10 / Megafauna of the Columbia Basin, 1800–1840

Lewis and Clark in a Game Sink

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The diversity of wildlife in the Americas was forged both by extinction and by the hunting practices of native people. Historical ecologists probing radiocarbon time—the last 40,000 years—recognize two catastrophes that shaped the biogeography of large mammals in the American continents. The first was a megafaunal extinction around 13,000 years ago, when the Americas lost two-thirds of their large mammals, including all species of elephants, horses, glyptodonts, and ground sloths.[1] The second was a post-Columbian catastrophe that repeatedly decimated native human populations, owing to epidemics of Eurasian pathogens in tandem with cultural changes brought about by the arrival of new cultigens, metals, domestic animals, and religions.

Despite dynamic changes throughout the Holocene,[2] there were no additional losses of American megafauna (animals over 44 kilograms of adult body weight) beyond taxa of bison in the mid-Holocene. By 12,000 years ago, continental extinction had run its course. The survivors in western North America included bison (*Bison bison*), moose (*Alces alces*), elk, wapiti or red deer (*Cervus elaphus*), mule and white-tail deer (*Odocoileus hemionus* and *O. virginianus*), bighorn or mountain sheep (*Ovis canadensis*), mountain goat (*Oreamnos americanus*), pronghorn antelope (*Antilocapra americana*), and woodland caribou (*Rangifer tarandus*). Large predators, scavengers, and omnivores included the wolf (*Canis lupus*), grizzly bear (*Ursus arctos*), black bear (*Ursus americanus*), mountain lion (*Felis concolor*), and jaguar (*Panthera onca*).

Biogeographers have long regarded the ranges and numbers of all animals—both large and small—as essentially natural, with scant recognition that ranges and numbers of certain preferred prey might be shaped by native people. Recently historians have begun to reexamine the role of Native Americans as hunters.[3] Wildlife ecologist Charles E. Kay has replaced the concept of an "ecologically noble savage" with that of an "ultimate keystone species."[4] According to Kay's hypothesis, in regions of sizable and stable human populations that were supported primarily by other resources, hunters would be sufficiently numerous to drive populations of desirable "target species," or "preferred prey," such as buffalo, elk, and deer, to low levels or even to local extinction. The result would be "game sinks."

The historical record, however, also demonstrates that there were game-rich regions, or "game sources." Although this seems paradoxical if native hunters were highly effective, Harold Hickerson provides an answer.[5] He found that the forest-prairie border in Wisconsin and Minnesota, a favorable habitat for deer and other game, constituted a buffer zone between warring Chippewas and Sioux. In this no-man's-land, hunters themselves might become the hunted. As a result, game thrived until a peace treaty was enforced by the United States government, after which hunting of game intensified.

This essay provides a fresh look at historic documents of the contact period, seeking neglected indications of Native American influence on wildlife. Focusing on the Columbia River drainage, we test Kay's and Hickerson's concept that native people had a significant effect on populations of large animals.

As Kay has shown,[6] historic documents offer untapped resources for understanding wildlife dynamics—and the Columbia River basin has a rich load of such documents. The natural history data in Lewis and Clark's journals and those of other members of their party are truly outstanding.[7] For the Columbia River those records are matched by David Thompson's *Narrative* and *Columbia Journals*.[8] Less trustworthy are some parts of the narrative of Ross Cox, who was 19 when he got lost on a cross-country trek from Palouse Falls to Spokane House, a misadventure that lost no dramatic impact in the telling.[9]

Journals or narratives from various employees of fur trading companies, such as Ross Cox,[10] Daniel Harmon,[11] Alexander Henry,[12] Gabrielle Franchere,[13] Peter Skene Ogden,[14] Alexander Ross,[15] Robert Stuart,[16] and David Thompson,[17] yield insights not found in the journals of Lewis and Clark.

The fur traders spent decades with various tribes, learned to speak some of the native languages, and probed regions previously unexplored by Europeans. They married or lived with Indian women, raised families, joined hunts, lamented the destructive impact of epidemic diseases and of alcohol (even as they provided it), and witnessed the collapse of traditional beliefs. Exposed in small posts that were at best marginally defensible against any sustained attack, the fur traders out of necessity developed considerable diplomatic skill. They managed to provision themselves and to conduct business while maintaining a peace of sorts with a variety of Indian nations often hostile to each other and unimpressed by the claims of the alien traders that they came from lands of vast wealth and power.

