Lewis and Clark, Aboriginal Overkill, and the Myth of Once Abundant Wildlife

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INTRODUCTION

It has long been postulated that Native Americans were conservationists who had little or no impact on wildlife populations (e.g.; Speck 1913, 1939a, 1939b). Studies of modern hunter-gatherers, however, have found little evidence that native people purposefully employ conservation strategies (Alvard 1993, 1994, 1995, 1998a, 1998b; Hill and Hurtado 1996), while archaeological data suggest that prehistoric people routinely overexploited large-mammal populations (Broughton 1994a, 1994b, 1997; Jones and Hilderbrant 1995; Janetski 1997; Butler 2000). Kay (1994, 1995, 1997a, 1997b, 1998, 2002) has even proposed that Native Americans were the ultimate keystone predator who structured ecosystems ca. 12,000 B.P. to 1492 A.D.

To test these competing hypotheses, I performed a continuous-time analysis of wildlife observations made by Lewis and Clark on their expedition across North America in 1804-1806 because their journals are often cited as an example of how the West teemed with wildlife before that area was despoiled by advancing European civilization (Botkin 1995, Patten 1998:70, Wilkinson and Rauber 2002). Lewis and Clark were the first Europeans to traverse what eventually became the western United States, and many of the native peoples they met had never before encountered Europeans. In addition, historians universally agree that Lewis and Clark's journals are not only the earliest, but also the most detailed and accurate, especially regarding natural-history observations (Burroughs 1961, Ronda 1984, Botkin 1995). Thus, the descriptions left by Lewis and Clark are thought by many to represent the "pristine" state of western ecosystems (Craighead 1998:597, Patten 1998:70, Wilkinson and Rauber 2002). Botkin (1995:1), for instance, described Lewis and Clark's journey as "the greatest wilderness trip ever recorded."

METHODS

I used three measures to quantify the wildlife observations recorded by Lewis and Clark in their original journals, which have recently been re-edited and republished (Moulton 1986, 1987a, 1987b, 1988, 1990, 1991, 1993 - - hereafter cited only by volume and page). First, game seen. If Lewis and Clark reported old sign of a species, that was assigned a value of one, fresh sign a two, and if they actually saw the animal, a three. This included bison (*Bison bison*), elk (*Cervus elaphus*), white-tailed deer (*Odocoileus virginianus*), mule deer (*O. hemionus hemionus*), black-tailed deer (*O. h. columbianus*), moose (*Alces alces*), pronghorn antelope (*Antilocapra americana*), bighorn sheep (*Ovis canadensis*), grizzly bears (*Ursus arctos*), black bears (*U. americanus*), and gray wolves (*Canis lupus*). This was done each day for the entire 863 days of the expedition.

Second, game killed. On each day, Lewis and Clark recorded the number of animals that were killed to provision their party. In three instances, though, Lewis and Clark reported that "some" white-tailed deer (day 78), elk (day 365), or bison (day 413) were killed. In these cases, "some" was recorded as three animals killed. While on 12 occasions, Lewis and Clark reported that "several" white-tailed deer (days 46, 365, 367, 373, 408, and 811), bison (days 354, 406, 408, and 413), mule deer (day 404), or black-tailed deer (day 602) were killed. In those cases, "several" was recorded as seven animals killed. Similar to game seen, the number of animals killed was recorded for all species on all days.

Third, herd size. If Lewis and Clark reported sighting large numbers of a particular animal, a value of ten was assigned to that species on that day. A value of ten was also assigned if Lewis and Clark reported killing 10 or more of one species on a single day. I then added game seen, game killed, and herd size values for all species on each day to obtain a daily measure of wildlife abundance. Again, this was done for all 863 days of the expedition.

I also developed a similar convention to quantify the relative abundance of native people that Lewis and Clark encountered on their journey. If Lewis and Clark observed old sign, that was assigned a value of one, fresh sign a two, and if Lewis and Clark actually saw Native Americans, a three. If Lewis and Clark met more than ten native people on a given day that was assigned a value of ten. On most days Lewis and Clark traveled together but on a few occasions they took separate routes, most notably on the return trip. In those cases, Lewis' observations were recorded separately from Clark's. These conventions produced nearly 40,000 numerical data entries. To facilitate analysis, Lewis and Clark's route was divided into 55 trip segments (Table 1), for which mean daily abundances of wildlife and mean daily abundances of native people were calculated. It should be noted that Lewis and Clark generally sent their best hunters ahead of the main party so that game would more readily be encountered.

Lewis and Clark left St. Louis, Missouri on May 14, 1804 and proceeded, via watercraft, up the Missouri River through present-day Missouri, Kansas, Nebraska, Iowa, South Dakota, and into North Dakota where they built Fort Mandan in close proximity to the Mandan and Hidatsa villages. Lewis and Clark over-wintered at Fort Mandan, and then ascended the Missouri River into present-day Montana during the spring of 1805. After leaving their larger boats and portaging the Great Falls, Lewis and Clark continued up the Missouri to Three Forks before ascending the Jefferson and Beaverhead Rivers, on whose upper reaches they met the Shoshone. After obtaining horses from the Shoshone, Lewis and Clark cached their canoes where Clark Canyon Reservoir is now situated and traveled over the Continental Divide into Idaho and down the Lemhi and Salmon Rivers. From there, Lewis and Clark ascended the North Fork of the Salmon and crossed Lost Trail Pass, re-entering Montana.

Next, Lewis and Clark traveled down the Bitterroot Valley to Lolo Creek which they traced to its source. Lewis and Clark then followed the high ridges north of Idaho's Lochsa River and eventually descended to the lower Lochsa where the explorers met the Nez Perce. At this point, Lewis and Clark left their horses and proceeded via canoe down the Clearwater, Snake, and Columbia Rivers through present-day Oregon and Washington state. Finally, Lewis and Clark built Fort Clatsop and overwintered on the south bank of the Columbia near the Pacific Ocean.

During the spring of 1806, Lewis and Clark retraced their route, with minor variations, until the expedition reached present-day Lolo, Montana where the party divided. Lewis ascended the Blackfoot River, crossed the Continental Divide, and proceeded to the Great Falls on the Missouri River, where the party split a second time. Lewis left most of his men to repair the boats cached in 1805, while he and three companions traveled by horseback to Cutbank Creek, where they met the Blackfeet. After the only fatal encounter

with native people on the entire trip, Lewis retreated to the Missouri where he rejoined the rest of his men and together they floated down that river until reunited with Clark below the Yellowstone in present-day North Dakota.

Clark, on the other hand, left Lolo, Montana and ascended the Bitterroot River to Chief Joseph Pass where he entered the Big Hole. From there, Clark crossed to the Beaverhead and refloated the canoes cached in 1805. Clark's party then proceeded by land and water to Three Forks, where the group split a second time. Clark sent some of his men and the canoes down the Missouri to meet Lewis at Great Falls, while he traveled overland via Bozeman Pass to the Yellowstone. At this point, Clark fashioned canoes and floated down the Yellowstone and Missouri Rivers until reunited with Lewis. Lewis and Clark then descended to St. Louis (2:64; 3:6; 4:6; 5:6, 110, 176; 6:6, 80; 7:6; 8:8-9, 49, 84).

RESULTS

Lewis and Clark's observations show an inverse relationship between wildlife and native people (Figure 1). Wildlife was abundant only where Native Americans were absent, and if it had not been for the presence of aboriginal buffer zones between tribes at war (Hickerson 1965; Steffian 1991; Martin and Szuter 1999, 2002; Farr 2001), there would have been little wildlife anywhere in the West.

Yankton Sioux Buffer Zone

As Lewis and Clark ascended the Missouri River, they met the Omahas and Otes on day 97 and the Yankton Sioux on day 108 (Figure 2). These two groups were at war (2:488) and wildlife was abundant only in the buffer zone between the tribes. Bison, in particular, were found only in the center of the buffer zone.

Sioux-Mandan Buffer Zone

Lewis and Clark met the Teton Sioux on day 135, the Arikaras on day 148, and the Mandan-Hidatsa on day 164. Wildlife was not abundant in the area between the Teton Sioux and the Arikaras, but was abundant between the Arikaras and the Mandan-Hidatsa (Figure 3). This was because the Teton Sioux and Arikaras were allied against the Mandan-Hidatsa (3:156, 161, 195-196, 207, 226, 233-234, 243-244, 251, 272-273, 295-297, 304-305; Porche and Loendorf 1987; Bouchet-Bert 1999). That is, peace had a negative impact on wildlife populations while war had a beneficial effect, similar to the conditions Hickerson (1965) reported for the upper Mississippi Valley (Farr 2001).

Missouri-Yellowstone Buffer Zone

In 1804-1806 all of Montana between the Missouri and Yellowstone Rivers was a six-sided buffer zone between warring tribes (4:21-22, 67, 108-109, 159-160, 216, 222, 354, 379, 401, 426, 437; 5:8-9, 45, 68-71, 77-80, 85, 87-91, 96-97, 102-106, 123-124, 178, 197, 259, 318; 7:242, 250; 8:88, 93-94, 104, 113, 123, 143, 182, 195, 278, 321, 323). The north was controlled by the Blackfeet Confederation, which consisted of five tribes (Ewers 1958), while on the west were the Flathead, Salish, Kootenay, and their allies. The Shoshone occupied the southwest (Trenholm and Carley 1964), the Crow the south-central, and the Sioux, Cheyenne, and their allies the southeast. To the east were the Mandan, Hidatsa, and their allies (Ahler et al. 1991). Within this large buffer zone (Martin and Szuter 1999, 2002; Farr 2001), wildlife was relatively more abundant (Figures 4-7) because the warring factions did not hunt along the Yellowstone and Missouri as frequently as they did more secure environments closer to each tribe's core area. As noted by Lewis and Clark, tribes did venture into the buffer zone, but only in force due to fear of attack. So the Missouri-Yellowstone buffer zone was not unhunted (4:232), instead the area was just hunted less frequently (Farr 2001), which apparently was sufficient to permit greater numbers of wildlife.

Deer

Lewis and Clark killed more deer than all other large mammals combined, and 94% of those animals were whitetails. By comparison, mule deer were rare and were only found in tribal boundary zones, while blacktails were restricted to the Cascade Mountains west to the Pacific (6:328, 331, 403-404). Even along the lower Columbia, though, Lewis and Clark encountered more whitetails than blacktails. This was because whitetails had a more effective escape strategy than the other deer (Geist 1998, Whittaker and Lindzey 2001, Lingle 2002, Robinson et al. 2002) and thus were less affected by native hunting. Even where native people were abundant, a few whitetails were usually able to survive (Figure 8a) because, when discovered, whitetails fled into riparian thickets from which they could not easily be dislodged (5:87, 6:403). When chased, Lewis and Clark noted that mule deer and elk fled into the open (4:136-137, 6:403), making those species easier to hunt.

Elk

Lewis and Clark reported that elk were easier to kill than deer (6:85, 242), which is reflected in the fact that native hunters had a greater impact on the abundance of elk (Figure 8b) than they did deer (Figure 8a). Lewis and Clark did kill a number of elk at Fort Clatsop, but only because they purposefully built the fort where elk were relatively more common and native people infrequent (6:92-93, 95-96, 105, 108, 112). That is, Lewis and Clark sited Fort Clatsop in an intervillage buffer zone to take advantage of the more abundant elk. Nevertheless, Lewis and Clark observed that most of the elk they killed during the winter of 1805-1806 had old arrow wounds (6:208, 210), indicative of intense native hunting. "Many of the elk we have killed since we have been here, have been wounded with these arrows, the short piece with the barb remaining in the animal and grown up in the flesh" (6:208). Lewis and Clark also described how native people used pit traps to kill elk. "Then pits are employed in taking the elk, and of course are large and deep, some of them a cube of 12 or 14 feet. These are usually placed by the side of a large fallen tree, which as well as the pit [lie] across the [trails] frequented by the elk. [The] pits are disguised with the slender boughs of trees and moss; the unwary elk in passing the tree precipitates himself into the pit which is sufficiently deep to prevent his escape" (6:208). Thus, even in thick coastal forests, elk were being intensely hunted by native people.

