prior to settlement by Europeans. Within the assessment area, designated critical habitat for the listed fish is located within the 100 year floodplain of the Gunnison River. BLM sensitive animal species potentially present in the assessment area include: Allen's big eared bat, spotted bat, fringed myotis, Yuma myotis, Townsend's big eared bat, long-billed curlew, ferruginous hawk, roundtail chub, bluehead and flannelmouth sucker, midget faded rattlesnake, long-nosed leopard lizard, northern leopard frog, canyon tree frog, and rocky mountain capshell.

METHODS

The land health assessment was conducted on public lands in the Escalante Area during August and September of 1998. The following procedure was used:

- 1). The area was first broken apart into around one hundred different polygons that contained relatively homogeneous vegetation and topography, or repeating patterns of these. A vegetation map derived from classified Landsat imagery was combined with maps of topography and allotment boundaries to arrive at the polygons. Polygons ranged from 44 to 4,466 acres in size.
- 2). The team spent two days at the beginning of the field work going over the data forms and collecting data together, trying to gain consistency. Afterwards data was collected primarily by teams of two people.
- 3). Each polygon was visited in the field, and land health assessment forms were used to describe the plant community characteristics, and various soil and community health attributes. Steep, inaccessible areas were evaluated using a quick form at only one or a few points meant to typify the polygon. More accessible polygons were evaluated at five points spread across the polygon. Only the data collection occurred in the field, evaluation of each polygon against the standards was put off until after completion of all field work. Each of the stop points was mapped on a USGS 7.5min quad.
- 4). Riparian data from the riparian PFC assessment that took place in 1994-1997 was used to address standard 2.
- 5). Data from the forms was entered into DBASE (several modules: speciera, grpcvrra, healthra, headerra, shortra), and polygons and stop points from the maps were entered into ARC. The databases were then linked to the polygons and to the stop points to provide a system that allows

maps to be made based on any of the data attributes collected.

6). 2 forms (one for standard 1 and one for the small scale aspects of standard 3) were developed that identified the important data to use from the health assessment for evaluating each standard. Polygons were grouped by the allotments they fell into and the data was filled in for each polygon, on each form.

7). Stop points were grouped into 13 different site types based on site characteristics (slope, aspect and elevation). Frequency distributions for each site type, for each type of data on the 2 forms were developed to show the range of scores and the average scores.

8). The frequency distributions were used to rank data for each stop point in a polygon, for each parameter, as to whether it was average, better or worse than average. (Colored felt pens pink=below, orange=average, blue=better). Once done, then the ID team judged each polygon as to whether it was meeting the standard, not meeting the standard, or meeting with problem areas, based on a preponderance of evidence. Reasons for the rankings were documented.

9). Polygon rating (meeting, not meeting, meeting with problems (Functioning At Risk)) was then entered into the ARC polygon map attribute table.

10). Tables were developed in the spreadsheet software EXCELL to list each polygon and its rating, to total up acreage for meeting, not meeting, FAR, and unknown for standards 1-5, to document reasons for the rating, and to list causes. Causes for polygons not meeting or FAR for any standard were discussed by an ID team using grazing dates, actual use, and by evaluating the type of problem.

11). Numerous maps were created showing the locations of different types of problems across the assessment area, using the stop points as sample points. Maps of existing roads and tracks which were inventoried over the summer of 1998 were also created.

12). Large scale health issues were assessed by using the Landsat vegetation map and the desired landscape map being developed for the fire planning process.

RESULTS

Standard 1: *Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, land form, and geologic process. Adequate soil infiltration and permeability allows for the accumulation of soil moisture necessary for optimal plant growth and vigor, and minimizes surface runoff.*

*Indicators used to assess this standard include: rills and pedestals, active gullies, appropriate groundcover and plant canopy cover, litter accumulation, litter movement, appropriate soil organic material, plant species diversity and vigorous, desirable plants.**

* *bolded text identifies the indicators which were most important for this assessment*

Acreage Figures

A total of 62,461 acres (57%) were judged to meet Standard 1, while an additional 25,047 acres (25%) were considered to meet but with some problem areas. Another 15,899 (14%) acres were identified as not meeting the standard, and 5,669 (4%) were not assessed.

Specific Problems

The main reasons for a polygon not meeting Standard 1 were 1) lack of protective cover on the soil surface for the particular site type, or 2) the presence of obvious, accelerated erosion, higher than average for the site type. Protective cover includes plant basal area, plant litter, or rock, and lack of protective cover is indicated by large plant interspaces or high percentages of bare soil. Obvious accelerated erosion was indicated by the presence of active gullies where down cutting, bank sloughing, or head cutting was taking place; or by pedestaling, where surface soil had been eroded away, leaving plants or rocks perched up on pedestals of protected soil.

Maps:

1) Standard 1-Soils gives the polygon rating for Standard 1, which amounts to an index showing the level of combined soil problems rather than specific problems. Two concentrations of problem polygons are obvious--one centered around 25 Mile, Dry and Sawmill Mesas, and the other around Good Point and Gunnison Gulch. The first area is larger and the problems more serious than the second area.

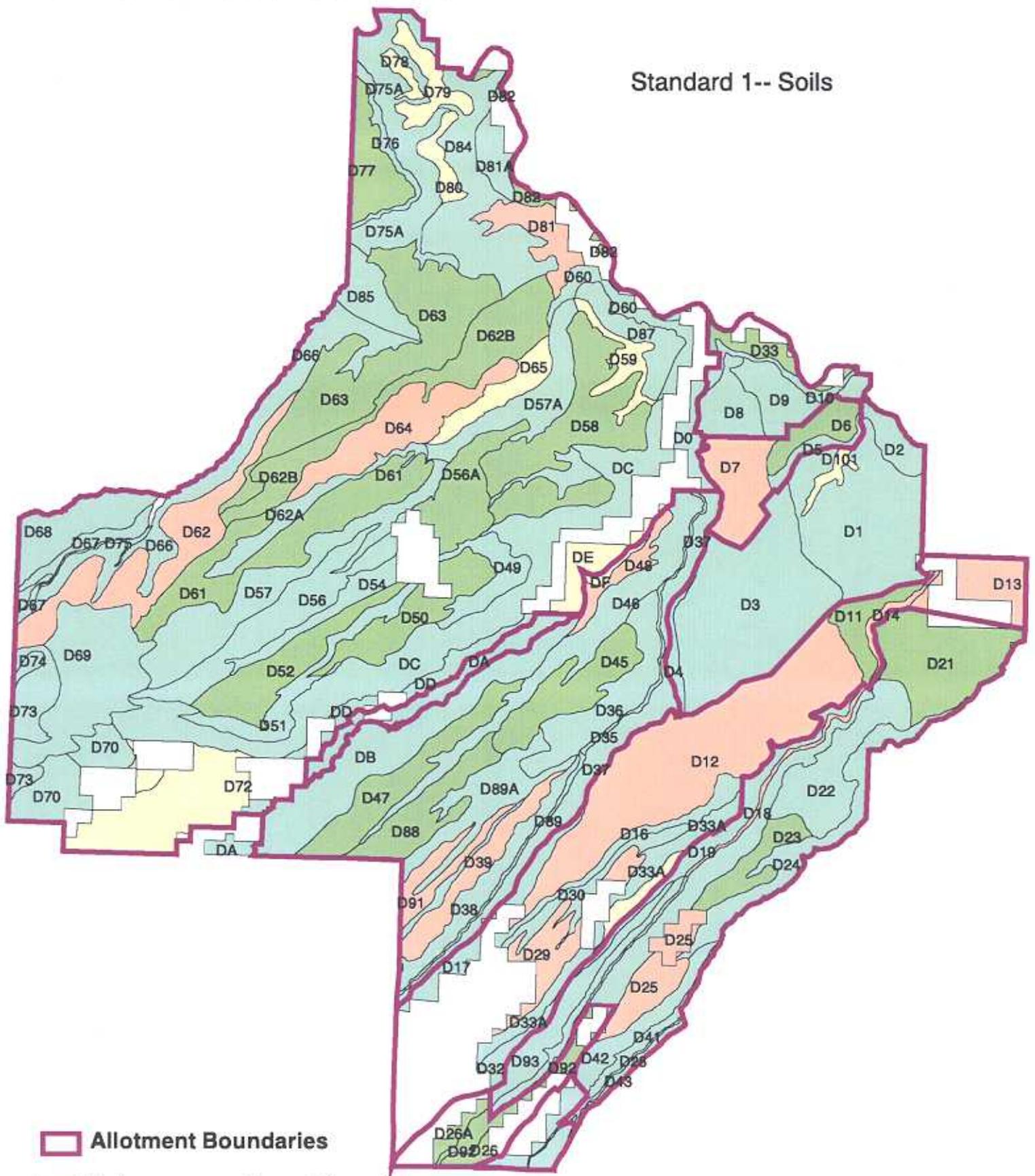
2) Soil Loss Problems shows sample points color coded according to the level of pedestaling, with red points being higher levels of pedestaling than average for the site type. Three areas have concentrations of red points--the Leonard's Basin area just off the Gunnison River, Escalante Flats and Alkali Flats area, and upper Dry Mesa-Sawmill Mesa area. Gullies are also depicted, and are most concentrated along the lower parts of 25 Mesa and Sawmill Mesa Allotments

3) Sites With High Levels of Bare Soil shows sample points color coded for amount of bare, unprotected soil. Red points denote higher than average bare ground readings for the site type. Many more sites show problems with bare soil than with actual soil loss. Concentration of bare soil problem sites occur on lower 25 Mesa, upper Dry Mesa, and across much of the Dominguez Allotment.

4) Sites With Low Levels of Plant Basal Cover gives the sample points with lower than average basal cover for the site type in red, and average or better basal cover in green. The most

