Feast and Famine on the Lewis and Clark Trail

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Abstract

The Lewis and Clark Journals (1804-1806) provide the first reliable documentation of diversity, relative abundance, distribution, and harvest of large animals in the upper Missouri plains and Columbia River corridor regions between Fort Mandan and the Pacific Ocean. The Upper Missouri plains served as a living dynamic entity with a biological diversity that was nurtured and sustained by the main arterial stem of the Missouri and its extensive network of perennial tributaries. From the Lewis and Clark Journals daily entries, I provide summaries of kills of large wild game by the Expedition by geographic region. I also present these summaries of game kills in context of Merriwether Lewis' 24-hr ration-unit requirement for the Expedition's personnel providing a reasonable picture of animal protein availability along the travel route through a variety of physiographic regions. East of Traveler's Rest, to the Montana-North Dakota border, the accumulation of surplus daily ration units averaged well above the daily requirement. The geographic region between Traveler's Rest and Fort Clatsop provided an average daily ration unit of one-half the needed requirement on the outward and return trip.

Key Words: megafauna, physiographic regions, ration units, recorded kills

Introduction

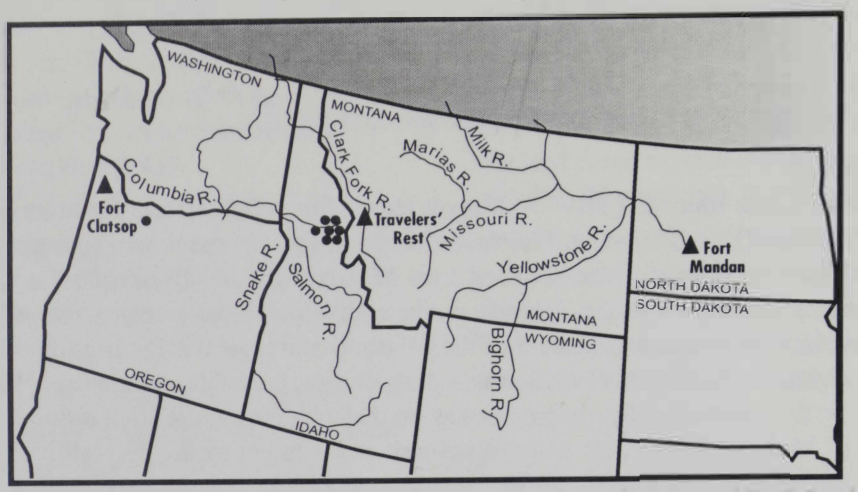
The Lewis and Clark journals (Moulton 1983-2001) provided the first documentation of pre-settlement wildlife habitats, natural history, behavioral characteristics, and game kills during their epic 28-month outward and return journey. The journals also provide an impression of an upper Missouri-Yellowstone drainage basin filled with staggering numbers of wild ungulates.

On departure from Fort Mandan in the late afternoon of 7 April 1805, some concern about the unpredictable aspects of penetrating further into the unknown certainly must have passed through Meriwether Lewis' mind. "We are about to penetrate a country at least 2000 miles in width, on which the foot of civilized man had never trodden; the good or evil it had in store for us was for experiment yet to determine" Lewis wrote in his journal. No Expedition member could guess what the "good" might hold, but an optimistic Lewis was relying on the land to provide substantial amounts of wild game to satisfy and sustain their animal protein needs.