All of these sources, of course, suffer from an unavoidable shortcoming: they postdate the onset of significant biocultural change triggered by Eurasian diseases, guns, horses, and so forth, the legacy of Columbian contact. Nonetheless, the information they contain offers evidence supporting the conclusion that native people had a substantial impact on populations of game species—and thus on the environment. We begin with an example of a game source or park and follow with examples of game sinks.

LEWIS AND CLARK IN A GAME PARK

On the Great Plains east of the Rockies, Lewis and Clark found large animals in abundance (fig. 10.1). Near Great Falls, Montana, Clark thought he saw 10,000 buffalo in one view,[18] and he estimated 20,000 animals on the Missouri near the White River.[19] According to an accounting by R. D. Burroughs, the Corps of Discovery shot 1,000 deer, 375 elk, 227 bison, and hundreds of individuals of other species,[20] not an excessive number when one considers the size of the party—30 men along with Sacagawea, a Shoshone woman, and her infant—and its reliance on wild game for subsistence.

In four months during the spring and summer of 1805, between the time they left the vicinity of the Hidatsa-Mandan villages north of modern Bismarck, North Dakota, and their rendezvous with Shoshone hunters at Lemhi Pass on the Continental Divide on the Idaho-Montana border, the Corps of Discovery encountered no other Indians. For the first hundred miles upstream, in Hidatsa and Mandan hunting grounds, game was scarce. Approaching the mouth of the Yellowstone River near the modern town of Williston in western North Dakota, conditions changed. Lewis reported that "the whole face of the Country was covered with herds of Buffalo, Elk & Antelopes . . . so gentle that we pass near them while feeding. . . . When we attract their

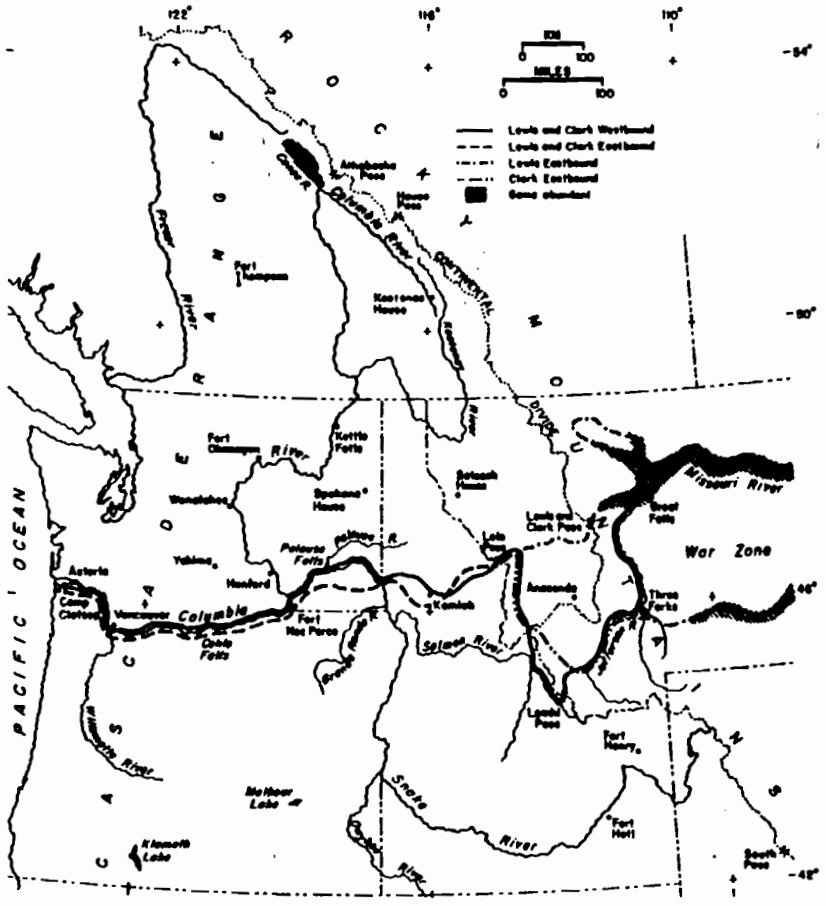

FIG. 10.1. Lewis and Clark's routes, showing areas of game abundance. Elsewhere game was scarce except for elk in the forest outside Fort Clatsop.

attention, they frequently approach us more nearly to discover what we are and in some instances pursue us a considerable distance."[21]

On May 8 Lewis claimed: "We can send out at any time and obtain whatever species of meat the country affords in as large quantities as we wish." On May 9 he added: "We saw a great quantity of game today particularly of Elk and Buffaloe, the latter are now so gentle that the men frequently throw sticks and stones at them in order to drive them out of the way." Wolves scavenging dead buffalo were so tame that Clark speared one.

