

Keeping Wilderness Wild: Increasing Effectiveness With Limited Resources

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Abstract—Wilderness managers are forced to make increasingly difficult decisions about where to focus limited resources. Traditionally, areas of high visitor use and high impact are prioritized over areas of light use and light impact. However, areas that contain little to no human impact and contain the qualities that lead to the area's designation as wilderness are most precious and have the greatest potential to be responsive to management. We mapped attributes of the Gros Ventre Wilderness in Wyoming to demonstrate how the most precious, vulnerable and responsive areas can be identified and prioritized. This information shows how on-the-ground management attention can be shifted to more effectively retain the area's wilderness character.

Numerous studies of recreational impact in wildland settings have revealed that, with increasing use, impacts to the resource and to visitor experience accelerate quickly, then tend to level off. However, recovery is very slow after use is reduced (Cole and Hall 1992; Hammit and Cole 1987). These results have been widely applied at the site scale to guide campsite management and to guide recreationists' behavior, as evidenced by the Leave No Trace principles "concentrate impacts in high use areas" and "avoid places where impact is just beginning" (Cole and Krumpel 1992). Wilderness planning efforts have also incorporated these results by developing a spectrum of zones to concentrate use in certain zones, thus enabling better protection for wilder portions of the wilderness, rather than trying to disperse use throughout the wilderness in order to meet one set of standards. However, results from wildland recreation studies have not yet been used to guide where on-the-ground management attention is focused.

Wilderness ranger presence is typically focused where visitor contact can be maximized, where impacts are perceived to be greatest, and where trail clearing needs are the greatest. All of these criteria lead the manager to schedule wilderness ranger presence in the more heavily used portions of the wilderness. The wilderness ranger job includes monitoring conditions but with increasingly limited resources monitoring is typically done along with other duties such as visitor contact, trail clearing, and campsite cleanup. Because wilderness ranger presence is focused in the more

heavily used portions of the wilderness, monitoring data are scant to nonexistent in the more lightly used portions of the wilderness.

Recently, the traditional strategy of focusing management attention in heavily used areas rather than in lightly used areas has been questioned as to its long-term effectiveness in protecting wilderness qualities (Cole 1997). A compelling case has been made that lightly used areas are most precious, most vulnerable to change and most responsive to management action. By shifting the focus to monitoring and protecting lightly used areas, managers with limited resources can more effectively prevent impacts and ensure that more of the wilderness meets the spirit of the Wilderness Act.

The purpose of this project is to demonstrate how the conceptual framework of allocating on-the-ground management attention based on criteria of preciousness, vulnerability, and responsiveness can be applied and how this information can be used to prioritize where wilderness rangers spend their time. The Gros Ventre Wilderness in Wyoming is used as the demonstration area. This project was not done as part of a planning effort but rather as part of ongoing implementation of existing plans. The results of the analysis has three intended uses:

- 1) Identify priority areas to focus wilderness monitoring,
- 2) Identify areas most at risk if nearby roads were improved or other development activity occurred, and
- 3) Prioritize areas where proactive management action would be most effective.

