COLLABORATIVE FOREST LANDSCAPE RESTORATION

ECOLOGICAL INDICATORS REPORT

2014

Uncompahgre Plateau Project

CFLR003

Project Name: Uncompahgre Project/CFLR003 **State: Colorado**

Initial Landscape-scale Desired Conditions for the life of the project as defined by the Collaborative

Goals for the Uncompahgre Plateau Project:

- Enhance the resiliency, diversity and productivity of the native ecosystem on the Uncompahgre Plateau using best available science and collaboration.
- Reintegrate and manage wildfire as a natural landscape scale ecosystem component that will reduce the risk of unnaturally severe or large crown fires.
- Restore ecosystem structure, composition and function to encourage viable populations of all native species in natural patterns of abundance and distribution.
- Preserve old or large trees while maintaining structural diversity and resilience; the largest and oldest tress (or in some cases the tress with old-growth morphology regardless of size) should be protected when feasible from cutting and crown fires, focusing treatments on excess numbers of small young trees where this condition is inconsistent with Historical Range of Variability (HRV) conditions.
- Reestablish meadows and open parks and re-establish grasses, forbs, and robust understory communities.
- Manage herbivory - Grass, forbs, and shrub understories are essential to plant and animal diversity and soil stability. Robust understories are necessary to restore natural fire regimes and to limit excessive tree seedling establishment. Where possible, defer livestock grazing after treatment until the herbaceous layer has established its potential structure, composition, and function. Project partners will work with the CDOW to manage big game populations to levels that will contribute to successful restoration treatments.

Results Summary

Current Landscape-Scale Evaluation based on treatments implemented and monitored in 2010-2014. See details below.

Ecological Indicators	Datasets and/or databases of records used	Good, Fair, Poor and (%) landscape across which progress is being made towards desired conditions	Are you achieving your CFLRP objectives? (Y/N)	If NO, briefly explain…
Fire Regime Restoration	Field-sampled data and Forest Vegetation Simulator canopy fuels estimates.	Overall – Fair 4.3 % of the landscape with progress.	YES – See details below	
Fish and Wildlife Habitat Condition	Project-scale monitoring, FACTS, WIT	Overall – Good 3.7 % of the landscape with progress.	Yes – stated goal is 52,620 acres of treatment over 10-years. We have completed treatment on 41% of the targeted acres to date.	
Watershed Condition	National Forest datasets were consulted – WCC Protocols	Overall – Fair 0% of the landscape moved from fair to good watershed condition class. However, specific attribute affecting watershed condition class did improve: open road density and fire condition class but improvement was of insufficient magnitude to change overall class rating. Some watersheds moved from class I to II for invasive species due to improve inventory data and the types of species being treated. Conditions improved for invasive species through increased treatment and fair to good efficacy rates.	Yes – See details below	
Invasive Species	Project-scale monitoring. FACTS database	Overall – Good-Fair O.5 % of the landscape toward desired conditions = Good. Average efficacy is 0.76 = Fair	Yes – stated goal is 6,800 acres of treatment with at least 80% efficacy over 10-years. We are currently at 3,471 acres treated with and average efficacy of 0.76.	

Fire Regime Restoration

Desired Conditions Target for Fire Regime Restoration: 100 % change (relative to the desired condition) occurs across 15.4% of the landscape area by 2019. Data only exists for the Escalante Project Area which is 25% of the entire Uncompahgre Plateau project area (see details below).

BACKGROUND AND STATED OBJECTIVES

Fire history data suggests that ponderosa pine and dry mixed-conifer forests historically experienced frequent, low-severity fires that killed saplings but not large diameter trees. Fires would occasionally burn with high severity, leaving a vast majority of trees dead in small patches across the landscape. Differences in topography and weather/wind conditions across the Plateau likely caused dramatic variability in fire return intervals prior to the 1900s, but fire-scars suggest that many ponderosa pine forests on the Plateau experienced fires every 8-17 years. Large-scale fires occurred on the Plateau in 1785, 1818, 1842, 1863, and 1879, with fires stopping abruptly after this point.

Ponderosa pine and dry mixed-conifer forests of today are much different from those of the past. Logging, livestock grazing, and fire suppression have greatly reduced the frequency and extent of fires on the Plateau, causing fuel conditions to change in ponderosa pine and dry mixed-conifer forests. Ponderosa pine and dry mixed-conifer forests have potentially "missed" three or more fire events over the past 120 years, although some areas might not have burned even in the absence of human activities. The absence of frequent fires has increased hazards associated with high-severity fires (e.g., deep litter and duff layers, high basal areas, low canopy base heights, and continuous tree canopies). Some mixed conifer forests on the Uncompahgre Plateau have basal areas that are almost three times greater than conditions in 1875.

The Uncompahgre Plateau Collaborative Restoration Project is largely focused reducing the risk of widespread, high-mortality fire but also working to allow fire to be a natural disturbance. Overarching goals are to: (1) reduce spatial homogeneity in forest fuels, both within stands and across the landscape; (2) move away from the status quo where money is spent fighting fires and work towards forest conditions which would allow resource managers the flexibility of allowing fires to burn (either prescribed fire or wildland fire for resource benefit); AND (3) prevent or slow the spread of invasive weeds into burned areas.

To date, much of the work towards these goals has occurred in in mixed conifer and ponderosa pine forests as part of the Escalante Project. To help our progress towards these broad goals, the collaborative developed a set of "undesired" conditions at the landscape and stand scales for these vegetation types, and developed a monitoring program to evaluate our progress away from these conditions. The undesired conditions are:

A. Landscape scale:
    - Undesirable condition #1: Active crown fires are likely across >300 contiguous acres or in patches >30% of burn units under 90th percentile weather conditions. By 2019.

- Undesirable condition #2: Historically we have been overly cautious with prescribed fires. Our objective is to increase the use of prescribed fire by reducing wildfire hazard in treatment areas.

B. Project scale:
    - Undesirable condition #1: We implement treatments that fail to reduce crown fire hazards. We leave ladder fuels covering >30% of the stand, and crown continuity remains high because we didn't create treeless openings (0.25 to 0.5 acres) across the stand.
    - Undesirable condition #2: Prescribed burning kills >10% of residual ponderosa pine and Douglas-fir trees >8 inches dbh.
    - Undesired condition #3: Invasive weed spread is increased following prescribed fires relative to areas without fire.

We then developed metrics that allow quantification of if conditions are moving away from these undesired conditions, at both scales. (See Tables 1 and 2 for Landscape and Project level metrics and evaluation results.) Please note that treatment has begun on other portions of the Plateau, but they were not evaluated here since our multi-party monitoring program was focused on the Escalante project area.

PROGRESS AWAY FROM UNDESIRED CONDITIONS

Landscape scale

For the purposes of this report, the total landscape is defined as the Escalante project area, or 142,000 acres. Landscape-scale progress toward fire regime restoration was defined based on the assumption that 100% progress would be achieved if the expected proportion of treatments has been completed, and if these treatments were effective. We project that by the end or 2019, 21,900 acres, or 15.4% of the landscape, will have been directly affected. We are currently 5 years into the project, and to be on schedule we should have treated around 10,950 acres. Therefore, 100% success would be achieved if 10,950 acres had good progress away from undesired conditions. This translates to 7.7% of the landscape. (The treatments are expected to have positive effects on surrounding lands, but we are being conservative and only including actual areas treated in our estimate of the portion of the landscape affected.) As such, good, fair, and poor scoring was as follows:

- Good = Expected progress is being made towards Desired Conditions across 5.3 – 7.7% of the CFLR Landscape area.
- Fair = Expected progress is being made towards Desired Conditions across 2.5 to 5.29% of the CFLR Landscape area
- Poor = Expected progress is being made towards Desired Conditions across 2.49% or less of the CFLR Landscape area

Overall, expected progress has been made on 4.3% of the landscape area. We are having FAIR success towards achieving restoration at the landscape scale (Table 1). Active crown fire potential has been reduced, and will make contiguous high severity fire patches >300 acres less likely near treatments. Importantly, mechanical treatments have made surface fire likely even under severe fire conditions, which will make prescribed fire feasible in these stands.