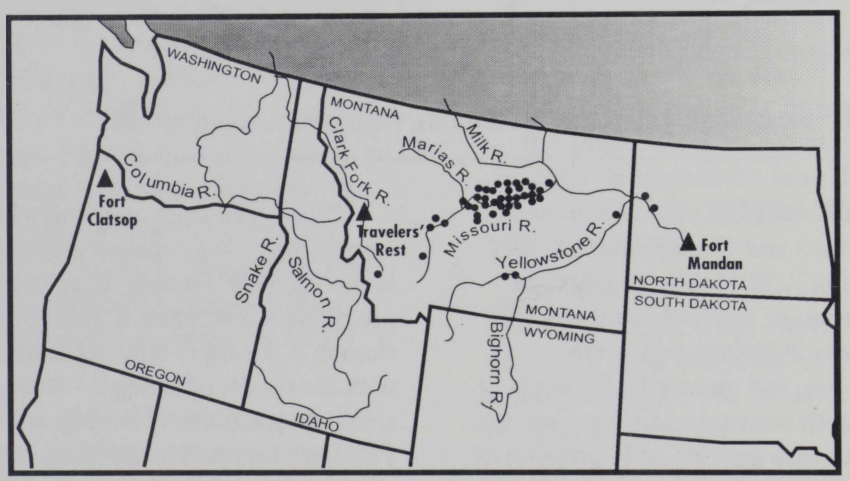
"Food," as Furtwangler (1993) emphasized, "is a constant preoccupation in the Journals. Finding it, capturing or procuring it, preparing it, preserving it, sharing it, eating it, and, not least, coping with the results of eating it—these processes stand out prominently on page after page." The Journals provide elaborate lessons as to how the explorers coped with feast, famine, and adjusting metabolisms as they penetrated and explored different regional environments.

Between 7 April 1805 and 12 August 1806, a total of 494 days of travel from Fort Mandan to the Pacific and their return to the Mandan villages the following year, the expedition killed 567 deer (*Odocoileus* spp.), 280 elk (*Cervus elaphus*), 187 bison (*Bison bison*), 40 bears (*Ursus* spp.) of which 32 were grizzlies (*U. arctos*). In addition they killed 44 mountain sheep (*Ovis canadensis*), 69 pronghorns (*Antilocapra americana*), and an undetermined number of smaller mammals, waterfowl, and fish. Approximate locations for the seven big game species location kills are shown in Figure 1. Although the total number of

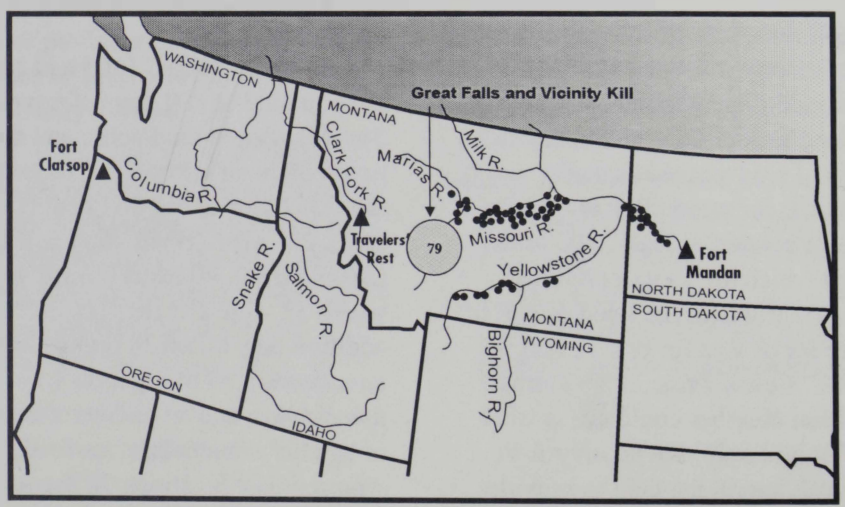
Fig. 1. Lewis and clark 1805-1806 Expedition approximate big game kill locations from Fort Mandan to Fort Clatsop (1805) and return (1806) trip to Fort Mandan.



Corps of Discovery black bear kills (1806) between Ft. Clatsop and Ft. Mandan. Total black bear kill on return trip (8). Each l represents one bear kill.