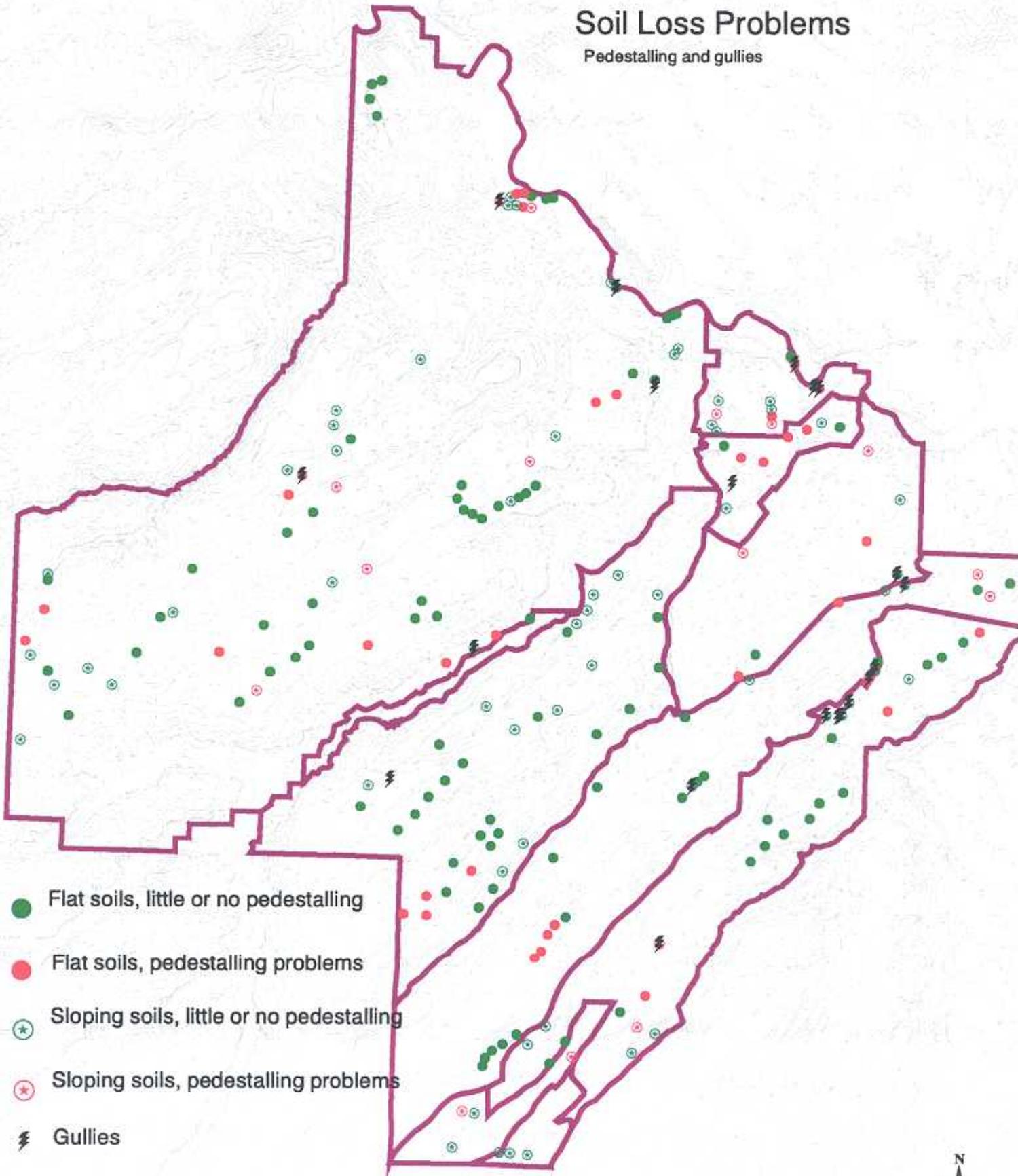
Escalante Area- Health Assessment

Standard 1-- Soils



Soil Loss Problems

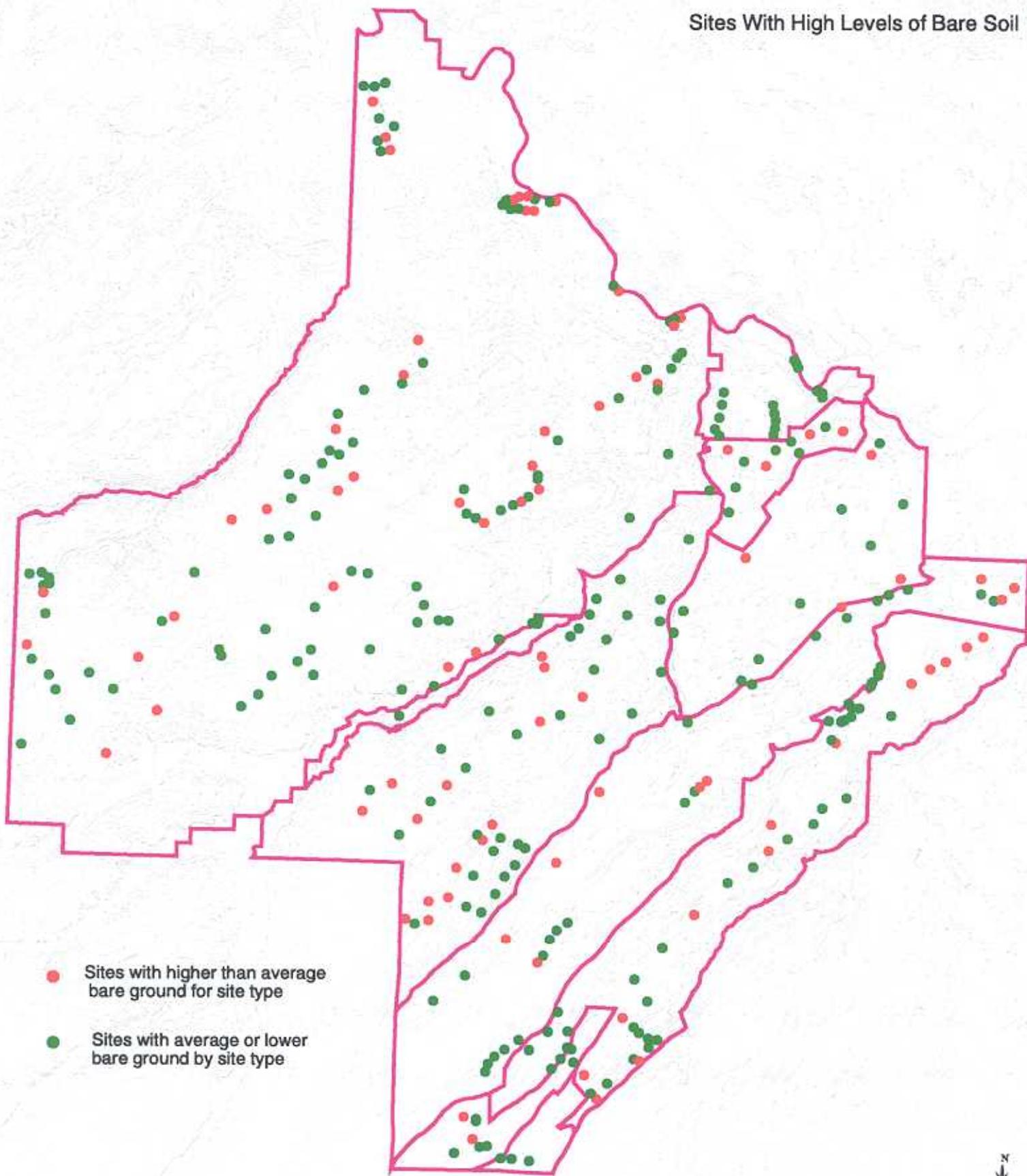
Pedestalling and gullies



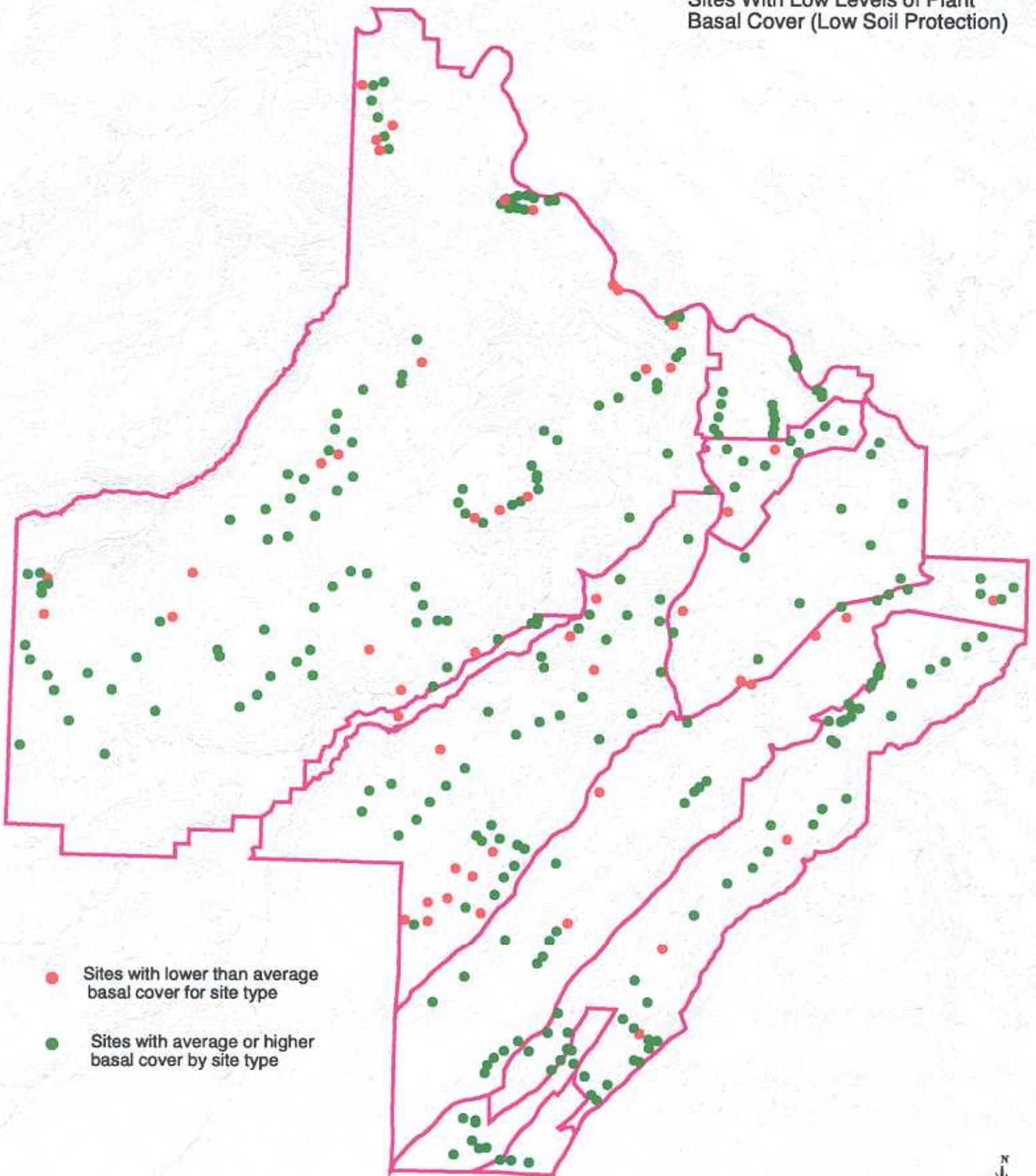
- Flat soils, little or no pedestalling
- Flat soils, pedestalling problems
- ⊛ Sloping soils, little or no pedestalling
- ⊛ Sloping soils, pedestalling problems
- ⚡ Gullies



Sites With High Levels of Bare Soil



Sites With Low Levels of Plant Basal Cover (Low Soil Protection)



- Sites with lower than average basal cover for site type
- Sites with average or higher basal cover by site type

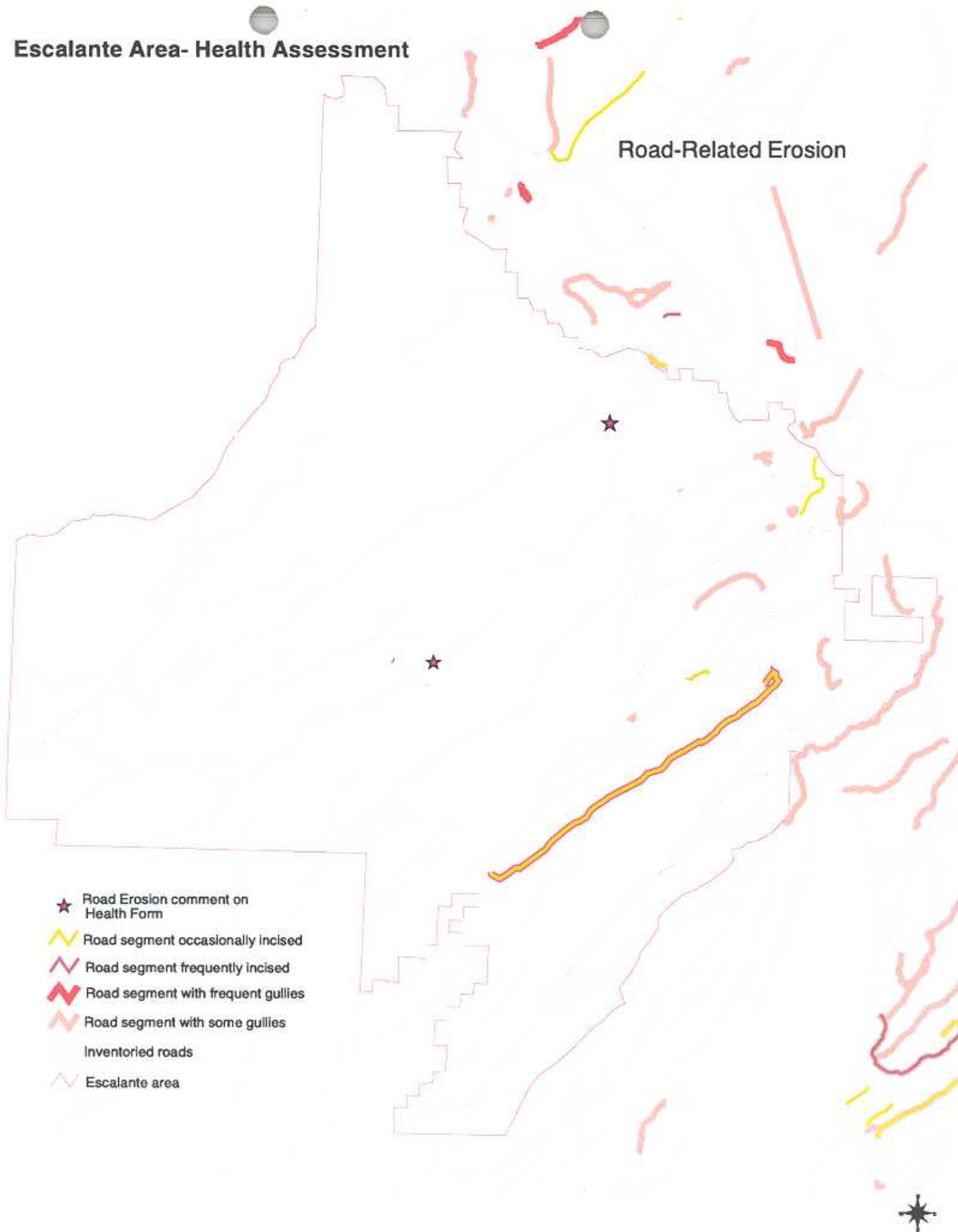


noticeable concentration of problem sites are in the southern portion of the Dry Mesa Allotment, and along Sawmill Mesa Road.

5) Road-Related Erosion depicts roads that are associated with gullies or have problems with being deeply incised into the soil. Most of the problems are occurring in the Alkali Flats and lower Sawmill Mesa areas. The inventory showed road proliferation with spur roads and loops has occurred along Sawmill Mesa Road, 25 Mesa Rd., and in Alkali Flats. The majority of roads inventoried do not have significant erosion associated with them.

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Road-Related Erosion



Standard 2: *Riparian systems associated with both running and standing water, function properly and have the ability to recover from major disturbance such as fire, severe grazing, or 100 year floods. Riparian vegetation captures sediment, and provides forage, habitat and biodiversity. Water quality is improved or maintained. Stable soils store and release water slowly.*

Indicators used to assess this standard include: native or desirable vegetation dominant, vigorous vegetation, diversity of vegetation age classes, vertical and compositional structure, vegetation has root systems capable of withstanding high stream flows, species indicate maintenance of riparian moisture, stream in balance with water and sediment supplied from watershed, indications of high water tables, point bars colonized by vegetation in range of age classes, active floodplain, floodplain vegetation available to capture sediment and dissipate flood energies, appropriate channel meander patterns, woody debris a part of stream morphology where appropriate.