LANDSCAPE SCALE FIRE REGIME RESTORATION PROGRESS			
Undesirable condition #1: By 2019, active crown fires are likely across >300 contiguous acres or in patches >30% of burn units under 90th percentile weather conditions.			PROGRESS: **FAIR (success on 4.3% landscape)**
Metric for successful progress	Measurement tool	% of landscape with progress	Explanation
#1: Active crown fire is not predicted to occur in 90th percentile weather conditions in all treatment units completed, or 7.7% of the landscape.	Field-collected data and fire modeling in Forest Vegetation Simulator.	4.3%	Active crown fire is not predicted in any areas following treatments. .
Undesirable condition #2: Historically we have been overly cautious with prescribed fires. Our objective is to increase the use of prescribed fire.			PROGRESS: **FAIR (success on 4.3% of landscape)**
Metric for successful progress	Measurement tool	% of landscape with progress	Explanation
Metric 2 a) forest conditions are such that surface fire is likely at 90th percentile weather across 100% of treated areas or 7.7% of the landscape.	Field-collected data and fire modeling in Forest Vegetation Simulator.	4.3%	Surface fire is predicted at all monitored units that have been mechanically treated.
Metric 2 b) prescribed fires occur on >50% of treatment units where broadcast burning has been planned as part of prescription.	Measured-with year-end reports of acres treated (in future)	NO DATA	It is too early to report on prescribed fire success, since mechanical treatments were only recently completed. The first projects are now ready for burning.
			OVERALL PROGRESS: FAIR

Project scale

Project-scale progress toward fire regime restoration was based on results from 100% of monitored treatment areas completed to date (through 2014). Good, fair, and poor scoring was as follows:

1) Good = 66% or more of implemented treatments result in measurable progress towards individual project-level Desired Conditions.
2) Fair = 33% - 65.9% of implemented treatments result in measurable progress towards individual project-level Desired Conditions.
3) Poor = 32% or less of implemented treatments result in in measurable progress towards individual project-level Desired Conditions.

Treatments have been successful in reducing crown fire hazard and avoiding Undesirable Condition #1 (Table 2). Nearly all stands had improved canopy fuels conditions (large increases in canopy base height, and reduced canopy bulk density). Surface fire was predicted under 90th percentile conditions in all treated units.

We are planning future monitoring efforts to show if we are avoiding the other aspects of project-scale undesired conditions. We will be assessing canopy cover heterogeneity with aerial imagery analysis. This analysis technique has shown if treatments have shown decreased canopy cover and increased complexity of forest cover patterns for the Front Range CFLRP and we anticipate it being an important monitoring tool. We will also be monitoring to ensure undesired conditions do not occur following prescribed fires. We do not want residual large trees to be killed by fire, and we do not want to speed weed invasion. This effort has not begun due to the few areas that have been burned to date.

PROJECT SCALE FIRE REGIME RESTORATION PROGRESS			
Undesirable condition #1: We implement treatments that fail to reduce crown fire hazards. We leave ladder fuels covering >30% of the stand, and crown continuity remains high because we didn't create treeless openings (0.25 to 0.5 acres) across the stand.			PROGRESS: **GOOD (96%)**
Metric for successful progress	Measurement tool	% of treatments with progress	Comments
# 1: Within 2 – 3 years of treatment, ladder fuels are reduced across >30% of treatment units as measured by canopy base height increases.	Field-sampled data from treated stands	88%	Canopy base height increased 5 – 40 feet, on average, in 88% of monitored plots, while it was unchanged in 12% of plots.
2a) A reduction in canopy bulk	Field-sampled data and Forest Vegetation Simulator canopy fuels	100%	Estimated canopy bulk density

density	estimates.		decreased by 28% - 95%.
2b) Active crown fire is not predicted at 90th percentile weather conditions	Field-sampled data and Forest Vegetation Simulator potential fire behavior estimates.	100%	All monitored areas are expected to burn with surface fire under 90th percentile weather conditions.
2c) Decreased cover of canopy as measured by aerial imagery (to be done in future monitoring).	Decreased cover of canopy as measured by aerial imagery. Has not begun.	NO DATA	We will be beginning spatial heterogeneity monitoring in 2015.
Undesirable condition #2: Prescribed burning kills >10% of residual ponderosa pine and Douglas-fir trees >8 inches dbh.			PROGRESS: **NO DATA**
Metric for successful progress	Measurement tool	% of landscape with progress	Explanation
Mortality level of ponderosa pine and Douglas-fir >8 inches dbh is <10% of residual stems following fire.	Will be measured with field-sampling following prescribed fires. The first prescribed fire was burned in September 2014.	NO DATA	Will be monitored within 2 – 3 years of prescribed fire implementation.
Undesired condition #3: Invasive weed spread is increased following prescribed fires and mechanical treatments relative to areas without fire.			PROGRESS: **Fair**
Metric for successful progress	Measurement tool	% of landscape with progress	Explanation
Invasive weeds are not increasing on areas treated mechanically or with prescribed fire. Efficacy of pre-and post-spraying or mechanical removal of weeds is at least 80%.	• Completion of pre-treatment risk assessment. • Spray or mechanical remove/kill weeds prior to completing Rx or mechanical treatments in high risk areas. • Complete efficacy surveys to ensure at least 80% kill rate.	See Below	Measure annually prior to and following prescribed burning or mechanical treatments.
% landscape with progress for undesirable condition #3: Progress: 1501.4 acres of weed risk assessments have been conducted pre-Rx and mechanical treatments in high risk			

areas. 708.9 acres have been treated with a kill rate of 87%. 47% of all project acres inventoried have been treated with an average kill rate of 87% There needs to more of an emphasis on completing weed risk assessments and treating weeds in high risk areas in association with Rx treatments. Overall Progress: I would be inclined to list this as fair. The projects on which risk assessments and treatments have occurred have yielded very good results. However, the number of acres on which assessments and treatments have occurred in relation to the number of total project acres is small.	
	OVERALL PROGRESS: FAIR

A)Pre- and B)post-treatment pictures of a stand. Ladder and canopy fuels have been reduced substantially, and surface fire is predicted to burn in this stand even under 90th percentile weather conditions.

A)

B)

Fish and Wildlife Habitat Condition

Desired Conditions Target for Fish and Wildlife Habitat Condition: 100 % change (relative to the desired condition) occurs across 9% of the landscape area by 2019.

Background

Recent assessments and studies indicate that current seral conditions dominate vegetation types within the Uncompahgre Plateau project area are not well distributed between Early, Early-Mid, Late-Mid and Late seral stages as compared to Potential Natural Vegetation (USDA, Grand Mesa, Uncompahgre and Gunnison National Forest(s), 2005). Due to the lack of disturbance and/or treatment, most vegetation types have moved to a later seral condition. All vegetation types discussed include wildlife habitat for a diversity of wildlife species. It is important to have a greater distribution of seral stages for each vegetation type to maintain suitable wildlife habitat for a variety of species.

The vegetation types discussed for wildlife habitat include: mixed conifer, Ponderosa Pine, Sagebrush, Pinyon- Juniper, Oak (and other mountain shrubs), Aspen, spruce-fir and riparian. Treatments in these vegetation types have included: commercial timber harvest, non-commercial mechanical harvest and prescribed fire. The majority of the commercial timber harvest has occurred in the mixed conifer and Ponderosa Pine stands but these treatments have also benefitted aspen, oak and mountain shrubs.

Desired conditions on the landscape include:

- Move all vegetation types to a broader range of seral stages as shown in 2005 Comprehensive Assessment for the GMUG NF.
- Restore or improve habitats for wildlife in all vegetation types.
- Improve the diversity of habitat available.

