ADOT Vegetation Management Guidelines - Mowing

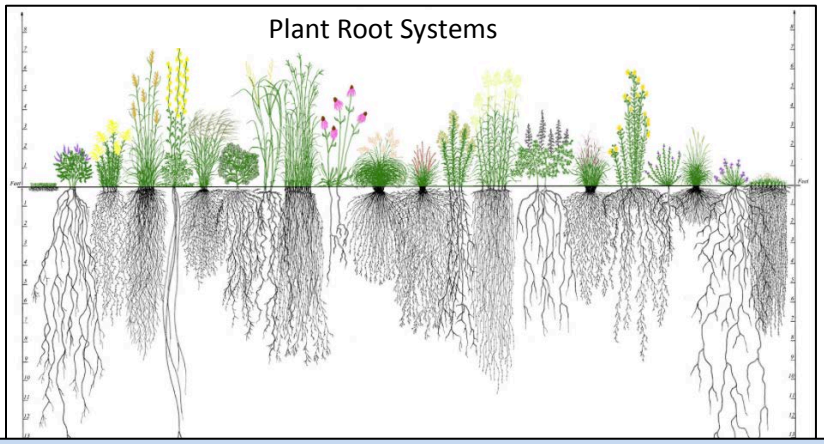
1.0 Purpose of Mowing

Because mowing can have opposite effects on plant growth depending on when and how it is done, it's important to have the goal of the mowing in mind when planning when and how to do it. Mowing should be used selectively in roadside vegetation management for specific purposes, such as:

- Improving horizontal sight distance at intersections and cross streets
- Maintaining visibility of hazard markers, guardrails, and delineators
- Controlling weeds and tree/brush seedlings, often coordinated with herbicide use
- Reducing snowdrift
- Reducing summer fire fuels
- Reducing wildlife grazing
- Increasing vegetative growth in native grass species to encourage seed production

Mowing can shorten the lifespan and health of plants depending on the timing, frequency and height at which plants are cut. Wait until late in the growing season and mow at a minimum height of six inches to in areas with desirable plants and grasses. Mowing causes grasses and broad-leaf plants to deplete energy stored in their root systems. If plants are mowed too often, too short (under six inches), or during the growing season before they transfer energy to the roots, they may not live to regrow the next year. Mowing later in the season also allows seeds to fall, leading to more new plants the next year.

Mowing grasses during the active growing season can cause the next growth to be shorter and spread out more. The shorter the grass is mowed, the closer to the ground it will start branching off to grow, creating more spreading growth; Bermuda grass is a good example of this.



The mass of living roots belowground is directly related to the amount of leaves aboveground – plants need leaves to capture energy and don't support the roots if they do not have enough energy. Native plants and bunchgrasses have deeper root systems than shorter non-native grasses.

