



**Rocky Mountain National Park
Continental Divide Research Learning Center**

Evaluation of Revegetation

The Question: What is the most successful and cost-effective method to revegetate disturbed sites?

Many natural areas of the park are disturbed by human activities each year due to visitor use and construction or improvement of facilities, roads, trails, and parking lots. A primary goal of resource managers in Rocky Mountain National Park is to revegetate these disturbed areas back to predisturbed conditions. As both success and finances are important to park management, Todd Ontl and Edward Redente of Colorado State University conducted a research study in order to determine which of the current revegetation methods are most successful and cost-effective.



Seeding, such as the hydroseeding shown here, is the most cost-effective revegetation method.

The Project: Determine the success and compare costs of each revegetation method.

During the summer of 2004 the researchers chose 20 sites that had been disturbed in previous years and had been subject to some form of manipulative revegetation. They compared three revegetation methods: (1) seeding for native plant species, (2) transplanting plants grown in a nursery, and 3) a combination of the two. They used three variables to compare the revegetation success of these disturbed sites to adjacent undisturbed areas including: (a) vegetative cover, (b) the number of species present (including exotic weeds), and (c) species and community similarity with respect to undisturbed areas. They then compared the revegetation success of each different approach to the entire cost of the given method to determine which scheme is the most successful at the lowest cost.



Transplanting, as these resource managers are doing, is successful, but costly.

The Results: A combination of seeding and transplanting is the most successful; however, seeding alone is the most cost-effective method.

The researchers found that each of the three revegetation methods differed in effectiveness depending on which of the three variables was used to evaluate it. Vegetation cover data showed that sites that were revegetated using transplanting had the highest percentage of cover of native and perennial species. These results suggest that transplanting plants grown in a nursery will result in plant cover of native perennial forb and grass species most similar to undisturbed conditions. There was no difference in species richness for each of the revegetation approaches indicating that no one method is better at promoting biodiversity than the other. Sites revegetated by seeding were more similar in species and community structure to undisturbed sites than were those that were revegetated using transplanting suggesting the importance of seeding as a treatment for producing plant communities most similar to undisturbed communities. In terms of cost a combination of transplanting and seeding is the most expensive followed by transplanting alone. Seeding alone is by far the least expensive treatment.

Combining revegetation success with financial cost, the cost-effectiveness analysis revealed that transplanted sites had the highest ratio of cost to effectiveness while seeded sites had the lowest cost to effectiveness ratio. Overall these results suggest that when financial resources are not limited the combination of seeding and transplanting is the most effective revegetation approach. However when financial resources are limited seeding is the most cost-effective revegetation approach.