White Paper: **A report to the Yellowstone Ecosystem Subcommittee on grizzly bear mortalities and conflicts in the Greater Yellowstone Ecosystem**

Prepared by: The Interagency Grizzly Bear Study Team, March, 2000

The Interagency Grizzly Bear Study Team (IGBST) was asked by the Yellowstone Ecosystem Subcommittee (YES) to review grizzly mortalities and bear-human conflicts within the Greater Yellowstone Ecosystem and identify those causes and areas where most occur. The following report details this review. Montana Fish Wildlife & Parks maintains the complete mortality database (1959-94). The IGBST has corrected and added to the mortality database for years 1975-98. In this analysis, IGBST database was used. Yellowstone National Park maintains the conflict information database, and records are complete and updated from 1992-98.

Mortalities. Mortalities are defined as: (1) known when a carcass is recovered, (2) probable when strong evidence exists to indicate a mortality (i.e., cut collar or seriously wounded bear) but no carcass was recovered, and (3) possible when presumptive evidence of death exists but there is no immediate prospect of validation. For this summary, we only included known and probable deaths, hereafter referred to as mortalities. Poaching related mortalities are defined as malicious killing, cut radio-collars, and bears killed

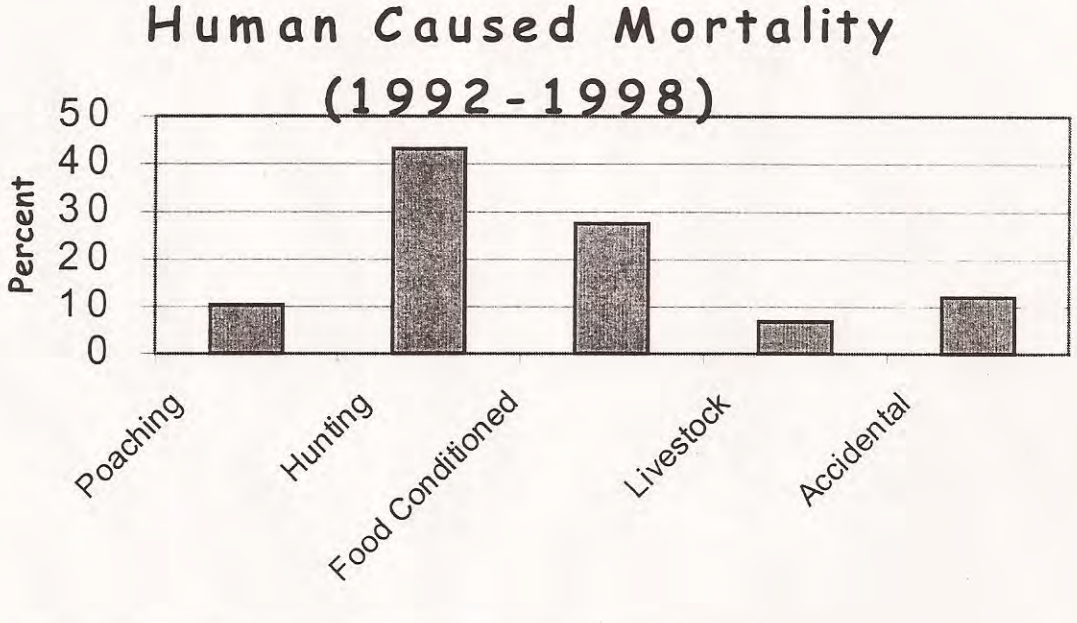

Figure 1. Categories of known and probable human caused mortality (n = 58) in the Greater Yellowstone Ecosystem, 1992-98.

and left. Hunting related moralities includes both legal defense of life and illegal, and mistake identity killing by black bear hunters. Of the 58 man caused mortalities in the GYE between 1992 and 1998, 31 (53%) were associated with poaching (n = 6, 10%) or hunting (n = 25, 43%), 16 (28%) human food conditioned (hereafter referred to as food conditioned) or aggressive bears, and 4 (7%) livestock related (Fig. 1).

Hunting related, self defense, and illegal mortalities have changed numerically and spatially in recent times (1992-98) (Fig. 2) when compared to the previous 7-year period (1985-91)(Fig 3).

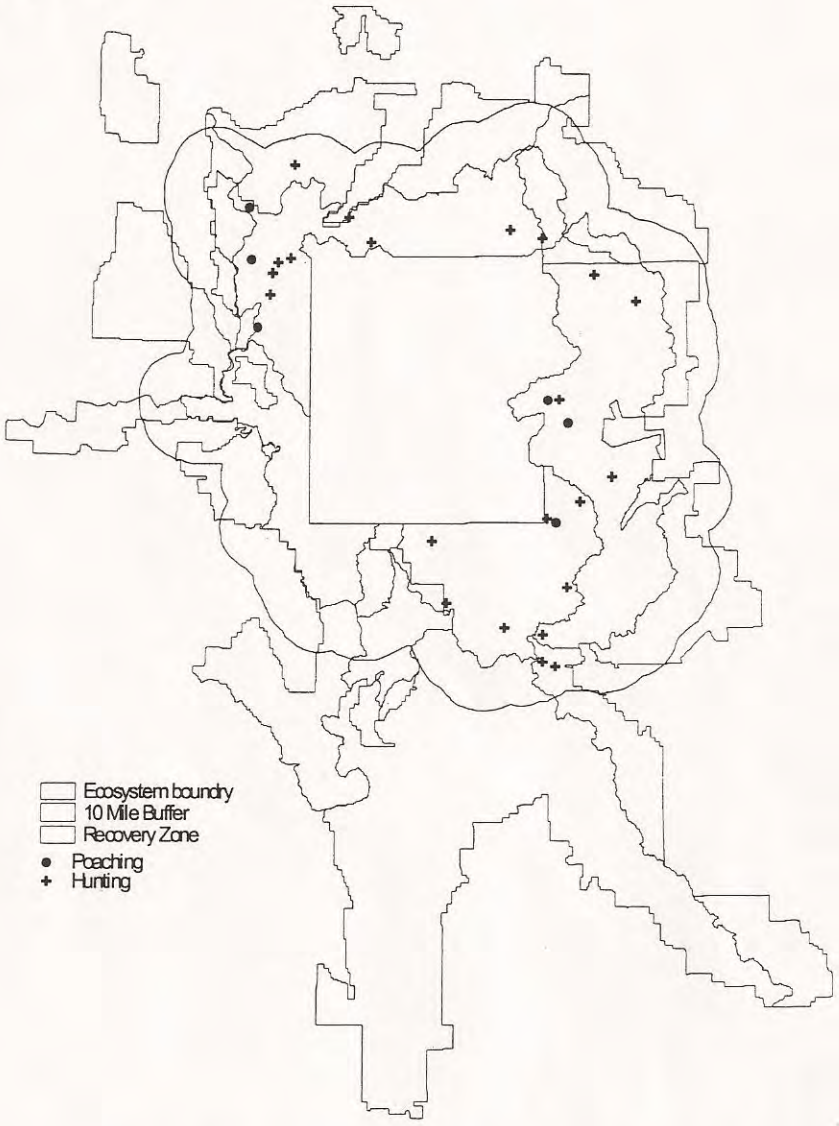

Figure 2. Poaching and hunting related mortalities (n = 31) of grizzly bears in the Greater Yellowstone Ecosystem, 1992-98.