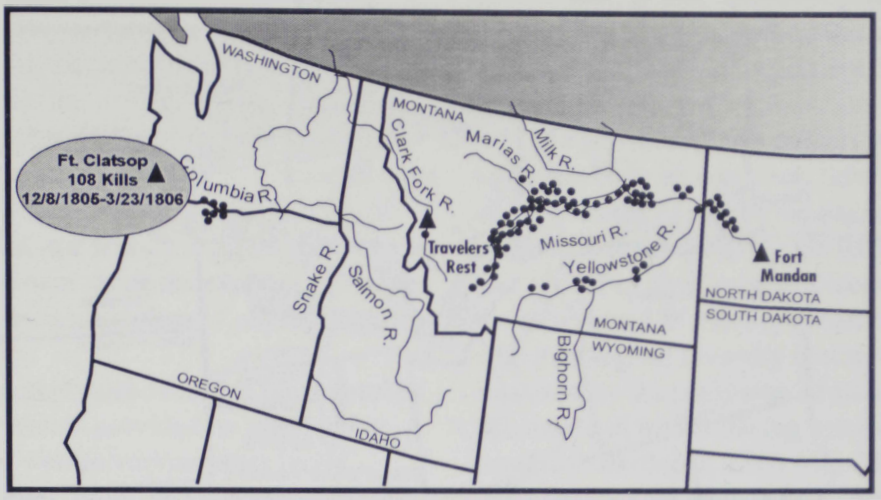


Corps of Discovery bighorn sheep kill (1805-1806) between Ft. Mandan and Ft. Clatsop. Total sheep kill on outward and return trips (44). Each l represents one sheep kill.

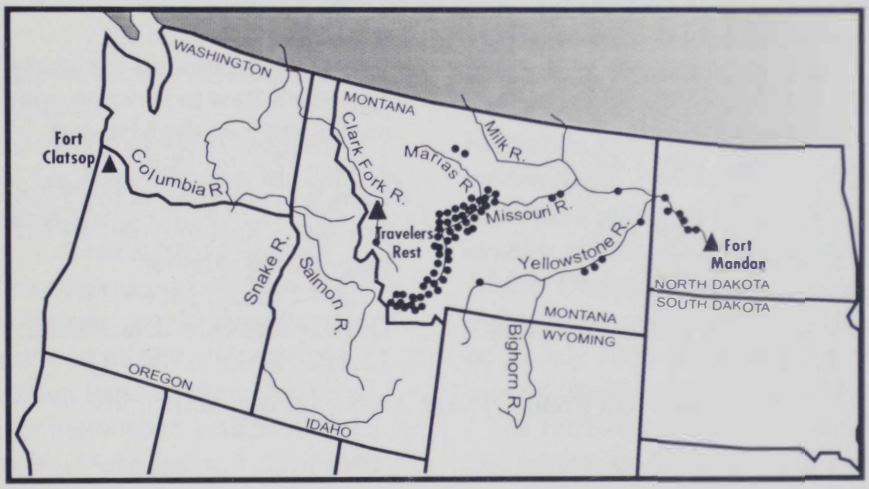


Corps of Discovery bison kill (1805-1806) between Ft. Mandan and Ft. Clatsop. Total bison kill on outward and return trips (187). Each l represents two bison killed.

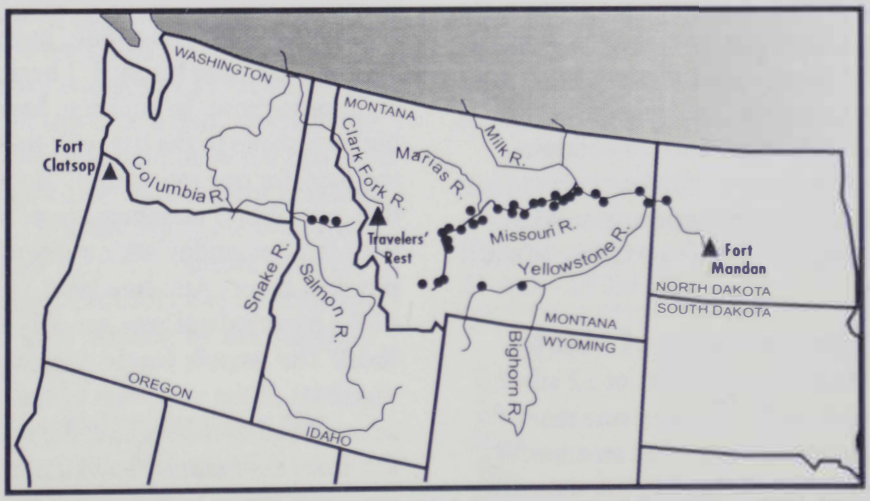
Fig. 1 (continued)



Corps of Discovery elk kill (1805-1806) between Ft. Mandan and Ft. Clatsop. Total elk kill on outward and return trips (280). Each l represents two elk killed.