Pronghorn Antelope

Native hunting had an even greater impact on the abundance of pronghorn antelope (Figure 8c). Despite their great speed, pronghorns were relatively easy for native people to kill (3:176; Frison 1991).

Bison

Native hunting controlled the distribution and number of bison on the northern Great Plains (Figure 8d). The only place Lewis and Clark saw bison, and especially large numbers, was in the center of aboriginal buffer zones between warring tribes. This is similar to what West (1995) documented on the central Great Plains - - if it had not been for warring tribes and buffer zones, there would have been few bison anywhere in North America (Kay 2002).

Bighorn Sheep

Native hunting had an even greater effect on bighorn sheep (Figure 8e). Lewis and Clark reported an abundance of bighorns only in the center of buffer zones far removed from native people.

Grizzly Bears

Native hunters also controlled the distribution and abundance of grizzly bears (Figure 8f). This is similar to what Birkdal (1993) reported in Alaska. Aside from one grizzly killed in the Idaho mountains, Lewis and Clark only observed grizzlies in aboriginal buffer zones.

Black Bears

Based on Lewis and Clark's observations and kill rates, black bears were less common than grizzlies.

Moose

Despite spending substantial amounts of time in what is currently prime moose habitat, Lewis and Clark recorded moose only once (6:313, 7:326, 8:95) and that was in a buffer zone between the Blackfeet and the Flathead-Salish. As explained elsewhere, native hunting controlled the distribution and abundance of moose throughout western North America (Kay 1997b). Contrary to what is generally believed, moose are more abundant in the West today (Stevens 1971, Pierce and Peek 1984) than they were in Lewis and Clark's time, or at any other point in the past (Kay 1997b).

Gray Wolves

Lewis and Clark observed a direct relationship between the abundance of game and the abundance of wolves. Wolves were common only where game was abundant (4:85). Thus, wolves were largely restricted to the same aboriginal buffer zones as were bison, elk, and other ungulates.

Dogs and Horses

I also recorded the number of dogs Lewis and Clark purchased when game was in short supply, and the number of horses the explorers killed for food. Lewis and Clark killed nine horses and bought (ate) 210 dogs, primarily in the Columbia Basin, where native people were particularly abundant and wildlife was virtually non-existent (7:49, 92). Lewis and Clark also bought large quantities of other foodstuffs from various native peoples, especially corn from the Mandan-Hidatsa and salmon from tribes throughout the Columbia Basin.

DISCUSSION

Optimal-foraging Theory

According to optimal-foraging theory, high-ranked diet items are more susceptible to overexploitation than lower-ranked items (Smith 1983, Stephens and Krebs 1985, Smith and Winterhalder 1992, Butler 2000). Theoretical considerations and studies of modern hunter-gatherers both indicate that large mammals are the highest-ranked diet items, and that, in general, the larger the animal, the higher its rank (Smith and Winterhalder 1992, Hill and Hurtado 1996). Moreover, if risk to the hunter or travel distances are great, only the highest-ranked diet items should be pursued (Smith and Winterhalder 1992). Thus, optimal-foraging theory would predict that when native people entered aboriginal buffer zones, they should have concentrated their hunting on the larger species, such as bison and elk, causing those species to decline accordingly. This would also imply that Native Americans lacked any effective conservation strategy regarding these prey items. This pattern was, in fact, observed by Lewis and Clark for as they left various native peoples and entered buffer zones, first white-tailed deer increased followed by elk and then bison. Conversely, as Lewis and Clark exited a buffer zone, bison disappeared first, followed by elk, while some white-tailed deer were usually able to escape native hunters (Figure 9). Furthermore, Lewis and Clark noted that native hunters preferred to kill female ungulates (3:61,270) due to that sex's higher fat content, which also runs counter to any conservation strategy (Kay 1994, 1997b, 1998; Kay and Simmons 2002).

Alvard (1998b, 2002) recently reviewed the conditions under which evolution by natural relation might favor resource conservation. In short, conservation will only be favored by evolution if the resource is economical to defend. For instance, if 1000 kcal are spent defending a resources, but less than 1000kcal are derived from that resource, evolution will not favor conservation. For a variety of reasons, including competition from carnivore predators, large mammals were seldom, if ever, economical to defend (Kay 1994, 1998, 2002). Instead the logical, rational thing to do was to kill-out the large mammals as quickly as possible and then move on to other resources, which is exactly what aboriginal people did (Kay 1998, 2002). Counter-intuitively, once that was accomplished, native populations actually increased because people were forced to consume lower-ranked, but more abundant diet items (Hawkes 1991, 1992, 1993). There is also an evolved discount rate, which acts to negate a wide range of possible conservation practices (Rogers 1991, 1994).

Predator-limited

Even within buffer zones, though, wildlife was not as abundant as one might think because the animals were predator, not food-limited (Kay 1998, 2002). Food-limited ungulates invariably destroy berry-producing shrubs and woody riparian vegetation due to repeated browsing, and once willows (*Salix* spp.), cottonwoods (*Populus* spp.), and aspen (*Populus tremuloides*) decline, so do associated species like beaver (*Castor canadensis*) (4:189-190), which are dependent upon those plants for food (Kay 1998 and references therein). Lewis and Clark, however, reported that riparian thickets were common in buffer zones, as were beaver and berry-producing shrubs (e.g.; 4:70, 145-146, 189-190, 247, 278, 332, 374, 391-392, 399, 414, 419, 428, 435, 451; 5:14, 42, 46, 59). In addition, Lewis and Clark noted that white-tailed deer often had twin fawns or triplets, and that

even lactating deer were fat (4:165), which would not have been physiologically possible if ungulate populations had been food-limited. Thus, carnivore predation and occasional hunting by native people (4:232) kept buffer zone ungulate populations well below what the habitat could otherwise support (White et al. 1998, Kay 2002).

Estimate of pre-Columbian Wildlife Populations

A number of investigators have cited Lewis and Clark's descriptions of abundant wildlife without realizing that those accounts only apply to the center of buffer zones (Craighead 1998, Wilkinson and Rauber 2002). Botkin (1995:49-86), for instance, used Lewis and Clark's observations of grizzlies along the Missouri and Yellowstone Rivers to estimate the number of bears in the western United States prior to European contact, and arrived at a figure of 78,000, which others increased to 100,000 for the entire continent (e.g.; Flores 1998:61). Although Botkin (1995:165-169) acknowledged that native people could be important ecological factors, he failed to realize that native hunting controlled the distribution and numbers of grizzlies throughout North America (Figure 8f; Birkedal 1993). During pre-Columbian times, there may have been no more than 4-5,000 grizzlies in all of North America because grizzlies were simply large packages of fat meat that native hunters killed at will (Birkedal 1993). Similarly, there never were 60 million bison on the Great Plains, as is widely believed (Shaw 1995, Geist 1996, Kay 2002).

Prey Behavior

Lewis and Clark also reported a direct relationship between prey behavior and native hunting. In the center of buffer zones, where native people hunted only infrequently, game was relatively tame and could generally be approached (e.g.; 4:67, 108). Elsewhere, however, game was exceedingly wary. "The country about the mouth of this river [Little Missouri] had been recently hunted by the Minetares, and the little game which they had not killed and frightened away, was so extreemly [sic] shy that ... [our] hunters could not get in shoot [range] of them" (4:26). "The Borders of the river [Missouri] has so much hunted by those Indians ... [that] the game is scerce [sic] and veery [sic] wild" (4:39). This also applied to grizzly bears and other animals. "[The bears] appear more shy here [near the Shoshone] than on the Missouri below the mountains" (4:426). "These anamals [sic] [beaver] in consequence of not being hunted [in a buffer zone] are extreemly gentle, where they are hunted [though] they [the beaver] never leave their lodges in the day" (4:100). Similarly, in 1819 Long observed that bison fled in panic at the mere scent of humans. "The wind happening to blow fresh form the south, the scent of our party was borne directly [to the bison], and we could distinctly note every step of [our scent's] progress through a distance of eight or ten miles, by the consternation and terror it excited among the buffaloes. The moment the tainted gale infected their atmosphere, [the bison] ran with as much violence as if pursued by a party of mounted hunters" (Thwaites 1905:255-256) - - not unexpectedly, these observations were made in an aboriginal buffer zone along the Platte River (West 1995). This is identical to what Diamond (1984) reported in New Guinea where even low-intensity aboriginal hunting completely altered the behavior of prey species (Kay 2002).

Habitat

Over the years, I have retraced most of Lewis and Clark's route across North Dakota, Montana, Idaho, Washington, and Oregon and there are no habitat features that could explain the distribution and abundances of the various species observed by the explorers. Lewis and Clark, for instance, did not find any buffalo in the large, treeless valleys of southwest Montana, which they attributed to the fact that bison had been driven-out and/or killed-out by Shoshone hunters, not habitat characteristics (8:182). At another point in their journey, Lewis and Clark commented on how they could see no difference between the country west of the mountains and the plains along the Missouri, except that wildlife was common only on the latter. "I see very little difference between the apparent face of the country here [eastern Washington and western Idaho] and that of the plains of the Missouri only that these [the Columbia Basin grasslands] are not enlivened by the vast herds of buffaloe [sic] Elk [etc] which ornament the other" (7:196). Bighorn sheep are certainly restricted to areas with precipitous escape terrain, but Lewis and Clark found bighorns common only in the center of aboriginal buffer zones. Other suitable habitat was unoccupied because those areas were more frequently used by native people.

Native Populations and European Diseases

It has long been known that Native Americans had no immunological resistance to European diseases, but only recently has it been learned that those diseases had a significant impact on native people prior to direct European contact (Dobyns 1983), or how this, in turn, caused abnormal increases in wildlife populations (Neumann 1985; Preston 1996, 1997, 2002; Kay 1998, 2002; Kay and Simmons 2002). European diseases, for instance, preceded Lewis and Clark. The smallpox epidemic of 1780 was especially devastating (Boyd 1985, Trimble 1985), and its aftermath was noted by Lewis and Clark (2:478-482; 3:285, 295, 311-312; 6:81-82, 285, 308). In 1804-1806, Lewis and Clark found four Mandan villages along the Missouri but observed that there had been 12 prior to the 1780 epidemic. Similarly, Arikaras villages were reduced from 32 to 2 (Ahler et al. 1991:57). Thus, if Lewis and Clark had journeyed west in 1775 instead of 1804-1806, they would have met more native people and correspondingly there would have been even less wildlife (Geist 1998:4-5; Kay 1998, 2002). Furthermore, European diseases may have decimated native populations throughout the West as early as 1550-1600 (Ramenofsky 1987; Campbell 1990; Kornfeld 1994:198; Preston 1996, 1997, 2002), which suggests that pre-Columbian wildlife populations were likely much lower than even what Lewis and Clark experienced. Butler (2002), who studied resource depression in the Columbia Basin, reported that high-ranked diet items, such as ungulates, increased only after epidemic diseases decimated native populations.

CONCLUSIONS

Contrary to prevailing paradigms (Lyman and Wolverton 2002, Moore 2002, Wilkinson and Rauber 2002), native people controlled the distribution, abundance, and behavior of wildlife, and large mammals were common only in boundary or buffer zones between warring tribes (Martin and Szuter 1999, 2002; Farr 2001). It is also clear that Lewis and Clark recognized this phenomenon, for Clark (8:328) "observed that in the country between the [Indian] nations which are at war with each other the greatest numbers of wild animals are to be found." This pattern can only be explained if native

hunters pursued an optimal-foraging strategy and did not employ any effective conservation measures (Alvard 1998b, 2002). Only twice did Lewis and Clark report high wildlife values and encounter large numbers of native people on the same day. In both cases, native hunters were busily killing as many animals as possible (3:176, 253-255). Moreover, Lewis and Clark were only able to complete their journey because of the food, horses, and above all else, knowledge that they received from native people. There were no unnamed streams, there were no unnamed mountains, and there was no wilderness (Kay and Simmons 2002). As noted by Lewis and Clark, the West was even more densely populated prior to the smallpox pandemic that decimated native people in 1780.