Desired conditions on the project scale include:

- Historically mini-meadows (≥0.25 acres in size) covered about 70% of the area and currently they average 25%. The desire is to move stand structure to include historic levels of mini-meadows in all conifer vegetation types.
- Treat aspen stands to enhance re-sprouting and ensure that regeneration rates will withstand browsing from wild and domestic ungulates.
- Currently Ponderosa Pine Stands have a higher tree density per acre than historic levels. Stands are closed in and contain fewer openings. Treat Ponderosa Pine stands to reduce tree density and open stands so fire can be re-introduced to maintain stand vigor.
- Treat spruce-fir stands to encourage an uneven age class stand structure. In Lynx habitat, create openings up to 2 acres in size that are in areas to enhance aspen sprouting and spruce-fir regeneration to improve habitat for snow shoe hares.

- Treat oak/mountain shrub vegetation to break up age-class and distribution. Currently most oak is classified in the mid to late seral stage. Early seral oak and mountain shrub vegetation is important for big game browse. Focus treatments that encourage re-sprouting and more open stands.
- In Pinyon/Juniper stands, focus treatments in areas previously disturbed. Treatments should open stand structure and allow for grasses, forbs and mountain shrubs to grow and provide adequate big game winter range forage.
- Treat riparian habitats to improve green line vegetation composition and increase habitat for native cutthroat trout species.

Landscape-scale scoring

For purposes of this report, the total landscape is defined as the Forest System Lands identified in the Uncompahgre Collaborative Forest Landscape Restoration Project area which is 572,000 acres. Landscape-scale progress towards wildlife habitat improvements was defined based on the assumption that 100% progress would be achieved if the expected proportions of treatments have been completed, and if these treatments were effective. It was projected that by the end of the CFLR project that a total of 52,620 acres would be treated in some way which is 9% of the Uncompahgre Plateau. We are currently 5 years into the project, and to be on schedule we should have treated around 26,310 acres in the vegetation discussed above. Therefore 100% success would be achieved if 26,310 acres (4.5% of the landscape) had good progress toward desired conditions. Treatments are expected to have positive effects on surrounding lands, but we are being conservative and only including actual areas treated in our estimate of the portion of the landscape affected. In some cases acres treated may have been counted more than once if they accomplished multiple vegetation types within a project area (e.g. treatment of mixed conifer may also stimulate aspen regeneration through disturbance). As such, good, fair and poor scoring was as follows:

- Good = Expected progress is being made towards Desired Conditions across 3.1-4.5% of the CFLR landscape area.
- Fair = Expected progress is being made towards Desired Conditions across 1.6- 3.0% of the CFLR landscape area
- Poor = Expected progress is being made towards Desired Conditions across 0-1.5%% of the CFLR landscape area

"Expected progress" will be defined using 5 year benchmarks for FY2010 projects and 3 benchmarks for FY2012 for each DC based on a percentage of the lifetime outcome specified in each Landscape's proposal.

Overall, expected progress has been made on 3.7% of the landscape area (21,574 acres). We are having **Good** success towards achieving restoration at the landscape scale. Treatments have occurred in all vegetation types and response of the vegetation is showing progress towards more desirable conditions. The majority of the treatments have been mechanical because conditions have not been conducive to prescribed fire.

Landscape Scale Wildlife Habitat Restoration Progress			
Desired Condition: Move all vegetation types to a broader range of seral stages as shown in 2006 Comprehensive Assessment for the GMUG NF			**Progress:** Fair (treatments on 41% of proposed acres for all veg types.)
Metric for successful progress: Vegetation type	**Measurement tool**	**% of 10-year objected treated**	**Discussion**
Mixed Conifer	Field-collected data and reported acres treated	36%	Treatments have occurred on a total of 3,973 acres of the proposed 11,000 acres
Ponderosa Pine	Field-collected data and reported acres treated	37%	Treatments have occurred on a total of 5,526 of the proposed 15,000 acres
Sagebrush	Field-collected data and reported acres treated	118%	Treatments have occurred on 2,124 acres and only 1,800 were proposed
Pinyon/Juniper	Field-collected data and reported acres treated	109%	Treatments have occurred on 2,741 and only 2,500 acres were proposed
Oak/Mountain shrub	Field-collected data and reported acres treated	37%	Treatments have occurred on 2,611 acres of the proposed 7,000 acres
Aspen	Field-collected data and reported acres treated	20%	Treatments have occurred on a total of 2,238 acres of the proposed 11,000 acres
Spruce/Fir	Field-collected data and reported acres treated	50%	Treatments have occurred on a total of 2010 acres of the proposed 4,000 acres.
Riparian	Field-collected data and reported acres treated	116%	Treatments have occurred on a total of 370 acres and only 320 acres were proposed

Field data indicates that treatments in each vegetation type have helped move them to a more desired range of successional stages. Some vegetation types had a majority of acres in the late successional stages and little acreage in earlier successional stages. Other vegetation types were closed in and desired conditions were for more open stands. Overall treatments have been successful at achieving desired conditions on the landscape scale. For the remainder of the CFLR project, focus should be on increasing treatments in oak, aspen, spruce-fir, mixed conifer and ponderosa pine habitat types. Additional treatments in the other vegetation types may still occur if opportunities exist even though treatments to date have exceeded what was identified in the CFLR project proposal.

Project-scale scoring

Project level monitoring has been extensive with Forest Service specialists and partners. Responses in all vegetation treatments have been well documented and tracked. Some projects have not reached objectives but design features were adjusted for future treatments. Based on results from monitoring all implemented treatments will be rated on the following scale for project level objectives listed above.

- Good = 75% or more of implemented treatments result in measurable progress towards individual ***project-level*** objectives.
- Fair = 26% - 74% of implemented treatments result in measurable progress towards individual ***project-level*** objectives.
- Poor = 25% or less of implemented treatments result in in measurable progress towards individual ***project-level*** objectives.

Project scale wildlife habitat restoration progress

		Progress: Good (All veg types are ≥75% resulting in progress toward project-level objectives.)	
Vegetation type	**Measurement tool**	**% of treatments with progress**	**Comments**
Mixed Conifer **Ponderosa Pine** **Sagebrush** **Pinyon/Juniper** **Oak/Mountain shrub** **Aspen** **Spruce/Fir** **Riparian**	On ground monitoring	≥75%	Monitoring suggests that design features at the project level are meeting desired conditions for this vegetation type which would be a rating of **good** for all veg types.

Monitoring of current projects plays a key role in developing and implementing additional projects. The 2014 annual report for the Uncompahgre Collaborative Forest Landscape Restoration project has identified the monitoring that has taken place within treatment areas (USDA, Forest Service, 2014). These monitoring reports include: Sanborn Park Monitoring Report, A report by CFRI on Ponderosa Pine and mixed-conifer forests, Pinyon-Juniper Ecosystems assessment, Aspen Browse study by Binkley and Romme, and many others. Monitoring shows that treatments at the project level are being effective at ≥75% for reaching project-level desired conditions this rates out as good.

Literature Cited

USDA, Forest Service, 2014. The Uncompahgre Plateau CFLRP 2014 Annual Report.

USDA, Grand Mesa, Uncompahgre and Gunnison National Forests, 2005. Comprehensive Assessment Volume 3 – Terrestrial Resources

Watershed Condition

Desired Conditions Target for Watershed Condition: 100% change (relative to the desired condition) occurs across 5% (2 watersheds) in the landscape area by 2019 (overall watershed score). Maintain individual watershed indicators at class I and move class II and II watersheds to a higher watershed class (class II to class I and class III to class II).

BACKGROUND AND STATED OBJECTIVES

Since the initiation of the Uncompahgre Plateau Collaborative Forest Landscape Restoration Project (CFLRP) in 2010, completed projects have affected the landscape in ways that can be indicated through metrics within the Watershed Condition Framework reported through the Watershed Classification and Assessment Tracking Tool (WCATT). The WCATT tool is described in the Watershed Condition Classification Guide (USDA, 2011). Five individual attributes in WCATT have been determined to correlate with the Ecological Outcome Measures and desired conditions identified for the Uncompahgre Plateau CFLRP. These WCATT attributes were evaluated to determine what changes have occurred to watershed condition based on CFLRP activities between 2010 and 2014.

The Uncompahgre Project watershed desired conditions focuses on five primary indicators from the Watershed Condition Framework.