The Demonstration Area

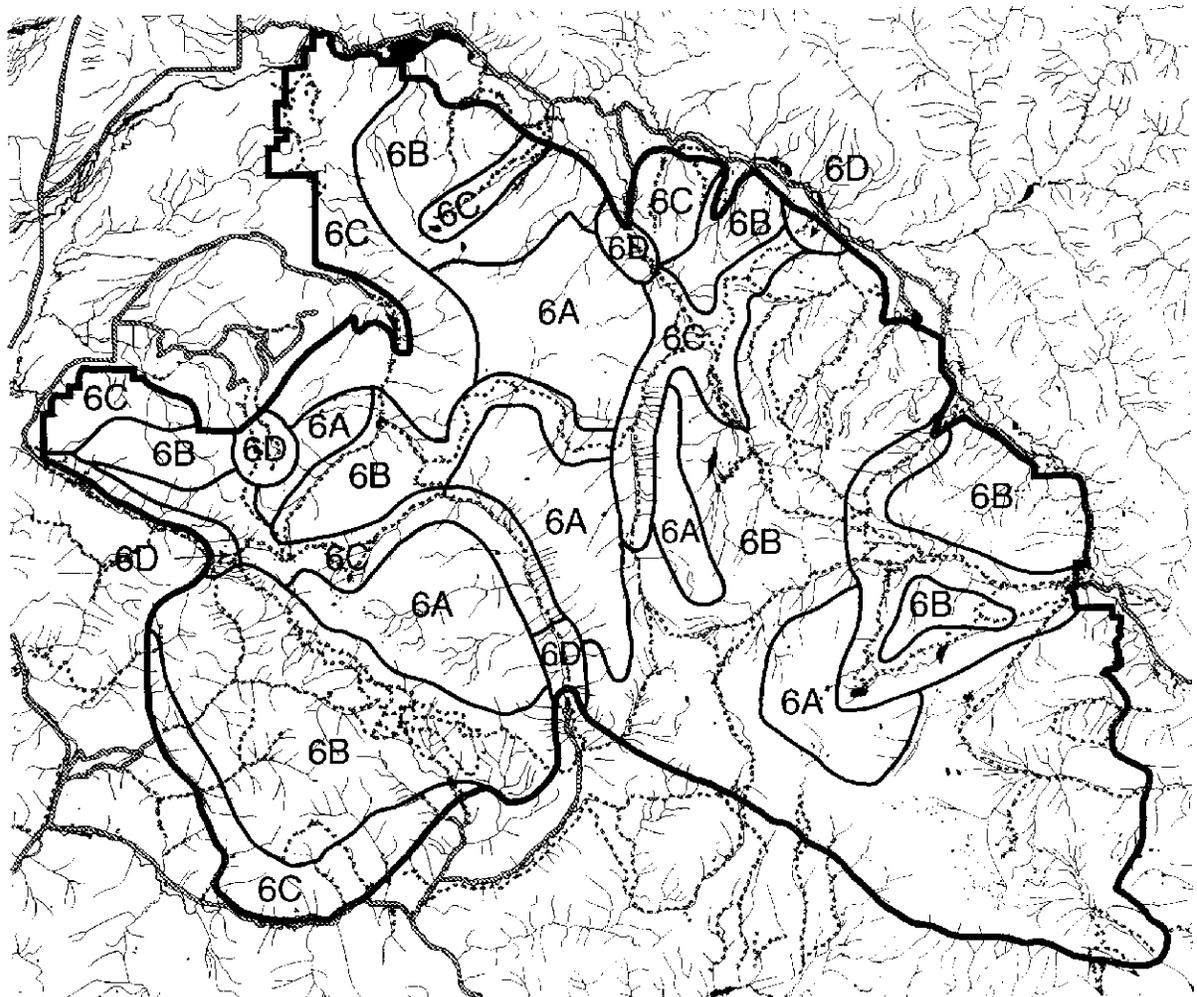
The 287,000 acre Gros Ventre Wilderness lies in the heart of the Greater Yellowstone Ecosystem on the doorstep of Jackson, Wyoming. Natural qualities leading to its designation included its "interesting and unique expressions of geology", such as one of the largest concentrations of landslides in Wyoming. Other key reasons for designation were watershed protection and protection of wildlife habitat, especially for elk and bighorn sheep. Although roughly three million people visit Jackson Hole each summer, the Wilderness receives light use (estimated at 30,000 recreation visitor days per year). This is largely due to the lack of easy access. Consequently, the Gros Ventre Wilderness is closest to the wilderness ideal when compared with surrounding wildernesses and national parks. Despite current light use, significant pressures exist that could increase impacts greatly in the future. These include potential for improved road access and greatly increased visitation from tourists, as well as residents seeking refuge from increasingly crowded and regulated areas.