These data have important implications for anthropology and archaeology, as well as other disciplines. Most anthropological subsistence models, for instance, incorporate the view that native people harvested ungulates at or near sustained yield levels, yet these and other data do not support that assumption (Kay and Simmons 2002). Similarly, cultural or religious beliefs are often invoked to explain how aboriginal peoples interacted with their environment (Krech 1999), yet irrespective of what the various native groups encountered by Lewis and Clark believed, or said they believed, the ecological patterns were identical, at least regarding the hunting of large mammals (see Figure 1). Finally, these data support the hypothesis that Native Americans were the ultimate keystone predator who once structured entire ecosystems (Kay 1998, 2002). Thus, national parks, wilderness areas, and the like are entirely unnatural (Kay and Simmons 2002).

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Okoyi: To Have a Home

Presenter: Darrell Robes Kipp

Banishment was the strongest punishment my tribe imposed on a member unable to abide tribal ways. Without realizing it, I almost banished myself from my tribe.

One premise I am confident about concerning my tribe the Pikuni, or as we are called today, the Blackfeet, is despite the fantastic amount of detail required to make a honest description of even the smallest aspect of the tribe's existence one item remains and it is good things stay the same. Living on an Indian reservation we are well aware of the unacceptable rates of poverty, social and economic problems, and the breakdown and failure patterns in our communities. Nevertheless, those of us who live in Indian communities still enjoy the premise many good things stay the same. The mixed, but beautiful burden of extended families, our long standing connection to the land we live on, our music, dance, art, oral traditions, and language.

The Blackfeet today still live in their original space on this earth, and maybe in a country of a mobile society questing for the American Dream this sounds naive, or retro, to us it is a blessing taken seriously. Our reservation is our home, and it is always good to be home.

Scrape away the distorted fallacies; misunderstandings, and negative depictions used to describe Indian historical or contemporary elements and any open minded individual can be rewarded with intriguing and interesting, if not refreshing, insights into a homogenous tribal people placed here by the Creator, and despite some incredulous near escapes in the past 200 years, remain in many good ways, the same. If we move past the dismal sociological based statistic analysis of the people chronicling their contemporary ills (lets not overlook America's similar ills, and even those of this city) we can find outstanding lessons of goodwill, aptitude and logistics for living in our Good Earth's bounty, and, more so, working and meaningful parables worthy of utilization in today's hectic life style. Further, sincere appreciation of the legacy of knowledge available from a group of people living in this region for thousand of years is indeed endearing and informative.

Yet, this is often a formable task despite our best intentions. The basis of historical oral tradition in the tribe is truthfulness. There are no fictional accounts when it comes to tribal historical accounts of events. To tell the truth was the hallmark of oral histories. The memory record of my tribe's knowledge of the Lewis and Clark Expedition is faded, but intact. The Pikuni version of Meriwether Lewis's hostile encounter with a group of Pikuni boys on the Two Medicine River in 1806 will be recounted by our children, in our language, in our way, tomorrow evening. These children will refresh the account for all of us, and over the years tell it to their children according to the way it is told in our tribe.

In this way a full spectrum of historic knowledge can be presented to better understand how the past impacts on the present and future of the tribe, state, and country.

Keeping our tribal memory alive is an arduous task even among responsible tribal members. It is too often to great a task due to the burdens of the day, and the conditioning that tribal societal elements, language, heritage, history, and knowledge have little place in a modern techno, secular American Dream trek. I believe this is why the depiction of Indians diverged from the real to the distortions abundant today concerning Indians.

Are the only Real Indians left those in turn of the century paintings and photographs? Those Indians chronicled in the journals of Lewis and Clark? Worse yet, those Indians chronicled in the social statistics of human breakdown? It is important to be able to balance all the negative images against the positive ones.

Every person's lifetime is a relationship between the time our lifespan covers, and the space our bodies occupy. My tribal history represents countless lifetimes. My own lifetime as a tribal member is where past, present, and future exists for me. This view allows me to put imposed definitions of my tribe aside. One of the horrors Indians endure is having outsiders define us based on one-dimensional studies. Today, many tribal names are not their true tribal language names, but ones imposed on them by English speaking colonizers. It is better we use the correct names from our languages for our tribes and ourselves. It is better we rely on our own historical accounts, and it is better we tell our stories in our own language. I am one of the many lifetimes existing in Pikuni Time, and therefore am part of the historical memory once and forever. I should be responsible enough to keep the record intact despite life's daily tribulations and time consuming errands that now pass as modern lifestyle. Today's modern lifestyle is clock controlled and demands a 28 hour day for mere survival.

The Pikuni language is my teacher now, and is in my view the truth keeper for future Pikuni generations. This is my vocation and belief. I believe loss of tribal languages diminishes the truth of Indian ways, and dishonor the lifetimes within the tribe. We should remember recently imposed and misrepresentative tribal labels are insignificant compared to the biological, linguistic, religious and historical continuum tribal essence possesses. Understand this, and imposed definitions of tribal status quo become clearly inadequate and misleading.

Words such as half-breed, full blood, mixed-blood, and the myriad of other archaic descriptive terms are fragmentary and inflammatory. Don't use them regardless of any circumstance. Instead seek out your tribal language and use it for knowledge. Allegiance to tribal languages is at present hard to come by, and many people have yet to find the way to embrace the notion. It is difficult because allegiance must come to you through the heart and mean something. Yet, it is the way home, and can still be done.

A CONFLUENCE OF CULTURES™

NATIVE AMERICANS AND THE EXPEDITION OF LEWIS AND CLARK

Quanah Parker, c. 30" x 30" oil on linen, 1999, courtesy of the artist Robert Graham

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Table 1. Trip segments and itinerary of Lewis and Clark 1804-1806.

Trip segment	Segment length (days)	Description	Dates
1	30	St. Louis to Grand River, MO	5/14 - 6/12/1804
2	50	Grand River, MO to Council Bluffs, NE	6/13 – 8/1/1804
3	20	Council Bluffs to Big Sioux River, NE	8/2 – 8/21/1804
4	4	Big Sioux River to above Vermillion River, NE	8/22 – 8/25/1804
5	8	Above Vermillion River	8/26 – 9/2/1804
6	22	Above Vermillion River to Bad River, SD	9/3 – 9/24/1804
7	22	Bad River to below the Cannonball River, ND	9/25 – 10/16/1804
8	7	Cannonball River to Mandan Villages, ND	10/17 – 10/23/1804
9	9	Mandan Villages, ND	10/24 – 11/1/1804
10	156	Fort Mandan, ND	11/2/1804 – 4/6/1805
11	6	Fort Mandan to Little Missouri River, ND	4/7 – 4/12/1805
12	13	Little Missouri River to Yellowstone River, ND	4/13 – 4/25/1805
13	12	Yellowstone River to Milk River, MT	4/26 – 5/7/1805
14	12	Milk River to Musselshell River, MT	5/8 – 5/19/1805
15	14	Musselshell River to Marias River, MT	5/20 – 6/2/1805
16	13	Marias River to Great Falls, MT	6/3 – 6/15/1805
17	29	Great Falls portage	6/16 – 7/14/1805
18	10	Great Falls to Three Forks, MT	7/15 – 7/24/1805
19	13	Three Forks to Big Hole River, MT	7/25 – 8/6/1805
20	6	Big Hole River to meeting Shoshone in Idaho - - Lewis' account	8/7 – 8/12/1805
21	14	Present Clark Canyon Reservoir across divide to Lemhi River, ID - - Lewis' account	8/13 – 8/26/1805
22	16	Above Three Forks, MT to present Clark Canyon Reservoir, MT - - Clark's account	8/1 – 8/16/1805
23	12	Clark Canyon Resersvoir to Lemhi River to Salmon River and return to Lemhi – Clark's account	8/17 – 8/28/1805
24	13	Lemhi River, ID to present Lolo, MT	8/29 – 9/10/1805
25	9	Lolo, MT over Lolo Trail to lower Lochsa River, ID	9/11 – 9/9/1805
26	17	Lower Lochsa River - - canoe camp	9/20 – 10/6/1805
27	18	Canoe Camp to the Dalles, WA	10/7 – 10/24/1805
28	9	Cascade Mountains and portage, WA	10/25 – 11/2/1805
29	22	Cascade Mountains to mouth of Columbia River on the north bank, WA	11/3 – 11/25/1805
30	11	Crossed to south bank of the Columbia River, OR	11/26 – 12/6/1805
31	106	Ft. Clatsop, OR	12/7 – 3/22/1806
32	15	Ft. Clatsop to the Cascade Mountains, WA	3/23/ - 4/6/1806
33	12	Cascade Mountains to the Dalles, WA	4/7 – 4/18/1806
34	25	The Dalles to Camp Chopunnish, ID	4/19 – 5/13/1806
35	27	Camp Chopunnish	5/14 – 6/9/1806
36	15	Attempted crossing of mountains	6/10 – 6/24/1806
37	5	Crossed mountains on Lolo Trail	6/25 – 6/29/1806
38	3	Present Lolo, MT - - here Lewis and Clark separated	6/30 – 7/2/1806
39	5	Lewis - - up Blackfoot River and across Continental Divide, MT	7/3 – 7/7/1806
40	14	Lewis - - Divide to Great Falls (split party) Lewis to Cutbank Creek, MT	7/8 – 7/21/1806
41	6	Lewis - - Upper Cutbank Creek, met Piegan, fled back to Missouri River	7/22 – 7/27/1806
42	11	Lewis - - Marias River down Missouri to Yellowstone River, ND	7/28 – 8/7/1806
43	4	Lewis - - Down Missouri until reunited with Clark	8/8 – 8/11/1806
44	10	Clark - - Lolo, MT up Bitterroot into Big Hole Valley then to present Clark Canyon Reservoir and down to Three Forks where the party again split	7/3 – 7/12/1806
45	3	Clark - -Three Forks to Bozeman Pass and on to the Yellowstone River, MT	7/13 – 7/15/1806
46	18	Clark - - Down Yellowstone River to Missouri River, ND	7/16 – 8/2/1806
47	9	Clark - - Down Missouri River until reunited with Lewis, ND	8/3 – 8/11/1806
48	6	Little Missouri River to Mandan Villages to Ft. Mandan, ND	8/12 – 8/17/1806
49	3	Heart River to Cannonball River, ND	8/18 – 8/20/1806
50	2	Aricara villages, SD	8/21 – 8/22/1806
51	7	Moreau River to White River, SD	8/23 – 8/29/1806
52	5	White River to Vermillion River, NE	8/30 – 9/3/1806
53	5	Big Sioux River to Council Bluffs, NE	9/4 – 9/8/1806
54	9	Platte River to Grand River, MO	9/9 – 9/17/1806
55	6	Grand River to St. Louis, MO	9/18 – 9/23/1806

Figure 1. Relationship between the abundance of native people and the abundance of wildlife as observed by Lewis and Clark in 1804-1806. Plotted are the mean daily abundance of all wildlife species and the mean daily abundance of Native Americans by trip segments - - segments 1, 2, 54, and 55 were excluded because those areas were near European settlements. Line fitted using a smoothing spline with cross validation (MathSoft 1997:158-167). X and Y axes are offset. Note that there are no data points in the upper right as might be expected if cultural beliefs fostered conservation. Clearly, it made little difference what native people believed, or said they believed. Instead, aboriginal hunting followed predictions derived from optimal foraging theory and other evolutionary ecology models.