- Riparian/wetland vegetation Condition Indicator
- Roads and Trails Condition Indicator
- Terrestrial Invasive Species Indicator
- Fire Regime Condition Class Indicator
- Aquatic Biota Condition Indicator

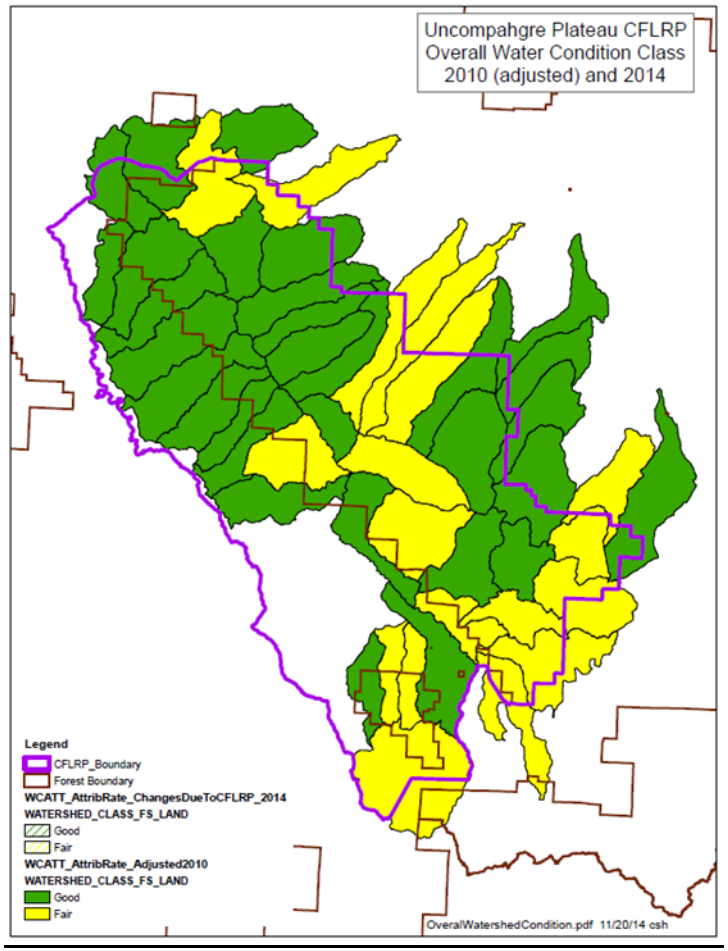
For each of these specific indicators, specific projects and outcomes have been identified that could when fully implemented alter the overall condition class of a watershed.

PROGRESS TOWARD DESIRED CONDITIONS

Overall Watershed Class Changes between 2010 and 2014):

Because the roads and trails considered in the original WCATT assessment were less inclusive than this review of watershed conditions (see description above under open road density), the overall watershed class for 2010 was adjusted. Only one watershed condition classification was different between the adjusted 2010 value and the original WCATT (2010) - one overall watershed condition classification decreased from Good to Fair (140300030603 - Shavano Creek-Tabeguache Creek), due to the percent of open routes within 300 feet of water (See Overall Watershed Condition Map). When comparing 2014 overall conditions to the adjusted 2010 overall conditions, there was no change as a result of activities completed for the Uncompahgre Plateau CLFRP.

Overall Watershed Condition Class	WCATT 2010	Adjusted 2010	2014
Good	32	31	31
Fair	17	18	18



Individual Condition Indicators:

- **Riparian/wetland vegetation condition indicator – move riparian in the upper-Dominguez Creek watershed from Fair (2) functioning-at-risk to Good (1) Functioning Properly.**

Progress to date: The Forest implemented the Dominguez Creek riparian pasture in 2013. Annual monitoring indicates improving trend in riparian vegetation but progress is slow. The Multiple Indicator Monitoring (MIM) methodology (U.S. Department of Interior, 2011) is being used to assess ecological changes over time. We are currently not meeting objectives for this indicator.

- **Roads and Trails Condition Indicator – reduce open road density through implementation of the Uncompahgre Travel Plan. The goal is to decommission 130 miles of routes over 10 years. The goal is to move 7 watersheds to an improved condition class as it relates to roads and trails.**

  Progress to date:

  Open Road Density – Watershed condition class for adjusted open road/motorized trail density improved within 5 sub-watersheds since 2010. This represents 71% of goal (see details below).

  Proximity to Water - Watershed condition class for adjusted roads/motorized trails in close proximity to water has not changed since 2010 (see details below).

<u>Open Road Density</u>

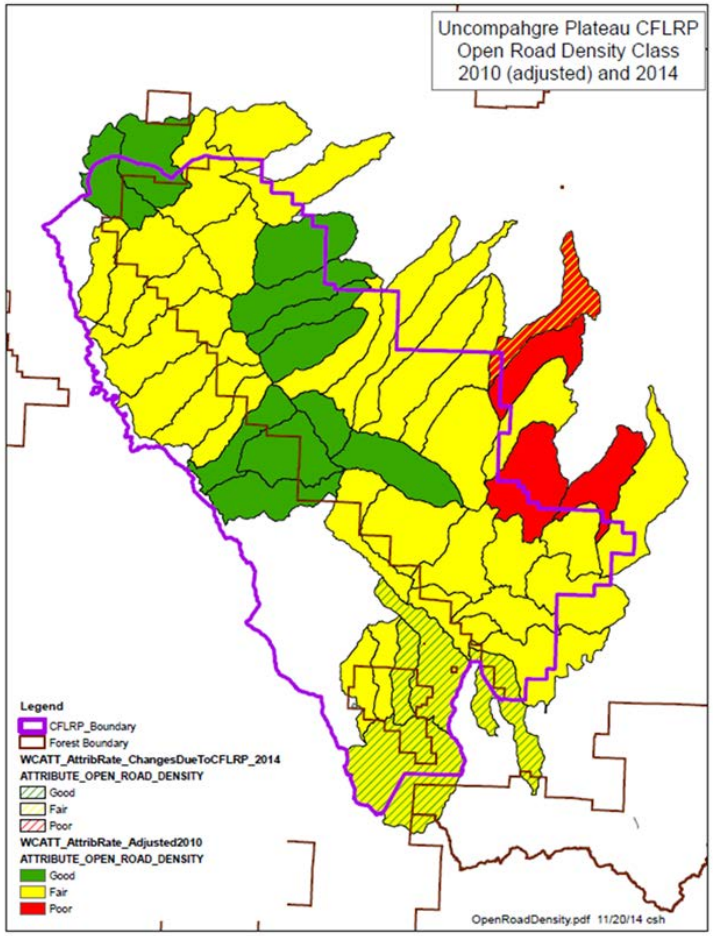
The open road density values originally reported in WCATT in 2010 were derived based on supplemental direction from the Washington Office to only consider open roads with Forest Service jurisdiction on national forest system lands with maintenance level 2 through 5. No trails, administrative routes (maintenance level 1), non-Forest Service jurisdiction (e.g. private, county), user created routes or roads on non-NFS lands within the forest boundary were considered in the previously reported WCATT results. (WCATT results are shown in table below:

In 2010, forest personnel wanted to use all existing roads (system and non-system) and motorized trails within the forest boundary, but were directed not to because not all national forests had consistent data. For this evaluation of the effects of road and trail decommissioning on the Uncompahgre Plateau CFLRP area, all existing open roads (system and non-system) and motorized trails were considered in determining the open road density within the portion of each sub-watershed within the forest boundary. The table below shows the adjusted 2010 density (includes all roads and motorized trails) and the 2014 open route density ratings. Reported ratings in 2010, adjusted 2010 and 2014 classifications are based on the rating system from the Watershed Condition Classification Technical Guide.

Good (1) - density < 1 mil/sq.mi.;
Fair (2) – density 1 to 2.4 mi/sq.mi.;
Poor (3) – density > 2.4 mi/sq. mi.

