

Weeds alongside roads

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As I drive throughout the state I am amazed on how weedy our roadsides are. This phenomenon is not exclusive to New Mexico, but can be seen on most of the roadsides throughout the world. Researchers have found several factors responsible for this. Three of the most common factors are 1) increased dispersal of weed propagules along roadsides 2) alteration of site characteristics adjacent to the road, and 3) management practices that selects against native plant species. This article will discuss how each is beneficial to weeds and how roadsides can be managed to counteract these factors.

Increased dispersal of weed propagules

For any invasion to occur, a weed propagule (any portion of a plant that can produce a fully mature plant that is capable of reproducing; e.g. seed, root fragment, tuber, stem fragment) must be transported to the site. With the invention of motorized vehicles and our highway system, we have dramatically enhanced the spread of weeds along roads. There are many examples of weed propagules successfully dispersing long distances via roadways. For a New Mexican example, look at the spread of malta starthistle along many of our southern highways. This should be no surprise as many of our weed species originated in other countries and have evolved traits that improve long distance dispersal.

Weed propagules can be transported on vehicles by many methods. The most common are propagules attached to vehicles (e.g. goatheads on tires), soil infested with weed seeds clinging to the chassis of the vehicle, or vehicles transporting a product that is contaminated with weed propagules (e.g. bales of hay, livestock, even the socks of the driver). Some common roadside weed species utilize other means of dispersal. For example tumbleweeds (e.g. Russian thistle) are some of the most common roadside weeds. They disseminate their seeds by tumbling through the landscape. Seeds are held loosely within the dead shoots, and when the tumbleweed hits something it will drop several seeds. These tumbleweeds dominate many of our roadsides throughout New Mexico, and can be seen accumulating along fencelines. Drivers help deposit many seeds along roadsides by hitting tumbleweeds. This will release nearly all the seeds to the roadside areas. This is no small amount as Russian thistle plants can produce more than 200,000 seeds! Many other methods of dispersal of weeds exist; the key point is that propagule dispersal is essential for an invasion of weeds to occur. By eliminating the introduction of weed propagules, new infestations will be prevented from establishing.

Alteration of site characteristics

The process of constructing a road results in the habitat of the roadside area being dramatically altered. Typically soils near roads are of low quality and very shallow (especially in New Mexico). The process of constructing and maintaining a road changes characteristics such as these. Typical changes to these sites include increased soil depth, added nutrients, and additional water from runoff. Native plants that reside along this area are not adapted to these conditions, and as a result have difficulty competing with other species (usually weeds) for limiting resources along the road. Furthermore, the process of building a road, constant vehicular traffic, and/or road maintenance provide continual disturbance of the site. These disturbances can create what ecologists call "safe sites". A safe site is an area in which a species

can establish and grow where they previously could not. Once plants establish along these safe sites, they can invade adjacent areas that have not been disturbed.

Management that selects against natives

Management of the site can also benefit weeds. Typical management methods along roadsides include mowing and herbicide applications. While these methods can be effective in controlling existing weeds, native species are typically also susceptible to these techniques. After many years of intensive management, the only species that remain are those that can tolerate the management. These tend to be weed species. Once these tolerant weed species become dominant, management of these areas become much more intensive, with little hope of native plants returning to the area unless alternative tools are used.

What can you do to limit this?

As you can see this is a difficult problem as the presence of roads favors weeds. The easiest way to prevent weeds from establishing along roadsides is to never build a road. This isn't very realistic, but in natural areas this concept is important. If you travel in a natural area, stay on existing trails/paths or roads, as increasing the number and length of roads will likely increase weed populations. If you travel on a road, practice techniques that prevent the dispersal of weed propagules. Cleaning your vehicle and dislodging dirt and other potential sources of weed propagules before you leave that area will remove most weed propagules. This is especially important if you are in an area with a known infestation of a weed that is not present at the location you are traveling to.

Since roads are such an important part of our society, it is unrealistic to stop the construction and maintenance of roadsides. While the sites will be altered by these techniques, several things can be done to limit the creation of safe sites after construction. Revegetating the roadsides after construction is an important step to prevent weeds from establishing. Selection of species to use is critical, as we want species that will be competitive in this new environment and can occupy the safe sites created from construction/maintenance before weeds can. This will prevent propagules that are deposited in the area from establishing. Species selection for revegetation can be a difficult choice as many times native plants that are established in adjacent areas are not good choices for species along roadsides.

Unfortunately it is inevitable that weeds will establish along roadsides. This is why it is also important to make sure that the species used in your revegetation plan can tolerate management methods that will eliminate weed species before they establish large populations. With minimal management the roadside area can remain weed free. The key is to frequently monitor the area to make sure no weed species are establishing. It is a well-known fact that weed species that are small and establishing are much easier to eliminate and require many fewer resources to manage. With early detection and response weed populations can be easily managed, with little impact to the roadside. So next time you see just one weed along your road, stop and pull it, the future driver's of New Mexico will thank you!