During the years 1992-98, there were 25 hunting and 6 poaching related moralities reported for an average of 4.4 per year. All occurred inside the recovery zone and 10-

mile perimeter area. During 1985-91, there were 7 hunting and 6 poaching related mortalities reported inside the recovery zone and 10 mile perimeter area for an average of 1.9 per year. There was also one mortality outside the perimeter area. Documented mortalities have more than doubled in recent years with the majority associated with defense of life killing by fall big game hunters (Fig. 2a).

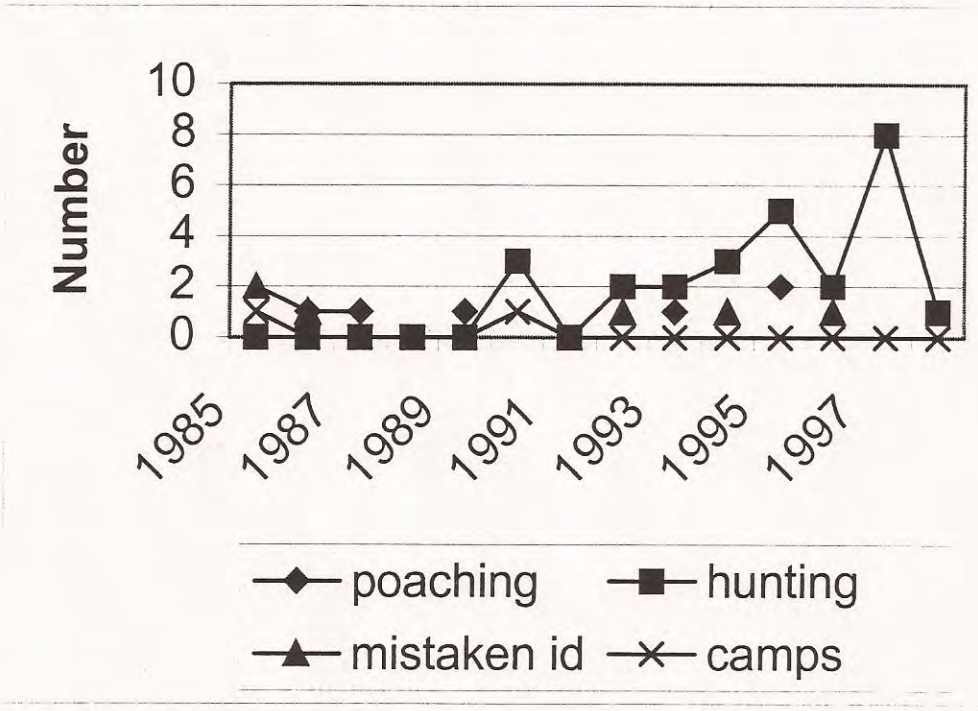

Figure 2a. Grizzly bear mortalities by cause from 1985-98 in the Greater Yellowstone Ecosystem. Legal defense of life and illegal killings were pooled for both hunting related and at backcountry campsite (camps) categories.

Although mortalities occurred ecosystem wide (1992-98) on both public ($n = 28$) and private ($n = 3$) lands, the most noticeable increase was on the Gallatin National Forest in the northwest part of the recovery zone from Gardiner, Montana west to the Taylor Fork of the Gallatin River and south to Hebgen Lake on the Madison River (Fig. 2 and 3).

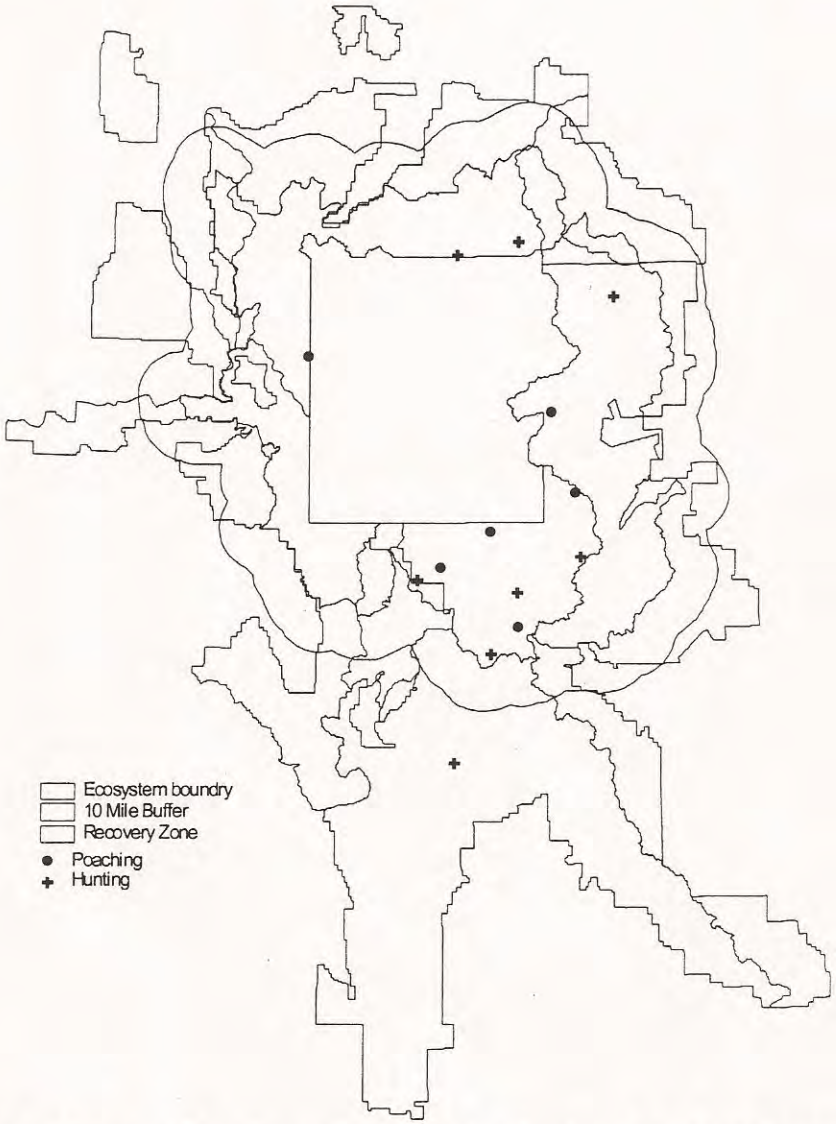

Figure 3. Poaching and hunting related mortalities (n =14) of grizzly bears in the Greater Yellowstone Ecosystem, 1985-91.