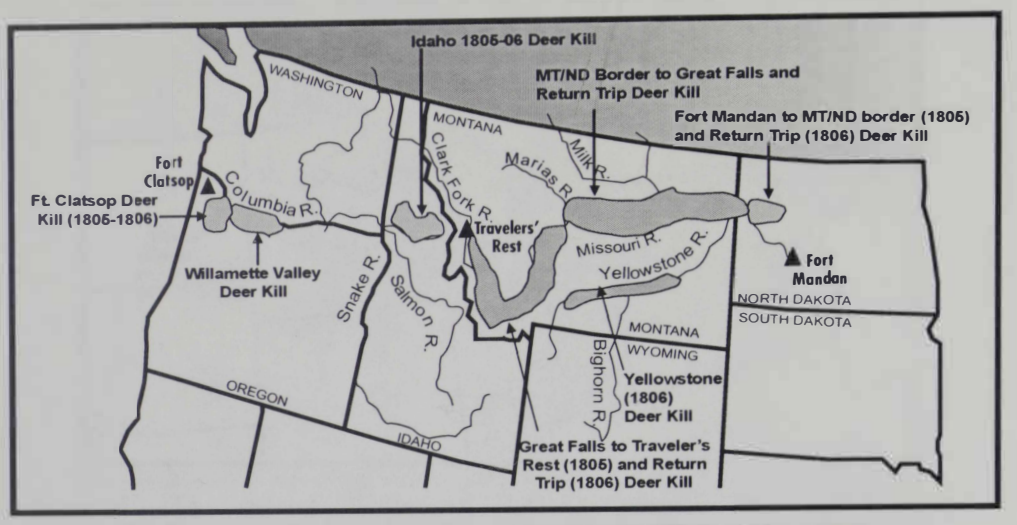


Corps of Discovery pronghorn kill (1805-1806) between Ft. Mandan and Ft. Clatsop. Total pronghorn kill on outward and return trips (69). Each l represents one pronghorn kill.



Corps of Discovery grizzly kill (1805-1806) between Ft. Mandan and Ft. Clatsop. Total grizzly kill on outward and return trips (32). Each l represents one grizzly kill.

Fig. 1 (continued)



LEWIS AND CLARK EXPEDITION DEER KILL (1805-1806).
Shaded areas show major deer kill areas.

- Fort Mandan to Traveler's Rest
  7 Apr. 1805 - 11 Sep. 1805 - 235
- Traveler's Rest to Ft. Clatsop
  12 Sep. 1805 - 8 Dec. 1805 - 45
- Winter at Ft. Clatsop
  8 Dec. 1805 - 23 Mar. 1806 - 11
- Ft. Clatsop to Traveler's Rest
  23 Mar. - 30 Jun. 1806 - 89
- Expedition's 3-day stay at Traveler's Rest
  30 Jun.-12 Jul. 1806- 21
- Lewis' exploration of the Marias - Traveler's Rest to Meeting with Clark contingency on the Missouri
  3 Jul. - 12 Aug. 1806 - 78
- Clark's exploration of the Yellowstone - Traveler's Rest to reuniting with Lewis and party on the Missouri
  3 Jul. - 12 Aug. 1806 - 71
- Ordway and Gass detachments
  13 Jul. - 28 Jul. 1806 - 17

Total Deer Kill Count –7 Apr. 1805 - 12 Aug. 1806 - 567

big game kills might sound impressive, it does not portray marked differences in the abundance/scarcity of game for the various physiographic regions that the Expedition passed through each with distinctive climatic, topographic, and vegetative differences. The importance of obtaining sufficient wild game for food and other basic necessities played an important role in determining the success or failure of the expedition.