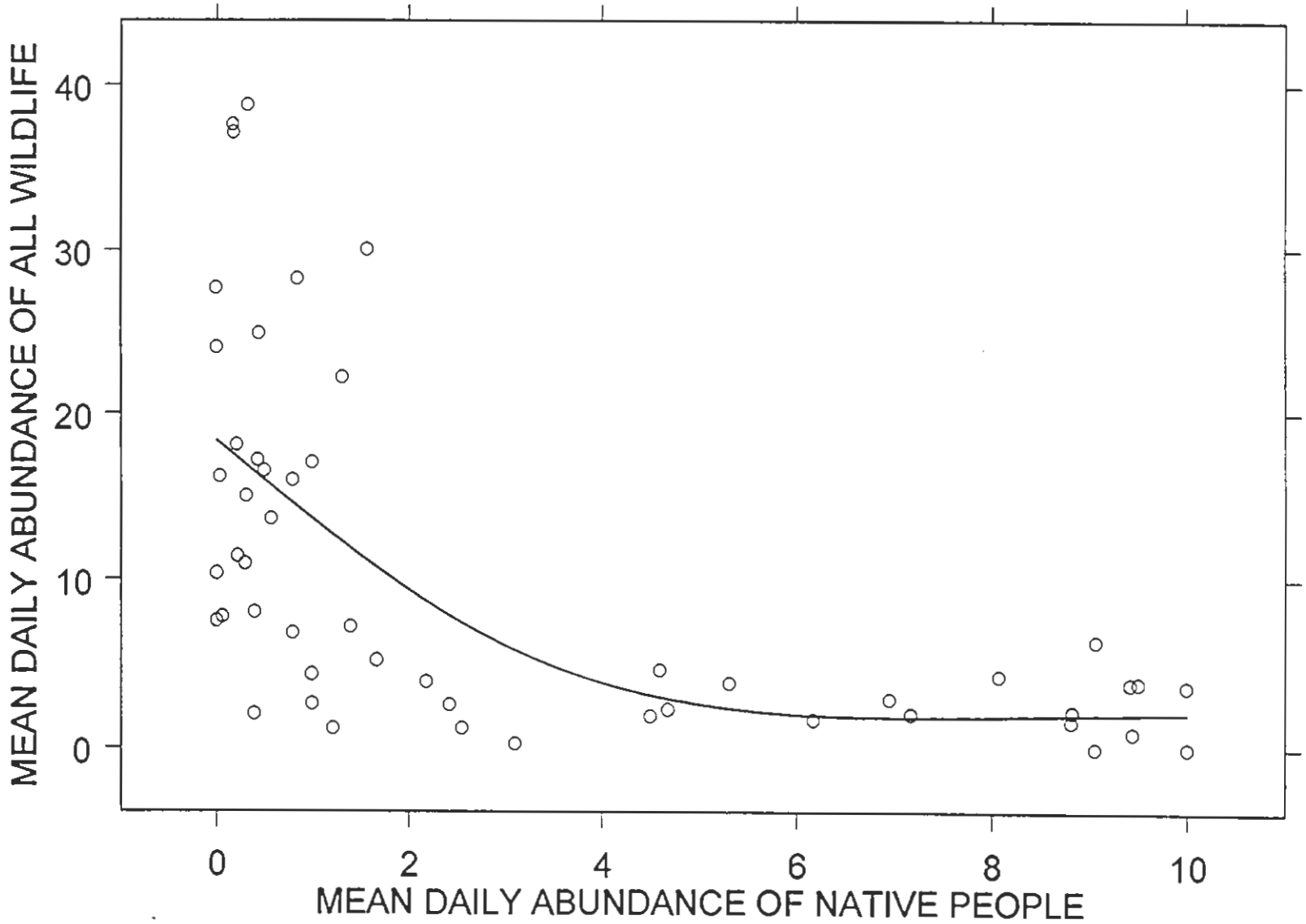

MEAN DAILY ABUNDANCE OF ALL WILDLIFE
40
30
20
10
0
0
2
4
6
8
10
MEAN DAILY ABUNDANCE OF NATIVE PEOPLE

Figure 2. Yankton Sioux buffer zone along the Missouri River as reported by Lewis and Clark in 1804. Wildlife was abundant only in the zone between warring tribes.

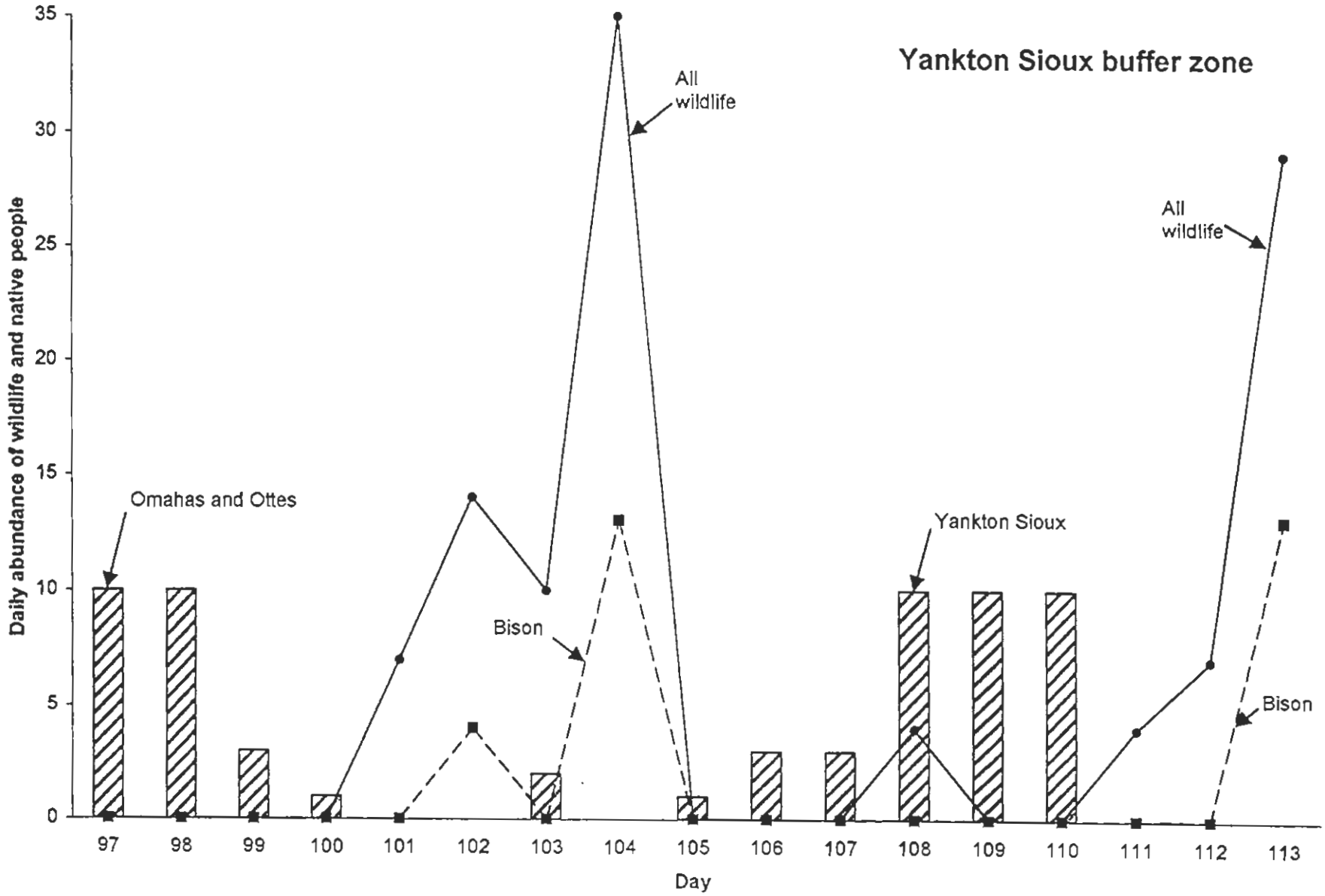

Yankton Sioux buffer zone
Daily abundance of wildlife and native people
35
30
25
20
15
10
5
0
All wildlife
All wildlife
Omahas and Ottes
Yankton Sioux
Bison
Bison
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
113
Day

Figure 3. Sioux-Mandan buffer zone along the Missouri River as reported by Lewis and Clark in 1804. The Teton Sioux were allied with the Arikaras against the Mandan-Hidatsa and wildlife was abundant only in the zone between warring factions. There was little wildlife and no bison in the area between the allied tribes.

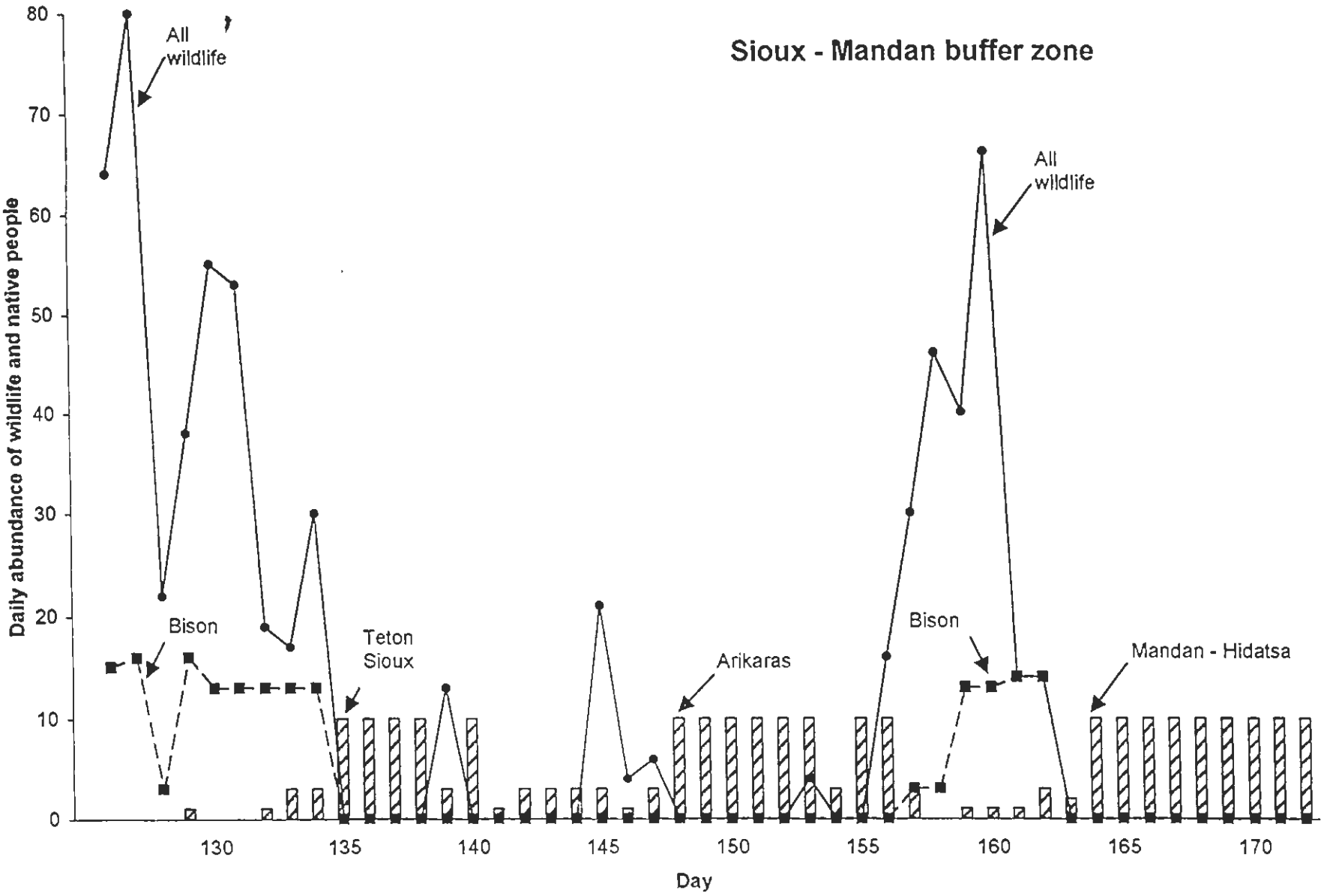

Sioux - Mandan buffer zone
Daily abundance of wildlife and native people
Day
All wildlife
All wildlife
Bison
Bison
Teton Sioux
Arikaras
Mandan - Hidatsa
0
10
20
30
40
50
60
70
80
130
135
140
145
150
155
160
165
170

Figure 4. The mean daily abundance of wildlife and native people along the Missouri River buffer zone as reported by Lewis and Clark in 1805. On their trip across this section of Montana, Lewis and Clark did not see a single Native American from the time they left the Mandan (trip segments 9 and 11) until they met the Shoshone along the Montana-Idaho border (trip segment 21). Bison were observed only where native people were absent.