In: Cole, David N.; McCool, Stephen F.; Borrie, William T.; O'Loughlin, Jennifer, comps. 2000. Wilderness science in a time of change conference—Volume 4: Wilderness visitors, experiences, and visitor management; 1999 May 23–27; Missoula, MT. Proceedings RMRS-P-15-VOL-4. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

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Wilderness management direction for the Gros Ventre is found in the Forest Plan (USDA Forest Service 1990) and the Wilderness Action Plan (and Implementation Schedule) (USDA Forest Service 1994). As part of this direction, the Wilderness is divided into four zones (6A-6D), ranging from an undisturbed setting (6A) to a natural setting where evidence of localized human use exists (6D) (fig. 1). Within

each zone, standards for acceptable conditions have been established for trail development, campsite impact, grazing impact, and encounters between groups (table 1). Recently, the Forest has focused more attention on road management, and new funding has been obtained to significantly improve some existing roads. At the same time, there has been increasing recognition that how roads and other projects



LEGEND

 Road  Stream
 Trail  Lake
 Gros Ventre Wilderness Boundary

6A: An undisturbed setting where little to no evidence of human presence exists.

6B: A relatively undisturbed setting where minor evidence of human presence exists.

6C: A relatively undisturbed setting where minor evidence of human use or presence exists, particularly in concentrated-use areas such as campsites and travel corridors.

6D: A natural setting where evidence of localized human use exists and encounters with other groups may be frequent.

Figure 1—Management zones in the Gros Ventre Wilderness.

Table 1—Management strategy and protection standards for priority areas.

Priority areas	Zone category	Management strategy	Key standards
Priority #1	6A	Impact prevention and elimination	Wildlife: human activity is prohibited in crucial winter ranges from Dec 15 to April 30; human activity is restricted in elk calving areas between May 15 and Jun 30. Grazing: cattle and domestic sheep are not authorized; maximum utilization of key forage species by recreational stock is 50%. Recreation: visitors encounter no more than one other group per day; no groups are camped within sound or sight of each other. Campsites: vegetation may be flattened but is not lost. There are no fire rings or other camp structures. Trails: existing routes look like game trails. No new routes are created. No signs, cairns or other trail markers exist.
Priority #2	mostly 6B, some 6C	Strong upward trend in conditions	Wildlife: same as priority #1 areas plus trail locations will be managed to protect elk wallow complexes. Grazing: range improvements, management activities and trailing will be designed to help meet wildlife habitat needs on key areas such as crucial winter range and seasonal calving areas; maximum utilization of key forage species is specified in individual allotment plans. Recreation: visitors encounter no more than four other groups per day; no more than two groups will be camped within sight or sound of each other. Campsites: vegetation is lost only around the fire ring or center of activity. Trails: system trails are passable but may be brushy. Tread is narrow and may be rocky; no more than an average of 0.2 miles of system trail per square mile of area exists.
Priority #3	6A	Stable conditions	Same as priority #1 areas
Priority #4	mostly 6B, some 6C	Upward trend in conditions	Same as priority #2 areas
Priority #5	mostly 6C, some 6B and 6D	Prevent impact spread; concentrate use on established sites.	Wildlife and Grazing: same as priority #2 areas. Recreation: visitors encounter no more than six other groups per day; no more than three groups will be camped within sight or sound of each other. Campsites: vegetation may be lost but mineral soil and tree roots are not exposed. Trails: Trails are narrow but well-defined and corridor is passable; no more than an average of 1.0 miles of system trail per square mile of area exists.

adjacent to the Wilderness are addressed will dramatically affect how wild this area is in the future.

Methodology

Lightly impacted areas best meet the criteria of preciousness since they are closest to the wilderness ideal. Lightly impacted areas are also most likely to change with increasing use (vulnerable) and most responsive to management (Cole 1997). Preciousness can also be defined as a characteristic of those areas offering the qualities that lead to wilderness designation. Of the three primary qualities leading to the designation of the Gros Ventre Wilderness (geology, watershed and wildlife protection), increasing recreational use is most likely to adversely affect wildlife. Thus, we based our prioritization on the overlap between those areas which have little to no impacts from recreation and grazing use (the two primary sources of human disturbance within the Wilderness) and those areas which are crucial in terms of wildlife habitat.