Acreage Figures

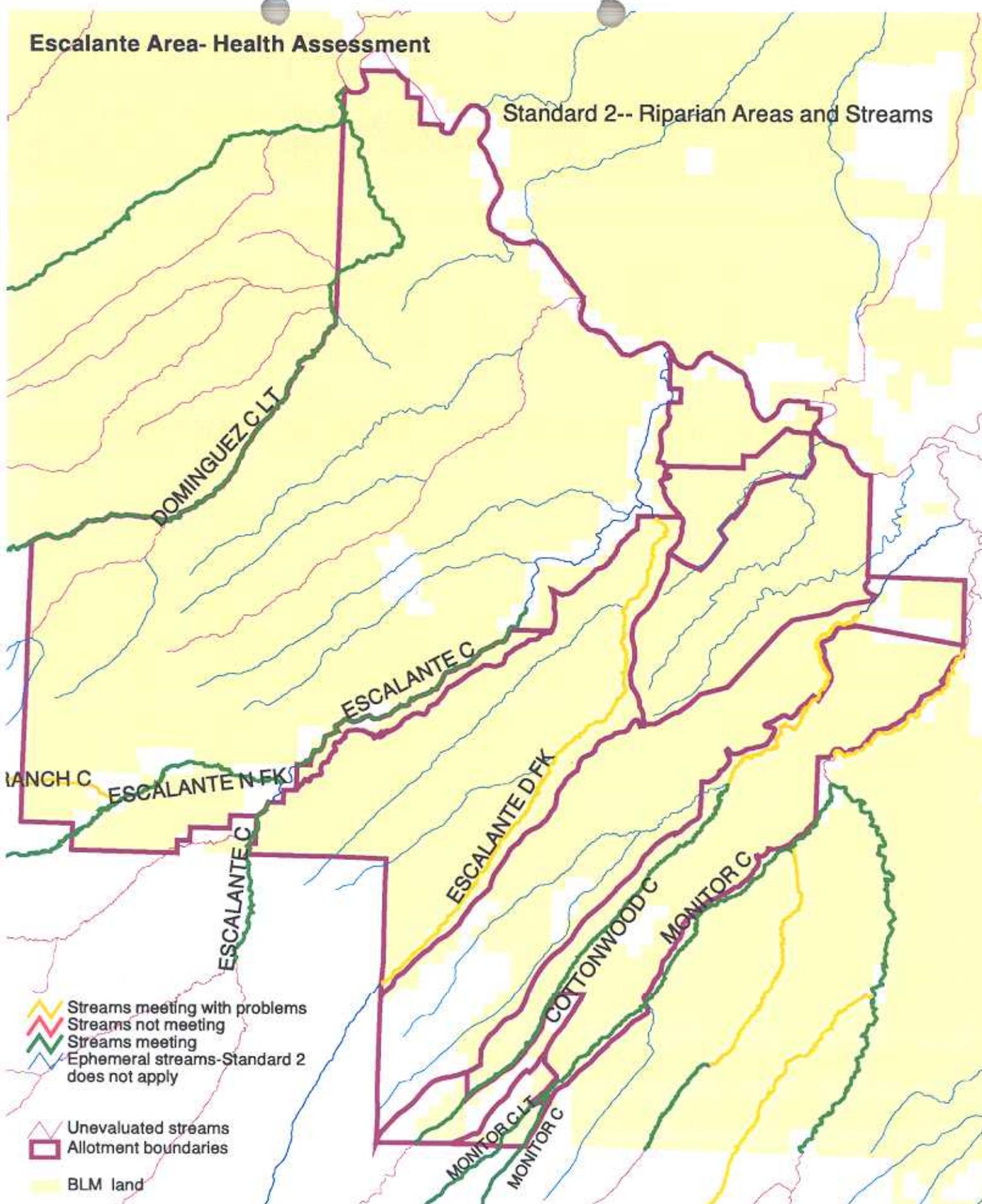
An estimated 34.4 stream miles (58%) were found to be properly functioning, and to meet Standard 2. Another 20.5 miles (35%) were considered to meet but to have some problems threatening their functional capabilities (Functioning At Risk). No riparian acreage fell into the non-functioning category. Approximately 4.2 miles (7%) of streams in the Escalante Area were not assessed. This acreage was mainly along the Gunnison River.

Specific Problems

The problems which caused the three stream reaches to be judged as Functioning At Risk were varied. Two of the streams were rated down because they are intermittent in flow and do not support the quantity of riparian vegetation needed for full functioning-- a site potential constraint. The lower reach of Cottonwood Creek was found to have a braided channel and exotic species. Dry Fork of Escalante Creek was found to have significant cattle grazing, and grazing on resprouts of woody riparian vegetation. Although the Gunnison River was not evaluated for riparian PFC, we do know that there are extensive problems with knapweed invasions along the upper terraces, and with salt cedar along the water's edge.

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Standard 2-- Riparian Areas and Streams



Standard 3: *Healthy productive plant and animal communities of native and other desirable species are maintained at viable population levels commensurate with the species' and habitats potential. Plants and animals at both the community and population level are productive, resilient, diverse, vigorous, and able to reproduce and sustain natural fluctuations, and ecological processes.*

Indicators used to assess this standard include: native plant and animal communities distributed adequately to assure sustainability, age class diversity to sustain recruitment and mortality fluctuations, adequate habitat connectivity, photo synthetic activity throughout growing season, resilience to human activities, appropriate plant litter accumulations, and landscapes composed of a variety of successional stages.

Acreage Figures

For the site-level indicators, the largest fraction of the acreage — 46,781 acres (43%)— was found to be meeting Standard 3 without significant problems. An additional 30,966 acres (28%) was judged as meeting, but had some problem areas. Approximately 25,660 acres (24%) were considered to not meet Standard 3. Inaccessible areas made up 5,669 acres (5%) and were not assessed.

Specific Problems

Polygons were judged as not meeting this standard, or meeting with problem areas for a variety of reasons. The main types of problems that relate to Standard 3 which are occurring in the Escalante Area include: high levels of exotic plants, mainly cheatgrass, presence of noxious weeds, low levels of perennial grass, low plant vigor, lack of cool season grasses, low vegetation diversity, lack of forbs, pinyon-juniper invasion, dominance by late seral stage, and old shrubs.

Maps:

1) Standard 3-- Healthy Plant Communities (small scale) gives the overall polygon ranking for Standard 3 for the site level indicators. Since the ranking combines all of the different plant community health indicators, its best use is as an index of plant community health which shows the relative severity of plant community problems rather than the specific problems. Two concentrations of problem polygons stand out--one around Little Dominguez Creek near its confluence with the Gunnison, and another on the eastern side of the assessment area that includes the low country of Alkali Flats, lower Sawmill Mesa, and lower 25 Mesa.

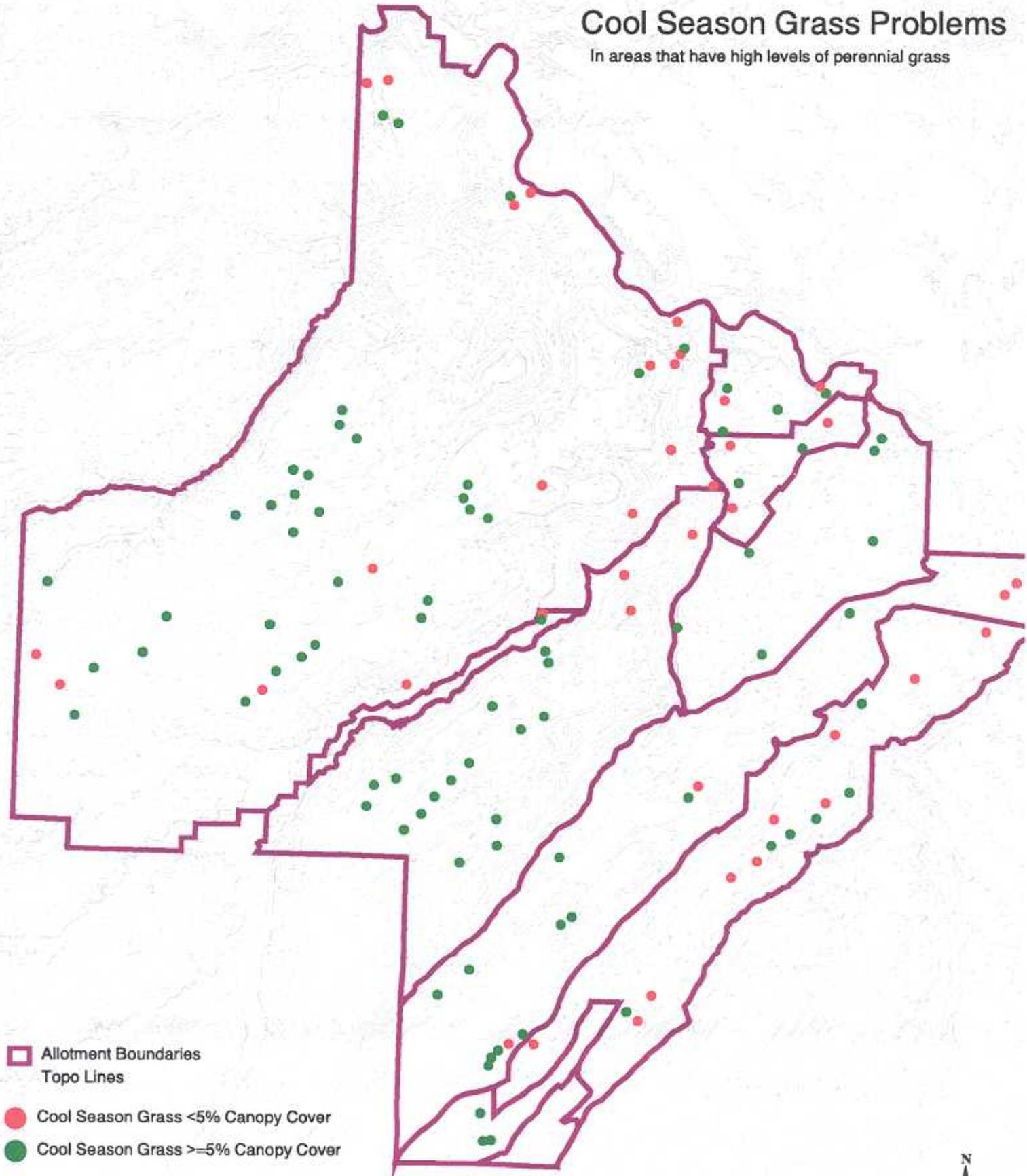
2) Cool Season Grass Problems shows sites with lower than expected cool season perennial grass cover in areas that otherwise support high levels of perennial grasses (cover $\geq 15\%$). A concentration of cool season grass problems is evident in the lower elevations of the Escalante Area except for Alkali Flats.

3) Pinyon-Juniper Invasion shows the sample sites for which the young trees (pinyon or juniper) were dominant. Concentrations of red dots are evident throughout the middle elevations of the Escalante Area, and primarily on the mesa tops.

4) Shrub Utilization gives the sample sites which had obvious to severe hedging on the shrubs. Concentrations of heavily utilized sites are noticeable on Dry Mesa and the lower part of Camp