Open Road Class	WCATT 2010	Adjusted 2010	2014
Good	25	11	15
Fair	21	34	31
Poor	3	4	3

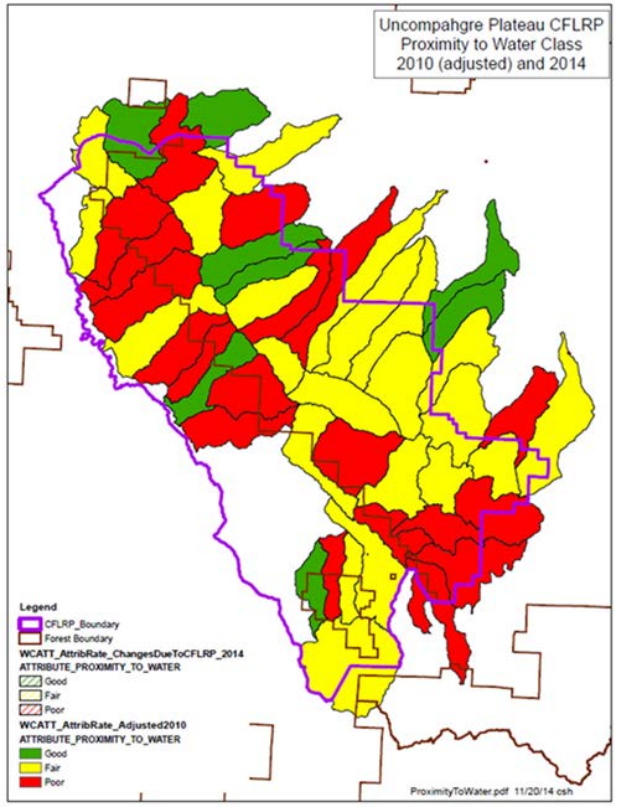
Twelve sub-watershed have a different class when comparing the 2014 results to the WCATT 2010 results (11 are worse, 1 is better). This difference is due to the increased mileage of routes considered in the density calculations in 2014. When comparing the 2014 results to the adjusted 2010 classification, none of those same 12 sub-watershed differ between 2014 and 2012; however five other sub-watersheds show an improved open route density (140300030405-Headwaters Maverick Draw, 140300030402-McKee Draw, 140300030401-Headwaters Naturita Creek, 140200060505-Lower Dry Creek, 140300030305-Specie Creek-San Miguel River) (See Adjusted Open Road Density Map below).



Proximity to Water

Proximity to water of open roads and motorized trails considered in the open road density attribute described above, were evaluated to determine the number of miles within a 300 foot buffer of water bodies and/or perennial or intermittent streams. As with the open road density determination above, because all open roads (system, non-system, all jurisdictions) and motorized trails were included in this evaluation but were not in the original WCATT in 2010, the proximity to water rating was adjusted for 2010 to include all roads and motorized trails within 300 feet of water. The difference between the WCATT 2010 value and the adjusted 2010 values below are due to non-system roads and open motorized trails within 300 feet of water-bodies and streams. There is no change in ratings between 2014 and the adjusted 2010 values even though 97 miles of routes were decommissioned between 2010 and 2014, because the routes that were decommissioned were mostly not within 300 feet of water (see Proximity to Water Map below)

Proximity to Water Class	WCATT 2010	Adjusted 2010	2014
Good	11	8	8
Fair	26	22	22
Poor	12	19	19



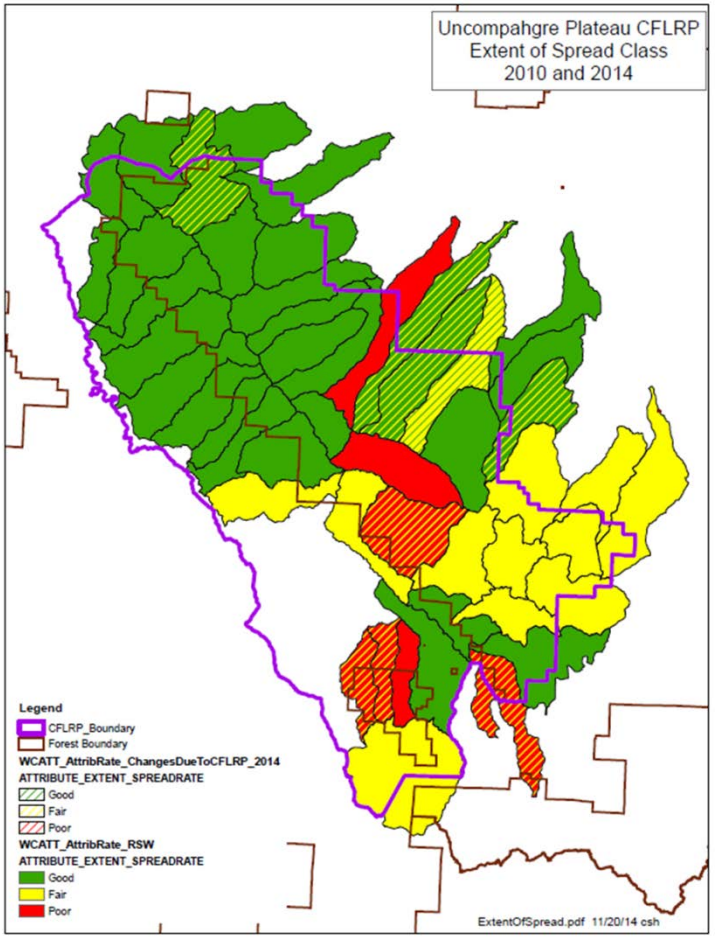
- **Terrestrial Invasive Species – Maintain extent and rate of spread less than 10% of the watershed area within functional watersheds. In watershed rated as Fair (2) Functioning-at-risk and Poor (3) Impaired Function reduce terrestrial invasive species spread. The restoration performance outcome (efficacy) is scored as follows:**

  Progress to date: Five sub-watersheds improved by a condition class since 2010 however, due to better inventories on invasive species and species being treated and rate of success of treatment three sub-watersheds moved from good to fair.

Invasive Species

When the initial WCATT rating was made for invasive species in 2010, inventory data was very limited so the WCATT invasive species rating for the GMUG used a subjective extent of spread rating based on the species known to occur in a given sub-watershed, and the potential risk for invasive species infestation following disturbance. Since 2010 inventory and treatment of invasive species has increased within the Uncompahgre Plateau CFLRP area. Invasive species treatments complete under CFLRP have been done in 33 sub-watersheds. Inventory and treatment work since 2012 indicate that five sub-watersheds improved by a condition class. The condition class remained the same in eleven sub-watersheds but conditions were improved in six of them. The condition class in three sub-watersheds moved from good to fair condition due to improved inventory of invasive species locations, species being treated and the success rate of treatments. Across the entire CFLRP landscape conditions related to invasive species has been improved. Specifics are discussed under the invasive species ecological outcome measure. Changes in rating by watershed are displayed in the table below. (See Extent of Spread Map below)