We first created an impact map displaying three categories of disturbance from human activities. Pristine areas were those containing no system trails and no inventoried campsites; they were also outside of any grazing allotment. Lightly disturbed areas were those areas containing secondary system trails, minor campsite impacts (few campsites

with condition class ratings of 1 or 2), and minor grazing impacts such as trailing. Disturbed areas were those areas containing primary system trails (main travel corridors) and moderate campsite impacts (clusters of campsites with some condition class ratings of 3 or 4), and they were within core areas of grazing allotments. Four map layers were used to create the impact category map: the map of the four wilderness zones (6A-6D), a map of system trails, a map of campsite locations and condition class ratings and a map of grazing allotment boundaries. Field observations from wilderness rangers and a range specialist were used to supplement the map information. Next, we created a map displaying crucial wildlife habitat (winter range and calving/lambing areas) for elk, moose, deer and bighorn sheep. Crucial wildlife habitat is one of the layers in the Forest GIS database and was generated jointly by Wyoming Game and Fish Department and Forest Service biologists.

The impact map and crucial wildlife habitat map were then overlain to identify priority areas (fig. 2). We chose the strategy that it is most effective to “protect the best, then restore the rest.” Thus, pristine areas were prioritized over lightly disturbed areas, and areas containing crucial wildlife habitat were prioritized over areas that did not contain crucial habitat. Using this logic, priority #1 areas are pristine areas containing crucial wildlife habitat. Priority #2 areas are lightly disturbed areas containing crucial wildlife

habitat. Priority #3 areas are the remaining pristine areas, and priority #4 areas are the remaining lightly disturbed areas. Priority #5 areas are the rest of the Wilderness.

Results and Discussion

In past years, wilderness ranger field presence in the Gros Ventre was focused in the more heavily used portions of the Wilderness in order to maximize visitor contact and work on

trail projects located in the primary travel corridors (fig. 3). Based on the prioritization of areas where limited management attention has the greatest potential to keep conditions wild and retain the values for which the area was designated, a new map was generated to show how future wilderness ranger field presence would be distributed (fig. 4). Some current areas of heavy presence were designated medium presence areas, and some current areas of light or medium presence were dropped. This presence was then reallocated