Bear mortalities associated with property damage, food conditioned, and aggression occur ecosystem wide (Fig 4.) almost exclusively within the recovery zone and 10 mile buffer. Most (93%) were management removals. Nearly half occurred on private land (n = 13) and half on public lands (n = 14) between 1985-98. Private land constitutes a small fraction of the area within the recovery zone (2%) and perimeter area (29%). The nearly equal split indicates that these types of mortalities occur disproportionately higher on private lands. Most mortalities were associated with human garbage and property damage (70%, n = 19) and have not changed from 1985-91 (64%) when compared to recent times,1992-98, (75%). Most property damage was associated with unnatural foods and garbage.

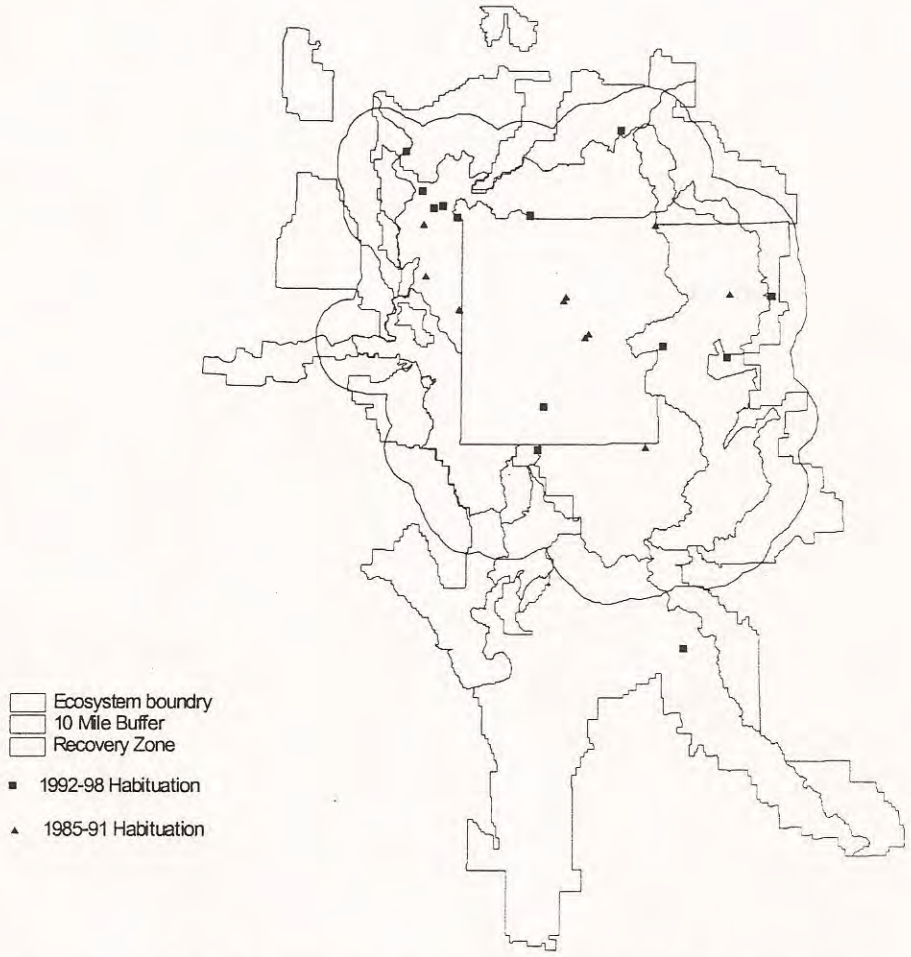

Figure 4. Food conditioned and aggression mortalities of grizzly bears in the Greater Yellowstone Ecosystem, 1985-91 (n = 11) and 1992-98 (n = 16).

Hunting related, poaching related , and food conditioned mortalities were the most prevalent category identified within the ecosystem. During the period 1992-98, nearly half (n = 24 of 47) of these recorded mortalities occurred during the 2 bad food years of 1994 and 1995; annual mortalities were nearly 3 times higher during bad food years (12/year) when compared to average of good food years (4.6/year).

We also examined these categories for a pattern of change from 1985-91 period to the 1992-98 period. The most noticeable increases expressed as a percentage change occurred in the Hilgard Bear Management Unit (BMU), the Shoshone BMU, and outside the recovery zone (Fig. 5). When evaluated on an absolute change in mortality numbers, the Hilgard and lands outside the recovery zone stand out (Fig. 6). Although the percentage increase on the Shoshone BMU increased by 300%, the absolute change only increased from 1 to 4 mortalities. This contrasts with the Hilgard where mortalities went from 1 to 10, and outside the recovery zone where mortality increased from 1 to 8.

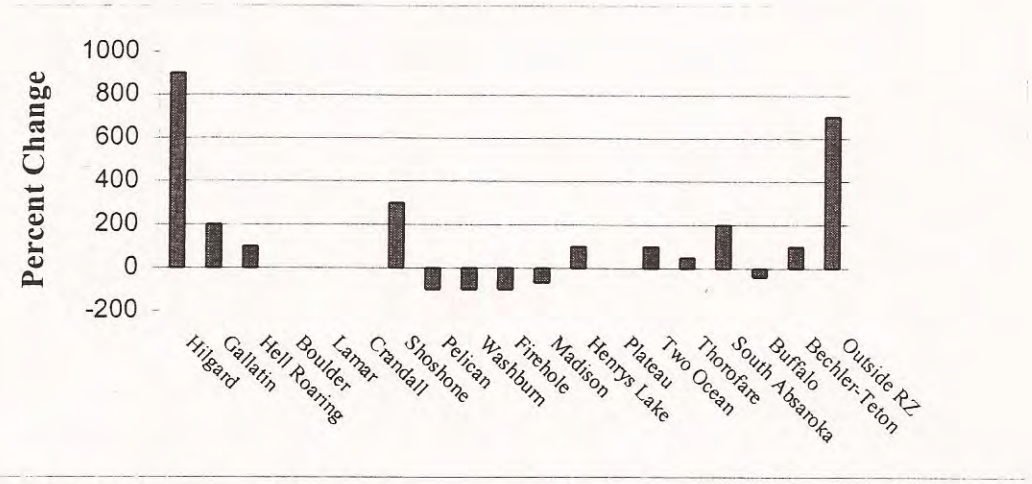

Figure 5. Percentage change in grizzly bear mortalities from hunting related, poaching related, and habituation from 1985-91 and 1992-98 by Bear Management Unit.