The following year, during their return in the summer of 1806, Clark found

game equally abundant on the Yellowstone River. They canoed past "emenc number of Deer Elk and buffaloes on the banks." Clark felt that "for me to mention or give an estimate of the different species of wild animals on this river particularly Buffalo, Elk Antelopes & Wolves would be increditable. I shall therefore be silent in the subject further."[22] His promise of silence on the subject proved impossible to keep. The next night the grunting noises around their camp—sounds of males in the buffalo herds in rut—ruined sleep. On July 27, buffalo and elk were "astonishingly numerous," the elk so gentle that the party passed within 20 or 30 paces without causing alarm.

Although they saw no Indians, Lewis and Clark found signs of them. On May 4 they discovered two abandoned Blackfeet war lodges. Twice the exploring party found stray Indian dogs. Southwest of Great Falls Lewis and Clark began to find brush huts used by the Shoshone. On their return a year later, they lost horses to unseen Indian horse thieves, probably Crow. Nevertheless, Indian activity was limited and hunting was easy.

Between April 25 and June 13, 1805, in 50 days of travel along the upper Missouri between Williston, North Dakota, and the mouth of the Marias River, Montana, Lewis and Clark's journals report that their hunters killed 79 deer, 50 elk, 44 bison plus 7 calves, 8 antelope, and 12 grizzly bears (table 10.1). In addition, they killed 9 mountain sheep and 3 wolves, took many beaver, and caught or killed a variety of small game. "We eat an immensity of meat," Lewis wrote.[23] "It requires 4 deer, an elk and a deer, or one buffaloe, to supply us plentifully 24 hours. Meat now forms our food principally as we reserve our flour, parched meal and corn as much as possible for the rocky mountains which we are shortly to enter, and where from the Indian account game is not very abundant." They also killed elk and deer for hides to trade, to cover an ill-fated iron-frame boat, and for moccasins and clothing.

LEWIS AND CLARK IN A GAME SINK

The transition from the upper Missouri to the Columbia River drainage was dramatic. As their Hidatsa Indian informants at Fort Mandan had predicted, they killed the last buffalo southwest of Great Falls on July 16. Farther upstream along the Jefferson River, near present-day Whitehall, Montana, they found only buffalo bones and dung. In the same area on August 2, 1805, the party killed its last elk in the Missouri drainage. From there onward the hunters found mainly deer and antelope, in diminishing numbers. From there to Tongue Point, near Astoria, on the mouth of the

TABLE 10.1

Lewis and Clark's Game Bag, 1805–1806

	Upper Missouri River, 25 April–13 July 1805	*Columbia River, 18 Sept.–6 Nov. 1805*	*Camp Clatsop, 1 Jan.–19 Feb. 1806*	*Columbia River, 23 Mar.–11 May 1806*	*Upper Missouri River, 30 June–18 Aug. 1806*
Deer	79	28	8	38	191
Elk	50	0	51	22	51
Bison	44	0	0	0	55
Antelope	8	0	0	0	9
Bear	12	0	0	1	12
Dog	0	101+	5	83+	0
Ration Units	111	7	40	26	150

SOURCE: Meriwether Lewis and William Clark, *The Journals of the Lewis and Clark Expedition*, ed. Gary E. Moulton (Lincoln: University of Nebraska Press, 10 vols. to date, 1983–97.

NOTE: Each sample spans 50 days. To compute ration units (excluding dogs), bison = 1, elk or bear = 3/4, deer = 1/4, and antelope = 1/8.