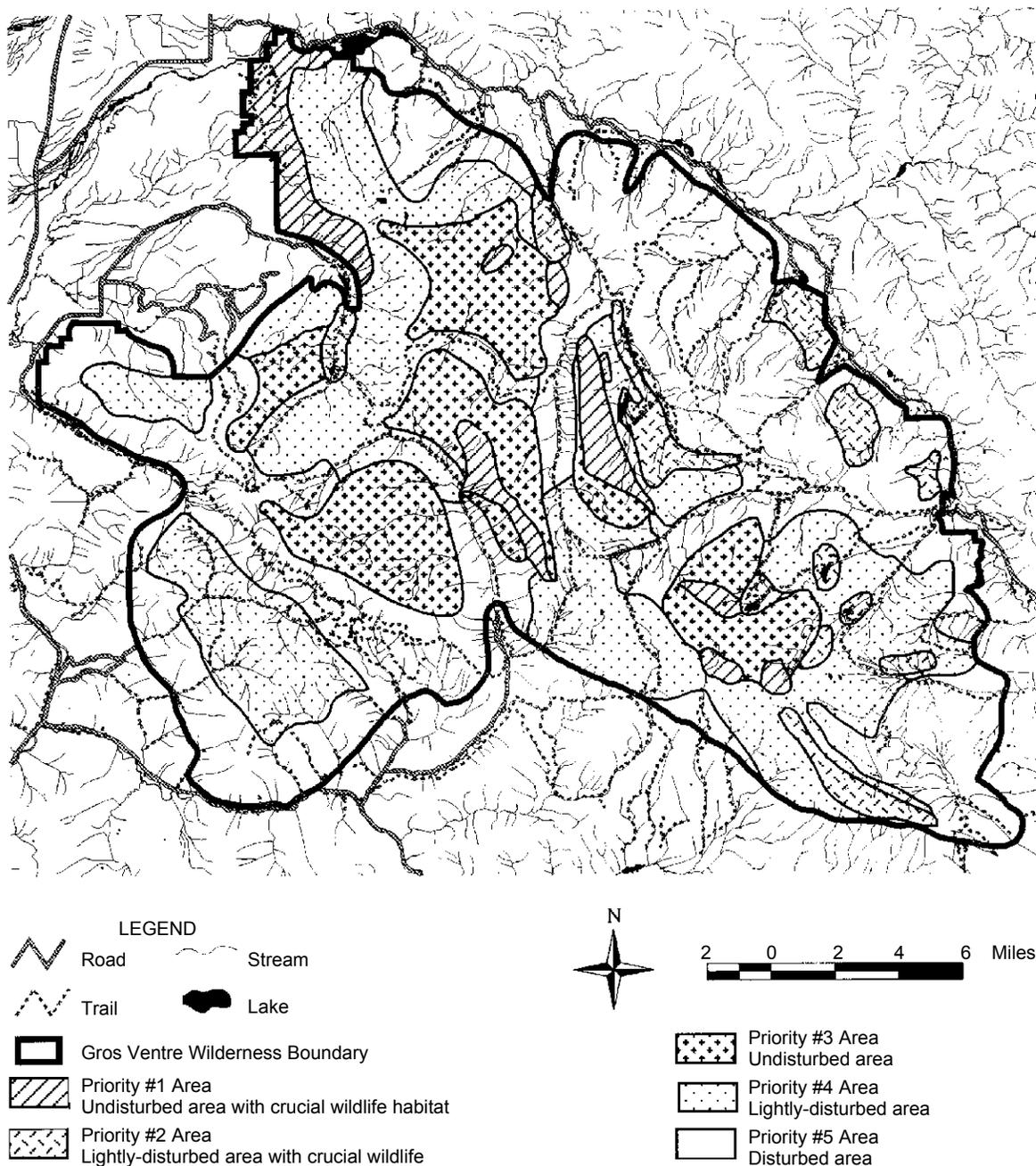


Figure 2—Priority areas, Gros Ventre Wilderness, where management will be most effective.

to increase presence in priority areas where there had previously been little to no presence.

As figure 4 shows, the strategy of focusing more management attention in lightly disturbed areas does not mean that the more heavily used portions of the wilderness are ignored. Management attention is still needed in heavily used areas to assist visitors, clear trails, prevent the spread of impacts and enforce regulations. Adopting this strategy also does not imply that heavily impacted areas cannot be restored with intensive management effort. However, most wilderness

managers do not have the luxury to intensively manage the heavily used portions of the wilderness and also adequately ensure the protection of lightly impacted, wilder portions. In these cases, limited resources focused primarily in the heavily used portions do not significantly improve conditions over time and may lead to an overall decline in wilderness, especially if use in heavily used portions is inadvertently displaced while trying to reduce impacts. Managers with limited resources can be most effective in ensuring protection of wilderness by devoting as much attention to the

