Species	Relative Cost/ Effort	Measured Variable	How Collected	Level of rigor	Ability to Detect Difference / Change	Inferential Strength About Severity of Recreation Impacts	Shortfalls/Comments
Elk (also applies to black-tailed deer and probably mountain goats)	Low	Presence/ Absence	Elk observed from roads/trails & areas of high and low use	Low	High	Low	These observations will allow us to compare/correlate elk presence and abundance in areas of high and low use. From these data, though, we will not be able to make inferences about the severity of recreation impacts (i.e. If numbers are lower in front country areas, we cannot tell whether elk are simply displaced or if population sizes are actually being reduced.)
	Moderate	Stress (corticoid levels)	Fecal samples from areas of high and low use	Low	High	Medium	These observations will allow us to compare/correlate chronic elk stress in areas of high and low use. From these data, though, we will not be able infer whether recreation increases in stress are tolerated or whether they are harming elk fitness and possibly leading to elk population declines.
	Moderate	Elk cow:calf ratios	Count cows and calves in populations in high and low use areas	Low	High	Medium/High	These observations will allow correlative inferences about recreational use and fitness level responses. If significant

							differences in calving success are detected between areas of high and low use are detected, this would likely trigger management action.
	Moderate	Elk cow:calf ratios	Count cows and calves in *multiple* populations in high and low use areas over *multiple* calving seasons.	Medium	High	High	Same as above, but with replication over time/space the level of rigor and inference values are increased.
	High	Elk stress OR cow:calf ratios	Same as above but using an experimental design in which recreation is simulated at different levels of intensity around selected populations.	High	High	High	Using an experimental approach may be useful in teasing out confounding factors, but probably would not lead to a substantially higher inferential strength and therefore, may not be worth the increased effort/cost.

Species	Relative Cost/ Effort	Measured Variable	How Collected	Level of rigor	Ability to Detect Difference /Change	Inferential Strength About Severity of Recreation Impacts	Shortfalls/Comments
Corvids	Low	Presence/ Absence (and abundance)	Corvid observations could be made in front and backcountry areas. Observations could be made opportunistically during other field work.	low	high	low	Similarly to the above comments for this kind of study of elk, it may be fairly easy to find a difference in corvid abundance between high and low use areas, but that is about as far as the inferences could go. To gain insights into the resulting nest predation on bird species would take a little more work.
	Moderate	Presence/ absence (& abundance)	Corvid observations could be made at varying distances from trails & other human use areas.	medium	high	medium	Observations could be made opportunistically but some thought/effort would have to go into making multiple observations at set distances from the trail/area of use. In addition to the correlative results in the above study, this research would also give insight to attenuation rates of impact as you move away from the recreation site.
	Moderate -High	Presence/ Absence (&	Corvid observations	Medium-high	High	High	Correlating corvid abundance and

		abundance) of corvids AND nest predation	in areas of high and low use and paired nest predation numbers in these same areas.				recreational use with actual nest predation would provide a very sound argument for managing to minimize corvid attraction.

Species	Relative Cost/ Effort	Measured Variable	How Collected	Level of rigor	Ability to Detect Difference /Change	Inferential Strength About Severity of Recreation Impacts	Shortfalls/Comments
Hoary Marmots	low	Marmot presence/ absence (& abundance)	Record and count marmots in areas of high and low recreational use. Observations could be opportunistically collected	low	high	low	As in the lowest effort study suggestions for elk and corvids, a correlative study of marmot abundance and recreational use will definitely provide some insight into whether recreation is having an population impact on marmots. However, since marmots may also be habituated or even attracted to recreational use (for food), the results of this study may not provide more than a guess of whether or not the current net result of recreation on marmots is detrimental.
	moderate	Stress indicators (glucocorticoids) & reproductive success	Marmots in colonies near to and far from recreation could be sampled. Fecal samples could provide corticoids. Simple counts	medium	high	medium	Recreation correlated with a change in stress level (increased or decreased) or change in reproductive success or both would be a good indicator of net effect of rec. disturbance on these animals. If habituation is occurring, there should

			of offspring put into a offspring:adult ratio could indicate population reproductive success.				be no difference between the front and backcountry colonies' stress levels and reproduction. If marmots are getting food from recreationists, the front country colonies may actually be better off, but managers should be wary of increased vulnerability to predators in colonies that have grown less wary.
	High	Fitness indicators such as individual survival and reproduction success	Using colonies in front country and back country areas, survival & reproductive rates could be recorded by designated observers or capture and mark studies.	Medium	High	High	In depth survival and reproduction investigation is the best way to predict how recreational disturbance will affect populations in the long term.

Species	Relative Cost/ Effort	Measured Variable	How Collected	Level of rigor	Ability to Detect Difference /Change	Inferential Strength About Severity of Recreation Impacts	Shortfalls/Comments
Cascade fox	low	Presence/ absence & abundance	Observations in front and backcountry areas (could be made opportunistically as a part of other field based monitoring work).	low	high	low	Again, this approach yields correlative results at best and would not necessarily pinpoint the best direction for management action.
	moderate	Stress (through glucocorticoid levels)	Fecal samples could be collected and tested for glucocorticoids.	medium	high	medium	Corticoids in fecal material will provide some indication of foxes' stress levels in areas of varying recreational activity. Perhaps if some fox work is already being done, it would even be possible to track individuals and check their stress levels in different recreational areas.
	high	Individual responses such as avoidance behaviors, stress, survival and	Radio-collared or marked foxes could be tracked, and stress, survival and reproduction could be	Medium-high	high	high	Recreation impact research could take advantage of other cascade fox research being conducted at the time. Depending on how foxes are being studied, there are a

		reproductive success.	compared in recreation and non-recreated areas.				number of ways that recreation impacts on foxes could be addressed just by adding some simple field methods.