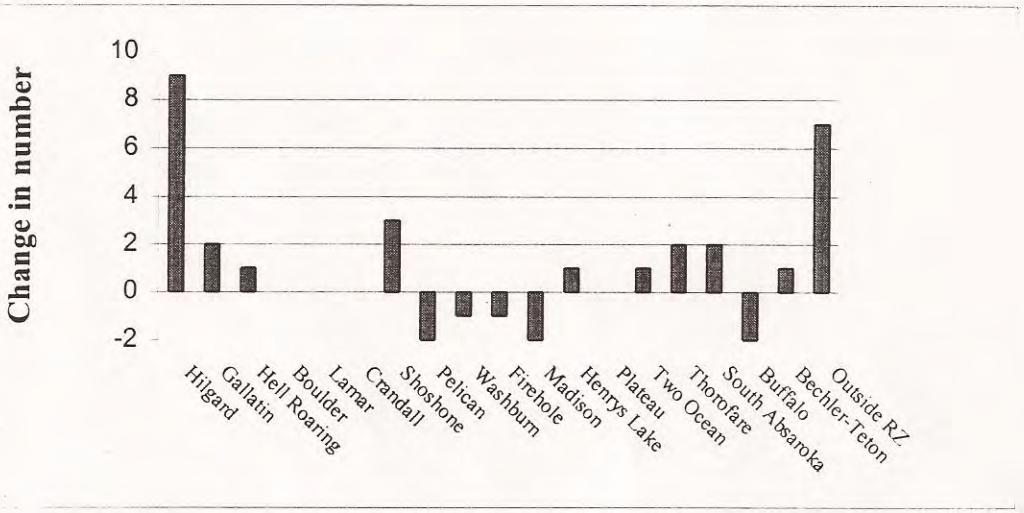

Figure 6. Change in the number of grizzly bear mortalities from hunting related, poaching related, and habituation from 1985-91 and 1992-98 by Bear Management Unit.

The 10 mortalities in the Hilgard BMU were the result of various causes. Six of the 10 mortalities were management bears that had been in conflict previously. Five of these 6 were translocated from elsewhere in the ecosystem prior to their deaths. Two of the 10 were killed in defense of life by hunters and were not problem bears. The remaining 2 bear mortalities were illegal actions.

The 7 mortalities outside the recovery zone were mainly human conflicts (n = 5) associated with habituation and aggression. Two were hunter-related mortalities.

Conflicts. It is important to recognize that conflicts between humans and grizzly bears do not necessarily result in dead bears. The agencies involved in conflict management make every effort to minimize grizzly bear mortalities as per the Interagency Grizzly Bear Guidelines (1986). Between 1992 and 1998, most conflicts (n = 718) were associated with livestock depredations (n = 299, %) and unnatural foods (n = , %) (Fig. 7). Nearly all livestock conflicts were resolved without mortalities. Between 1992 and 1998, there were 299 reported livestock bear conflicts (cow = 207, sheep = 89, horse = 1, duck = 2), with 4 resulting in bear mortalities. Most conflicts involved: (1) investigation and reporting (n = 161, 69.4%), (2) attempted/trap and relocate problem bear (n = 58, 25.0%, or (3) monitor the situation (n = 12, 5.2%), and (4) removal of the livestock(n = 1, 0.4%).

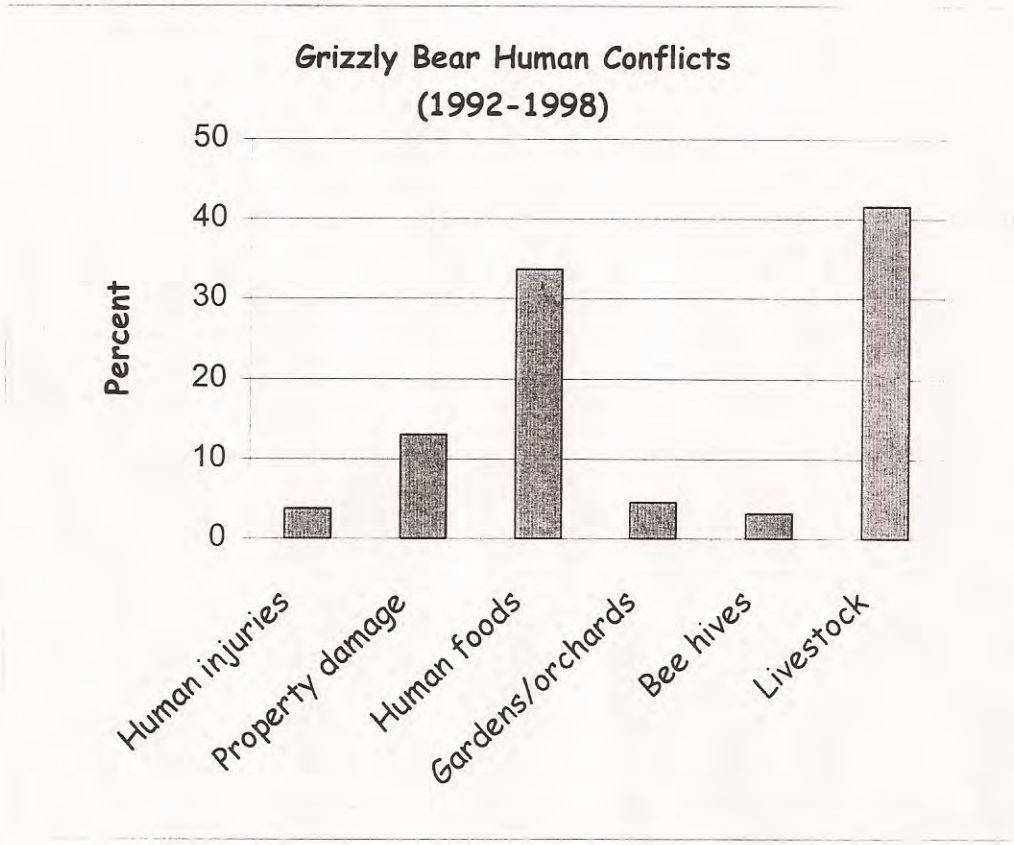

Figure 7. Categories of grizzly bear-human conflicts in the Greater Yellowstone Ecosystem, 1992-98.

Human conflicts vary annually, but the trend in livestock depredation is increasing (Fig. 8). We evaluated the relationship between conflicts and availability of natural foods. We divided the year into 3 seasons: spring = March-May, summer = June-August, and fall = September-November. Food abundance was qualitatively classified as below average,

average, or above average for each season. Conflicts with humans are related to availability of natural foods (Fig. 9), whereas livestock conflicts are independent of natural food availability (Fig. 9).

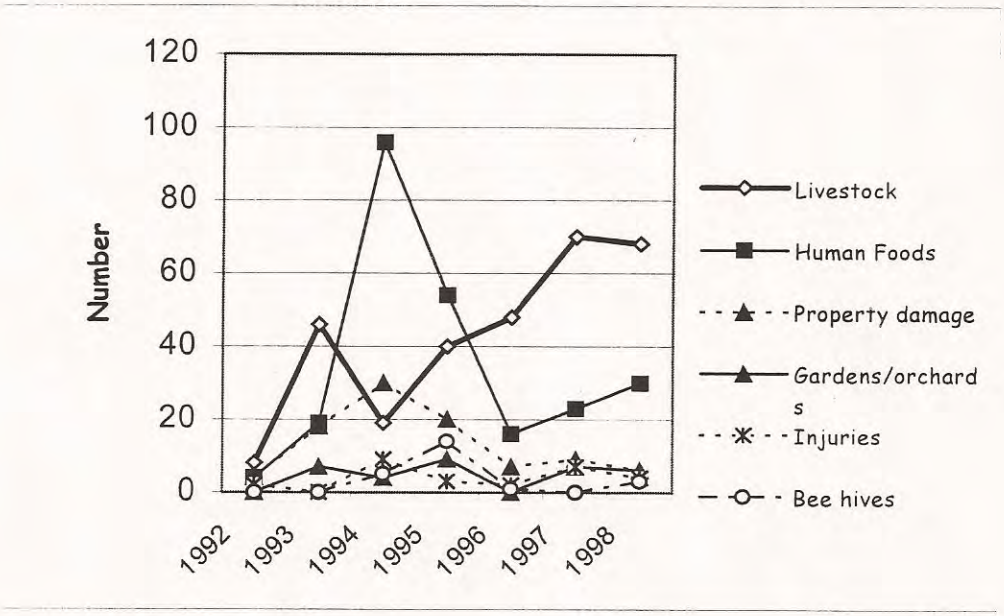

Figure 8. Trend in grizzly bear human conflicts between 1992 and 1998, in the Greater Yellowstone Ecosystem.

