

UPDATE

GUNNISON COUNTY CPAW MITIGATION DIFFICULTY AND IWUIC HAZARD CROSSWALK

Based on follow-up discussions with Gunnison County planning staff, anomalies in the grass and agriculture fuel types with regards to the hazard rating and mitigation difficulty were identified. The subsequent investigation into the anomalies prompted the CPAW team to make changes to the mitigation difficulty spatial layers, as well as Table 5. Gunnison County CPAW Mitigation Difficulty/ IWUIC Hazard Crosswalk.

IWUIC Hazard Crosswalk

Table 5. Gunnison County CPAW Mitigation Difficulty/ IWUIC Hazard Crosswalk was updated to reflect mitigation difficulty classes (1 to 9) in all appropriate hazard classes (moderate to very high). The appropriate IR Construction requirements were also adjusted to align with these changes. Finally, the N.C. definition was adjusted for further clarification to the user.

This new updated table should replace the current table 5 of the 2019 CPAW Gunnison County Final Recommendations document.

Replace IWUIC Fire Hazard Severity Rating with CPAW Hazard Assessment Tools

Within the IWUIC, the Fire Hazard Severity methodology is used to determine appropriate mitigation requirements. The critical fire weather threshold within this rating does define all of Gunnison County as “Extreme”; however, within the local environment, it does not account for the differences between heat transfer (radiant, convective, conductive) exposure of individual structures.

Heat transfer exposure and general mitigation guidance can be better demonstrated using the CPAW-generated “Local Wildfire Hazard” and “Mitigation Difficulty” maps to support land use planning and regulation within the county. The use of the wildfire hazard assessment for guiding the application of the IWUIC (2018) will link required mitigation actions to expected wildfire exposure (see Recommendation 1). The county should consider integrating the newly developed wildfire hazard assessment to determine the appropriate application of the proposed adopted IWUIC (2018) through the following process:

- A. Determine the Local Level Wildfire Hazard summarized ranking in which the proposed development is located to understand the likelihood of the building exposure to high-intensity fire.
- B. Determine the Mitigation ranking (0 to 9) of the parcel in which the proposed development is located and the parcel(s) immediately adjacent to it.
- C. Use the following table (Table 5) to determine the appropriate IWUIC mitigation standards to apply.

TABLE 5: GUNNISON COUNTY CPAW MITIGATION DIFFICULTY/ IWUIC HAZARD CROSSWALK

Local Wildfire Hazard	Table 603.2 Minimum Required Defensible Space (site/slope adjustment required) ¹	CPAW Mitigation Difficulty and Slope % category			24.301.181(21) Minimum IR Construction		
		<15	15≤ to <30	>30	Non-Conform ²	Conform	1.5x Conform
Moderate	30 ft.	1, 2, 4	1, 3, 5	4	IR 1 (N.C.)	IR 2	IR 3
High ³	30 ft	1, 2, 4	1, 3, 5	4	IR 1 (N.C.)	IR 2	IR 3
	50 ft.	6	7	6	IR 1 (N.C.)	IR 2	IR 2
Very High	30 ft.	1, 2, 4	1, 3, 5	4	IR 1 (N.C.)	IR 2	IR 3
	50 ft.	6	7	6	IR 1 (N.C.)	IR 2	IR 2
	100 ft.	7	8	8, 9	IR 1 (N.C.)	IR 1	IR 2

Table Notes:

(1) "Distances are allowed to be increased due to site-specific analysis based on local conditions and the fire protection plan" (Figure 603.2- 2012 IWUIC).

(2) **Non-conforming** indicates that the minimum slope-adjusted defensible space distances with appropriate mitigation cannot be achieved from the structure to vegetative fuels, or minimum water supply requirements cannot be achieved; as opposed to **conforming** in which the defensible space distances with appropriate mitigation and minimum water supply requirements can be achieved.

(3) High hazard is also used where non-conforming structures are present within 50 ft of the primary structure.

N.C. = requires feature or component (window, vent, siding), or group of features or components (a portion of the building) to be constructed of a rated Non-Combustible materials; including tempered glass where windows are the component or part of the group of features or components.