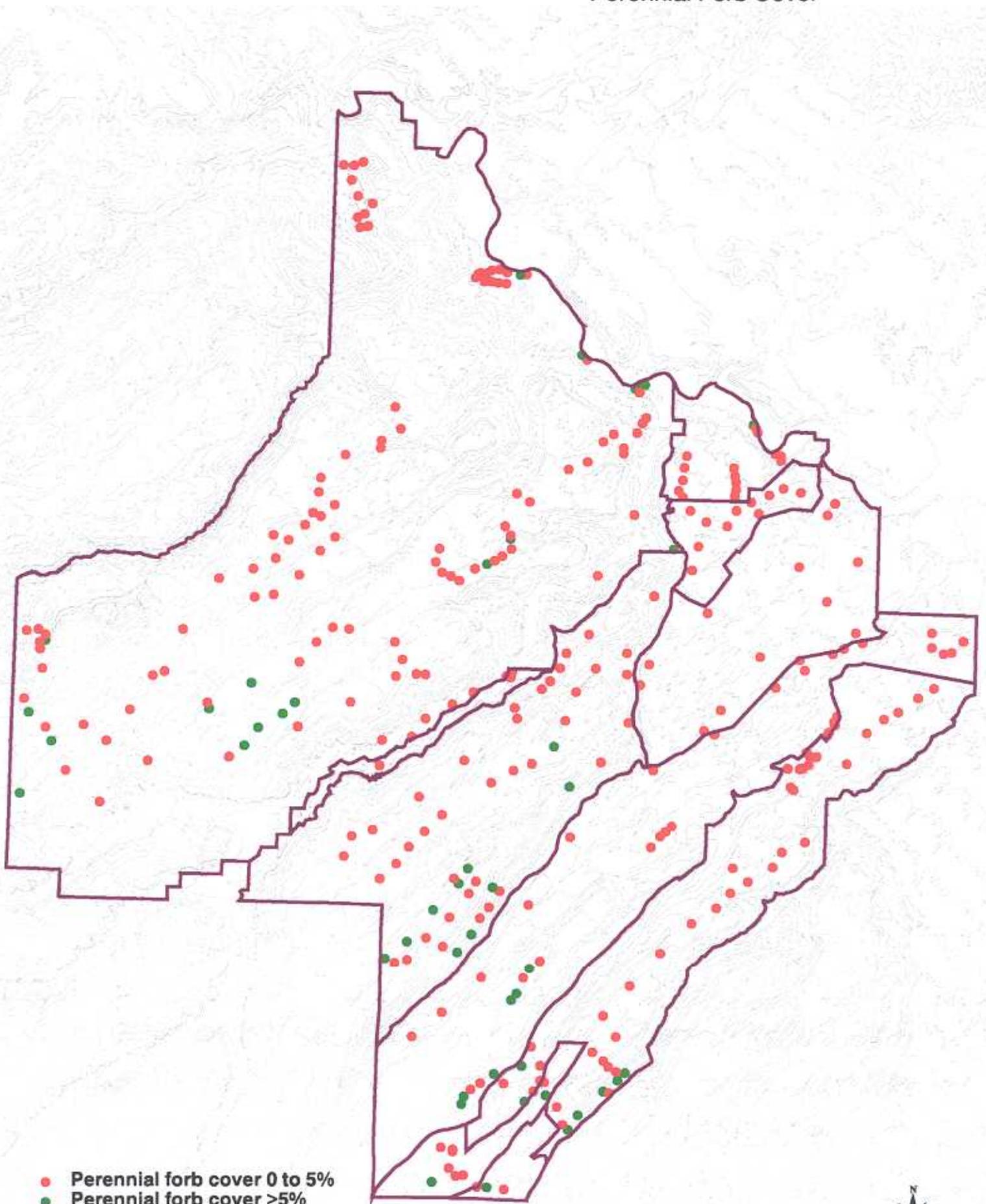
Cool Season Grass Problems

In areas that have high levels of perennial grass

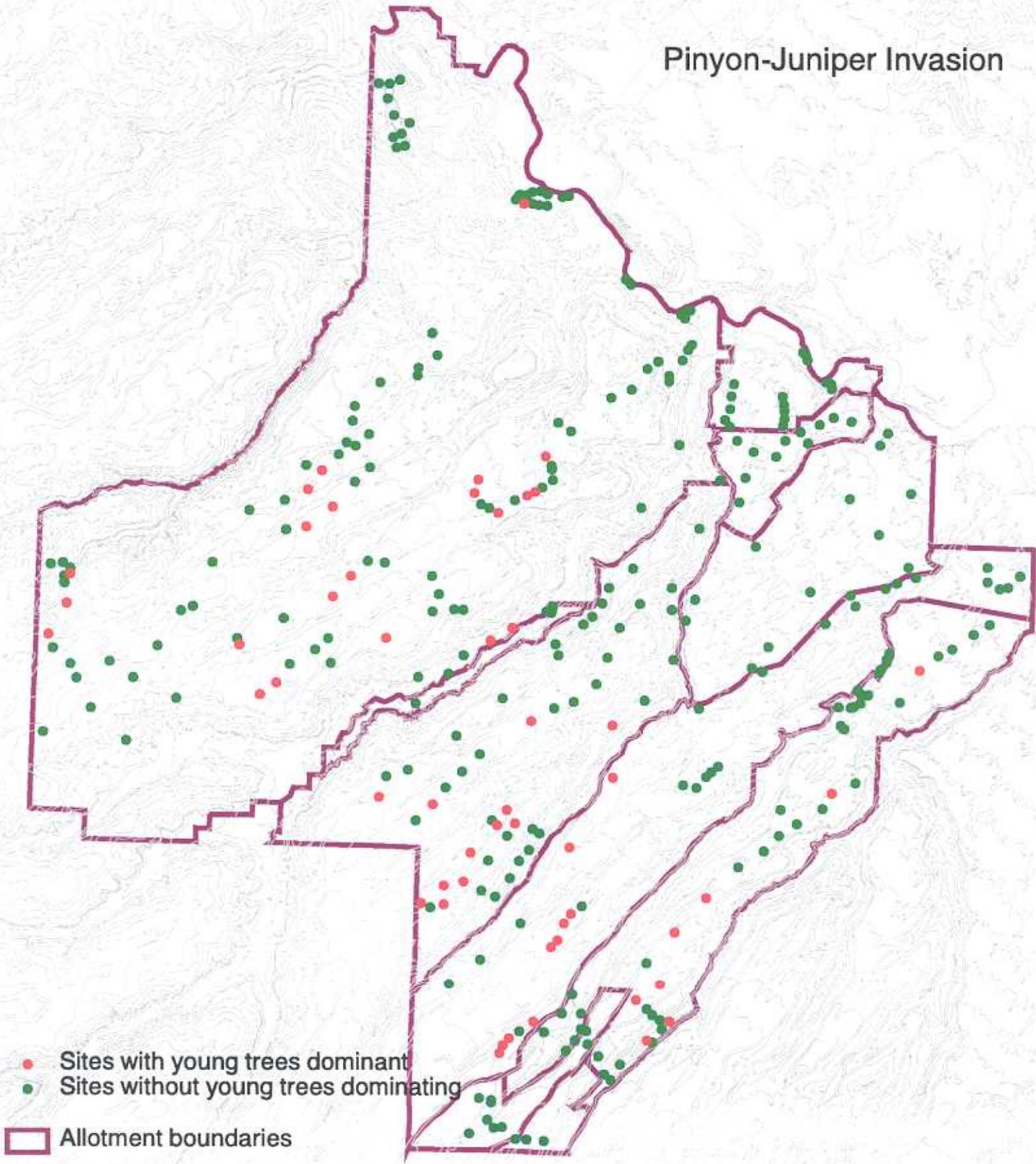


- Allotment Boundaries
- Topo Lines
- Cool Season Grass <5% Canopy Cover
- Cool Season Grass \geq 5% Canopy Cover

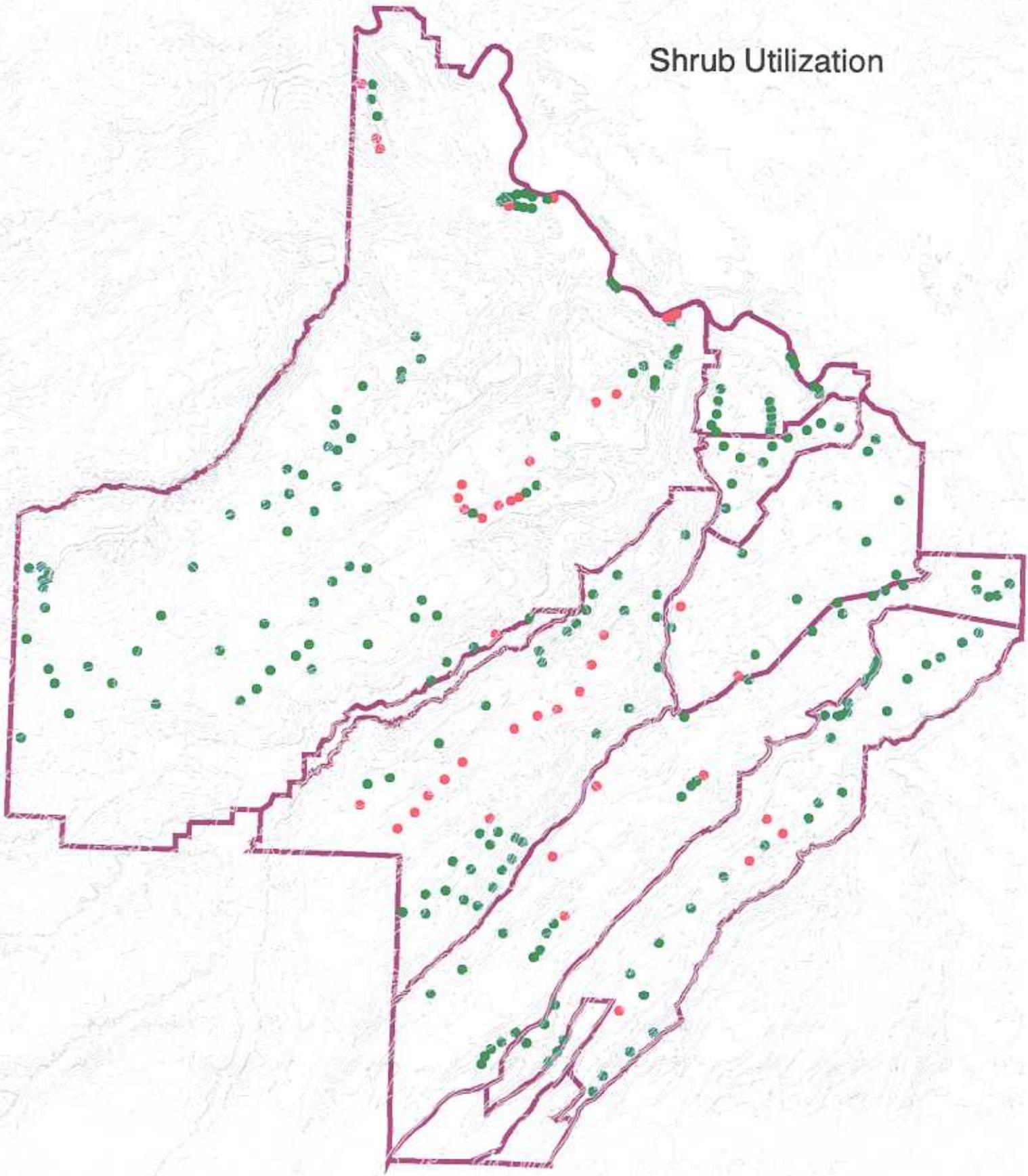




Pinyon-Juniper Invasion



Shrub Utilization



- Heavy Use (obvious to severe hedging)
- None to moderate use (no or light hedging)
- Allotment boundaries



Ridge. Sawmill Mesa and lower Little Dominguez Creek also have some areas of heavy shrub use, although not as extensive as the first two.

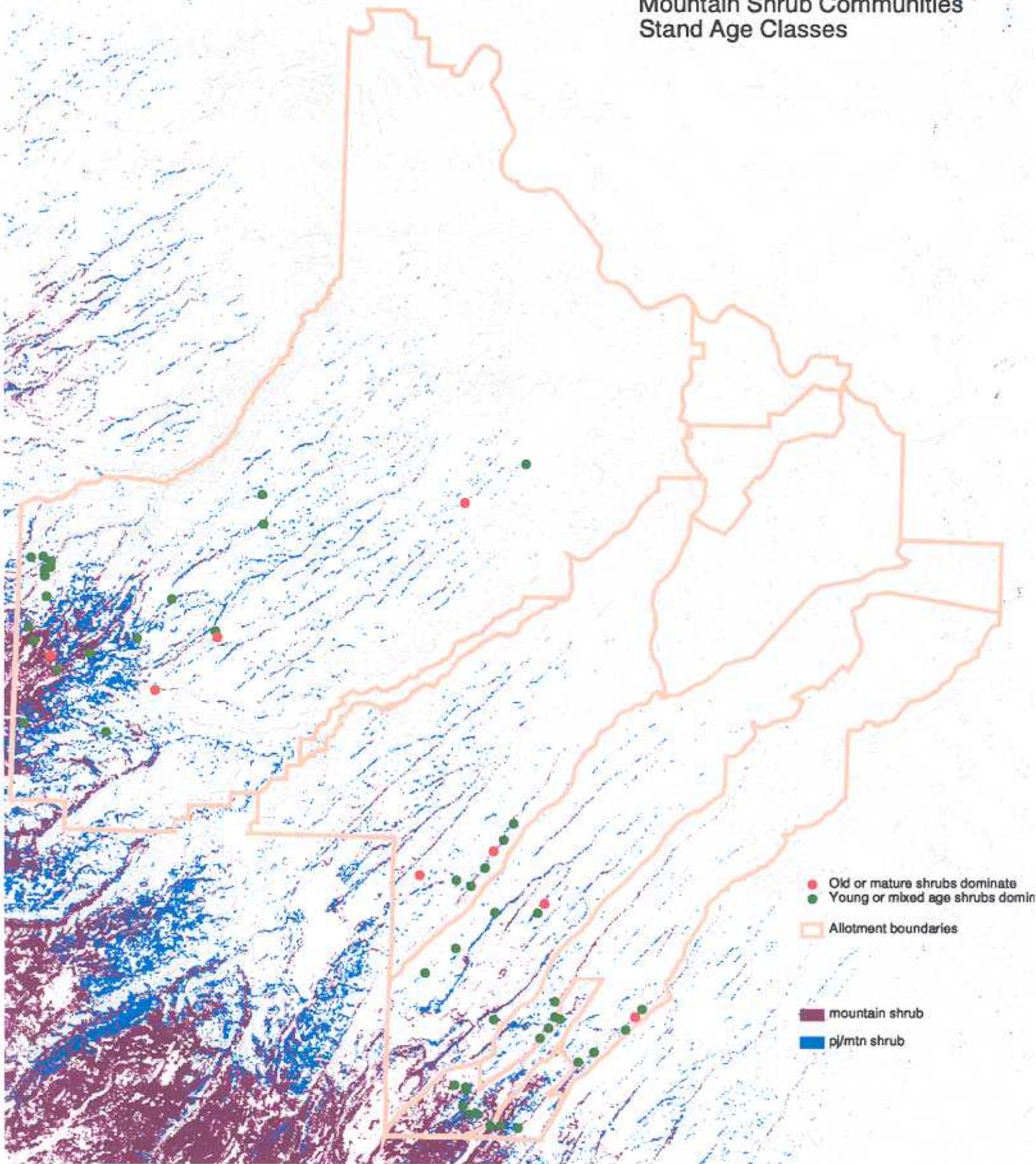
5) Mountain Shrub Communities and Stand Age Classes shows the locations of mountain shrub communities in the Escalante Area, as well as the pinyon-juniper/mountain shrub communities. This information comes from the Landsat vegetation map. These communities make up a very small proportion of the Escalante Area, with the largest areas of mountain shrub occurring on Brushy Ridge and on 25 Mesa next to the Forest boundary. The dots show the sites where there were significant amounts of deciduous shrubs with red dots being sites dominated by old or mature age classes. A relatively small proportion of the sites sampled showed shrub decadence to be a problem, and these were not obviously concentrated in any one area.

6) Exotic Plant Problems identifies the sites with exotic weed species dominating, sites with exotic species present in undisturbed communities, and sites with few or no exotic plants. Exotics are spread throughout nearly all of the Escalante Area in undisturbed communities (yellow), but only dominate a few sites, with concentrations along the Gunnison River, Little Dominguez Creek and Lower Escalante areas.