Extent spread Rate Class	WCATT 2010	2014
Good	30	27
Fair	12	19
Poor	7	3

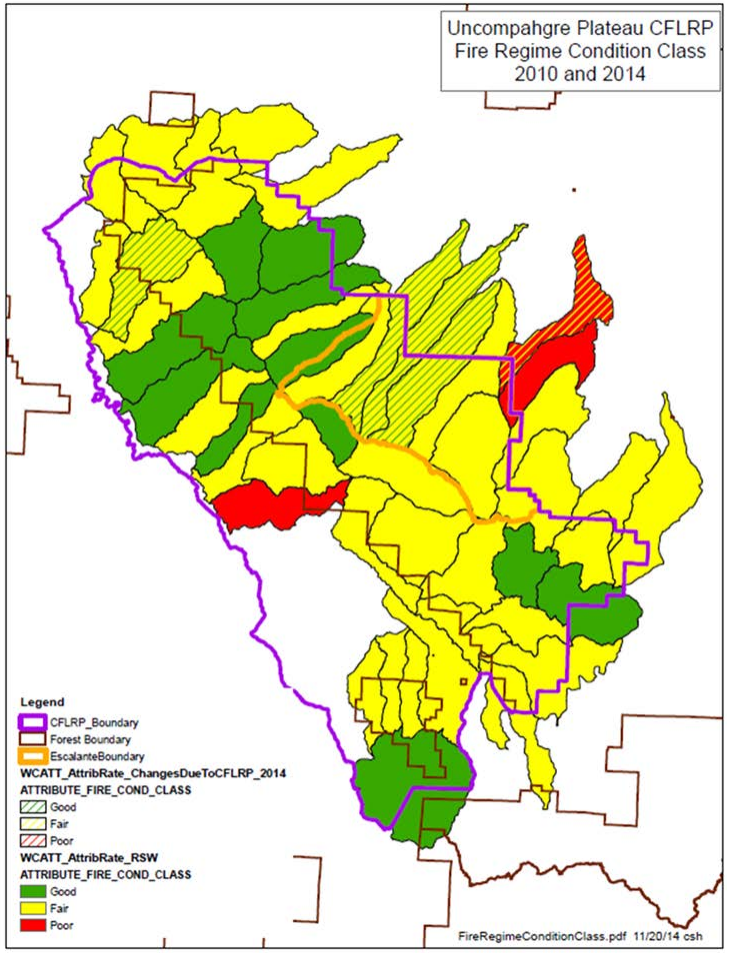


- **Fire Regime Condition Class – Improve the Fire Regime Condition Class (FRCC) attribute where the attribute is rated as Class II or Class III. Maintain areas classified as Class I.** (Note: The terrestrial biological indicator only accounts for 10% of the overall watershed condition outcome. The fire regime condition class makes up 1/5 of that score).

Fire regime restoration is an ecological outcome measure for CFLRP as well as an attribute rating for the watershed condition framework. For the ecological outcome measure, the Escalante project area was the landscape evaluated. The Escalante project area includes portions of eleven sub-watersheds. Activities intended to modify vegetation conditions in ways that could modify fire regime condition class have only occurred in nine of these sub-watersheds; however only four sub-watersheds have had sufficient activities to improve fire regime conditions on the NFS portion of these sub-watersheds (140200050202-Potter Creek fair to good, 140200050204-Cottonwood Creek fair to good, 140200050305-Dry Fork Escalante Creek fair to good, 140200060505-Lower Dry Creek poor to fair). In addition CFLRP activities within the Calamity Creek sub-watershed

(140300040402) have also improve the fire regime condition class from fair to good. (See Fire Regime Condition Class Map below) The vast majority of vegetation management work and data to document changes in fire condition class exists within the Escalante Project area which is 142,000 acres or 25% of the Uncompahgre Plateau (See Fire Regime Restoration portion of this report).

Fire Regime Condition Class	WCATT 2010	2014
Good – Class I	11	15
Fair – Class II	35	32
Poor – Class III	3	2



- **Aquatic Biota Condition Indicator – through chemical removal of non-native fish species and re-introduction of native cutthroat trout move the Dominguez Creek watershed from poor (3) impaired function to good (1) functioning properly. Targeted miles are 18.**
    - Removal of non-native fish and introduction of cutthroat in Dominguez Creek is scheduled for 2016 and therefore has not resulted in a change in the indicator.

Literature Cited

USDA, Forest Service, 2011. Watershed Condition Classification Technical Guide. FS-978. pp 41.

US Department of Interior. 2011. Riparian area management: Multiple indicator monitoring (MIM) of stream channels and streamside Vegetation. Technical Reference 1737-23.

"CFLRP – Uncompahgre Plateau, Desired Conditions for Watersheds," October 18, 2013

Invasive Species

Desired Conditions Target for Landscape Scale Invasive Species Severity: 1.2% of the CFLR landscape area was restored by reducing invasive species severity (preventing, controlling, or eradicating targeted invasive species) to meet desired conditions by 2019. This is based on a targeted acreage of 6,800 acres of treatment with an efficacy of at least 80% on treated acres.

Landscape Scale Inventory

Baseline inventory of invasive plant species within the project area is patchy and incomplete. More invasive species inventory is done each year, but mostly in areas of greatest demand, such as in campgrounds, right-of-ways, and in high-visibility wildland-urban interface.

It is difficult to tell whether increase in inventoried acres is due to more weed infestations or new areas explored. It is probably both of these, as invasive plants continue to expand within the project area, and our knowledge of them also is expanding. Almost the entire inventory of invasive plants is done directly preceding treatment. Most invasive species inventory and treatment is not coordinated with restoration projects.

Conducting inventory and monitoring in the CFLRP landscape

Desired Conditions

Desired Condition Statements[1]

General Desired Conditions

a. Management of invasive species is the responsibility of all cooperating agencies, and of all resource management functions within each agency. This would include landscape planning, project planning, maintenance planning, management of use by humans and animals, funding, and other invasive species management activities.

Landscape Level Desired Conditions

b. No Priority 1 species become established within the Uncompahgre Plateau landscape.
c. The number and size of infestations of Priority 2 species are reduced within the Uncompahgre Plateau landscape.
d. For Priority 3 species, develop strategies to contain existing infestations.
e. Expansion of Priority 4 species is limited within the Uncompahgre Plateau landscape.

Invasive Species Scoring System

Scoring for invasive species treatment efforts at both the landscape and project levels has been directly tied to treatment efficacy results obtained during monitoring. Within the Forest Service TESP-IS database, treatment efforts are assigned values based on how effective a chemical treatment is on the infestation. Efficacy is determined by reading cover frequency Daubenmire plots both pre- and post- treatment. The percent of the

[1] Extracted from "CFLRP – Uncompahgre Plateau, Desired Conditions for Invasive Plant Weed Species," October 18, 2013, 49 pp

infestation that is eliminated and restored to desired conditions due to the treatment is assigned one of the following values from the TESP-IS database:

TESP-IS database efficacy scoring

Efficacy	**Score %**
Complete	1
Excellent	0.95
Good	0.85
Fair	0.65
Marginal	0.35
Poor	0.15
Failure	0.03

The results obtained from averaged efficacies are then applied to landscape level scoring, as outlined in the Guidance: Tracking and Reporting Ecological Outcomes of the Collaborative Forest Landscape Restoration Act document.

Landscape-Scale Scoring:

- Good (Low Severity)=Treatment activities conducted to meet the Invasive species Desired Conditions result in an average restoration performance outcome of **90% – 100%** across all invasive species treatment activities within the CFLR Landscape Area over the life of the CFLR Landscape. The actual number of acres restored is at least **90%** of the planned number of acres restored across the entire CFLR Landscape Area.
- Fair (Medium Severity)= Landscape activities conducted to meet the Desired Conditions result in an average restoration performance outcome of **70% – 89%** across all invasive species treatment activities within the CFLR Landscape Area over the life of the CFLR Landscape. The actual number of acres restored is **70%-89%** of the planned number of acres restored across the entire CFLR Landscape Area.

- Poor (High Severity)= Landscape activities conducted to meet the Desired Conditions result in an average restoration performance outcome of **0% – 69%** across all invasive species treatment activities within the CFLR Landscape Area over the life of the CFLR Landscape. The actual number of acres restored is less than **70%** of the planned number of acres restored across the entire CFLR Landscape Area.

Landscape-Scale Scores 2010-2014

Landscape Score

Year	Acres Completed	Efficacy	Score
2010	153.5	0.65	Poor/High
2011	448.1	0.76	Fair/Medium
2012	394.4	0.84	Fair/Medium
2013	553.1	0.76	Fair/Medium
2014	651.6	0.78	Fair/Medium
	Average	0.76	

Treatment efficacy

Invisibility

Invisibility was calculated for the whole Grand Mesa, Uncompahgre, and Gunnison National Forests using existing vegetation, elevation, slope, aspect, and yearly precipitation. It shows that for the National Forest portion of the landscape, 82% of the land is in the High invisibility class.