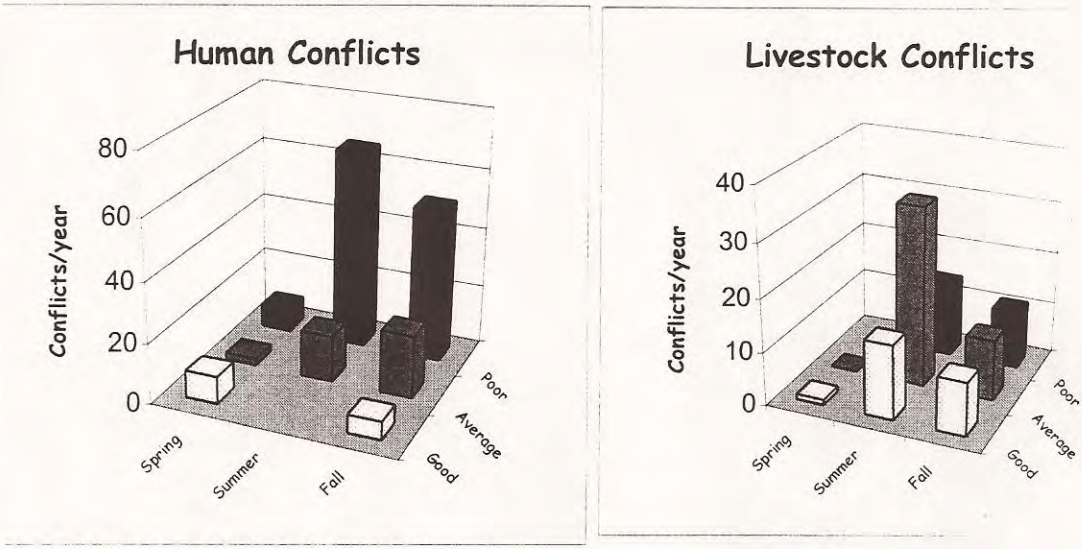

Figure 9. The relationship between seasonal food abundance during 3 seasons and the number of grizzly bear conflicts associated with humans and livestock in the Greater Yellowstone Ecosystem, 1992-98.

Seasonal timing of conflicts follows a general pattern with most in late-summer and early fall seasons (Fig. 10). Human conflicts tend to peak in September, whereas livestock conflicts peak in August.

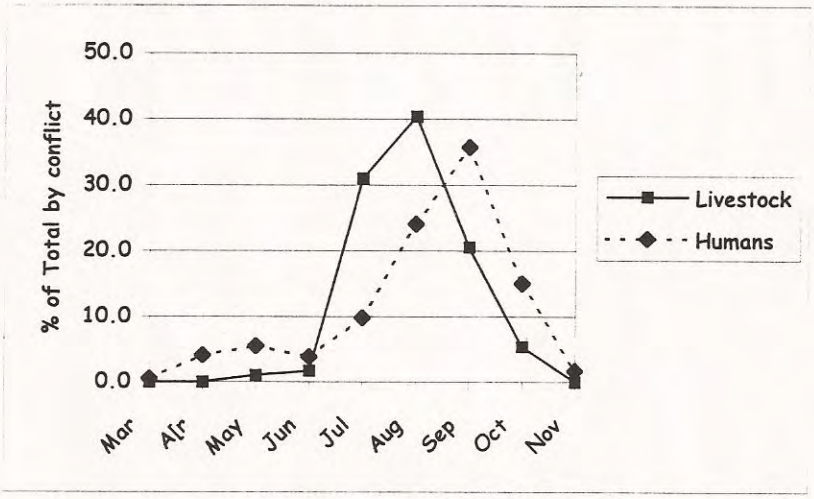

Figure 10. Seasonal distribution of conflicts in the Greater Yellowstone Ecosystem, 1992-98.

Livestock: The number of reported livestock depredations has increased from 8 in 1992 to 68 in 1998 (Fig. 11). Over the last 3 years (1996-98), livestock depredations have

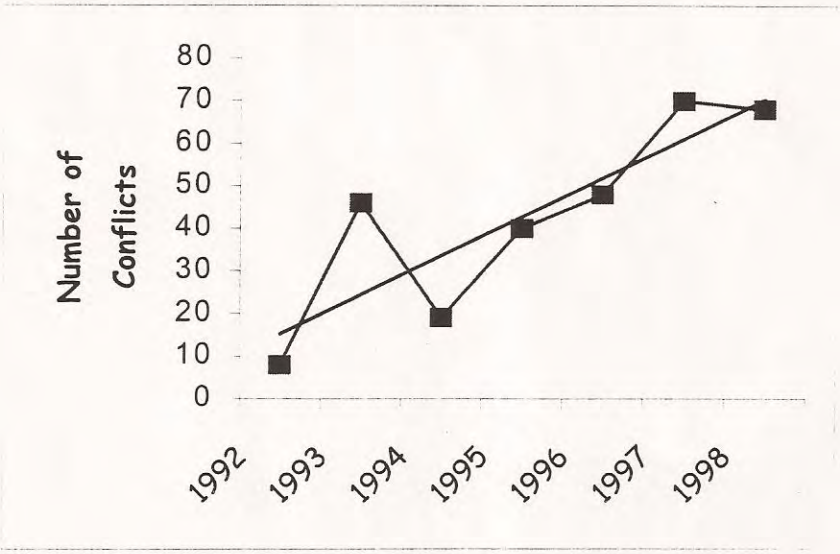

Figure 11. The relationship between number of livestock conflicts and year of conflict. The fitted line was significant ($R^2 = 0.738$, $P = 0.013$).

comprised 60.6% of all grizzly bear-human conflicts, and livestock depredations have increased 363% from 1992 to 1998, or 60.5% per year.

The proportion of livestock depredations occurring outside the designated Recovery Zone is also increasing (Fig. 12). In 1992 all livestock depredations occurred inside the Recovery Zone. By 1998, 83.6% of all livestock depredations occurred outside the Recovery Zone.