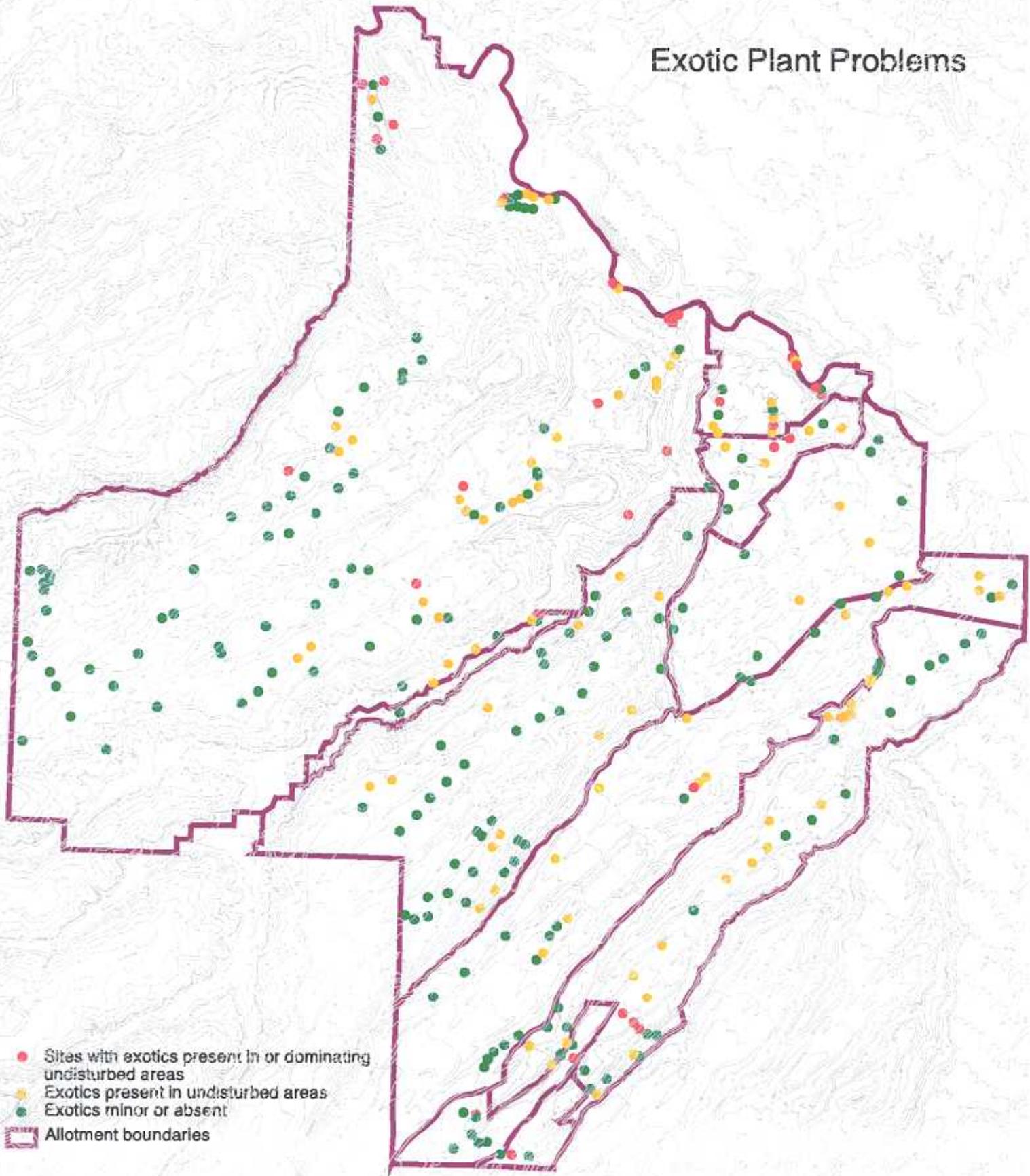
7) Roads and Noxious Weeds gives the roads which were found to have infestations of noxious weeds along them during the road inventory of 1998. Sites with noxious weeds found during the health assessment are also shown. Obvious problem areas with noxious weeds are found along the Gunnison River, and in the dense road network in the Escalante Flats, Alkali Flats and lower Sawmill Mesa areas.

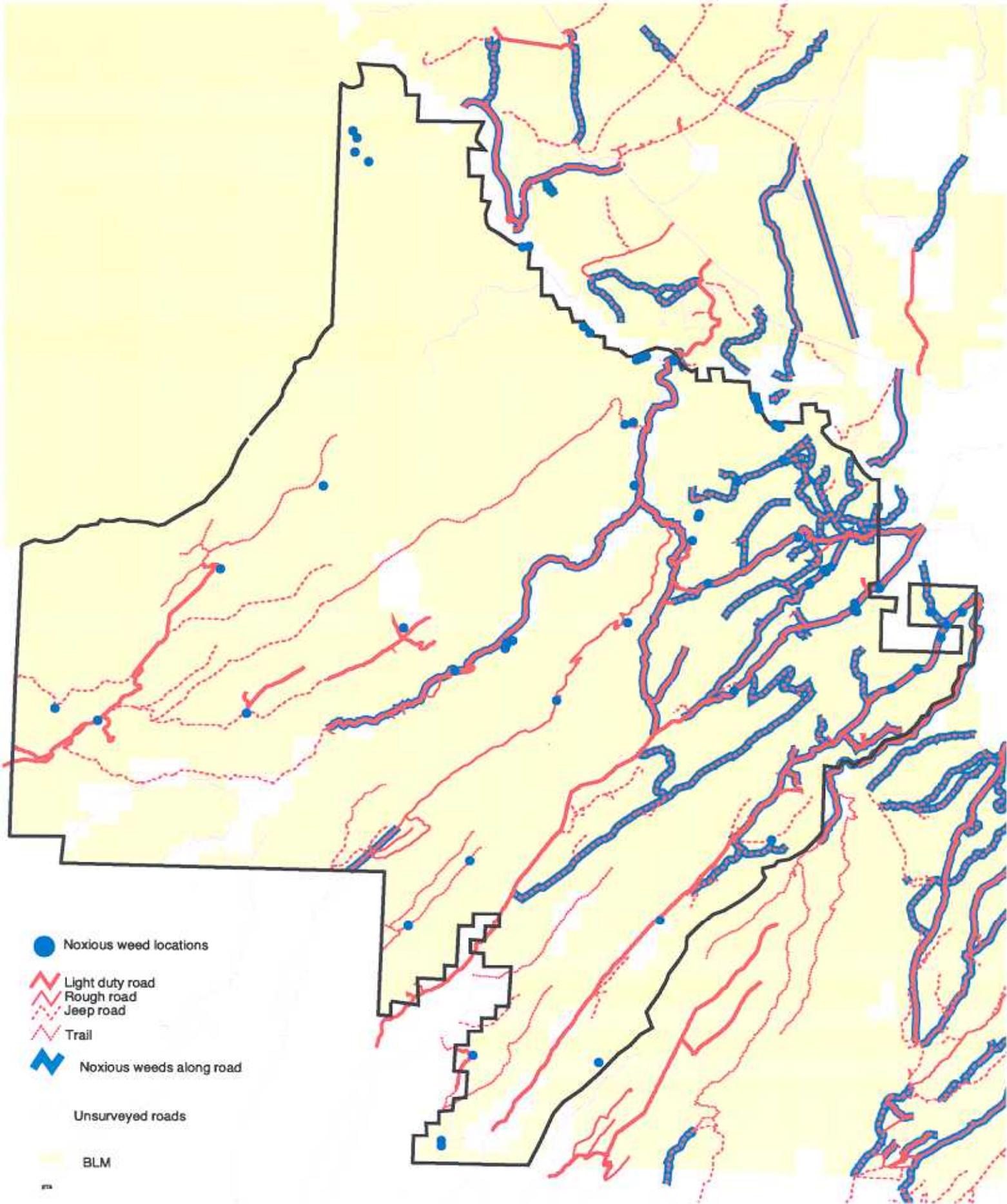
Escalante Area- Health Assessment

Mountain Shrub Communities Stand Age Classes



Exotic Plant Problems





Standard 3 Landscape Scale Indicators

Healthy Wildlife Community

The wildlife community health assessment in the Escalante Area, including habitat, was made using existing CDOW and BLM data, and qualitative knowledge in addition to data collected during the rapid assessment process. The rapid assessment process by itself does not provide adequate information. A much more complex and time consuming effort would be necessary to collect sufficient information for an accurate assessment of the wildlife community. Additional information is needed for many of the wildlife species. Specifically small mammals, herp's birds, and predators.

Based on the available information, the main problems or changes that relate to Standard 3 which are occurring in the Escalante Area at a landscape scale include: 1) major changes to habitat structure, condition and arrangement of habitat components across the Uncompahgre Plateau landscape, 2) the long-term mule deer population trend is down, 3) winter range quantity and quality is declining in the Escalante Area, 4) the elk population trend is up, and 5) several species of neo-tropical birds in the Western Colorado region are declining.

Specific problems or changes:

1. Wildlife habitat changes are occurring across the Uncompahgre Plateau.

Commutatively, the problems listed above in the Healthy Plant Community section are indicators of changes occurring to habitat structure, condition, and arrangement of habitat components in the Escalante Area, and across the larger Uncompahgre Plateau landscape. As these habitat changes occur, so will the species present, their abundance and distribution, and perhaps their role in the community. As habitat abundance and quality declines for some species, it will improve for others.

Habitat changes that are occurring in the study area, and on much of the Uncompahgre Plateau that affect the wildlife habitat quantity and quality are: Vegetation seral stage is advancing, the average patch size is getting larger, the amount of "edge" is decreasing, the size and quality of browse stands are declining, pinyon and juniper trees are invading many sites, and the abundance and amount of area supporting exotic and noxious vegetative species is increasing. Thus, diversity is decreasing. In general, this area as well as the rest of the Uncompahgre Plateau is becoming more favorable for species that require larger patch sizes of later seral stage vegetation, especially pinyon & juniper, and with less diversity. This ecosystem is becoming more stable, with fewer disturbances occurring.

2. The mule deer population trend is declining on the Uncompahgre Plateau, and is consistent with declines in mule deer populations throughout the west.

Although erratic annual fluctuations in mule deer numbers are typical, the 15-20 year trend is downward. The CDOW's desired population level for the Uncompahgre Plateau is 38,000 mule deer. During the early 1980's the population was estimated at over 40,000. The 1999 estimated population was 25,000, and the 1994 estimated population was 16,500, the lowest in recent years.

Fawn survival, hence the potential for population recruitment, since 1980 has steadily decreased from 74 fawns per 100 does to 33 fawns per 100 does measured during 1995 -1997. During a 1997 study of radio collared deer on the Uncompahgre Plateau to determine annual doe survival rates, and winter fawn survival rates, 16% of the radio-collared does and over 50% of the radio-collared fawns died. Coyote predation was the primary cause of winter mortality of fawns. Further study is required to more accurately determine causes and levels of mortality, and

the resulting effects occurring to the population.

On the Uncompahgre Plateau, habitat changes due to development, fragmentation, fire suppression, and grazing; human impacts due to commercial activities and rapidly increasing recreational use; predation from coyotes, cougars and black bears; and competition from the increased elk populations are among the suspected and possible factors interacting to contribute to this decline.

3. Winter range quantity and quality is declining in the Escalante Area, due mostly to: 1) the lack of disturbances scattered throughout the area to reset succession, hence creating a more desirable mosaic of feeding and cover areas, 2) existing browse stands are advancing in seral stage, and browse plants are being replaced by pinyon and juniper mostly and, 3) over use by mule deer and elk, caused by their number being concentrated on the remaining amount of shrinking winter range (see shrub utilization map) thus, quickening the decline of winter range condition. See the Desired Landscape Objectives map for a comparison of existing mule deer winter range conditions to the desired landscape objectives for winter range.

The highest potential value of the Escalante Area to mule deer is winter range. There is abundant summer range at higher elevations on the Uncompahgre Plateau. Presently, as shown in the land-sat Vegetative Community map, too much of the area, especially north of Escalante Canyon, is occupied by mature pinyon and juniper with poor forage producing under stories, and not enough cool season grasses and forbs, and shrubs. Also, not enough sites of early to mid seral stages, supporting sagebrush and/or mountain shrubs (see Mountain Shrub Community, and perennial forb cover map) are interspersed throughout the area.

4. The elk population is increasing on the Uncompahgre Plateau, and is consistent with increasing elk populations throughout Colorado, and most of the west. Elk have a greater capacity to increase than they currently are, due to intentional heavy hunting pressure to control population growth. Unchecked, the elk population growth would likely have greater effects on the mule deer population status.

The CDOW's desired population level for the Uncompahgre Plateau is 3,000 elk. By 1990 elk numbers had grown to 8,000, when high levels of antlerless harvest was used to reduce the numbers back to 5,000 by 1997. The 1999 estimated population size was 6,000. Habitat changes resulting in larger areas of more mature vegetation is believed to be a significant factor in this increase. Without continued high levels of harvest to this population, it would increase rapidly. Thus, serving as a good indicator that the wildlife community is changing to meet the conditions created by changing vegetation.

5. Several Neo-Tropical Migrant Bird species show population trend declines, or have inadequate data for making trend determinations in the Western Colorado region. The Breeding Bird Survey provides the most complete and accurate data available for NTMB species throughout their range, and in the Escalante Area.