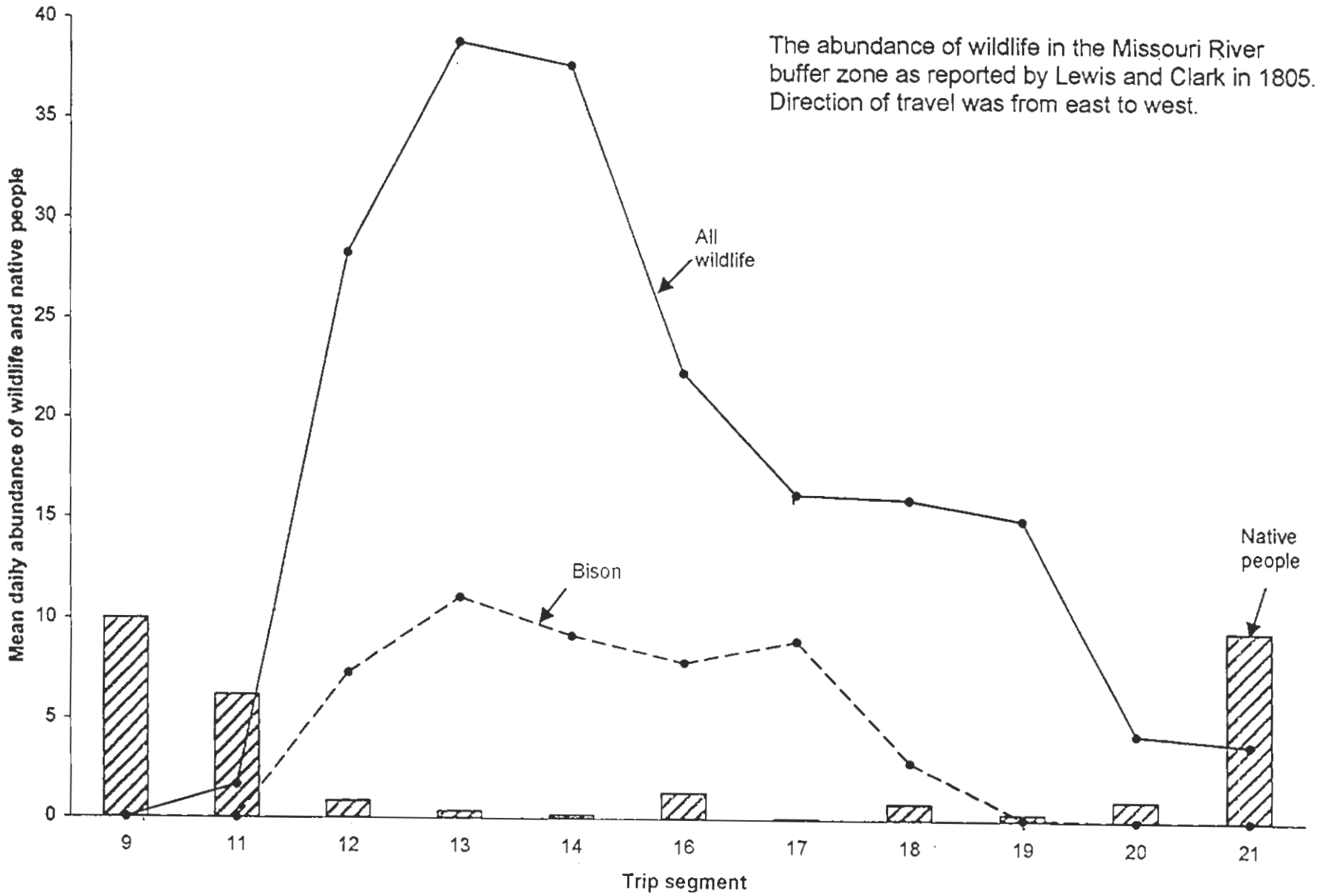

The abundance of wildlife in the Missouri River buffer zone as reported by Lewis and Clark in 1805. Direction of travel was from east to west.
Mean daily abundance of wildlife and native people
40
35
30
25
20
15
10
5
0
All wildlife
Bison
Native people
9
11
12
13
14
16
17
18
19
20
21
Trip segment

Figure 5. The mean daily abundance of wildlife and native people along the Missouri River buffer zone as reported by Lewis in 1806. Trip segment 34 included tribes in central Washington, while Lewis and Clark spent trip segment 35 with the Nez Perce. Lewis and Clark then crossed the Bitterroot Mountains (trip segment 36) and separated at Lolo, Montana. By trip segment 40, Clark was back at Great Falls on the Missouri River, which he descended to the Mandan villages (trip segment 48). As on the upstream journey (Figure 3), Clark did not see a single Native American on this section of the Missouri and wildlife was abundant only where native people were absent. Bison, in particular, occurred only in the center of the buffer zone.

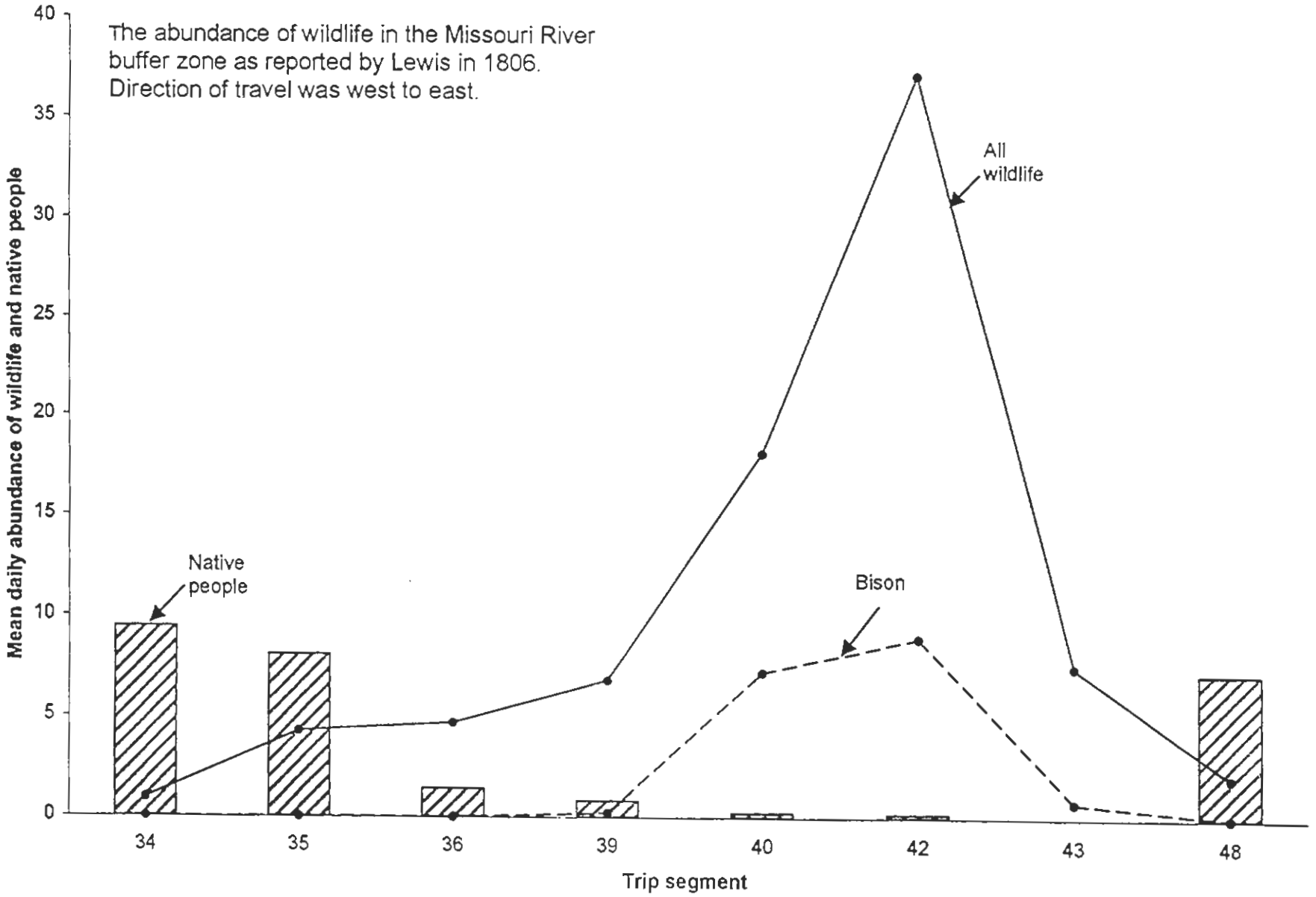

The abundance of wildlife in the Missouri River buffer zone as reported by Lewis in 1806. Direction of travel was west to east.
Mean daily abundance of wildlife and native people
40
35
30
25
20
15
10
5
0
All wildlife
Native people
Bison
34
35
36
39
40
42
43
48
Trip segment

Figure 6. The mean daily abundance of wildlife and native people along the Yellowstone River buffer zone as reported by Clark in 1806. Trip segments 34, 35, and 36 are the same as those in Figure 5. After Lewis and Clark separated, Clark returned to Three Forks by trip segment 44 and was on the Yellowstone River by trip segment 46. Although the Crow stole all of Clark's horses on the Yellowstone, he did not actually see a single Native American on his return trip across Montana until he neared the Mandan villages (trip segment 48). The only place wildlife was abundant was along the Yellowstone River and bison were only seen in the center of that buffer zone.