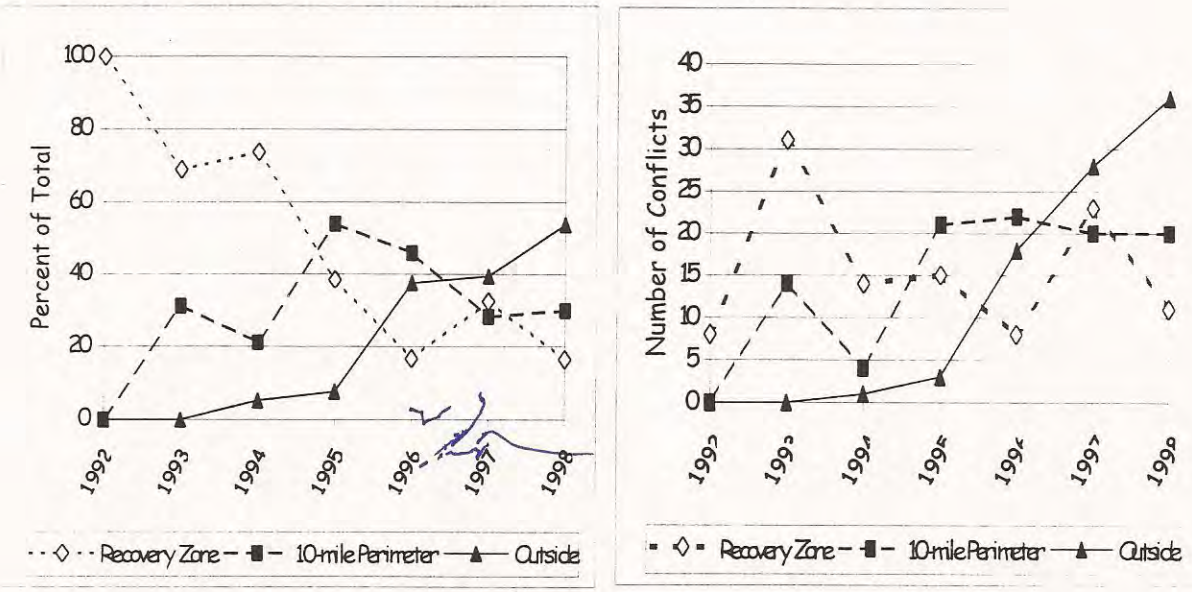

Figure 12. Percentage (right) and number (left) of livestock conflicts by year within the grizzly bear recovery zone, the 10-mile perimeter area, and outside the perimeter area, 1992-98, Greater Yellowstone Ecosystem.

Most depredations occur on the Bridger-Teton (B-T) National Forest (53%), private land in Wyoming (13%), and on the Targhee National Forest (12%). Depredations involve both domestic sheep and cattle.

Sheep depredations: Conflict summaries (Gunther et al. 1993-99) identify the major areas with sheep-grizzly bear conflicts (Fig. 13). Most were on the Targhee National Forest, Bridger-Teton National Forest, and the Shoshone National Forest and adjacent private lands.

> **Targhee National Forest**. Between 1992-98, there were 37 grizzly bear-sheep conflicts reported; all occurred between 1996-98. Conflict areas were South Badger Creek, North Leigh, and Adger Creek. Two female bears were trapped and translocated from the area. One was moved to the Shoshone National Forest, the other to the Targhee National Forest. Both bears have returned to the allotments and caused additional losses. Twenty-five of the 37 conflicts occurred

with the grizzly bear recovery zone in BMU 18; the other 12 occurred within the 10-mile perimeter area. These allotments have been active since at least 1987, but allotments to the north within the recovery zone were vacated prior to these conflicts starting (Ourem, pers. comm.)

Bridger-Teton National Forest. Between 1992-98, there were 39 grizzly bear sheep conflicts reported; all occurred between 1996-98. Four bears were trapped and translocated from the area. Three were moved to Yellowstone National Park and the fourth was moved to the Shoshone National Forest. One of

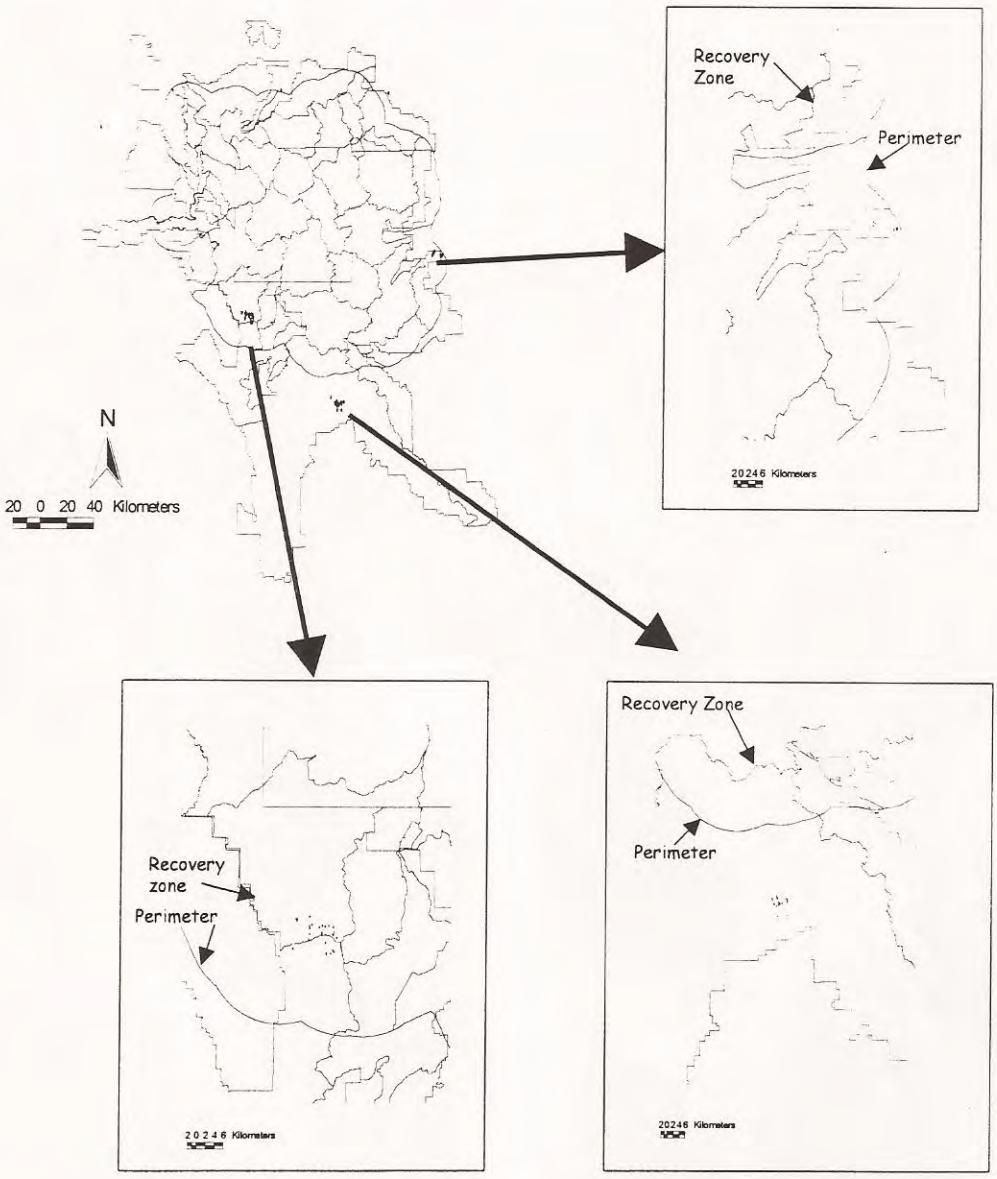

Figure 13. Location of grizzly bear-sheep conflicts (n = 89) within the Greater Yellowstone Ecosystem, 1992-98. Enlargements are segments of the Targhee

National Forest (lower left), Bridger-Teton National Forest (lower right), and the Shoshone National Forest (top right).

these bears was later euthanized due to sheep depredation in Montana. All conflicts occurred outside the grizzly bear recovery zone and outside the 10-mile perimeter area.