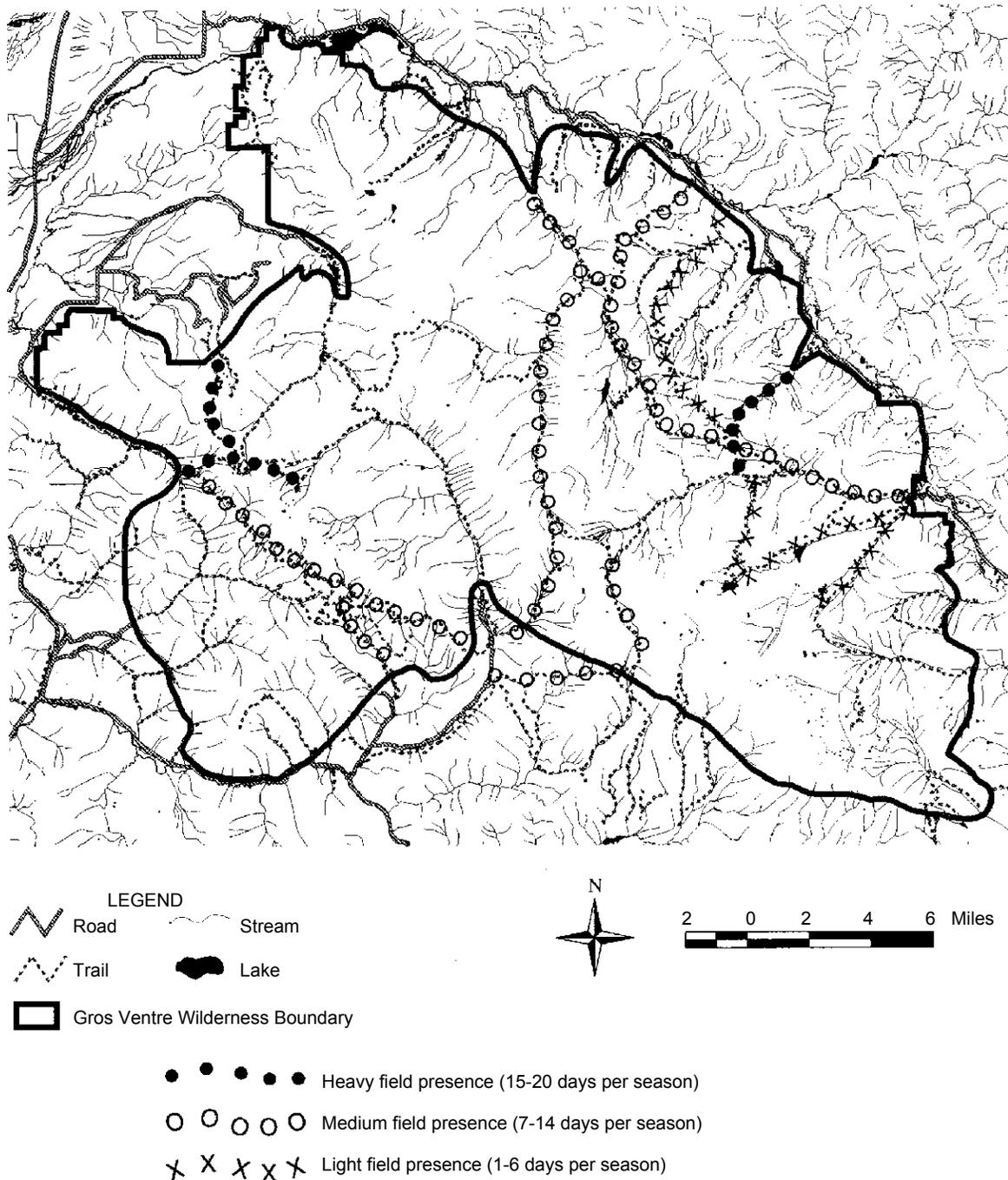


Figure 3—Current distribution of wilderness ranger presence, Gros Ventre Wilderness.