Columbia, elk were scarce. They managed to kill one in the Bitterroot Valley south of Missoula. From this experience and that of other explorers to follow, one might not anticipate the large numbers of elk now to be found throughout the Rockies. One would certainly not expect the recent irruption of elk such as that inside the Hanford reserve near Yakima, Washington, a treeless region of Great Basin shrub-steppe, a habitat not usually thought of as suitable for elk.[24]

In contrast, the vegetation along the Continental Divide—spacious grassy valleys and sagebrush steppe laced by streams draining conifer forests on north slopes—would seem ideal for most game species, including elk and bison. Despite the attractiveness of the habitat, the Corps of Discovery gradually passed from a land of abundant game (around Great Falls, Montana) to one of scarcity in Idaho along the Salmon River west of Lemhi Pass. The lack of game did not involve badlands or any major change in soil type, and in less than 20 years buffalo would overrun this country.

West of Lemhi Pass the Corps of Discovery could find little to hunt. While Clark scouted the Salmon, the wild "River of No Return," the rest of the party exhausted their food reserves. With Shoshone guides, the party proceeded

north over 100 miles before turning to the west again through Lolo Pass into the Bitterroots. Hunting game with no success, they killed and ate colts and a horse. Cameahwait, the Shoshone chief, Sacagawea's brother, had warned them to expect scarcity. But Lewis reasoned that if the Indians, including women and children, could pass the mountains, the explorers could as well. Furthermore, thought Lewis, if there were large numbers of Indians living on the river below the mountains, "they must have some means of subsistence which would be in our power to procure in the same country."[25]

On September 20, after a week of unusually rugged travel and near starvation, an advance party led by Clark descended out of the Bitterroots. They found a beautiful, level pine country whose friendly inhabitants, the Nez Perce (known to Lewis and Clark as Chopunish), shared their traditional foods. These included dried fish (from the salmon season), berries, roots (bulbs) of camas or "quamash" (*Camassia*), and even a small piece of buffalo meat.

In his journal entry for September 22, Lewis allowed himself the rare luxury of self-congratulation: "The pleasure I now felt in having tryumphed over the rocky Mountains and descending once more to a level and fertile country where there was every rational hope of finding a comfortable subsistence for myself and party can be more readily conceived then expressed, nor was the flattering prospect of the final success of the expedition less pleasing." Despite his rational hopes, Lewis found no "comfortable subsistence." He had misjudged their situation. Many members of the party became seriously ill on the new diet, Lewis included. The trouble was that the rations of dry fish and roots that the explorers could readily obtain from the Nez Perce they could not stomach. The problems continued. At their "Canoe Camp" in October, Clark killed a horse to make soup for sick men. Nevertheless, trouble persisted: "Nothing to eate but dried roots dried fish, . . . which filled us so full of wind, that we were scarcely able to Breathe all night."[26]

Although it was hard to hunt in the dry hills above the Clearwater,[27] their hunters bagged some deer. Nevertheless, during the 50 days the Corps of Discovery canoed and camped on the Clearwater, the Snake, and the Columbia, they killed a scant 28 deer (table 10.1), half of the animals on the upper Clearwater and the rest over 200 miles to the west as they reached forested parts of the lower Columbia near the Cascades. Besides ducks, geese, and swans, they shot and ate a coyote. But game birds were not enough. Their total kill of big game averaged 0.15 ration units a day (table 10.1), less than a fifth of their desirable daily ration and an order of magnitude less than their 50-day bag on the upper Missouri. Despite the best efforts of their best hunters, for 26 days beginning September 30 they found no big game (no elk, antelope, or deer) at all. The main alternatives were dried fish, roots, and dogs.

Unable to stomach the native diet of dry fish and roots and unable to find enough game in this vast game sink, the Corps of Discovery, not surprisingly, turned to the domestic animals of the local people to meet their needs. In 30 days beginning in early October, their journals report that the explorers bought at least 100 dogs. On October 17 they obtained all the dogs they could—the exact number unspecified. On October 18, in exchange for "beads, wire and other trinkets of little value," Clark acquired 40 dogs.

On January 3, 1806, Lewis wrote that "our party from necessity having been obliged to subsist some length of time on dogs have now become extremely fond of their flesh; it is worthy of remark that while we lived principally on the flesh of this animal we were much more healthy, strong and more fleshy than we had been since we left the Buffalo County." In his own contribution to the expedition's journal that day, Clark admitted that he had not become "reconciled to the taste of this animal yet."