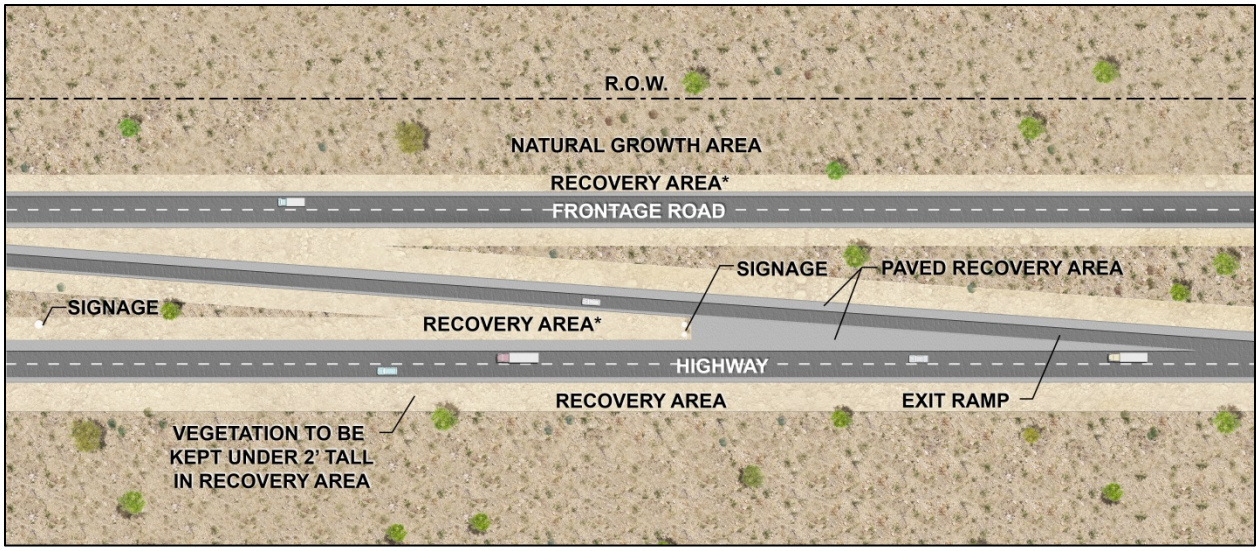


Diagram of highway with frontage road, showing recovery areas

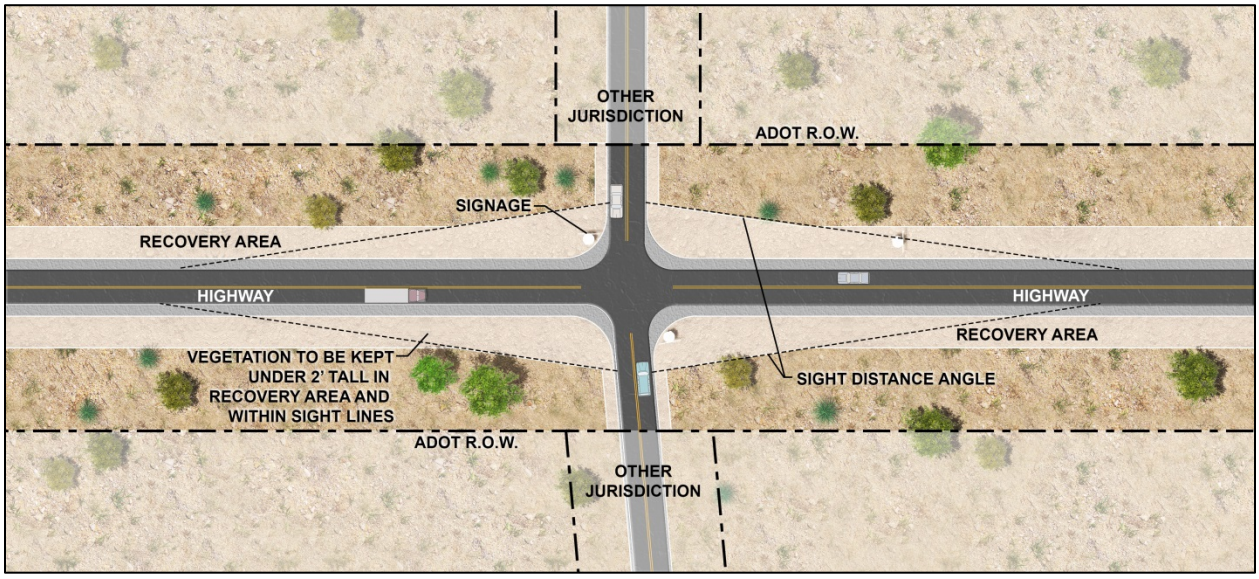


Diagram of highway with intersection, showing recovery areas

2.0 Planning to Mow

Cost vs. Benefits

Reducing the number of annual mowing cycles can have several short and long-term benefits, including:

- Fewer staff hours spent mowing, allowing staff to perform other maintenance activities
- Reduced fuel usage
- Reduced vehicle emissions and dust creation, contributing to improved air quality
- Reduced equipment maintenance
- Habitat conservation for pollinators and other wildlife

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Mowing periodically (but not too frequently) has the following benefits:

- Woody plants such as shrubs and trees are controlled before they become large
- Grasses and forbs, including wildflowers, may be rejuvenated

Pollinators benefit when more flowers can bloom as a result of reduced mowing.