Thirteen species (see table 1) shown population trend declines in both the 26 and 10 year Breeding Bird Survey data sets. All of these species have high "importance of area" rankings, indicating a high proportion of their habitat in this region provides essential breeding habitat components. Five of these species, Vesper Sparrow, Swainson's Hawk, Say's Phoebe, Rock Wren, and Loggerhead Shrike have very low abundance ratings, therefore, indicating they are the species' of highest concern in this area and landscape. The eight remaining species, Horned Lark, Common Nighthawk, Killdeer, Northern Flicker, Western Wood-Pewee, Chipping Sparrow, Sage Thrasher, and Brewer's Sparrow have moderate to good abundance ratings, thus, making them species' of second highest concern. Species for which inadequate data are available (Table 2) to

makes status determinations with a high degree of certainty are considered priority #3 species. Many other NTMB species are present in this area, but their status appears to be good, and not of high concern at this time. The Escalante Area is part of the larger overall landscape that provides habitat for all these species, which is important for their long-term sustainability.

Table 1: NTMB species showing declines during the 26 and 10 year BBS data sets in Western Colorado.

NTMB SPECIES	HABITAT	26 year Population Trend Ranking (PT26)	10 year Population Trend Ranking (PT10)	Abundance Ranking (AB)	Importance of Area Ranking (IA)
Priority #1 species: PT26 & PT10 ranking = 4 or 5, AB ranking = 3, 4, or 5, and IA ranking = 3, 4, or 5.					
Vesper Sparrow **	Annuals/Grassland	4	5	3	4
Swainson's Hawk *	Annuals/Grassland	4	4	3	3
Say's Phoebe **	Annuals/Grassland	4	4	3	5
Rock Wren **	Barren Land	4	5	3	3
Loggerhead Shrike *	Riparian	5	4	3	3
Priority # 2 Species: PT26 & PT10 ranking = 4 or 5, AB ranking = 3-5, and IA ranking = 3-5.					
Horned Lark **	Annuals/Grassland	5	5	1	5
Common Nighthawk	Annuals/Grassland	4	5	2	5
Killdeer *	Annuals/Grassland	4	4	1	3
Northern Flicker *	Generalist	5	5	1	3
Western Wood-Pewee *	Generalist	4	4	2	3
Chipping Sparrow **	Ponderosa Pine-Doug Fir	5	5	1	4
Sage Thrasher **	Sagebrush	4	5	2	4
Brewer's Sparrow **	Sagebrush	4	4	2	5

Breeding Bird Survey rankings: 1= low concern, 5 = high concern.

* =Low, **=moderate, ***=highest potential for effects (+ or -) in Escalante area based on Breeding Bird Atlas information.

Table 2. NTMB species with inadequate data for making trend determinations (Priority #3 species.)

SPECIES	HABITAT	Abundance Ranking (AB)	Importance of Area Ranking (IA)	26 year Pop. Trend Ranking (PT26)	26 year Uncertainty Ranking (PTU26)	10 year Pop. Trend Ranking (PT10)	10 year Uncertainty Ranking (PTU10)
Northern Harrier *	Annuals & Grassland	4	3	3	4	3	4
Savannah Sparrow *	Annuals & Grassland	3	3	3	4	3	4
Common Poorwill *	Mountain Shrub	3	5	3	4	3	4
Gray Flycatcher ***	Pinyon-Juniper	3	4	3	4	3	4
Gray Vireo ***	Pinyon-Juniper	3	4	3	4	3	4
Long-eared Owl *	Riparian	3	3	3	5	3	5
Bank Swallow *	Riparian	3	3	3	4	3	5
Swainson's Thrush *	Riparian	3	3	3	4	3	4

Breeding Bird Survey rankings: 1= low concern, 5 = high concern.

* =Low, **=moderate, ***=highest potential for affects (+ or -) in Escalante area based on Breeding Bird Atlas information.

Plant and Animal Distribution

Plants: 121 different plant species were documented as occurring in significant amounts on at least one site. Colorado pinyon was the most common, occurring on 141 sites, broom snakeweed was the second on 132 sites, followed by Utah juniper on 118, galleta grass on 104, shadscale on 87, cheatgrass on 85, Indian ricegrass on 82, basin big sagebrush on 81, black sage on 67 and blue grama on 55. Thirty-nine species occurred at substantial levels on only one site, and another 40 occurred on less than 10 sites. Mapping some of the species distributions indicates that most of the plants are tied to elevation, although some are more general occurring across most of the Escalante area. Some are strongly tied to soils. At the level of data collection, no problems with plant distribution that would interfere with population viability or resilience were identified. The movement toward dominance of the landscape by late seral plant communities may foreshadow future problems as early seral native species disappear from much of the land area.

Animals: Quantified data are inadequate to assert much about distribution of any of the animal species that may be present. Qualitative information however, suggests there are no problems with the distribution of any animal species in the Escalante Area that would interfere with population viability or resilience.

Connectivity

Not much information is available on assessing connectivity of habitat in dry woodland or semi-desert shrub land vegetation types, particularly in very rough terrain. A map of likely barriers and dispersal routes is included.

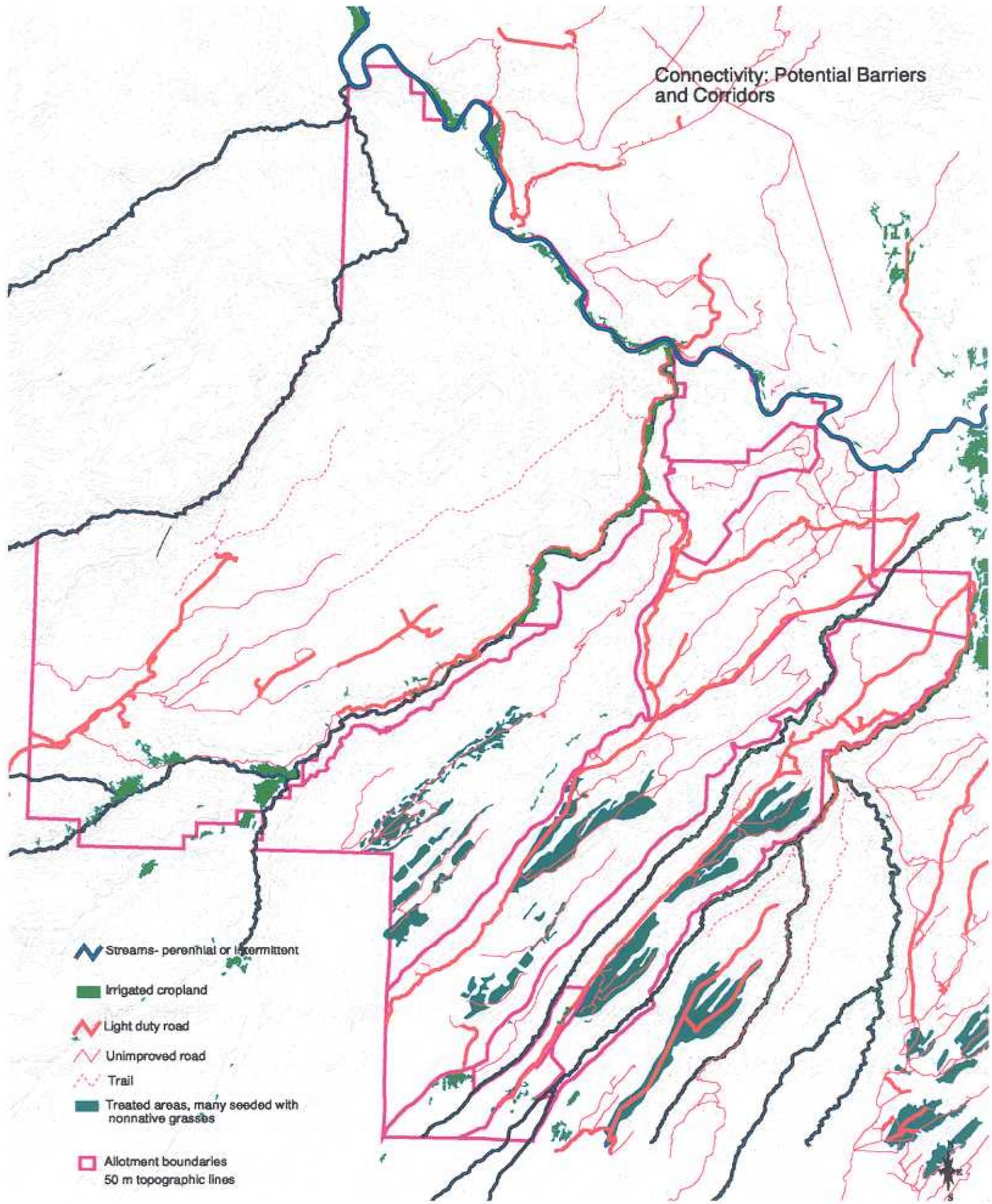
Possible Barriers:

Impassable topographic features like rock walls and very steep slopes:

The Escalante Area has plenty of these natural barriers that funnel travel along stream corridors or along mesa tops or benches down in the canyon, and prevent much northwest to southeast movement. We need to be especially aware of potential management-caused barriers since connectivity is already tightly constrained in this landscape. Antelope movement from one

Health Assessment--Escalante Area

Connectivity: Potential Barriers and Corridors



Mesa top to another would be the most likely example of a negative affect of a topographic barrier. In the case of mule deer and elk, the topographic features of this area encourage northeast to southwest travel more than it is a barrier to northwest to southeast travel. There are enough gaps and passages in the rims to allow them up and down, and enough vegetation and topographic features down in the canyons to serve as cover. There are numerous areas where mule deer and elk cross canyons as bad or worse than these on their way to and from summer and winter range. Connectivity of their habitat, proper distances between feeding, hiding, and protective cover areas on the Mesa tops, benches, and to some degree along the stream bottoms is most important for deer and elk movement.

Waterfalls, irrigation diversion dams, or water depletion that dries up stream segments is also a barrier to movement of aquatic species. There are some natural waterfalls in Escalante Creek that may restrict movement of many aquatic species upstream.

Agriculture or intensive human land uses:

The most extensive agricultural and human activity occurs along lower Escalante Creek and at Escalante Forks. There are also a few fields along the Gunnison River. The size and amount of the developed farmland in this area is not large enough, or continuous enough to impair movement of any species, and due to the narrow bottoms landform, it probably never will be. Bighorn sheep, as well as deer and elk will become a pest to the farmers eating the crops. If game proof fences were to be built to protect the crops, and extended far enough, then the farm operation could potentially be a barrier to movement, for water or other needs. Also, at the higher elevations along the better riparian areas, black bear use could increase as the result of certain uses or crops such as livestock grazing, or orchards, and could cause conflicts.

Roads:

Roads can be a barrier to movement because they are a strip of bare or altered ground, or because they are a focus of human activity and disturbance. Bob, what species are potentially affected by roads? The road network is densest in the Alkali Flats area. The activity that occurs on the roads is what could cause an effect to a wildlife population, more than the road itself. In the Alkali Flats area, high levels of vehicle use in antelope fawning areas at the time of fawning could increased disturbance to the fawns and perhaps increased predator mortality to fawns by reveling their locations.

Old treatment areas converted to nonnative grasses:

Old chainings are located on Dry Mesa, Sawmill Mesa and 25 Mesa. The treatments on Sawmill and 25 Mesas are the largest, and these were converted to a nonnative grass type. These may present barriers to movement by small mammals and reptiles. However, many of these are being reinvaded by native vegetation, especially pinyon and juniper, reducing the potential barrier to movement.

Extensive stands of single vegetation type:

Pinyon and juniper have grown to dominate much of this landscape that by early accounts had much less woody vegetation. Large expanses of pinyon-juniper as are found on the western 1/3 of the Escalante Area may be a barrier to movement by mule deer, whose movements could be hampered due to too much dense p-j, and not enough open areas for feeding. Also, such areas may be too large for some NTMB species and their distribution and use areas may be limited. Desert bighorn sheep range could be limited or reduced by thick p-j, and may be greatly enhanced or expanded by disturbances clearing travel or pathways through it. Also, turkey use of these

areas may be limited, because of lack of diversity, or inadequate passage ways through it.

Possible new dispersal corridors:

Roads:

Roads serve as easy dispersal corridors for some species such as disturbance-related plant species. The densest road network occurs in the Alkali Flats area, and this coincides with the heaviest noxious weed distribution. Roads can provide travel routes for some species to travel on, especially elk, and may change the way animals move to and from seasonal ranges, or use a year-long range. Roads that are constructed in a straight line, or nearly straight line, connecting the high and low elevation areas could speed up some elk, or deer movements to and from winter and summer range, by-passing normally used transition areas. Thus, placing heavier use on winter ranges or earlier use of summer ranges, or leading them to private lands in the valleys to cause depredation. Also, it is obvious that coyotes travel on roadways too, but I'm not sure they choose to travel on roads at a higher level than off roads. Animals are usually attracted to the vegetation along roadways because it is either an earlier seral stage with more herbaceous species, or it is embellished from receiving a higher amount of moisture, due to runoff from the road.

Livestock, People, Vehicles and Pets:

Livestock provide a mechanism for dispersal of seeds, insects, and other small biota as do people, their vehicles and pets. The presence of barnyard plant species in the native vegetation illustrates the effectiveness of these mechanisms.

Mosaic

The landscape mosaic in the Escalante Area (from the Landsat Vegetation map (1 hectare cell size)) was compared with the map showing the Desired Landscape Objectives (see map). There are six different landscape objective units in the Escalante Area. The seral stage composition and desired patch sizes are listed in the table below.