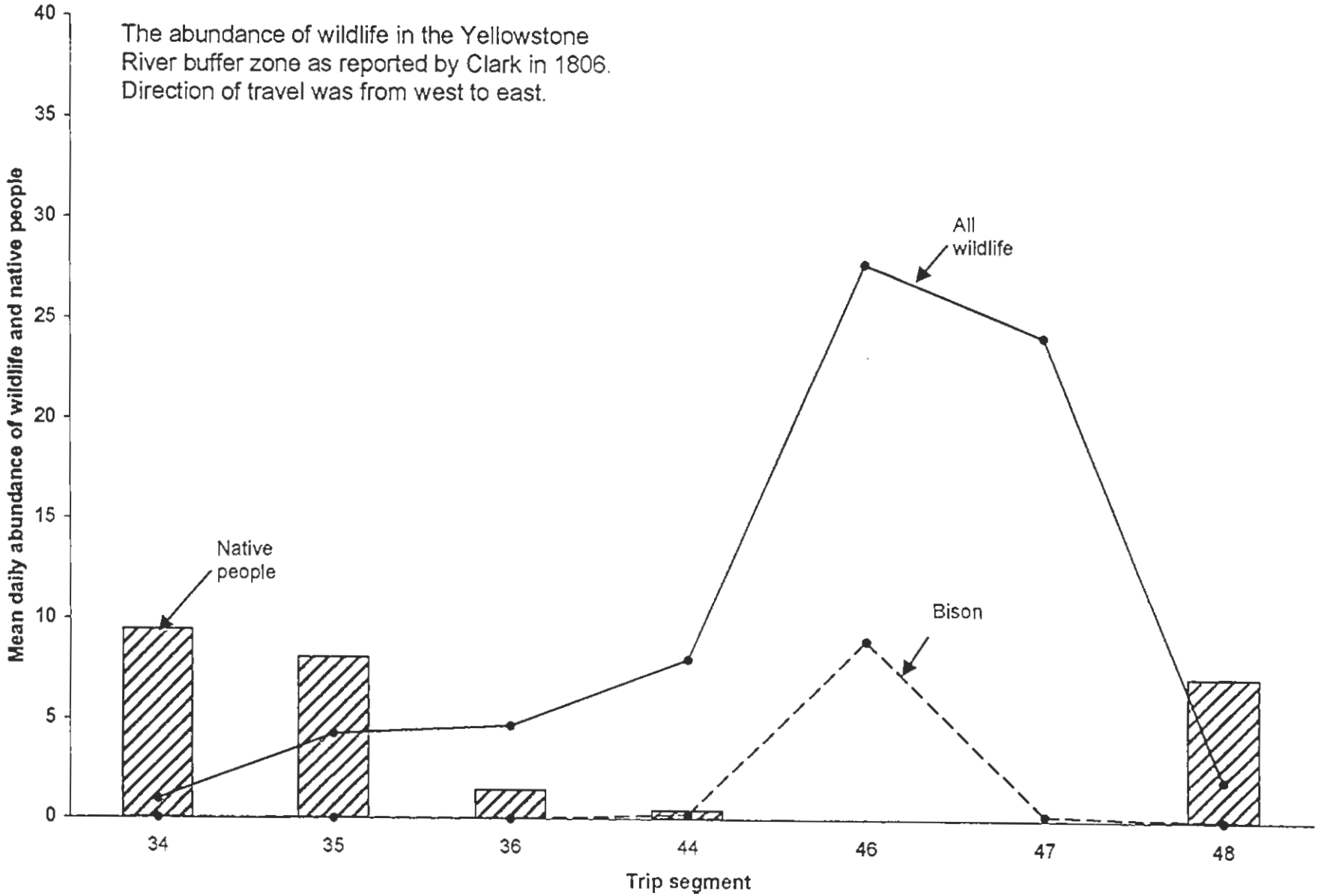

The abundance of wildlife in the Yellowstone River buffer zone as reported by Clark in 1806. Direction of travel was from west to east.
Mean daily abundance of wildlife and native people
40
35
30
25
20
15
10
5
0
All wildlife
Native people
Bison
34
35
36
44
46
47
48
Trip segment

Figure 7. Marias River buffer zone. After returning to Great Falls, Lewis ascended the Marias River and Cutbank Creek in what is now the Blackfeet Indian Reservation. As Lewis traveled from the Missouri, wildlife became less and less abundant, while bison disappeared. Wildlife was reported on days 803 and 804 only because Lewis sent his hunters downstream 20 to 25 miles to kill animals for food. On day 804 Lewis met seven Blackfeet who told him their village was less than one-half day's travel. Lewis camped with this small group of Blackfeet and next morning (day 805a) awoke to find the Blackfeet attempting to steal his guns and horses. An altercation followed and at least one Blackfoot was killed, the only Native American killed by Lewis and Clark on their entire journey. Fearing retaliation and annihilation, Lewis fled back to the Missouri, and by his own account, traveled more than 100 miles by nightfall (day 805b). Thus within one day's hard travel, Lewis went from an area with no game and native people to an area with abundant game and no natives. Bison were found only where Native Americans were absent (8:112-140).