Shoshone National Forest: Between 1992-98, there were 10 grizzly bear sheep conflicts reported; all occurred in 1993. Six of the 10 occurred on the Shoshone NF, the other 4 were on private land. Conflict areas on the Shoshone were Meeteetse Creek and Carter Creek. No bears were trapped and translocated from the area. All conflicts occurred with the 10-mile perimeter area. One incident listed 133 sheep killed, but investigations did not link this to grizzly bears. However, Wyoming Game and Fish Commission attributed it to bears and paid the claim. This allotment was vacated in 1993.

Private Land adjacent to the Shoshone National Forest: Between 1992-98, there were 4 grizzly bear sheep conflicts reported; all occurred in 1993. The conflict area was Meeteetse Creek. No bears were trapped and translocated from the area. All conflicts occurred with the 10-mile perimeter area. This area was part of the above public allotment which has been vacant since 1993.

Cattle depredations: All cattle-grizzly bear conflicts reported from 1992-98 occurred in the State of Wyoming. Conflicts occurred in Grand Teton National Park, the Shoshone and Bridger-Teton National Forests, and on private and state lands in Wyoming (Fig. 14). The highest percentage of conflicts occurred on the B-T National Forest.

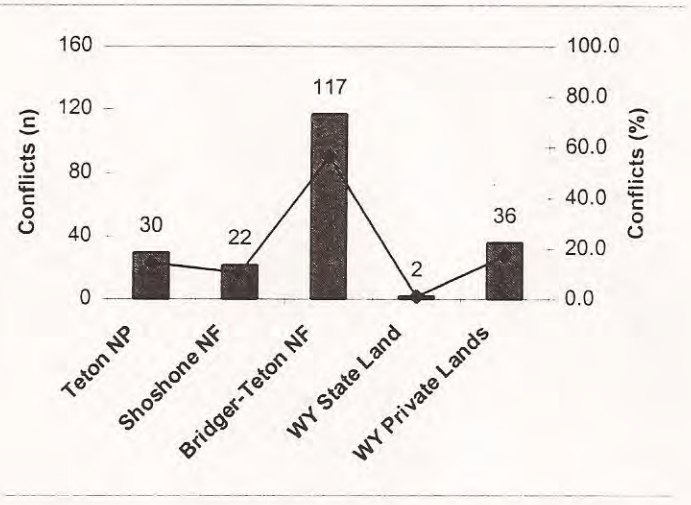

Figure 14. Number (n = 207) and jurisdiction of cattle-grizzly bear conflicts in the Greater Yellowstone Ecosystem, 1992-98.

Spatial distribution of these conflict sites tended to be clustered (Fig. 15). There were several areas of concentrated conflicts.

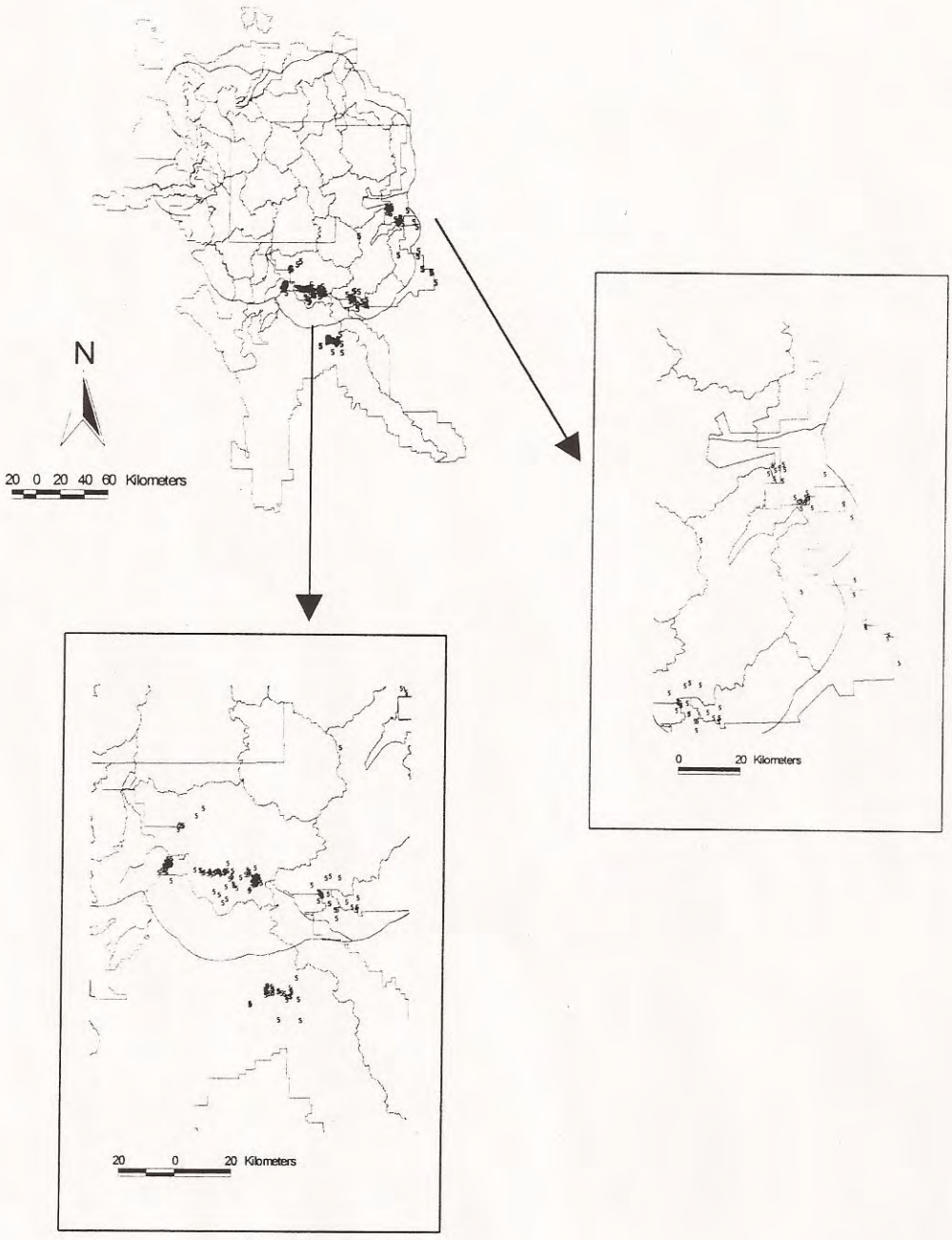

Figure 15. Locations of cattle-grizzly bear conflicts (n = 207) within the Greater Yellowstone Ecosystem, 1992-98. Enlargements are segments of Shoshone National Forest (right), and the Bridger Teton National Forest and Grand Teton National Park (bottom).