At Camp Clatsop at the mouth of the Columbia, Lewis and Clark wintered in the dense, wet forest of the Oregon coast. They sought a site with plenty of game. Unlike their experience upstream along the Columbia and the Clearwater, they found elk numerous, at least until spring when the animals retreated inland. Sergeant Gass calculated that between December 1, 1805, and March 20, 1806, the party's hunters bagged 131 elk and 20 deer.[28] The group also dined on wapato roots, candlefish, sturgeon, whale blubber, and a few dogs.

On the homeward journey, a few days spent near the mouth of Sandy River allowed hunters to forage far enough toward Mount Hood to shoot 14 elk and a bear—a surplus the corps held in reserve. Still, their kill of big game was about half their desired daily ration. Again dogs helped fill out the menu. On their trip down and up the Clearwater-Snake-Columbia River, the Corps of Discovery bought and ate more than 180 dogs and a few horses.

Members of the Corps of Discovery were not alone in their caniphagy. In 1811 and 1812 both Hunt (traveling west) and Stuart (returning east) purchased and ate dogs and horses on their perilous overland journeys to and from the Pacific Fur Company's Fort Astoria, pioneering a route that became the Oregon Trail.[29] In two weeks on the lower Columbia and the Willamette River in January 1814, Alexander Henry purchased 52 dogs for his party.[30] In December 1815, the Spokane brigade left Okanogan with 40

freshly killed dogs in the loading.[31] At villages between Celilo Falls and the land of the Walla Wallas, the North West Company traders purchased and ate 150 dogs,[32] which the Canadians preferred to horse flesh. Seeking provisions for his ravenous fur brigade in early December 1827 in the Klamath Lakes country of southwestern Oregon, Peter Skene Ogden discovered that the "Chimmette Nation" had plenty of dogs to sell. In four days he bought 137.[33]

Although game was scarce, people were not—the reverse of what the Corps of Discovery had found in Montana. Lewis and Clark contacted Indians daily and camped with or near them every night. From the bank, large numbers of Indians watched Lewis and Clark float down the river. Some of the groups they mention or learned of in the Columbia drainage were the Palouse, Yakama, Wanapam, Cayuse, Umatilla, Okanogan, Yakama, Clatsop, and other Chinookans, besides those Indians they encountered first, the Shoshone, Flat Heads, and Nez Perce, In aggregate a population estimated at 80,000.[34] In 1824, Governor George Simpson of the Hudson's Bay Company found that "the population on the banks of the Columbia River is much greater than in any other part of North America that I have visited."[35]

Such was not the case in the dense forest at the mouth of the Columbia where the corps wintered. The Clatsop and other coastal tribes were in eclipse. More exposed to diseases than the interior nations, the Clatsop would soon disappear. Dense coastal populations of indigenous people, particularly those along the mouth of the Columbia, were highly exposed to viral and venereal diseases brought by trading vessels.[36] More than 100 ships had landed in the area before Lewis and Clark arrived overland.[37] By then, smallpox had already struck the Clatsop at least twice, reducing the coastal populations by 40 percent.[38] According to Lewis, diseases "would account for the number of remains of villages which we find deserted on the river and sea coast in this quarter."[39]

The scarcity of wild game that the corps encountered in the Columbia basin above Celilo Falls might have resulted from either seasonal movements of game, poor habitat, or heavy hunting by the natives. Although seasonal change in game might account for scarcity in the Bitterroots when Lewis and Clark traveled west, it would not account for scarcity on their return, when the explorers, the Nez Perce, and wild game alike were confined to the lowlands until the snowpack melted in late June. And the fact that horses thrived in the area provides indirect support for the conclusion that the problem was not poor habitat.

HORSE HEAVEN

Only one large herbivore was vastly more numerous along the Columbia than along the upper Missouri River. This was the horse. Horses reached the Columbia Plateau region roughly a century before Lewis and Clark.[40] After tens of millions of years of horse evolution in North America, the extinction of all native American species of horses by 13,000 years ago is indeed strange. The unwitting restoration of horses by Spaniards in the sixteenth century was hardly a biogeographical anomaly. Not surprisingly, the animals thrived.