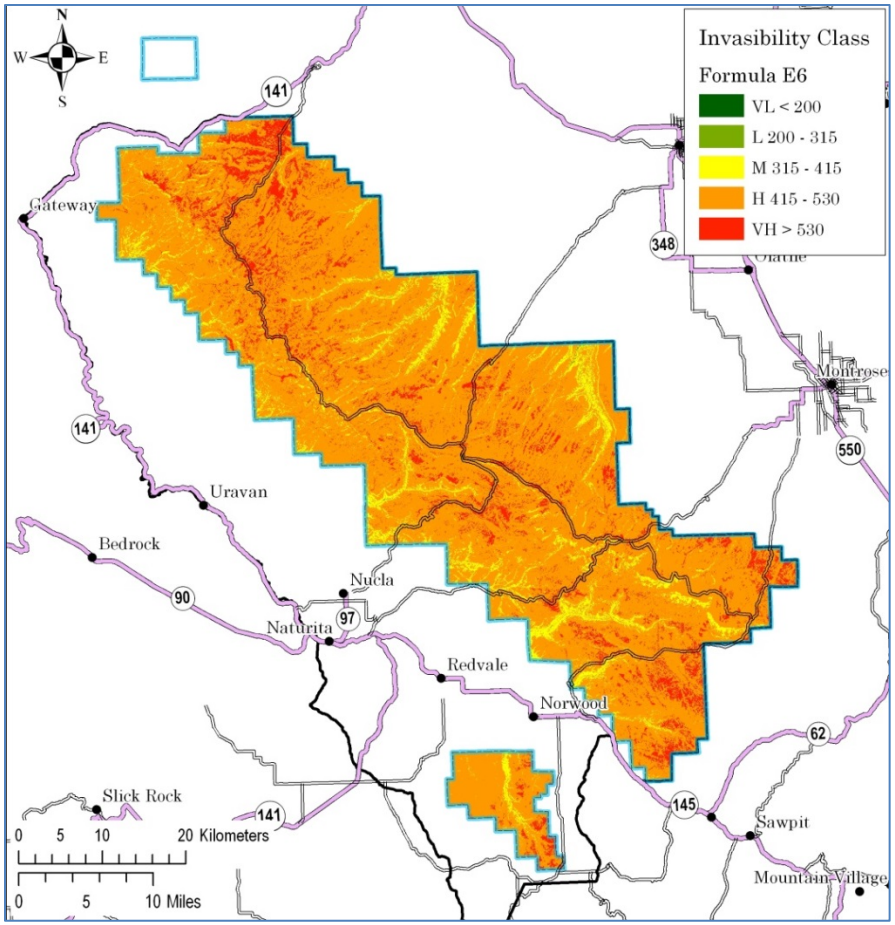
Acres by invisibility class in the NFS portion of the Uncompahgre landscape.

Class	Limits	Acres
V. Low	< 200	0.0
Low	200 - 315	391.6
Moderate	315 - 415	45,586.8
High	415 - 530	500,732.5
V. High	> 530	59,435.1
		606,145.9

Spatial data are not available for 2010 and 2011. Most of the acres treated in 2012-2014 were in the High invisibility class

Acres treated in the Uncompahgre landscape by invisibility class

Values	Invisibility	2012	2013	2014
< 200	Very Low	0.0	0.0	0.0
200 – 315	Low	0.0	0.0	0.0
315 – 415	Moderate	339.9	6.0	136.8
415 – 530	High	1,185.8	1,008.9	850.6
> 530	Very High	3.3	4.5	0.1
	Totals	**1,529.0**	**1,019.4**	**987.6**



Invisibility class for the National Forest portion of the Uncompahgre landscape.

Literature Cited

"CFLRP – Uncompahgre Plateau, Desired Conditions for Invasive Plant Weed Species," October 18, 2013

USDA Forest Service. 2001. Guide to noxious weed prevention practices. 25 pp. [Place of publication not stated]: USDA Forest Service. http://www.fs.fed.us/rangelands/ftp/invasives/documents/ GuidetoNoxWeedPrevPractices_07052001.pdf.

Project-scale scoring

Each management action funded through CFLR will have its own project-level objectives that are designed to contribute to achieving Desired Conditions at larger scales. Project-scale scoring should reflect how well the results of an individual management activity met the objectives for that project. Individual projects may not meet every desired condition of the CFLRP project. Project-scale scoring is conducted following completed management activities by the multi -party monitoring group at each Landscape.

- Good = 75% or more of implemented treatments result in measurable progress towards individual ***project-level*** objectives.
- Fair = 26% - 74% of implemented treatments result in measurable progress towards individual ***project-level*** objectives.
- Poor = 25% or less of implemented treatments result in in measurable progress towards individual ***project-level*** objectives.

Current Project-scale Evaluation (Based on and aggregation of the Collaborative's project-level monitoring)

Ecological Indicators	**Datasets and/or databases of records used**	**Project Level Good, Fair, Poor and (%) treatments resulting in measurable progress as defined above**	**Are you achieving your CFLRP objectives? (Y/N)**	**If NO, briefly explain…**
Fire Regime Restoration				
Fish and Wildlife Habitat Condition				
Watershed Condition				
Invasive Species	FACTS; Weed Risk Assessments	Fair; 84%	Yes	

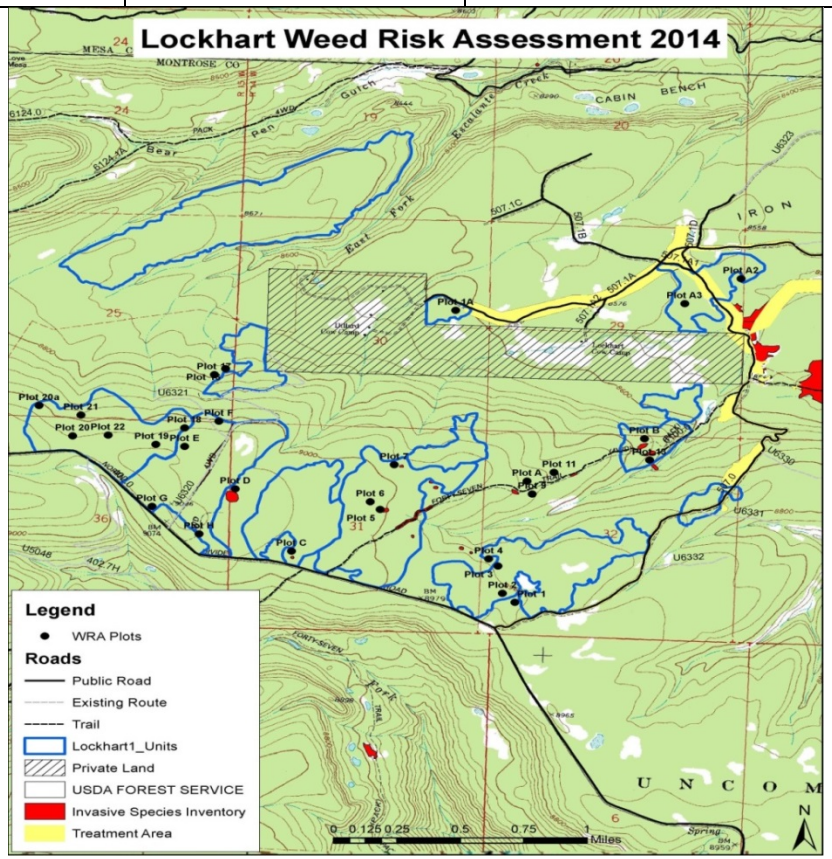
Project Scale Inventory

Within the project areas, inventory of invasive plant species appears to be more systematic and covers a greater proportion of the area on Bureau of Land Management public lands than on National Forest System lands. However, inventory protocols and data bases are very different and uncoordinated between the two agencies. BLM's data base is more locally controlled and easier to manage than the Forest Service's, and they

have more time to do inventory. Since 2012, an increasing number of invasive plant inventory acres have been conducted in association with restoration projects.

Risk assessment acres completed, by year and with associated restoration project.

Year	Risk Assessment Acres Inventoried	Associated Restoration Project
2012	186.1	Copper King Rx
2013	324.2	Sawmill Timber Sale
2014	991.1	Lockhart I, Glencoe Rx



Weed Risk Assessment Inventory 2014, Lockhart I Timber Sale

Desired Conditions

Desired Condition Statements[2]

General Desired Conditions

a. Management of invasive species is the responsibility of all cooperating agencies, and of all resource management functions within each agency. This would include landscape planning, project planning, maintenance planning, management of use by humans and animals, funding, and other invasive species management activities.