Health Assessment--Escalante Area

Desired Landscape Objectives (from Fire Management Plan)

C3-Elk. Majority of landscape in mature trees or shrubs, broken up by grass dominated patches 50-200 acres in size and 1/2 to 3 miles apart

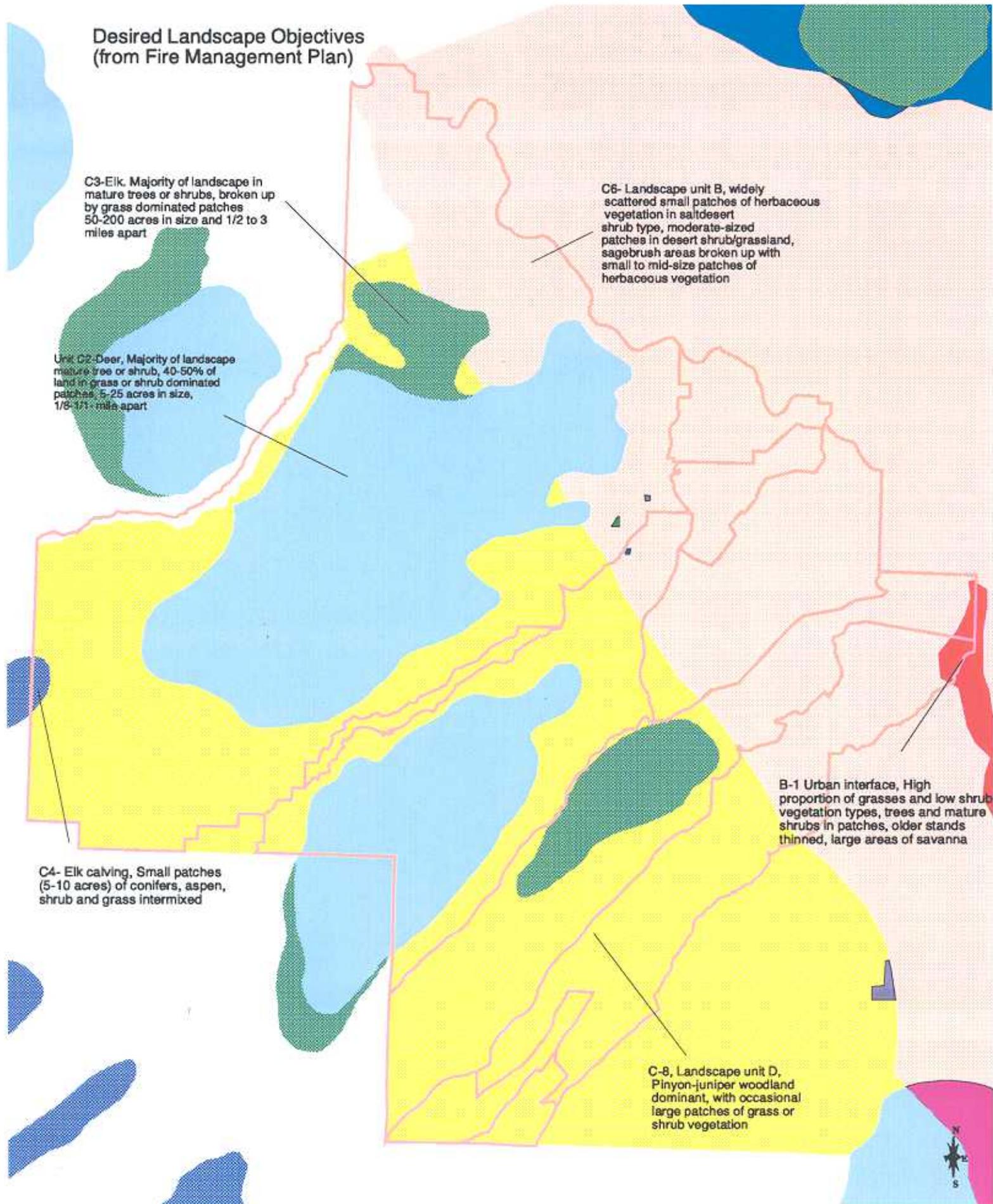
Unit C2-Deer, Majority of landscape mature tree or shrub, 40-50% of land in grass or shrub dominated patches, 5-25 acres in size, 1/8-1/1 mile apart

C6- Landscape unit B, widely scattered small patches of herbaceous vegetation in salt/desert shrub type, moderate-sized patches in desert shrub/grassland, sagebrush areas broken up with small to mid-size patches of herbaceous vegetation

C4- Elk calving, Small patches (5-10 acres) of conifers, aspen, shrub and grass intermixed

B-1 Urban interface, High proportion of grasses and low shrub vegetation types, trees and mature shrubs in patches, older stands thinned, large areas of savanna

C-8, Landscape unit D, Pinyon-juniper woodland dominant, with occasional large patches of grass or shrub vegetation



Landscape Obj. Unit	Seral Stage	Seral Stage % Objectives	Seral Stage % Measured	Desired Patch Size (acres)	Measured Patch Size (acres)
C2	grass/forbs	25	12	5-25	7
Deer winter concentration areas	shrub/grass	25	13	5-25	4
	shrub/tree	25	7	matrix	3
	mature tree	25	68	matrix	68
C3	grass/forbs	30	27	50-200	9
Elk winter concentration areas	shrub/grass	10	13	50-200	3
	shrub/tree	20	4	matrix	3
	mature tree	40	56	matrix	23
C4	grass/forbs	25	0	1-15	0
Elk calving areas	shrub/grass	25	4	1-15	3
	aspen/ shrub	25	74	1-15	15
	conifers	25	21	1-15	7
B1	grass/forbs	20	47	>50	7
Urban interface	shrub/grass	55	40	matrix	3
	tree/shrub	15	0	1-5	0
	mature tree	10	13	1-5	3
C6	grass/forbs	20	40	1-50	11
Landscape unit b	shrub/grass	80	24	matrix	3
	shrub/tree	N/A	9	N/A	3
	mature tree	N/A	27	N/A	34
C8	grass/forbs	20	19	50-200	11
Landscape unit d	shrub/grass	20	17	50-200	3
	shrub/tree	20	8	matrix	5
	mature tree	40	56	matrix	7

Unit C2: The present seral stage proportions in the unit are significantly different from the desired landscape objectives, with there being too much mature pinyon-juniper woodland, and too little early and mid seral stages. The average patch size of the earlier stages is on the small side, but still within the desired ranges.

Unit C3: This unit is based on elk winter concentration areas where they are not overlapping deer winter concentration areas. The seral stage proportions are close to those listed in the landscape objectives. The biggest problem is that the existing early and mid seral patch sizes are too small.

Unit C4: This unit is based on elk calving areas, and only a small amount falls into the assessment area. This piece has seral stage imbalances when compared with the landscape objective, and is especially lacking in grass/forbs stage.

Unit B1: A small piece of urban interface falls onto the far eastern edge of the assessment area. While there is more early stage and less late stage than outlined in the objectives, these probably result from the low elevation and site limitations of this piece of urban interface, and do not conflict with the objective of having low levels of fuel loading and fuel continuity.

Unit C6: The river valley landscape unit b makes up this unit and was supposed to be bounded at the upper elevation by the edge of the pinyon-juniper woodland, however some woodland was included when the boundary was drawn. Overlooking this mistake, too much of the unit is currently in the early seral state and too little in the mid seral state.

Unit C8: Landscape unit d makes up this unit where specific management issues are not present. Existing seral proportions are close, with a little too much mature woodland and too little shrub/tree stage. Patch sizes of the earlier stages should be larger if natural fire patterns are to be emulated.

Standard 4:

Special status, threatened and endangered species (federal and state), and other plants and animals officially designated by the BLM, and their habitats are maintained or enhanced by sustaining healthy, native plant and animal communities.

Indicators used to assess this standard include: stable and increasing populations of endemic and protected species, suitable habitat is available, minimal levels of undesirable or noxious plants, native plant and animal communities distributed adequately to assure sustainability, age class diversity to sustain recruitment and mortality fluctuations, adequate habitat connectivity, photosynthetic activity throughout growing season, community exhibits resilience to human activities, appropriate plant litter accumulations, and landscapes are composed of a variety of successional stages.

Acreage Figures

All 109.076 acres in the assessment area are considered to meet this standard.

Specific Problems

Rare plant associations in the ACEC include alkali cordgrass (*Spartina gracilis*), hanging garden plant associations (*Aquilegia micrantha* and *Mimulus Eastwoodii*), shadscale/galleta grass association, Utah juniper/galleta grass association, and needle-and-thread/westslope grassland association. The three grassland associations are not uncommon, but the sites selected are believed to be in nearly pre-settlement condition and devoid of non-native species. These sites are believed to still be in excellent condition, but there are no monitoring studies in place to assess them. The hanging garden associations are located in contact seeps that are in good condition, largely because their sites are not easily accessible, and difficult to physically impact. If there is a significant increase in recreation foot traffic to these sites in the future, they could be degraded. There are some thistles immediately downstream of the Cottonwood Spring area that do not appear to be spreading or causing any significant problems at this time. Monitoring of these sites is warranted to prevent domination of these drainages by thistle. The Alkali cordgrass wetland is secure throughout its range, but limited to less than 40 sites in Colorado. This community is in good condition in the ACEC, but there are some impacts from vehicle trails that should be closed. The soils in this community are often saturated, although the surface appears to be dry. The Potholes on Escalante Creek area located in the ACEC, and the site is an extremely popular swimming, party, and camping area. Throughout the ACEC recreation activities, especially off road vehicle use and overnight camping have increased dramatically since the site was designated, and impacts have become more noticeable. Although the RMP restricted vehicle use to designated roads and trails, the formal designation of the roads and trails has not occurred.

Wintering bald eagles may be found foraging anywhere within the assessment area, but there is a tendency for the birds to concentrate along the Gunnison River in the assessment area. Wintering bald eagles and peregrine falcon populations have improved throughout their range, and appear to be improving here as well. There are no essential habitats (nests, communal roosts, etc.) identified for bald eagles within the assessment area. Bald eagle use is limited primarily to foraging. Peregrine falcons are known to nest in two drainages on the Uncompahgre Plateau, one of which is Dominguez Canyon. Monitoring of the Dominguez site has only taken place for one year, and in 1999 there was an immature female with the mature male

and no production of young took place. The assessment area is well within the hunting range of the Dominguez Canyon birds. Nest habitat appears to be abundant in the area, including Escalante Canyon, and there is no data to indicate that prey availability is a problem in this area for this species. Southwest willow flycatchers are known to nest in the Escalante State Wildlife area near Delta, but there are no documented nest locations on public land. BLM has identified potential habitat sites along the Gunnison River within the assessment area. No potential habitat sites were identified on other streams within the assessment area. No nesting or transient SW willow flycatchers have been found on public land on the lower Gunnison River in the analysis area.

The U.S. Fish and Wildlife Service has an active reintroduction effort underway for the razorback sucker in the Gunnison River. Prior to this effort, the squawfish was also stocked in the lower Gunnison River. Although the river is historic habitat for bonytail chubs (Recovery Implementatin Program for Endangered Fish Species in the upper Colorado River Basin, 1999), there does not appear to be a viable population in the river at this time. Management of flows from the Currecanti project and impediments to fish migration like the Redlands diversion, are primary causes of habitat diminishment for the listed fish. BLM management of the floodplain has little impact on its suitability of the lower Gunnison for use by these species.

This portion of the Gunnison River population of the Uinta Basin hookless cactus appears to be in good condition. Localized impacts are likely from off road vehicle use, livestock trampling, and cactus borers. Repeated surveys of cactus populations and data from monitoring studies in Escalante Canyon have not identified specific population level problems on public land for this species. BLM has identified only one problem area, Escalante Canyon, where specific efforts to control impacts from recreation activities have been necessary, but no quantified impacts to this species have been identified. Permanent monitoring plots in the Escalante ACEC area show no significant change in the numbers of cactus plants present, or the health of those plants since 1983.

Of the BLM sensitive Species, only the long-billed curlew, roundtail chub, bluehead sucker, and flannelmouth sucker are confirmed to utilize habitats within the analysis area, and the curlew is here only as a migrant. BLM data contains sightings of migrating ferruginous hawks in the area but there are no specific habitat issues probable with migrant hawks. Habitat for the bats is believed to be essentially unchanged since pre-European settlement, and therefore standards for these species are being met. The sensitive fish species are believed to be impacted by dam related river flow alterations, as are the listed fish. BLM is currently a cooperator in annual plans to modify the flow regime in the Gunnison River to benefit the native aquatic species. The northern leopard frog has a high probability of occurring in the area as does the midget faded rattlesnake. We have no reason to believe that standards are not being met for these two species.

All of the listed species that occur in the assessment area are part of populations that occupy much larger ranges than that covered by this assessment. Because of the limited percentage of occupied habitat that is represented by the assessment area, there is little direct population level impact on any of these species from BLM actions that occur in the assessment area.. Populations of listed animal species in the area appear to have increased in the last ten years. Continued work on augmentation of the listed fish populations and negotiations for modification of flow management at the Curecanti Project should continue to enhance the populations of the listed and BLM sensitive fish.

Standard 5: *The water quality of all water bodies, including groundwater where applicable, located on or influenced by BLM lands will achieve or exceed the Water Quality Standards established by the state of Colorado. Water Quality Standards for surface and ground waters include the designated beneficial uses, numeric criteria, narrative criteria, and antidegradation requirements set forth under State law as found in (5 CCR 1002-8), as required by Section 303(c) of the Clean Water Act.*

Indicators used to assess this standard include: appropriate populations of macroinvertebrates, vertebrates, and algae, pollutants and sedimentation attributable to human activity is within amounts specified by the Water Quality Standards established by the State of Colorado.

Acres Figures: **Stream Acres Evaluated Against Standard 5**

Stream Type	Acres Meeting	Meeting but Problem Areas	Acres Not Meeting	Unknown
Perennial	719	57	0	0
Intermittent	93	95	0	12
Ephemeral	1050	238	0	10

Specific Problems:

The potential nonpoint source water pollutants yielded from the area include, sediment, nutrients, and biological pathogens (primarily bacteria and protozoans). Much of the accelerated levels of sediment are a result of historic and some present uses that have resulted in poor watershed condition and unstable stream channels. The influence of recent livestock grazing on water quality varies considerably with site specific conditions and is highly dependent on the frequency, magnitude and timing of runoff events, watershed condition, number and class of livestock, proximity of livestock to surface water systems, duration of grazing and season of use.