According to North West Company clerk Ross Cox, "among the Flatheads, Cootonais, Spokans, etc., whose lands are rather thickly wooded, there are not more [horses] than sufficient for their actual use, and every colt, on arriving at the proper age, is broken in for the saddle. But in the countries inhabited by the Wallah Wallahs, Nez Perce, and Shoshones, which consist chiefly of open plains, well watered, and thinly wooded, they are far more numerous, and thousands are allowed to go wild."[41] According to Sergeant Patrick Gass of the Corps of Discovery, "between the Great Falls [Celilo Falls] of the Columbia and this place [the Canoe Camp on the Clearwater] we saw more horses, than I ever saw in the same space of country."[42] "These people have immense numbers of [horses]; one individual might own 50 to 100 head," wrote Meriwether Lewis.[43] Large horse herds in places such as the Horse Heaven Hills along the Columbia suggest a substantial carrying capacity for megaherbivores. At a carrying capacity of three to five animals per square kilometer, the potential population of the region may have approached half a million.

The productivity of the habitat was also noted by Lewis and Clark, each of whom had a woodsman's eye for evaluating such things. In the sagebrush–rabbit bush shrub-steppe, wrote Clark, "great numbers of the natives pass us on horse back."[44] Lewis remarked the next day that "the soil is not as fertile as about the falls [Great Falls of the Columbia], tho' it produces a low grass on which the horses feed very conveniently; it astonished me to see the order [good condition] of their horses at this season of the year when I knew that they had wintered on the dry grass of the plains and at the same time [were ridden] with greater severity than is common among ourselves. I did not see a single horse which could be deemed poor and many of them were as fat as seals."[45]

In 1836, the missionary Samuel Parker was equally impressed with how well his worn-down horses had wintered outside Fort Nez Perce. In addition,

cattle kept outside the fort with nothing more to feed upon than what they found on the prairies thrived "in as good condition for market as oxen driven from the stalls of New England."[46]

FUR TRADERS, THEIR TRADING PARTNERS, AND WILDLIFE

The journals of fur traders and explorers of the early 1800s reiterate many of the observations of the Corps of Discovery. In the summer of 1807, a year after Lewis and Clark's return trip, David Thompson, his wife, Charlotte, their three small children, and 10 traders, along with other women and children, crossed the Canadian Rockies at Howse Pass to open a trading post in Kootenai territory. West of the Rockies on the upper Columbia, Thompson soon found he faced the same difficulty faced by Lewis and Clark—the lack of game. Even deer were scarce that summer: "We had very hard times and were obliged to eat several horses."[47] Once Thompson's party boiled and ate part of a wild horse killed the day before and left undisembowelled, "but it made us very sick, being half rotten."[48] When salmon arrived, they were scant and spent from the vast distance they had swum. The construction of Kootanae House, Thompson's new post, was delayed: "As we have no provisions and are too weak to build without food, the men went [fishing]."[49]

In the summer of 1811, Thompson and a party of 10 descended the Columbia from the forty-ninth parallel at Kettle Falls to its mouth at Astoria. Above the mouth of the Snake, Thompson mapped several hundred miles of previously unexplored river. Like Lewis and Clark, he found virtually no game.

Below Wenatchee, the natives "describe their country to the southward to being high dry and barren, without animals; to the northward the lands are good with Antelopes [deer], Mountain Sheep and Goats, of which their clothing is made, and of the fine long wool of the latter they make good rude blankets." They had a few bison robes, obtained by trade, and were better clothed than any other tribe Thompson had yet seen.[50]

Thompson also explored the uplands. Returning from Astoria, he left the Snake River at Palouse Falls, where he purchased horses, and proceeded overland 90 miles north to Spokane House. He must have crossed the Palouse Prairie, with its deep, fertile loess soils. Although the country became increasingly attractive, with groves of aspens and tender green grass on which their horses fed avidly, he found no game. "Provisions having fallen short and our Guide assuring us we should see no Deer, nor Indians to supply us, we had to shoot a Horse for a supply."[51]

Thompson was by no means the only one to resort to horse meat in the early days at Spokane. According to a footnote in Franchere's account, the traders wintering at Spokane House in 1812–13 had to live on horse flesh; they ate 90 horses.[52] Prior to his 1825 tour of inspection, Hudson's Bay Company Governor George Simpson discovered that to provision Fort Nez Perce near the mouth of the Snake, 130 miles southwest of Spokane, the traders had slaughtered some 700 horses in three years.[53]