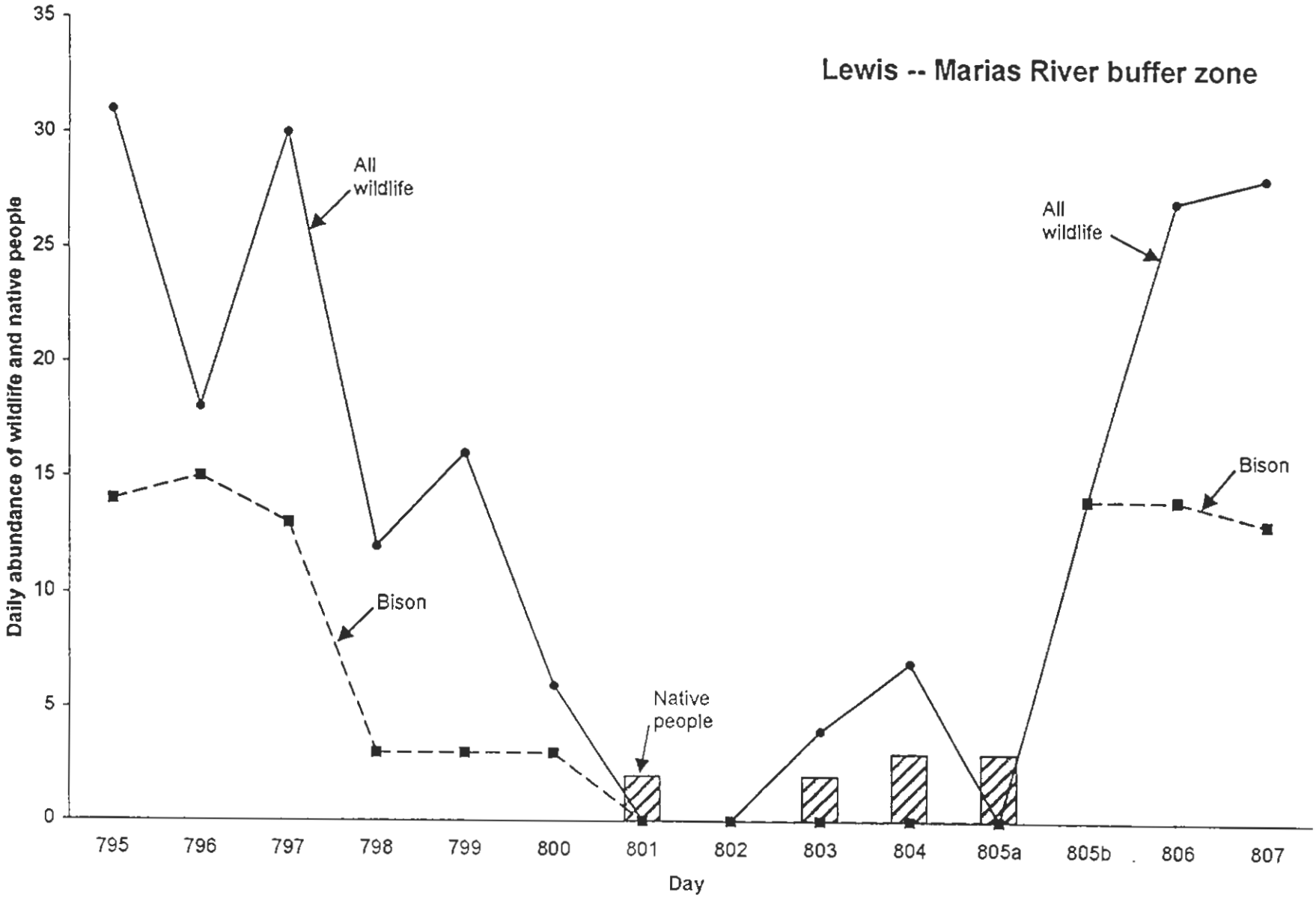
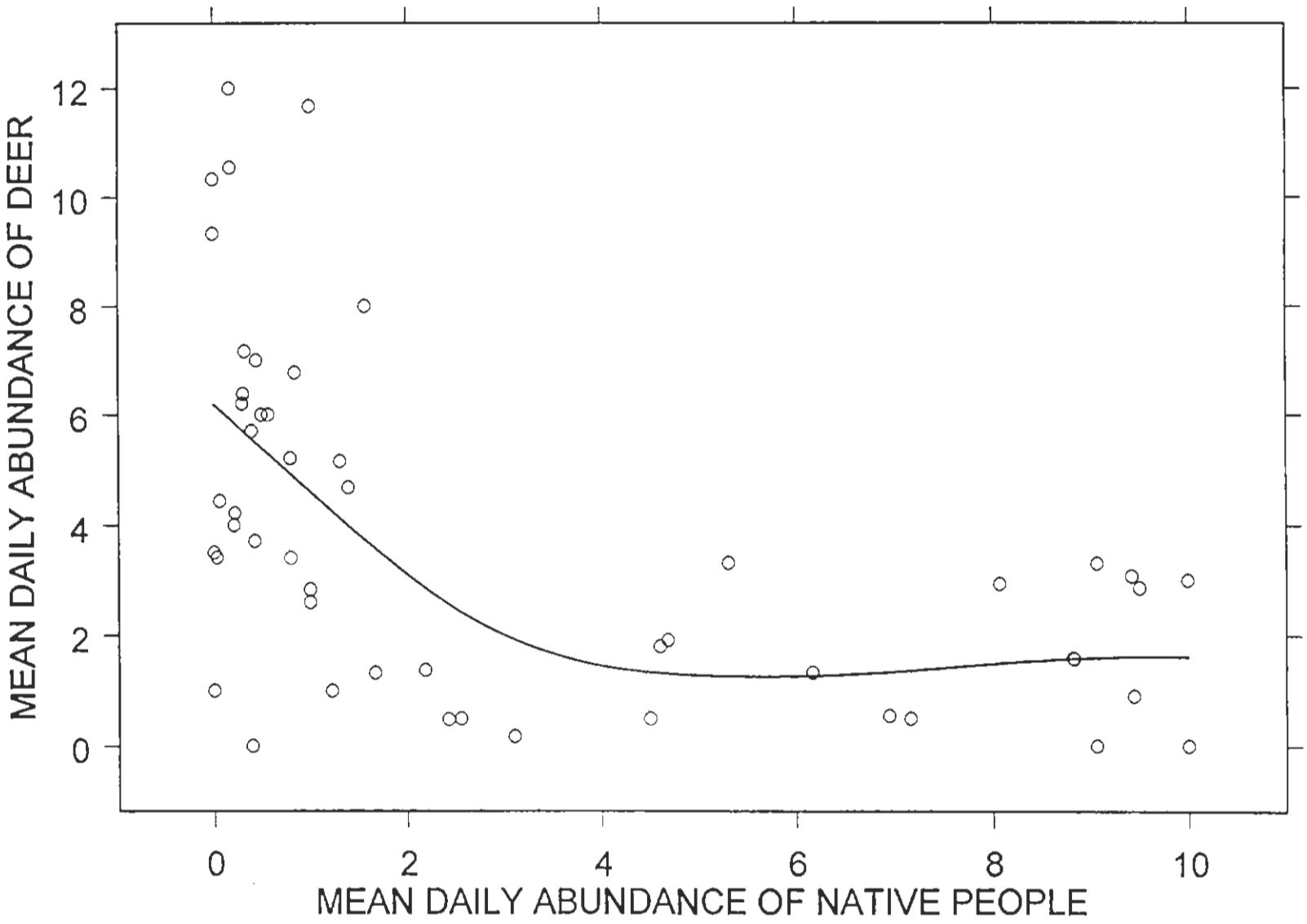
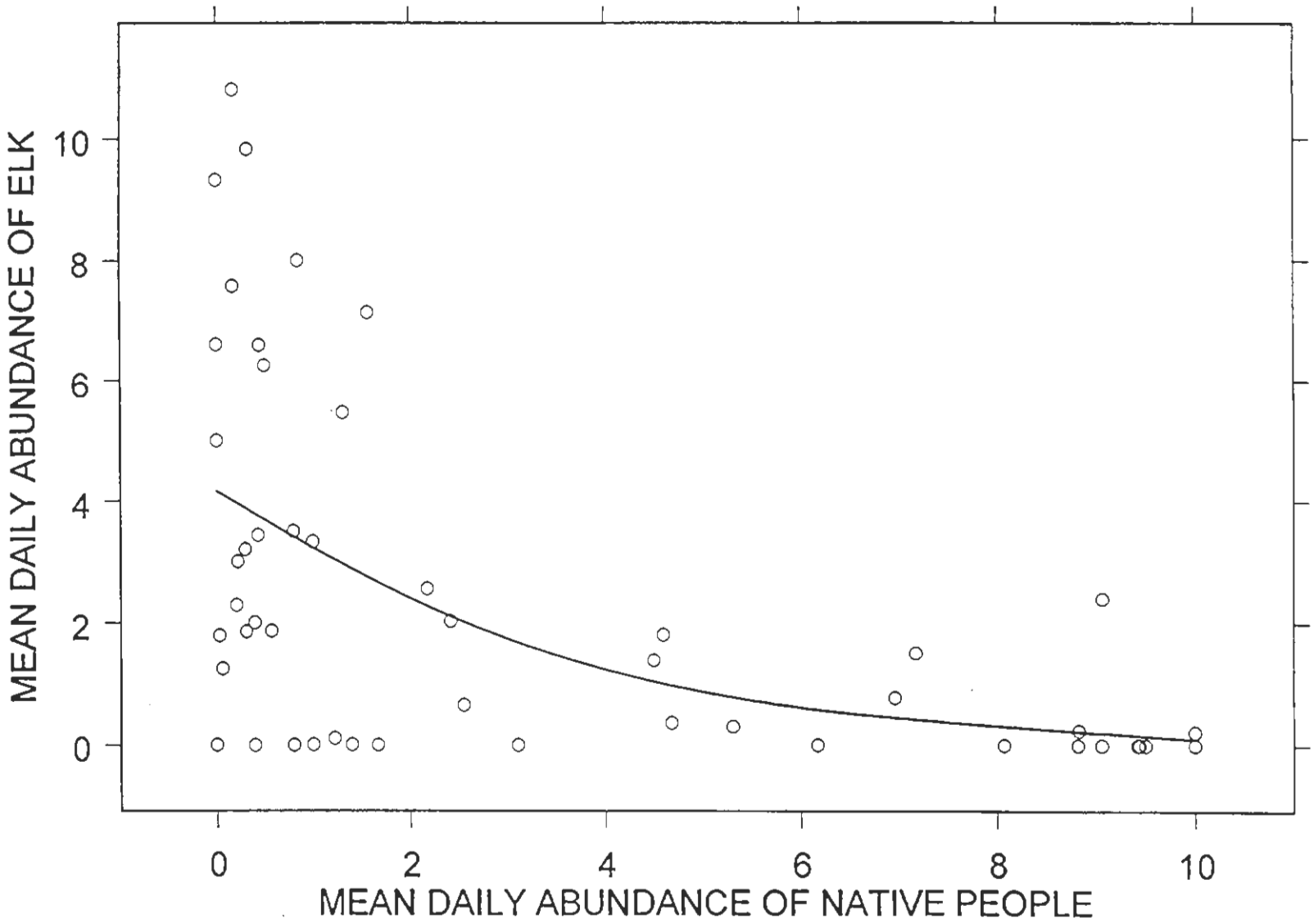
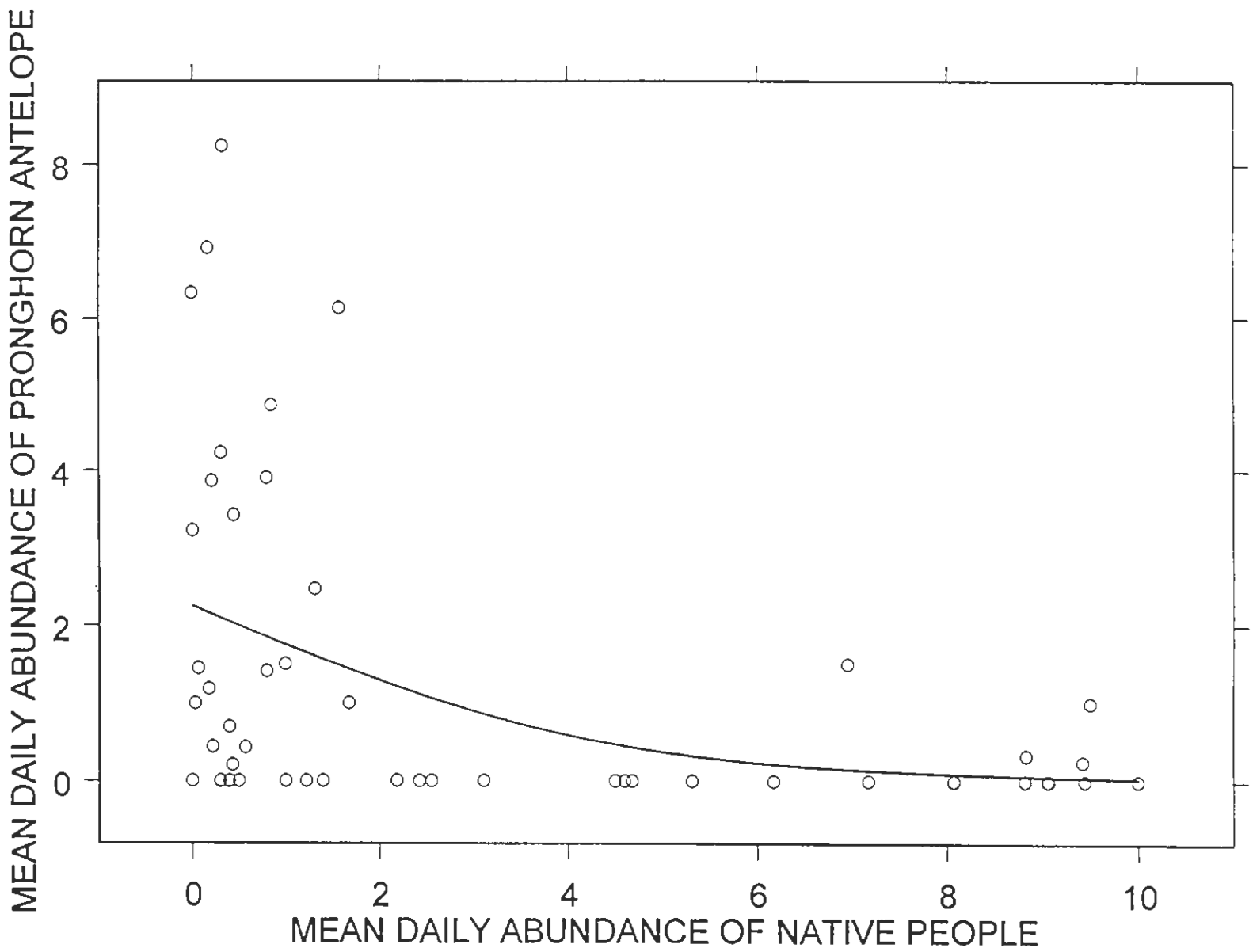
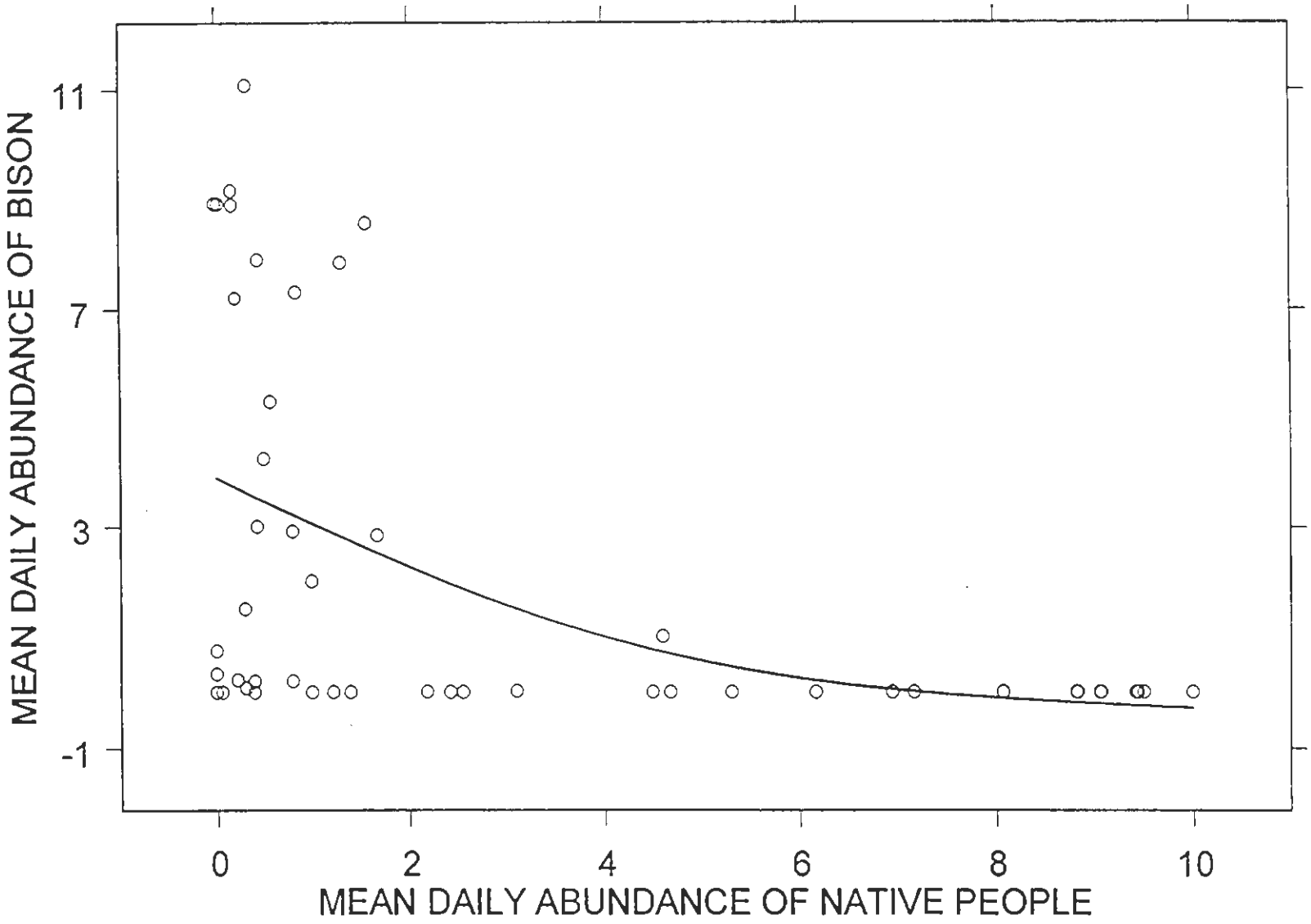

Lewis -- Marias River buffer zone
Daily abundance of wildlife and native people
35
30
25
20
15
10
5
0
All wildlife
Bison
Native people
All wildlife
Bison
795
796
797
798
799
800
801
802
803
804
805a
805b
806
807
Day