Project Level Desired Conditions

a. The number and size of infestations of Priority 2 and Priority 3 species is reduced in each 2 × 2 Km cell where restoration activities are occurring.

b. Expansion of Priority 4 species is limited in each 2 × 2 Km cell where restoration activities are occurring.

Invasive Species Scoring System

Scoring for invasive species treatment efforts at both the landscape and project levels has been directly tied to treatment efficacy results obtained during monitoring. Within the Forest Service TESP-IS database, treatment efforts are assigned values based on how effective a chemical treatment is on the infestation. Efficacy is determined by reading cover frequency Daubenmire plots both pre and post treatment. The percent of the infestation that is eliminated and restored to desired conditions due to the treatment is assigned one of the following values from the TESP-IS database:

TESP-IS database efficacy scoring

Efficacy	Score %
Complete	1
Excellent	0.95
Good	0.85
Fair	0.65
Marginal	0.35
Poor	0.15
Failure	0.03

The results obtained from averaged efficacies are then applied to project level scoring, as outlined in the Guidance: Tracking and Reporting Ecological Outcomes of the Collaborative Forest Landscape Restoration Act document.

[2] Extracted from "CFLRP – Uncompahgre Plateau, Desired Conditions for Invasive Plant Weed Species," October 18, 2013, 49 pp.

Project-Scale Scoring:

- Good (Low Severity) = Treatment activities conducted to meet the Desired Conditions result in a restoration performance outcome of **90% – 100%** across the treatment area for the life of the project. The actual number of acres restored is at least **90%** of the planned number of acres restored across the entire treatment area.
- Fair (Medium Severity) = Treatment activities conducted to meet the Desired Conditions result in a restoration performance outcome of **70% – 89%** across the treatment area for the life of the project. The actual number of acres restored is **70%-89%** of the planned number of acres restored across the entire treatment area.
- Poor (High Severity) = Treatment activities conducted to meet the Desired Conditions result in a restoration performance outcome of **0% – 69%** across the treatment area for the life of the project. The actual number of acres restored is less than **70%** of the planned number of acres restored across the entire treatment area.

Treatment effort at the project level

CFLRP Invasive Project-Scale Score 2011-2014

Project	Target Species	Year	Acres Treated	Efficacy	Score
Copper King	PORE5	2012	214.6	0.85	Fair/Medium Severity
Copper King	PORE5	2013	267.1	0.87	Fair/Medium Severity
Copper King	PORE5	2014	73	0.85	Fair/Medium Severity
Simm's Mesa	CEDI3	2014	9.9	0.85	Fair/Medium Severity

Project	Target Species	Year	Acres Treated	Efficacy	Score
Dave Wood	CEST8	2014	55.3	0.78	Fair/Medium Severity
Big Creek Reservoir	CANU4	2014	93.5	0.65	Poor/High Severity
Brushy Ridge	CEST8	2013	34	0.65	Poor/High Severity
Brushy Ridge	CEST8	2014	34	0.85	Fair/Medium Severity
Gutshall Pond	CIAR4	2013	0.8	0.85	Fair/Medium Severity
Thunder Road	PORE5	2011	111	0.95	Good/Low Severity
Thunder Road	PORE5	2012	297.4	0.85	Fair/Medium Severity
Thunder Road	PORE5	2013	55.4	0.85	Fair/Medium Severity
Thunder Road	PORE5	2014	321.9	0.95	Good/Low Severity
McKee Draw	CEST8	2013	0.6	1	Good/Low Severity
Plateau-Wide White Top	CADR	2011	1	0.85	Fair/Medium Severity
Plateau-Wide White Top	CADR	2012	1.2	0.65	Poor/High Severity
Plateau-Wide White Top	CADR	2013	3.7	0.77	Fair/Medium Severity
Plateau-Wide White Top	CADR	2014	2.7	0.85	Fair/Medium Severity
Craig Point	CEST8	2013	0.4	1	Good/Low Severity
25 Mesa	LIVU2	2012	158	0.85	Fair/Medium Severity
25 Mesa	LIVU2	2013	229	0.85	Fair/Medium Severity
25 Mesa	LIVU2	2014	240.3	0.95	Good/Low Severity
WAPA	CYOF	2012	7	0.85	Fair/Medium Severity

Project	Target Species	Year	Acres Treated	Efficacy	Score
WAPA	CYOF	2013	7.8	0.88	Fair/Medium Severity
WAPA	CYOF	2014	18.3	0.85	Fair/Medium Severity
Ute	CEST8	2014	129.29	0.86	Fair/Medium Severity

Treatment efforts at the project level

Restoration Projects

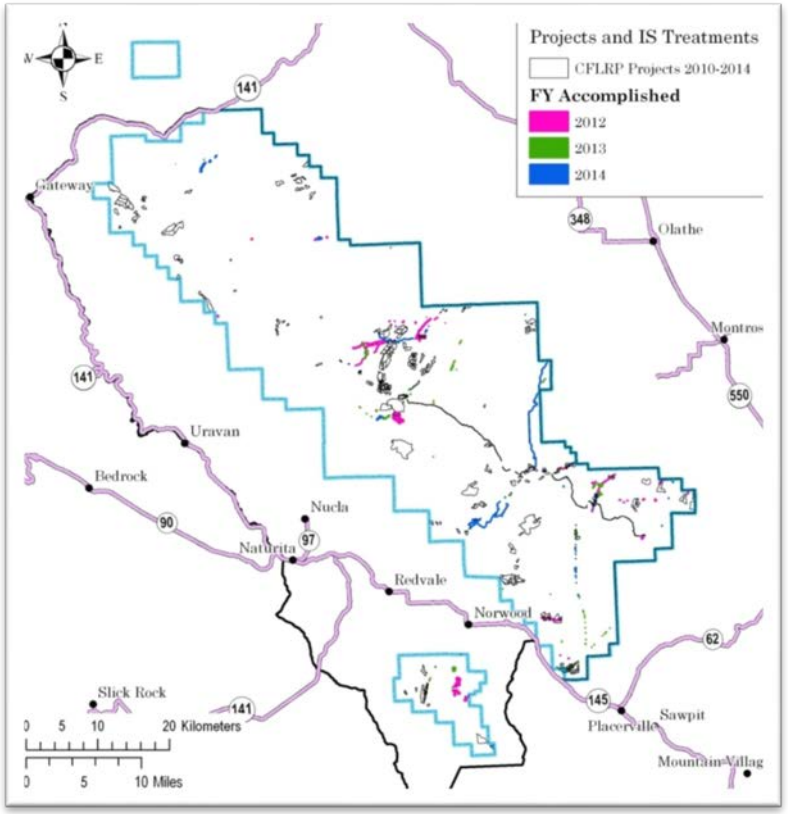
Most projects have considered invasive plant species to some degree, but few have followed the full process recommended in National guidance (USDA Forest Service 2001). A few projects (notably those in collaboration with power distribution companies) have considered invasives important enough to include in project design, implementation, and follow-up inventories. In some projects, invasive plant treatment is the responsibility of the contractor.

The overlap between 2010-2014 projects and 2012-2014 treatments on the National Forests is shown in table below. The invasive treatment units were buffered 10 meters.

Invasive species treatments within projects.

FY	Project Unit Count	Acres in Project Units	Acres Treated in Project Units*
2010	21	2,090.3	0.0
2011	52	5,761.5	0.0
2012	21	785.1	310.2
2013	54	3,200.3	467.4
2014	32	2,197.3	192.5
		14,034.5	970.2

*. Treatment units buffered 10 m.



CFLRP Projects 2010-2014, IS Treatments 2012-2014

Literature Cited

"CFLRP – Uncompahgre Plateau, Desired Conditions for Invasive Plant Weed Species," October 18, 2013

USDA Forest Service. 2001. Guide to noxious weed prevention practices. 25 pp. [Place of publication not stated]: USDA Forest Service. http://www.fs.fed.us/rangelands/ftp/invasives/documents/ GuidetoNoxWeedPrevPractices_07052001.pdf.

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