Seasonality

To make appropriate decisions about when to mow, ADOT vegetation managers must consider the type of vegetation; the overall health of the vegetation; the life cycle of the plants; and environmental conditions including drought and prolonged changes in temperature. There are several things to consider when setting mowing schedules.

General considerations:

- Do not mow during high fire-danger periods.
- Do not mow when desirable plants are blooming or before the seed has set so that they can reseed for the next year.
- Use extra caution when mowing during nesting times for local wildlife (typically spring and summer into fall, depending on elevation); avoid mowing during these to the extent possible.

If mowing undesirable vegetation (weeds or vegetation that is too tall or otherwise unwanted):

- Coordinate with District herbicide applicators before mowing. If the weeds have recently been sprayed, mowing too soon will not give the herbicide time to kill the roots. If the weeds are scheduled to be sprayed, mowing before spraying occurs will take away that opportunity.
- Avoid mowing noxious and invasive weeds unless there has been coordination to address those species. Mowing can spread seeds and plant parts to new areas, worsening the problem.
- Where weeds are prevalent and coordination has taken place, the mowing should occur before the weeds flower, to avoid seed set and spread of the seeds to other locations.

If mowing desirable vegetation to reduce height to maintain sightlines, reduce fire danger, or for snow management:

- It is preferable to mow the vegetation ONCE annually or less frequently, during the non-growing season or after the plants have set seed.
- Where the roadside vegetation consists of predominantly native species, mowing should be timed to occur after desirable plants have set seed and the seed has been dispersed.
- Do not mow near the end of the growing season, when plants are nearing dormancy and are less resilient; waiting until the growing season is over is better.
- Mowing should be done as infrequently as feasible: generally, once a year, and possibly only every other year, depending on environmental conditions. Mowing during the non-growing season makes annual or less frequent mowing more effective.

ADOT Vegetation Management Guidelines - Mowing

Recommended Mowing Times by Biozone

Mowing should be used selectively and only where needed, such as in targeted areas to prevent snow drift, to control invasive species, or to maintain sightlines, sign and guardrail visibility.

For 2 to 3 years following seeding, do not mow unless absolutely necessary and do not mow shorter than 6 inches.

Biozone						**Highest Temperatures**						
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Conifer Forest	+ (Snow)	+ (Snow)	+ (Snow)	O*	O*	--	-- (Rain)	-- (Rain)	+	+	+ (Snow)	+ (Snow)
Great Basin Conifer Woodland	+ (Snow)	+ (Snow)	+ (Snow)	O*	O*	--	-- (Rain)	-- (Rain)	--	+	+ (Snow)	+ (Snow)
Chaparral	+	+	+	O*	O*	--	-- (Rain)	-- (Rain)	--	+	+	+
Plains and Great Basin Grassland	+ (Snow)	+ (Snow)	+ (Snow)	O*	--	--	-- (Rain)	-- (Rain)	--	+	+	+ (Snow)
Semidesert Grassland & Chihuahuan Desertscrub	+	+	+	+	O*	O*	-- (Rain)	-- (Rain)	O*	+	+	+
Great Basin Desertscrub	+ (Snow)	+ (Snow)	+ (Snow)	+	O*	O*	-- (Rain)	-- (Rain)	-- (Rain)	O*	+ (Snow)	+ (Snow)
Sonoran & Mohave Desertscrub	O*	O*	O*	O*	O*	--	-- (Rain)	-- (Rain)	--	+	+	+

Notes:

Colors in table correspond to the colors in the biozones map (see Appendix C)

O = mowing not recommended (during sensitive stages for desirable plants)

-- = mowing okay, follow migratory bird measures

+ = best mowing times

* = mow in targeted locations for weed control only

Rain = highest rainfall; don't mow in muddy conditions; consider waiting since plants will regrow rapidly following rains

Snow = okay to mow if no snow or excessive mud

- If vegetation needs to be mowed during the growing season, it is best to mow when the vegetation is healthy and actively growing as a result of adequate moisture received during the previous winter as rain or snow, or following the summer monsoon rains.
- Do not mow severely drought-stressed vegetation (if it is desired that it continue growing).

