TABLE 5. Measures of *Braya* plant size and reproductive output in plots on and off the cutoff road at West Hoosier. Means ± 1SEM. For definitions of plant classes, see Table 2.

	Location		
Plant size class	On cutoff road	Off cutoff road	P-value
REPRODUCTIVE			
Height (mm)	30.3 ± 1.9	30.2 ± 1.5	0.96
Number of stems/plant	3.0 ± 0.4	2.4 ± 0.3	0.17
Number of fruits/plant	13.9 ± 2.3	10.7 ± 1.6	0.24
Number of leaves/plant	26.9 ± 1.7	21.1 ± 1.0	0.003
Rosette diameter (mm)	24.2 ± 1.3	18.8 ± 0.7	0.000
JUVENILE			
Number of leaves/plant	13.6 ± 1.3	12.3 ± 0.7	0.35
Rosette diameter (mm)	13.2 ± 0.9	10.0 ± 0.5	0.001
SEEDLING			
Number of leaves/plant	4.8 ± 0.2	5.0 ± 1.7	0.49
Rosette diameter (mm)	7.2 ± 0.2	5.5 ± 0.7	0.23

TABLE 6. Cover of dominant (>1% cover) vascular plant species and substrate components in *Braya* plots on and off of the cutoff road and plots off the cutoff road not containing *Braya* at West Hoosier. Means (%) ± 1 SEM.

	Location			
	Braya plots on road	*Braya* plots off road	Plots without *Braya*	P-value
PLANT SPECIES				
Dryas octopetala	0.1 ± 0.0	12.3 ± 3.9	30.5 ± 5.7	0.001
Carex rupestris	0.8 ± 0.3	6.5 ± 2.3	2.8 ± 1.0	0.060
Kobresia myosuriodes	0.9 ± 0.4	5.8 ± 2.3	10.8 ± 2.5	0.030
Erigeron pinnatisectus	2.0 ± 0.6	1.8 ± 0.6	2.8 ± 0.8	0.056
Polygonum viviparum	1.3 ± 0.3	2.2 ± 0.5	4.5 ± 0.8	0.556
Hymenoxys acaulis	absent	2.2 ± 0.6	1.7 ± 0.6	—
Calamagrostis purpurascens	1.0 ± 0.6	1.8 ± 0.5	2.4 ± 0.8	0.483
Silene acaulis	absent	1.8 ± 1.5	1.3 ± 0.9	—
Total vascular plants	9.8 ± 1.2	39.8 ± 5.3	70.7 ± 5.7	0.000
SUBSTRATE COMPONENTS				
Rock	58.1 ± 5.5	25.1 ± 5.3	16.4 ± 3.2	0.000
Bare ground	35.0 ± 4.9	46.5 ± 4.9	22.5 ± 4.2	0.002
Litter	2.0 ± 0.5	7.5 ± 1.2	17.4 ± 2.2	0.000

TABLE 7. Cover of dominant (>1% cover) vascular plant species and substrate components in plots with and without *Braya* at West Hoosier. Means (%) ± 1 SEM.

	Location		
	Plots with *Braya*	Plots without *Braya*	P-value
PLANT SPECIES			
Dryas octopetala	7.3 ± 2.6	30.5 ± 5.7	0.001
Carex rupestris	4.2 ± 1.4	2.8 ± 1.0	0.45
Kobresia myosuroides	3.8 ± 1.5	10.8 ± 2.5	0.02
Erigeron pinnatisectus	1.9 ± 0.4	2.8 ± 0.8	0.29
Polygonum viviparum	1.8 ± 0.4	4.5 ± 0.8	0.005
Hymenoxys acaulis	1.3 ± 0.4	1.7 ± 0.6	0.58
Calamagrostis purpurascens	1.4 ± 0.5	2.4 ± 0.8	0.29
Silene acaulis	1.0 ± 0.9	1.3 ± 0.9	0.86
Total vascular plants	27.5 ± 4.5	70.7 ± 5.7	0.000
SUBSTRATE COMPONENTS			
Rock	37.6 ± 5.2	16.4 ± 3.2	0.0015
Bare ground	42.1 ± 3.7	22.5 ± 4.2	0.0011
Litter	5.4 ± 1.0	17.4 ± 2.2	0.0000

disturbed areas. In some populations, only a few individuals have been found off these disturbances (E. E. Neely, personal observation). Congeners grow on unstable substrates, such as scree slopes, gravel bars, shorelines, and solifluction lobes (Harris 1985). Many rare taxa in the western flora of North America and their common relatives colonize disturbed habitats (Stebbins 1980). *Braya* may inhabit unstable or disturbed areas because of an inability to compete with other species, as suggested by Griggs (1940) for other species of rare plants.

Of the three populations, Mt. Bross plants appear to be the most vigorous, perhaps because past disturbance has reduced the density or size of other plants, leaving more resources available to *Braya*. The largest plants and those with the greatest amout of reproductive output at Mt. Bross occur mostly on the margins of a rough vehicle path and on spoil banks adjacent to a ditch. The path is level, and the surface is apparently stable. At West Hoosier, the cutoff road is considerably more disturbed than the adjacent areas. Possibly the degree of disturbance on the road is greater than optimum for *Braya*, given the virtual absence of seedlings and small proportion of juveniles.

Observations of *Braya* in the Spout Lake population reinforce the importance of soil disturbance. Here it typically grows in small gravels, scree slopes, and solifluction lobes that have been demonstrated in Rocky Mountain National Park, Colorado, to move downhill at a rate of 3–4 cm year^{-1} (Benedict 1970). *Braya* appears to be preadapted to unstable substrates, making it most successful where there has been some moderate level of natural or man-made disturbance.

The sizes of *Braya* populations before human intervention began is unknown, but if populations at relatively undisturbed sites such as Spout Lake are any indication, populations must have been small. In some cases human disturbance may simulate natural processes that create suitable habitat; however, drastic disturbances such as mine-related activities could greatly reduce or eliminate populations. Because *Braya* is found on calcareous soils derived from rocks such as limestone, which are often highly mineralized, it may be threatened by potential mining activities.

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