Impressed with the sizable Indian population on the banks of the Columbia, which appeared to be lined with lodges, Simpson imagined that the natives were content to live on fish and roots alone and did not turn their attention to hunting.[54] In contrast, brigade leader Alexander Ross, who had lived with the Salishan tribes, wrote: "Hunting is a favorite exercise with all Indians, and the Oakinackens are very fond of displaying their dexterity in riding and decoying animals of the chase. I have seen a fellow get into a deer-skin, stripped for the purpose, with the skin of the head and horns complete, walk off on all fours, and get actually among a herd of deer without their taking notice of the deception."[55] Indians of the Willamette Valley,[56] the Nez Perce,[57] and Shuswap[58] made effective use of a deer's head and horns to imitate and decoy wild animals. The Shuswap used a number of different calls for game. In season they lured does by imitating the bleat of a fawn,[59] a technique familiar to Lewis and Clark's hunters.[60]

CONCLUSION: CONTROLLERS OF THE GAME

We can only imagine what the West might have looked like when its native mammoths, camels, and horses roamed the land. From early accounts of certain uninhabited and underhunted regions, we learn of abundant and tame bison, elk, deer, and wolves. Nevertheless, the "wild America" reported by Lewis and Clark is an epiphenomenon in the history of contact. The game-rich upper Missouri was no more natural than the game-poor Columbia Plateau.

The journals of early explorers and the late prehistoric archaeological record suggest considerable suppression of large game by human activity. This was especially evident along floodplains featuring biologically productive, if limited, habitats highly attractive to farmers, foragers, and fishermen. A population subsidized by the underground storage organs of wild plants and by shoals of andromadous fish will maintain heavy hunting pressure on preferred prey (large mammals), thereby generating a classic predator pit.[61]

On occasion, the journals of early explorers describe regions of abun-

dance—game sources or game parks—in uninhabited land known or suspected to be war zones.[62] The introduction of horses created a new opportunity for nomadic raiders to generate or expand intertribal war zones. With chronic intertribal warfare fueled by guns from traders, sizable buffer zones developed, and in them game thrived. In these areas, the abundance of game simulated what one might expect in the absence of any human presence.

In the time of the mammoths, until 13,000 years ago, bison ranged coast to coast.[63] Historically, "it is probable that had the buffalo remained unmolested by man and uninfluenced by him, [buffalo] would have crossed the Sierra Nevada and the Coast Range and taken up an abode in the fertile valleys of the Pacific Slope."[64] "Unmolested by man," it is probable that throughout the West, from the Columbia Plateau and the intermontane region south into the Mexican Plateau, bison, elk, deer, antelope, mountain goats, bighorn, and javelinas, and their associated wolves, bears, and jaguars, would have ranged much more widely and in far greater numbers than they did historically. On a scale unimaginable in terms of historical observations, an unhunted fauna of bison, deer, elk, and the like would have proliferated, absorbing niches once held by the much more diverse megafauna of the late Quaternary.

If "wild" is to mean pristine or natural or essentially bereft of human influence, it vanished more than 12,000 years ago. The last "wild" West supported an unhunted megafauna of at least 39 species, including mammoths, mastodons, native camels, native horses, and ground sloths, three times the diversity of megafauna found since.[65] Whether or not the Clovis Paleoindian colonization initiated the extinctions of megafauna more than 12,000 years ago, numerous historical accounts suggest that the range and numbers of surviving large animals were profoundly influenced by the activities of Native Americans in the centuries before the intrusion of Europeans.

Although European settlement is commonly blamed for *all* important historic losses of wild game, the vital role of Native Americans in influencing numbers of large mammals can be detected in early historic accounts.[66] The implications for managers seeking to restore "wild America" to some imaginary "natural" condition are profound: not only did the full complement of native megafauna vanish around 12,000 years ago, but subsequent human activity controlled the population sizes and severely limited the ranges of the surviving buffalo, elk, moose, and other megafauna.