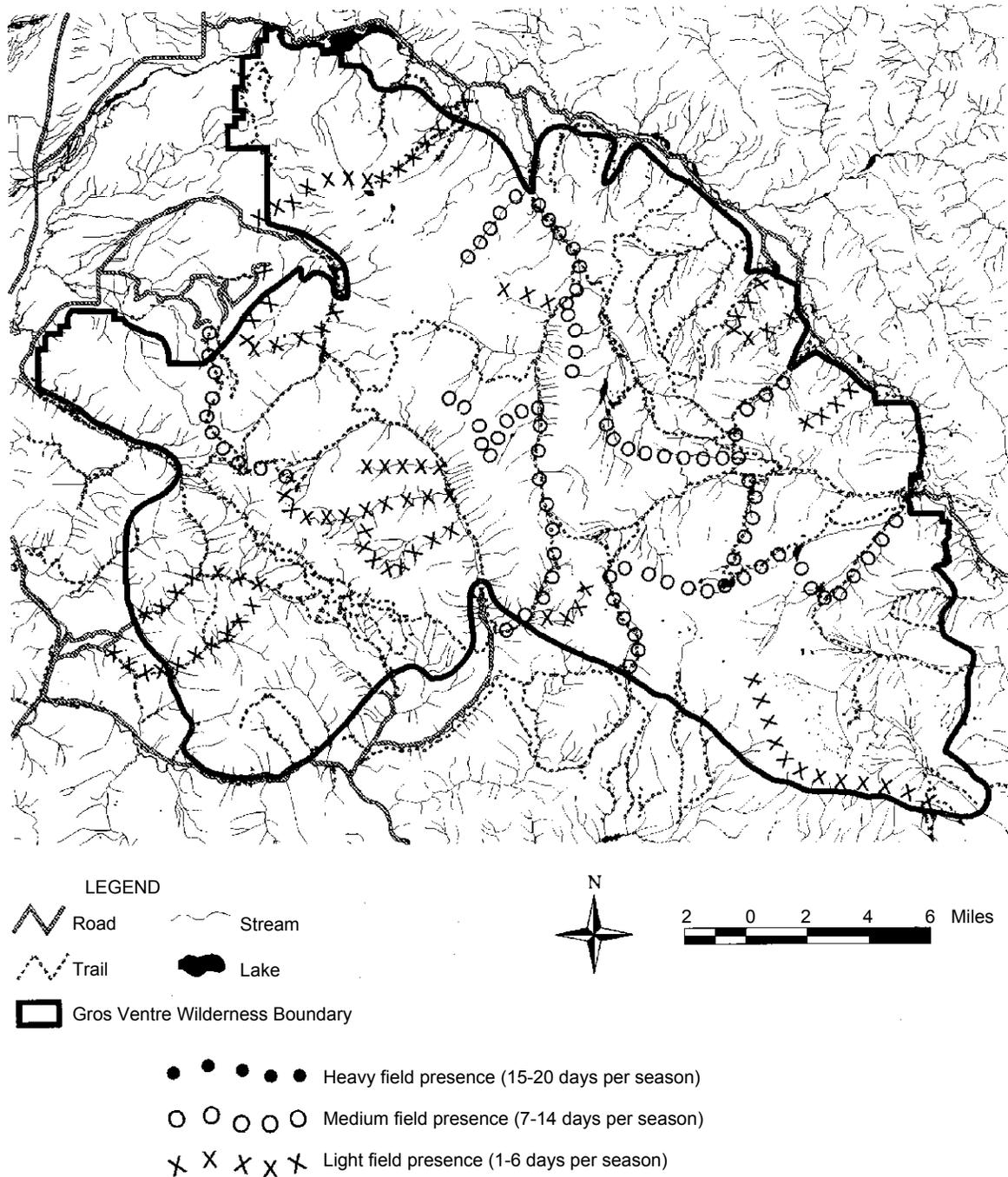


Figure 4—Future distribution of wilderness ranger presence, Gros Ventre Wilderness.

undisturbed and lightly impacted areas as the heavily used portions of a wilderness. Table 1 summarizes the management strategy identified for priority areas and the key standards for protection already established for these areas.

In the summer of 1999, we are using our prioritization of areas within the Gros Ventre Wilderness to direct wilderness ranger field presence. Wilderness rangers are thoroughly documenting existing conditions in the priority #1 and #2 areas. Information on which areas are most vulnerable to change and most precious is also being incorporated into the analysis of proposed improvements to existing

roads. By thoroughly documenting existing conditions in portions of the Wilderness not typically monitored, we should be able to pick up changes in conditions early on, when there is far more potential to apply corrective action. Change is inevitable with the increasing recreational growth in the region, and some degree of road improvement is likely. The strategy of focusing more management attention on the most lightly used and precious portions of the Wilderness offers the best hope to protect the Gros Ventre Wilderness in the wildest state possible.

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