Mitigation Difficulty

The Mitigation Difficulty component (30-m pixel resolution) uses the life form (grass, shrubs, trees), slope, and crown fire potential to classify the potential mitigation success of any given 30-m pixel on the map (Figure 12). This is represented by nine categories (Table 4).

The mitigation difficulty map was reviewed by Eva Karau, who subsequently updated the product. Please visit the link we provided in the email to download the new spatial data.

Eva provides a short explanation of her findings and changes:

While taking a closer look at the original Gunnison County Mitigation Difficulty map, I found some interesting patterns in the way an agricultural land type was mapped in the LANDFIRE 2016 data. It seems to overestimate the amount of ag lands in some areas, overriding where there may actually be other life forms besides grass. I compared some of these areas with previous versions of LANDFIRE data that did not have this problem. In general, I think the 2016 data is a better product and based on more recent satellite imagery, but for just the life form piece of the mitigation difficulty map, I investigated using a combination of the 2016 and 2012 LANDFIRE data. Specifically, for each pixel, I selected the life form that would have the higher difficulty rating from the 2012 or 2016 data. For example, if a pixel was grass in the 2016 version and shrub for the 2012 version, that pixel would be assigned to shrub for my final mitigation difficulty index. This method really seems to show more realistic patterns in the areas we were looking at on our last call, and I could demonstrate this on the next call.

I also included a polygon file with a field that contains the mitigation difficulty rating assigned to parcels. To derive the parcel rating, the maximum mitigation value for all 30-m cell size pixels within the parcel is assigned to the polygon parcel rating. So, in the case of a parcel that has half of its area in a low mitigation difficulty category, and half of its area in a high category, the final value assigned to the parcel will be high. This method will definitely overestimate the mitigation difficulty for some parcels, but the alternative would be underestimation. Ultimately that parcel rating will flag those parcels that have any areas where mitigation work will be difficult to accomplish. But, like we discussed on the call, a landowner whose parcel has a high/very high rating might be able to protest the rating if they were to provide evidence that where their structure lies within the parcel is actually a good distance away from the area that caused the high rating. In that case, the polygon file could be updated with the specific information, in a new, custom mitigation difficulty field.

Here is a metadata description of the 2 datasets included in the zip file:

MitigationDifficulty_pixel_MAR2020

This dataset is a 30-m cell size raster characterizing the difficulty and effort involved in modifying landscape characteristics in a way that could reduce hazard. This MAR2020 version is an update from the original JAN2019 version; it incorporates both 2016 and 2012 LANDFIRE Existing Vegetation Type data within life form element of the mitigation difficulty index calculations. This modification represents life form patterns in certain agricultural areas more realistically.

MitigationDifficulty_parcel_MAR2020

This is a polygon file with a field (named MitDiff) that contains the mitigation difficulty rating assigned to parcels. It is misleading that much of the county is in the highest mitigation difficulty category (9) in this file, but this is because many of the parcels are very large, and if any pixels with a value of 9 lie within the parcel, the whole parcel receives that value. This could be modified with GIS queries that reduce the pixels included in the analysis. For example, exempt parcels could be omitted. I did omit parcels that had no parcel IDs (most of these were roadways), but otherwise I left the layer in a more raw state, so that it could be customized locally.

Table 4. Mitigation Difficulty Classes and Descriptions

To help you with your follow up, we've included the original Table 4. Mitigation Difficulty Classes and Description below