3.0 Activity Coordination

Intra-agency Coordination

It is highly recommended to plan the mowing schedule at least 6 months ahead and share the information with the DEC and District herbicide contact to allow time for coordination on environmental concerns and herbicide treatments.

COORDINATION

WHO TO CALL

- Maintenance Supervisor
- District Environmental Coordinator
- Environmental Planning Maintenance Planner (E-mail to MaintenanceWorkOrders@azdot.gov)

Notify the District Vegetation Manager, Herbicide Contact, or DEC 10 work days prior to mowing for information on site status to avoid damage to plant communities, spreading noxious weeds, or conflicting with herbicide treatments.

Coordinate for litter to be collected prior to mowing to avoid creating more smaller pieces of litter.

Environmental Concerns

Prior to mowing, maintenance staff should consult with their Maintenance Supervisor to ensure that requirements of laws, rules, and regulations have been addressed. In particular, coordination is always required ahead of mowing in the ROW in the following areas:

- National Forests (coordinate with Forest Ranger District)
- Native American Tribal Communities
- Environmentally sensitive areas containing endangered species habitat and/or cultural resources.

➢ The Maintenance Supervisor or DEC may submit an Environmental Maintenance Work Order. The form is available on the ADOT intranet in Construction / Maintenance Essential Documents. Fill out the project information and as much of the rest of the form as possible and email it to: MAINTENANCEWORKORDERS@azdot.gov. An environmental planner will contact you to answer your questions.

ADOT Vegetation Management Guidelines - Mowing

4.0 Best Practices for Mowing

Mowing can affect the vigor of roadside plants, so it is important to follow best practices. To prevent the spread of noxious invasive weeds, mowers should be thoroughly cleaned before mowing and between mowing locations. Sites should be surveyed prior to mowing to look for hazards such as large rocks and features such as check dams that should be avoided.

Mowing Height

If the goal is to mow desirable vegetation to reduce height:

- Mow at the end of the growing season or during the winter (when vegetation is going into dormancy). Avoid mowing when plants are coming out of dormancy.
- Mow only when vegetation height is 17 inches or more.
- The minimum mowing height is six (6) inches. Mowing height may be reduced to a minimum of four (4) inches for winter snowstorm preparation.
- Small saplings and brush (stems up to 2 inches in diameter) within the mowing cut swath should be mowed to the same height as grasses and broadleaf plants.

WHO TO CALL WITH QUESTIONS

Maintenance Supervisor
District Herbicide/Invasive Species Contact (see map here)
District Environmental Coordinator
Design Landscape Architect – ADOT Roadside Development
Construction Landscape Architect –ADOT Construction Group

Mowing Width

- Restrict mowing to one (1) mower width or "swath" (typically 10-12 feet wide) located immediately next to the pavement edge.
- Increase mowing width to meet the requirements of specific conditions, including:
    - Sight line areas at intersections and cross-overs
    - Areas with a narrow right-of-way strip
    - Areas with weed infestations
- Mow cleanly around guardrail out to a distance of 18 inches to reduce potential for trapping sand, snow, and dirt.
- Mow in smooth lines that follow the landform and site features.
- See the Roadside Zones Diagram for additional information.

ADOT Vegetation Management Guidelines - Mowing

General Mowing Practices

- Mowers should be operated only in the direction of normal traffic flow when working within 30 feet of the edge of pavement.
- Mowing equipment should be operated at the optimum speed that safely produces clean cutting results, without digging into the soil, or throwing rocks and debris onto the roadway.
- Vegetation should be mowed cleanly around the bases of traffic signs, milepost/kilometer signs, delineators, guardrail, and other highway fixtures.
- Adjoining pavement should be left free of debris and cuttings.
- During times of drought and high fire danger land managing agencies may require additional fire suppression equipment and tools. Check with the land owner prior to mowing in high fire danger areas.
- When mowing has been done in an area with noxious weeds, the mowers shall be thoroughly cleaned in a designated non-vegetated area by air-blowing or washing to prevent the spread of weeds into the next mowable area.

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