Shoshone National Forest and adjacent private lands: From 1995-98 there were 34 cattle-grizzly bear conficts reported in the drainage's of the Shoshone Rivers (Fig. 15). Of these, 3% were in the recovery zone, 76% were in the 10-mile perimeter area,

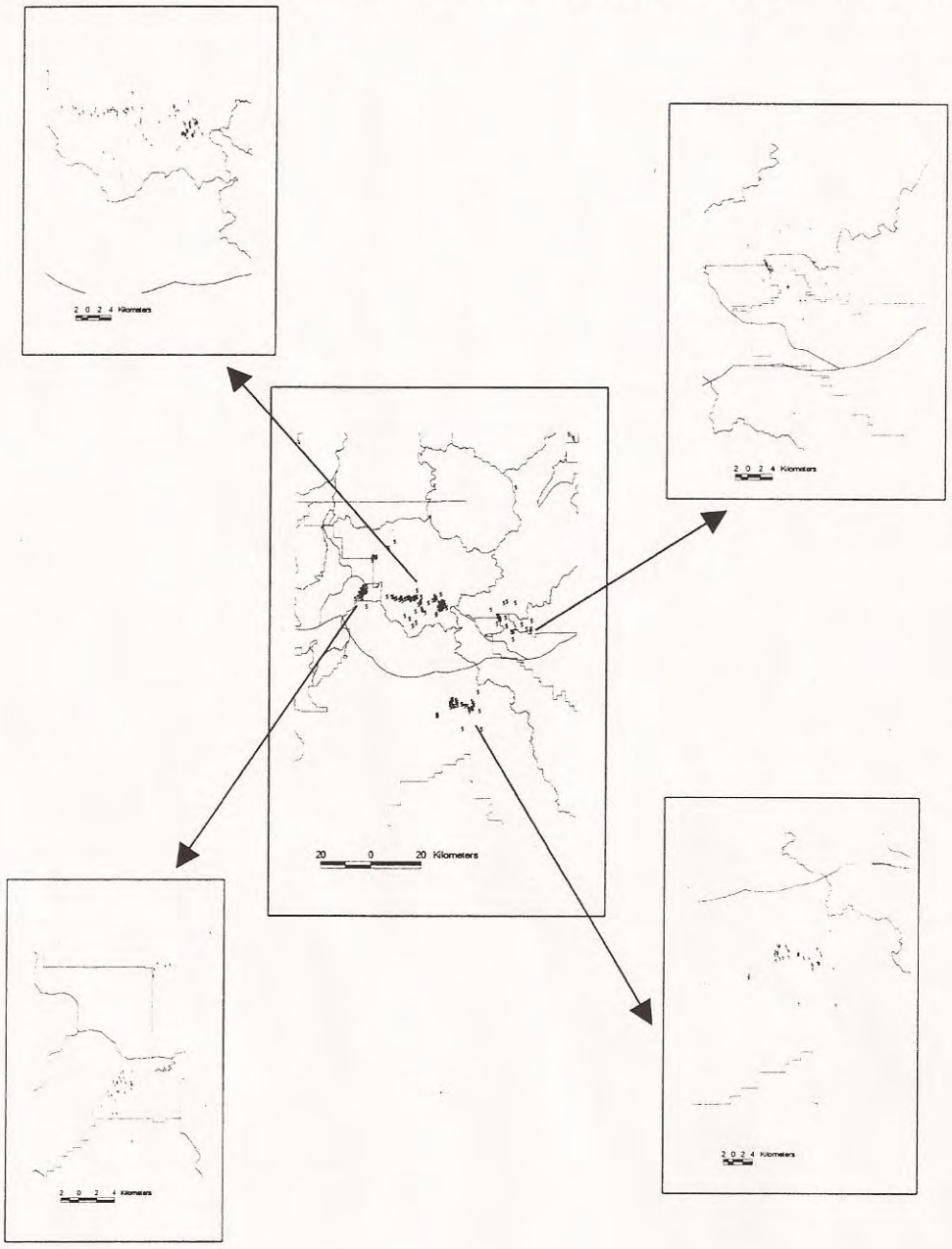

Figure 16. Locations of cattle-grizzly bear conflicts within the detail provided in Fig. 15, (bottom) enlarged into 4 areas. Enlargements are segments of the Blackrock-Spread Creek area (top left), the area west of Dubois (top right), Grand Teton National Park (lower left) and Green River (lower right) areas.

and 21% were outside the perimeter area. Of the 34 conflicts, 56% were on private land and the remainder (41%) was on the Shoshone National Forest. Two bears were trapped and translocated to Yellowstone National Park.

Bridger-Teton National Forest and Grand Teton National Park

Dubois Area: Between 1993-98, there were 24 grizzly bear-cattle conflicts reported from the Dubois area (Fig. 16, top right). Of the 24 reported conflicts, 4 (17%) were in BMU 16, and the remaining 20 (83%) were inside the perimeter area. Sixty-three percent of the conflicts occurred on private lands (n = 15), 29% on the Shoshone National Forest (n = 7), and 8% on state lands in Wyoming (n = 2). Two bears were trapped and translocated; one to Yellowstone National Park, the other to the Shoshone National Forest.

Green River Area: Between 1995-98, there were 38 grizzly bear-cattle conflicts reported from the Green River area (Fig. 16, bottom right). All conflicts were outside the 10-mile perimeter area on the Bridger Teton National Forest. One bear was trapped and translocated to Yellowstone National Park.

Grand Teton National Park: We divided this area into two clusters: a south area primarily within GTNP, and a north area on the B-T National Forest. There were 32 reported conflicts in the GTNP area between 1994-98; all occurred within the 10-mile perimeter area. The majority of conficts (94%) occurred within GTNP, with 3% each on private land and the B-T National Forest. One bear was trapped and translocated to Yellowstone National Park. This bear later returned and continued to depredate cattle and was euthanized. There were 7 conflicts reported from the north area: all were within the recovery zone in BMU 17 on the B-T National Forest. No bears were trapped or translocated.

Blackrock Spread Creek Area: Between 1992-98, there were 72 grizzly-cattle depredations reported. All conflicts occurred within the recovery zone in BMU 17, on the B-T National Forest. One bear was trapped and translocated twice to Yellowstone National Park. This is the same bear that later got into livestock in Grand Teton National Park and was ultimately euthanized.

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