Historical experience demonstrates the effects of reduced hunting pressure in intertribal war zones such as the one reaching from the forest-prairie edge in Wisconsin west to the Red River of the North, and a second on the plains of the upper Missouri, including the Yellowstone. On August 29,

1806, near the end of Lewis and Clark's expedition, William Clark observed that "in the country between the nations which are at war with each other the greatest number of animals are to be found." Lewis, Clark, and others of the period found very few large animals except for domestic horses in the neighborhood of populated, relatively peaceful settlements of the Columbia basin. The view that prior to European expansion, "Native Americans were the ultimate keystone species that structured entire ecosystems"[67] is abundantly supported by historic records of big game in the Northwest.

NOTES

1. Paul S. Martin, "Who or What Destroyed Our Mammoths?," in *Megafauna and Man: Discovery of America's Heartland*, eds. Larry D. Agenbroad, Jim I. Mead, and Lisa W. Nelson (Hot Springs, S.D.: The Mammoth Site of Hot Springs, South Dakota, Inc., Scientific Papers vol. 1, 1990), pp. 109–17; Paul S. Martin and Richard G. Klein, eds., *Quaternary Extinctions: A Prehistoric Revolution* (Tucson: University of Arizona Press, 1984).

2. W. R. Dickinson, "The Times Are Always Changing: The Holocene Saga," *Geological Society of America Bulletin* 107 (1995): 1–7.

3. Dan Flores, "Bison Ecology and Bison Diplomacy: The Southern Plains from 1800 to 1850," *Journal of American History* 78 (1991): 465–85; Elliott West, *The Way to the West: Essays on the Central Plains* (Albuquerque: University of New Mexico Press, 1995).

4. A "keystone species" determines the composition of the plant and animal community in which it lives. If the species is removed, the community will change, often dramatically. Charles E. Kay, "Aboriginal Overkill and the Biogeography of Moose in Western North America," *Alces* 33 (1997): 141–64; Charles E. Kay, "Ecosystems Then and Now: A Historical-Ecological Approach to Ecosystem Management," in *Proceedings of the Fourth Prairie Conservation and Endangered Species Workshop*, eds. W. D. Williams and J. F. Dormaar (Edmonton: Provincial Museum of Alberta, Natural History Occasional Paper no. 23, 1996), pp. 79–86; Charles E. Kay, "Aboriginal Overkill: The Role of Native Americans in Structuring Western Ecosystems," *Human Nature* 5 (1994): 359–98; Charles E. Kay, "Yellowstone's Northern Elk Herd: A Critical Evaluation of the 'Natural Regulation' Paradigm" (Ph.D. diss., Utah State University, 1990); C. E. Kay, B. Patton, and C. A. White, *Assessment of Long-Term Terrestrial Ecosystem States and Processes in Banff National Park and the Central Canadian Rockies* (Banff National Park, 1994).

5. Harold Hickerson, "The Virginia Deer and Intertribal Buffer Zones in the Upper Mississippi Valley," in *Man, Culture, and Animals: The Role of Animals in Human Ecological Adjustments*, eds. Anthony Leeds and Andrew P. Vayda (Washington, D.C.: American Association for the Advancement of Science, 1965), pp. 43–66.

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11 / Land Divided

Yakama Tribal Land Use in the Federal Allotment Era

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The Dawes General Allotment Act of 1887 was the cornerstone of federal Indian policy well into the twentieth century.[1] Through the act, Congress dramatically altered its previous policy of isolating tribes on remote reservations. As the ready supply of fresh land and unexploited resources elsewhere diminished, white settlers clamored to open Indian land to farming, mining, and other uses. In the postfrontier age, federal Indian policy aimed for nothing less than the total destruction of Indian cultures and the incorporation of their people, land, and resources into the national economy. How best to absorb Indians into nineteenth-century United States society was commonly known as the "Indian problem." The Dawes Act represented one solution to it. By endowing each individual member of a tribe with his or her own land, federal policymakers believed Indian people would quickly learn to become self-sufficient, market-oriented farmer-citizens.

But the "Indian problem" had no single easy answer, and the Dawes Act also contained seeds of a quite different policy. The act, and subsequent legislation that provided for leasing, taxing, and alienating individual allotments, not only permitted but even encouraged Indians to sell their land to whites. Moreover, like the Homestead Act before it, the Dawes Act existed in a land system that promoted speculation in land rather than settlement. As the historian Paul Gates noted some 60 years ago, the goal of federal land policies was to convert public land into cash as quickly as possible.[2] This goal reflected the larger economic system, in which land was a commodity whose only value inhered in the rapidity with which people could turn it