Because reliable water quality data is lacking to make a definite determination as to how any given water source compares to its intended uses, classifications and standards, no stream or stream segment was judged to be "Not Meeting" Standard 5, using the philosophy of being innocent until proven guilty. Acres of stream found to be "Meeting but Problem Areas" were based on the condition of the upland drainage area and the adjacent riparian system on perennial and intermittent streams, livestock use within close proximity to live surface waters in the warmer seasons, and livestock use during or just prior to seasons with a high potential for runoff events. Factors evaluated for upland condition include: sites with high levels of bare soil, sites with low levels of plant basal cover, sites exhibiting soil pedestalling, actively eroding incised channels, and road-related erosion problem areas. Riparian conditions were evaluated for stream channel stability, low vegetation cover, and on the perennial streams, presence and type of aquatic life. Areas exhibiting minor problems with upland and riparian conditions, or existing grazing management were rated as meeting Standard 5. As previously described, the "Use Protection" designation on the area's waters is the most liberal for allowing

elevated levels of pollutants.

All perennial stream systems in the area have aquatic life, including either cold or warm water fish. The only perennial system rated as “Meeting with Problems” is the lower reach of Cottonwood Creek, below the confluence of Grade Gulch. This reach has unstable channel conditions, a “Functioning at Risk” riparian system, and uplands with gullies and poor road drainage conditions. Present grazing use in the 25 Mesa Allotment occurs in May and early June when Cottonwood Creek is at peak flow from snowmelt. This situation has the potential to introduce both nutrients and biological pathogens to downstream surface waters from both the high water stage retrieving pollutants along the bank, and runoff events transporting pollutants from the uplands to the channel.

A couple of additional situations worth documenting in this assessment involve Escalante and Roubideau Creeks, both perennial streams. The “Recreation 2” classification on Escalante creek allows for Fecal Coliform concentrations to reach 2000 colonies/100ml. This level of bacteria assumes no human ingestion of water is occurring, such as would be expected from swimming or small, boating activities. However, both activities do occur on Escalante Creek during the spring runoff season. Grazing use can also occur on this allotment at the same time. Consequently, there is the potential for human health issues with this situation.

Lower Roubideau Creek is privately owned but does receive drainage from the lower end of 25 Mesa Allotment. The watershed condition of this contributing area is poor. Accelerating concentrations of sediment potentially occur in Roubideau Creek from high levels of bare soil, gullying and road-related erosion from the uplands on Lower 25 Mesa. Because this reach of Roubideau Creek is privately owned and is not within the Escalante Area, it is not included in this assessment.

The only intermittent channel rated “Meeting with Problems” is the Dry Fork of Escalante Creek (Dry Fork). The entire creek, within the Escalante Area, was included with this designation but conditions appear to progressively worsen in the downstream direction. The stream channel has poor bank stability from historic livestock use, and the uplands have low plant basal cover densities and high amounts of bare soil, both of which contribute to accelerated levels of sediment in the Dry Fork. Black Point Draw is an ephemeral channel that drains into the Dry Fork and was also rated as “Meeting with Problems” because of poor watershed condition. Both the Dry Fork and Black Point Draw are within allotment 4006. The present grazing use for this allotment occurs in late fall and early winter (45 days) which minimizes the potential for excessive loading of nutrients and biological pathogens to local surface waters.

In addition to Black Point Draw, discussed above, other ephemeral drainages rated “Meeting with Problems”, include: Grade Gulch, a tributary to Cottonwood Creek that drains the upper portion of the Sawmill Mesa Allotment (4007); Negro Gulch, a direct tributary to the Gunnison River that drains allotments 4003 and 4017; Boyce Gulch, a tributary to Escalante Creek in allotment 4001; and Leonards Basin, a direct tributary to the Gunnison River in allotment 4001. All of these stream systems drain uplands that have the potential to produce elevated levels of sediment from either soil or gully erosion. Since these channels flow only in response to runoff events, the potential nutrient and biological pathogen contribution from these systems to perennial systems downstream is minimal, especially in allotments 4003 and 4017 that have livestock use periods in the winter season.

Both Branch Creek, an intermittent tributary to the North Fork of Escalante Creek, and Lightning Basin, an ephemeral tributary to Little Domenquez Creek were not rated against Standard 5 because of a lack of data.

CAUSATIVE FACTORS

The existing range trend studies, wildlife studies, and actual use information were poorly suited to assess causes for the polygons not meeting the Standards. However, based on the types of problems uncovered in the rapid assessment, historic livestock grazing, some current grazing practices, fire suppression practices, poorly implemented vegetation treatments, and roads were identified as the main causative factors. These factors have led to the increase in pinyon-juniper invasion and dominance, and the spread of the nonnative cheatgrass, which were cited as major secondary causes for failure to meet health standards.

Historic Grazing:

Histories of the area provide evidence of past conditions, including stocking rates of 40,000 cattle running the Escalante, Roubideau and Dominguez drainages during the winter, spring and fall months-- a rate that is at least 25 times higher than the current level of use. Recorded accounts of how the area looked at the end of the 1800s include descriptions of how the "whole valley was predominantly white sage (winterfat), ...the creeks and streams on the mountain were flowing on top of the ground, meandering through the meadow grass, without the deeply defined channels now present. There was no underbrush in those days, and a cow was visible for long distances unless hidden by the tall, lush grass." Since then, the creeks had cut deep channels lowering the bed of the stream many feet in the space of 40 years or less, and the underbrush and aspen had come in so thickly. Sustained heavy use in spring and fall throughout most of the Escalante Area is thought to have depleted the cool season grass species in particular, both in terms of the plants themselves, and the amount of seed in the soil (seedbank).

Current Grazing:

Current grazing in some areas is maintaining low grass production, and spring use for too many days may be preventing recovery of the cool season species. Grazing of the same areas in both spring and fall probably reduces vigor of herbaceous species, and promotes site dominance by the woody, unpalatable species. Livestock grazing along some streams, particularly in the fall is impacting the riparian species in a few localized spots.

Fire Suppression:

Fire, which is an important force in shaping the plant communities and their distribution on the Plateau, has been aggressively suppressed since the early part of this century. During the early 1880s, the Utes are said to have burned nearly the entire Plateau as they were forced to leave the country. Since that time, few fires have burned to any significant size in the Escalante area, leading to landscape dominance by woody plant species and reductions in the amount of herbaceous species. In fact, the fuels which carry a fire have changed from fine fuels to heavier, hotter burning and harder to ignite fuels, changing the way the landscape would burn if fire were not suppressed. Depleted seedbanks and the presence of nonnative weedy species also impact the way the vegetation now recovers from fire.

Old Vegetation Treatments:

Treatments poorly implemented in the 50s through the 70s were also thought to have caused

some of the polygons to not meet the standards. Chainings or plow and seeds which did not include reseeding, or seeded with nonnative species, or in which follow-up grazing management was not improved typically show problems with erosion, woody species invasion, amount of native grasses and forbs, low diversity, and heavy shrub utilization.

Roads:

Roads and road maintenance are considered to be the major cause of noxious weed infestations. In some areas, particularly along the Gunnison River, livestock grazing has caused the invasions to spread. Poor road placement or drainage is also the main reason behind most of the active gullies.

RECOMMENDATIONS

Standard 1 Soils:

- 1) Change the plant community on some mesa tops in the Dominguez WSA to an earlier seral stage that will provide better protection against soil erosion by allowing more natural fire to burn (implement the UFO Fire Management Plan). Manage grazing to avoid livestock concentrations for long periods on burned patches.
- 2) Leave more litter to protect the soil by changing grazing practices in Leonard's Basin, Little Dominguez, Escalante Flats, Lower 25 and Sawmill Mesas, and Alkali Flats.
- 3) Change the plant community to reduce woody species and increase herbaceous species and soil protection on many of the deep soil areas and old treatments on Dry Mesa and Sawmill Mesa using fire or brushbeater followed by seeding, or by interseeding alone. Manage grazing to avoid livestock concentrations for long periods on treated patches.
- 4) Determine if gullies along Sawmill Mesa Rd., 25 Mesa Rd., and along Alkali Flats roads are active, and if they can be fixed. Work with road maintenance to improve them.
- 5) Expand on existing monitoring studies by placing studies in problem areas noted above, and include a broader representation of community types.

Standard 2 Riparian:

- 1) Change grazing along Dry Fork of Escalante to minimize grazing on woody riparian vegetation (this has been done since the PFC evaluation was made).
- 2) Determine if grazing is contributing to channel braiding along Lower Cottonwood Cr.
- 3) Control Russian knapweed along Gunnison River, prevent future overgrazing along riparian area that promotes knapweed dominance.
- 4) Expand current monitoring studies by placing some transects in riparian areas.

Standard 3 Healthy Native Communities:

1) Control duration of spring grazing to promote increases in cool season grasses and try interseeding select areas with native cool season species throughout all of 25 Mesa, lower Sawmill Mesa, the area along the Gunnison River, and mouth of Escalante Canyon.

2) Increase prescribed fire and natural fire to set back pinyon-juniper invasion into shrub/grass parks and deep soil areas. Also look at tree cutting and roller chopping in parks on upper Sawmill Mesa, 25 Mesa, Dry Mesa and Sowbelly and Tatum Ridges.

3) Reduce the level of shrub utilization in hard-hit areas by stopping the trespass goats on Little Dominguez Creek, by increasing deer and elk dispersal through the creation of more early seral openings via natural and prescribed fire and vegetation treatments, and by including browse species in any interseed or post-disturbance seed mix.

4) Reduce the levels of nonnative species where they already occur, and prevent their expansion into new areas by doing: a) a comprehensive spraying program on the Gunnison River knapweed infestations and other road related infestations (forward roads to Delta County Weed Control. b) reseeding following any soil disturbance in most of Escalante Area: e.g. following pond maintenance, vegetation treatments, etc. c) interseed in old crested wheatgrass seedings where natives are not dominant. d) graze to avoid favoring cheatgrass, and try cheatgrass treatments with livestock, taking care to avoid damage to the limited number of cool season species remaining in the communities, or even to the desirable shrubs. e) minimize development of new roads or of off road travel to prevent spread of weeds and accompanying soil disturbance. f) control salt cedar, halogeton and thistle. g) make sure the TransCO weed monitoring effort and appropriate follow-up measures are followed through with by the company along the Transco pipeline for the next 5 years.

5) Improve landscape mosaic by a) top priority work in C2 polygons creating small early seral patches 5-25 acres in size, b) 2nd priority work in C3 polygons enlarging early and mid seral patches to 50-200 acre size range, c) 3rd priority work in C8 polygons increasing early and mid seral patch size, and d) 4th priority work in C4 polygon increasing amount of early seral patches. Use prescribed and natural fire (UFO Fire Management Plan), and mechanical treatments to do this, with a target of treating 500-1000 acres per year.

6) When designing any new fence or vegetation treatment, consider the topographic limitations on connectivity in this area, and avoid blocking off any mesa top or canyon bottom completely. In addition, avoid cross fencing of riparian areas as livestock are too often allowed to pile up at riparian cross fences, and damage the plant communities.

7) Do not allow change of livestock class from cattle to sheep so that we are in compliance with bighorn sheep management guidelines, unless there is agreement that the change would not jeopardize existing bighorn populations.

8) Where it will not jeopardize bighorn sheep populations, pursue the changing of sheep/cow use to cow/sheep use on a temporary basis to allow for the recovery of shrubs on the sheep areas and grasses on the cow use areas.

9) Review the project feasibility, impacts and design for ponds that were identified in the Dominguez AMP, implement those that will provide water for wildlife and livestock but won't result in range deterioration or violation of WSA regulations.

10) Create pasture set aside for emergency use, e.g. to provide rest for treated or burned area, etc.

11) Change (supplement) existing monitoring studies with canopy and groundcover transects. Add new studies in at risk areas sample more types of plant communities.

Standard 4 Special Status Species:

1) To improve management of listed plants, rare plants, and plant associations in the Escalante ACEC, close all unnecessary roads in the Escalante ACEC. Close all roads and trails that lead across the *Spartina* grassland in the Escalante ACEC. Develop some educational material for the users of the area that includes some information on the plants and geology.

2) Treat the thistle plants that have established immediately below the contact seeps in the Escalante ACEC area, to remove them from the drainage. In addition, make certain that there is no large seed source for thistle upstream of the seeps.

3) Enforce the livestock "trailing use only" provisions for the Escalante ACEC to prevent potential damage to Uinta Basin hookless cactus and other rare plants in the ACEC.

4) Develop monitoring studies to track the integrity and health of the ACEC's important plant communities and special status plant populations.

Standard 5 Water Quality:

1) Monitor for Fecal coliform bacteria in Escalante Creek during the spring runoff period below the pot holes. For ingestion of small quantities of water, coliform should not exceed 200 colonies/100 ml.

2) Minimize spring livestock use along perennial and intermittent drainages as much as possible.

3) Perform road maintenance on identified problem areas.

4) Improve watershed condition (vegetation cover) on Lower 25 Mesa, Dry Mesa, Sawmill Mesa, Leonards Basin, and the Negro Gulch and Boyce Gulch watersheds.

5) Implement riparian management on the Dry Fork of Escalante and Lower Cottonwood Creeks to improve bank stability.

6) Assess identified gullied systems as to their stage of development and causal factors, and prepare

corrective actions.

References:

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