TABLE 4. MITIGATION DIFFICULTY CLASSES AND DESCRIPTIONS		
Class	Characteristics	Mitigation Discussion
1	Sparsely vegetated, or developed, with potential for ember impact	Barren ground/water/developed/ sparse vegetation or land that lies within potential spotting distance of a wildfire. Mitigation will involve appropriate structure ignition zone and structure construction.
2	Herbaceous on a shallow slope (<15%)	Fires are typically easier to suppress in these areas. However, high winds combined with dry conditions lead to potentially dangerous, fast-moving, high-intensity fires. Mitigation may involve a combination of irrigation, mechanical (mowing) treatment, frequent burning, and fuel breaks in conjunction with appropriate structure ignition zone and structure construction.
3	Herbaceous on moderate slope (≥15 to <30%)	Harder to construct fuel breaks, increased difficulty in mechanical (mowing) treatment, increased potential for erosion, increased rate of spread and intensity may make frequent burning and other mitigation more difficult. Focus should be on appropriate slope setbacks, structure ignition zone, and structure construction mitigation.
4	Herbaceous on steep slope (≥ 30%)	Significant challenges in fuel break construction, unlikely option for mechanical (mowing) treatment, significant potential for erosion, high rate of spread and intensity potential may make frequent burning and other mitigation difficult. High winds combined with short-term drying conditions lead to potentially dangerous, fast-moving fires with fire fighter access concerns. Mitigation potential may involve a combination of frequent burning and fuel breaks in conjunction with slope setback, appropriate structure ignition zone, and structure construction.
	Shrub on shallow slope (<15%)	Fires are typically harder to suppress than grassfires in these areas. High winds combined with dry conditions lead to potentially dangerous, fast-moving, high-intensity fires with fire fighter access concerns. Mitigation may involve a combination of frequent burning and fuel breaks in conjunction with appropriate structure ignition zone and structure construction.
5	Shrub on moderate slope (≥15 to <30%)	Harder to construct fuel breaks, increased difficulty in mechanical (mastication) treatment, increased potential for erosion, increased rate of spread and intensity may make prescribed burning more difficult. Focus should be on a combination of appropriate mechanical treatment and burning, slope setbacks, structure ignition zone, and structure construction mitigation.
6	Shrubs on steep (≥30%) slopes	Significant challenges in fuel break construction; unlikely option for extensive mechanical (mastication) treatment. Significant potential for erosion or slope instability resulting from treatments is a likely mitigation challenge. Increased

TABLE 4. MITIGATION DIFFICULTY CLASSES AND DESCRIPTIONS

Class	Characteristics	Mitigation Discussion
		rate of spread and significant intensity may make prescribed burning more difficult. Focus should be on a combination of appropriate mechanical treatment and burning, slope setbacks, structure ignition zone, and structure construction mitigation.
	Tree on shallow slope (<15%)	Open canopy must be maintained to prevent increased crown fire potential. Surface fuels must be treated/maintained in a state that reduces the chances of fast-moving surface fires. Mitigation should also include appropriate slope setbacks, structure ignition zone, and structure construction mitigation.
7	Tree on moderate slope (≥15 to <30%)	Open canopy must be maintained to prevent increased crown fire potential, which may be more difficult due to the slope. Surface fuels must be treated/maintained in a state that reduces the chances of fast-moving surface fires. Increased potential for erosion or slope instability resulting from treatments can be a mitigation challenge. Mitigation should also include appropriate slope setbacks, structure ignition zone, and structure construction mitigation.
	Tree on shallow slope (<15%) with potential for crown fire	Dense canopy needs to be thinned to reduce crown fire potential. Surface fuels must be treated to reduce risk of fast-moving surface fires. Mitigation should also include appropriate structure ignition zone and structure construction mitigation.
8	Tree on moderate slope with potential for crown fire (≥15 to <30%)	Dense canopy needs to be thinned to reduce crown fire potential, which may be more difficult due to the slope. Surface fuels must be treated to reduce risk of fast-moving surface fires. Increased potential for erosion or slope instability resulting from treatments can be a mitigation challenge. Mitigation should also include appropriate slope setbacks, structure ignition zone, and structure construction mitigation.
	Tree on steep slope (≥30%)	Open canopy must be maintained to prevent increased crown fire potential, which can be significantly difficult due to the slope. Surface fuels must be treated/maintained in a state that reduces the chances of fast-moving surface fires. Significant potential for erosion or slope instability resulting from treatments is a likely mitigation challenge. Mitigation should also include appropriate slope setbacks, structure ignition zone, and structure construction mitigation.
9	Tree on steep slope (≥30%) with potential for crown fire	Dense canopy needs to be thinned to reduce crown fire potential, which may be extremely difficult if not prohibitive due to the slope. Surface fuels must be treated to reduce risk of fast-moving surface fires. A very high potential for erosion or slope instability resulting from treatments is a likely mitigation challenge. Mitigation should also include appropriate slope setbacks, structure ignition zone, and structure construction mitigation.