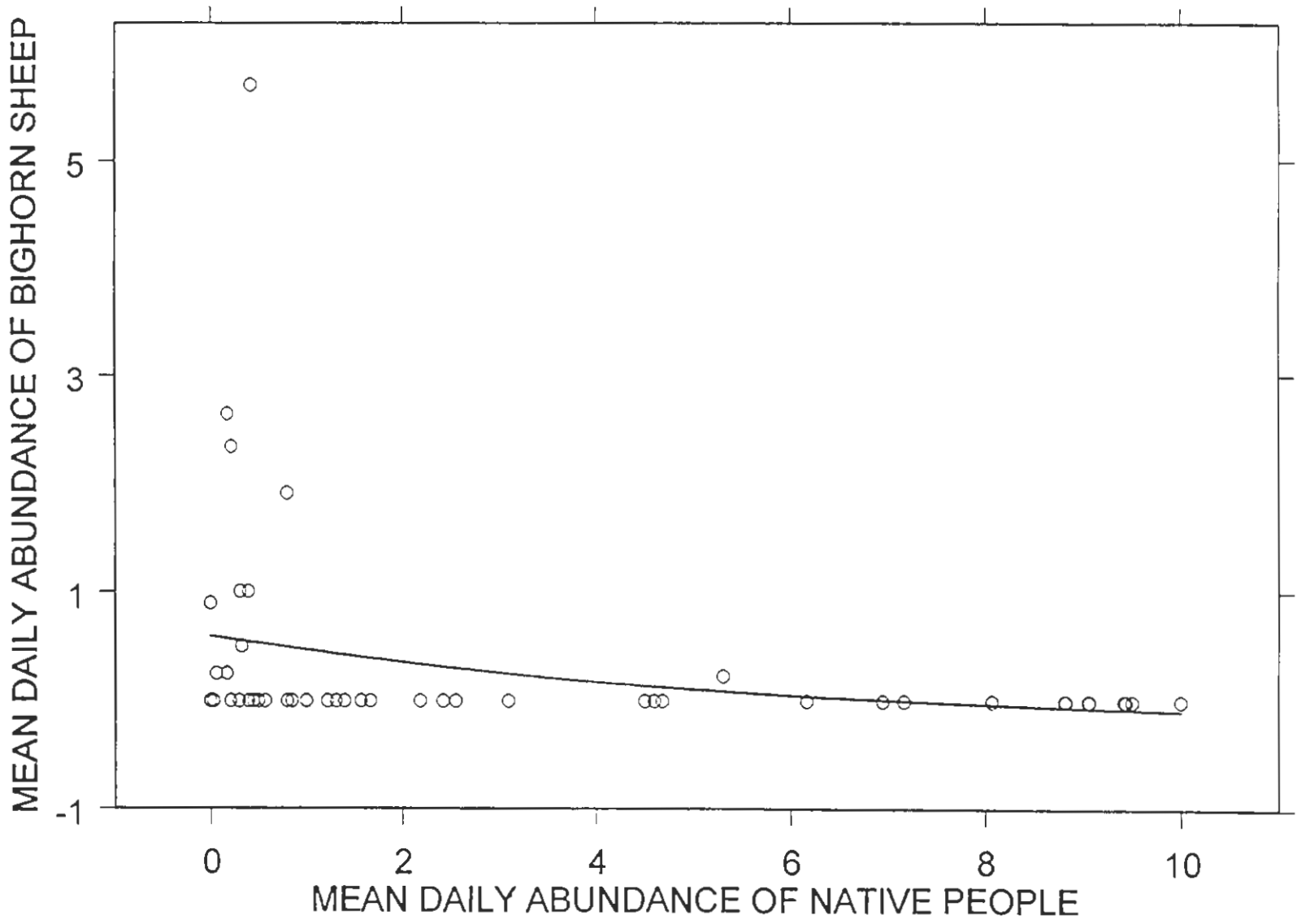
Figure 8. Relationship between the abundance of native people and the abundance of various wildlife species as observed by Lewis and Clark in 1804-1806. Plotted are the mean daily abundance of species and the mean daily abundance of Native Americans by trip segments - - segments 1, 2, 54, and 55 were excluded because those areas were near European settlements. Lines fitted using a smoothing spline with cross validation (MathSoft 1997:158-167). X and Y axes are offset. (a) Deer, (b) elk, (c) pronghorn antelope, (d) bison, (e) bighorn sheep, and (f) grizzlies.


MEAN DAILY ABUNDANCE OF DEER
0
2
4
6
8
10
12
0
2
4
6
8
10
MEAN DAILY ABUNDANCE OF NATIVE PEOPLE


MEAN DAILY ABUNDANCE OF ELK
0
2
4
6
8
10
MEAN DAILY ABUNDANCE OF NATIVE PEOPLE


MEAN DAILY ABUNDANCE OF PRONGHORN ANTELOPE
0
2
4
6
8
0
2
4
6
8
10
MEAN DAILY ABUNDANCE OF NATIVE PEOPLE


MEAN DAILY ABUNDANCE OF BISON
11
7
3
-1
0
2
4
6
8
10
MEAN DAILY ABUNDANCE OF NATIVE PEOPLE


MEAN DAILY ABUNDANCE OF BIGHORN SHEEP
5
3
1
-1
0
2
4
6
8
10
MEAN DAILY ABUNDANCE OF NATIVE PEOPLE

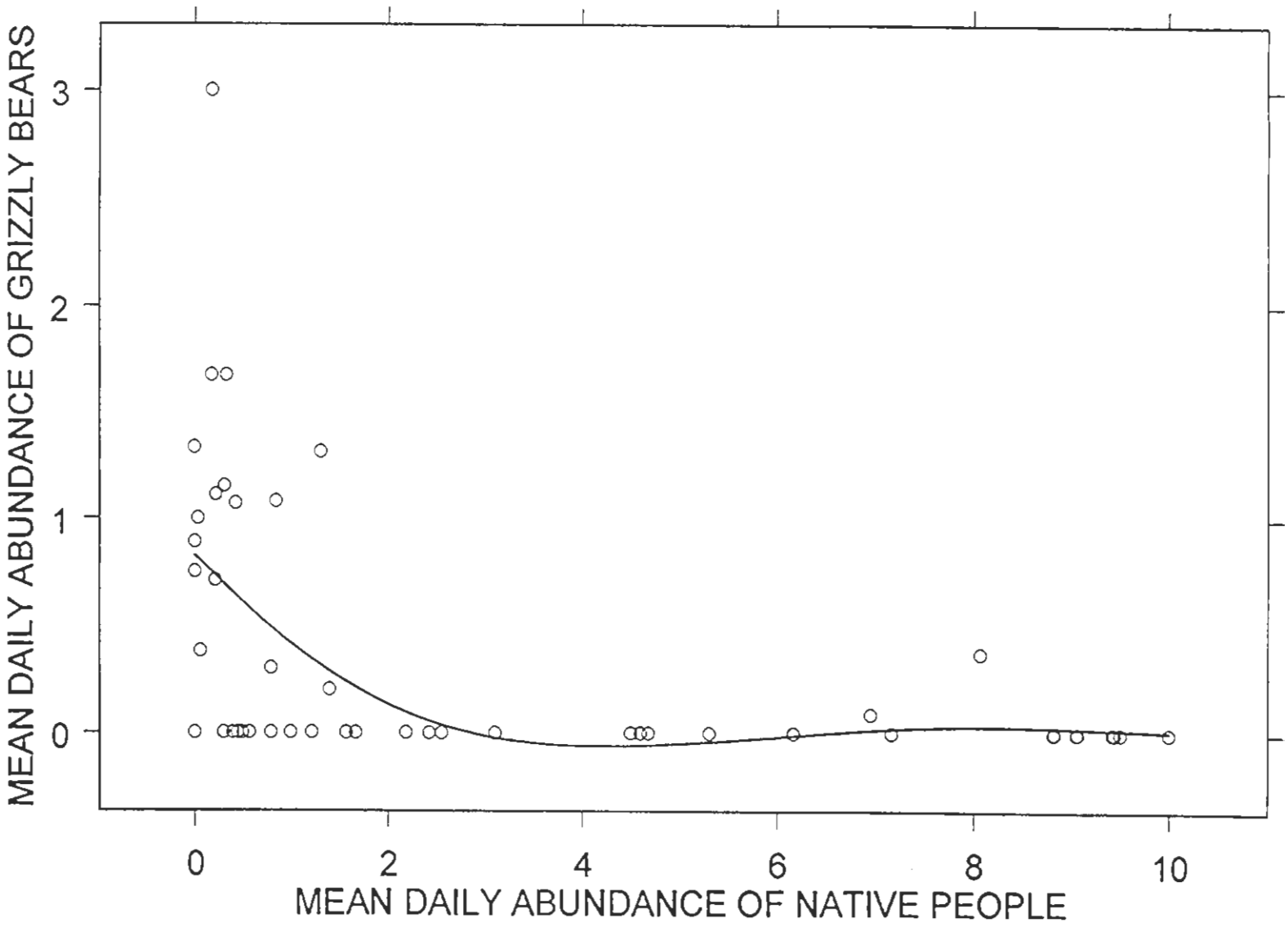
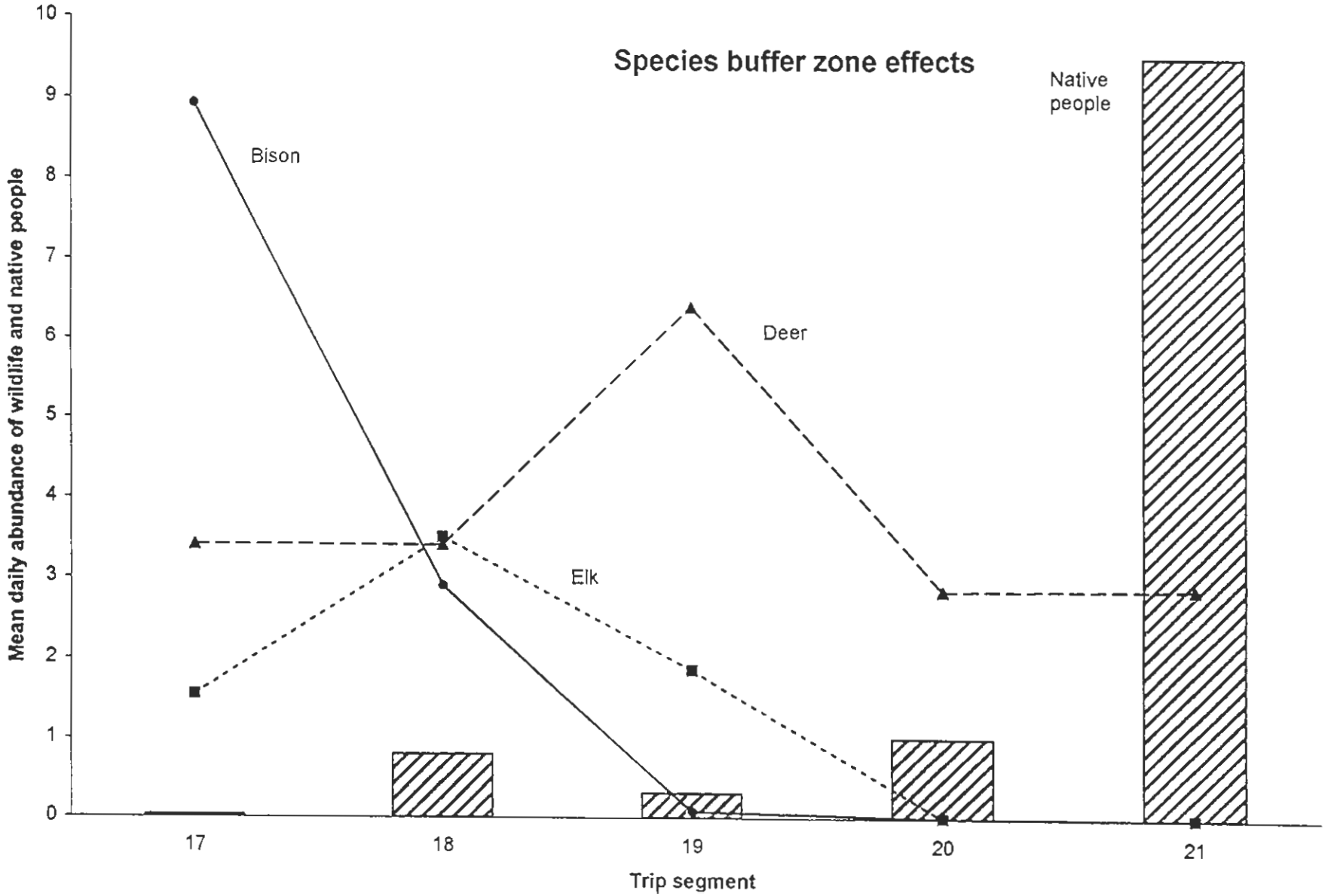

MEAN DAILY ABUNDANCE OF GRIZZLY BEARS
0
1
2
3
0
2
4
6
8
10
MEAN DAILY ABUNDANCE OF NATIVE PEOPLE

Figure 9. The effect of native hunting on bison, elk, and whitetail deer. As Lewis and Clark ascended the Missouri River from Great Falls (trip segment 17) and finally met the Shoshone (trip segment 21), wildlife became less and less abundant. First, bison disappeared, and then elk, until only a few white-tailed deer remained. This is the pattern that would be expected if native hunters foraged optimally without regard to conservation.


Species buffer zone effects
Native people
Bison
Deer
Elk
Mean daily abundance of wildlife and native people
Trip segment
0
1
2
3
4
5
6
7
8
9
10
17
18
19
20
21