"We Eat an Emensity of Meat"

To sustain the expedition of 32 adult members with sufficient big game meat, Lewis acknowledged, "we eat an emensity of meat; it requires 4 deer, an Elk an a deer, or one buffaloe to supply us plentifully 24 hours." Each category equates to a single 24-hour ration unit. Following Martin and Szuter's (1999) methodology, each of the following equals one ration unit required for the expedition on a daily basis: four deer; 1.3 elk; one bison; 1.3 bear; and eight pronghorn. In addition, I would add bighorn sheep to the list with four sheep required for one ration unit. Some purport that expedition members ate as much as 9-10 lb of meat/day after a day of excessive physical labor (Ambrose1996). How much of the meat/animal was actually utilized for food? The answer would depend on such variables as the condition of the animal, sex and age of the animal, distance of the kill from the main party of the expedition, spoilage due to warm temperatures, loss of meat to scavengers, killing of animals

primarily for hides to make clothing, tow ropes, and other factors. In some areas of game abundance, excess and a waste of meat certainly occurred as only choice cuts, bison tongues and marrowbones were taken. Despite the interpretive limitations, Lewis' 24-hr ration requirement for the expedition's personnel does provide for a fairly realistic picture of animal protein availability to meet that requirement along the expedition's route of travel through a variety of physiographic regions.

The journals also recorded other sources of animal protein provided by small game animals, as well as various other foods including dogs, roots, and fish purchased from Indians. Although this information is important and these foods were necessary for survival and success of the Expedition, I present here only the relative contribution of native game animals to meeting the daily ration requirement.

An examination of the expedition's daily kills of big game provides information on (1) big game species harvested and relative abundance by distinctive physiographic regions, and (2) how well the available wild game provided game ration units in specific localities. For example, as the expedition traveled through a blend of plains river bottom and prairie badlands after leaving Fort Mandan on 7 April 1805 and arrived at the mouth of the Yellowstone River on 26 April 1805, 22 deer (5.5 ration units), eight elk (6 ration units), 20 bison (20 ration units), and three pronghorns (0.38 ration units) were killed.

The above equates to 32 ration units for the 21 days of travel or a daily average of 1.5 ration units. It should be noted that some of the animals killed were in poor condition. The failure to kill any big game until five days after their 7 April departure from the Mandan villages probably can be attributed to excessive local hunting by the Mandan, Hidatsa, and Assiniboin.

Mouth of the Yellowstone to the Great Falls of the Missouri

The expedition's route of travel from the mouth of the Yellowstone to the Missouri's Great Falls consists of a complex and diverse landscape dominated by a plains riverbottom, prairie uplands, badlands and timbered breaks, each with distinct topographic, climatic, vegetative features, and microsites.

The Missouri plains country at this time was apparently an American Serengeti—a wildlife utopia of staggering proportions with bison dominating the landscape. When first visited by the Corps of Discovery, the area served as a living dynamic entity with a biological diversity nurtured and sustained by the main arterial stem of the Missouri and its interlacing network of perennial tributaries. On 6 May 1805 while traveling through what is now McCone County, Montana, Lewis wrote " It is now only amusement for Capt. C. and myself to kill as much meat as the party can consum; I hope it may continue thus through our whole rout, but this I do not much expect." Two days later he added another note in his journal on game abundance in the plains environment, "We can send out at any time and obtain whatever species of meat the country affords in as large quantity as we wish." During Clark's exploration of the Yellowstone on the return trip, he reported on 27 July 1806 while traveling through present day Treasure County, Montana that " The Buffalow and Elk is estonishingly noumerous on the banks of the river... particularly the Elk...so jintle that we frequently pass within 20 or 30 paces of them without their being the least alarmd." Harvest data obtained from the journals (Table1) verifies that the productive river plains corridors in the plains were a hunters utopia.

Table 1. Harvest data recorded for 78 days travel from the mouth of the Yellowstone River to the Great Falls of the Missouri – 27 Apr - 13 Jul 1805

Species	Recorded kills	Ration units
Deer	11	28.75
Elk	63	48.46
Bison	87	87.00
Bear	14	10.70
Pronghorn	27	3.40
Bighorn sheep	9	2.25
Total ration units		**180.6(2.3/day)**

Because one daily ration unit was sufficient to feed the 32 adult members of the expedition for a 24-hr period, a daily average of 2.3 units (Table 1) assured that the prospects for starving, as Lewis put it, would be " consequently small." However, in retrospect, as Allen (1975) indicated, "...the game-rich abundance of the Plains environment would become greater when, during the next year, the members of the Corps of Discovery with persistent hunger pangs would look back upon the rich buffalo plains from the gameless heights of the Rockies and the sterile plains of the Columbia basin."

Great Falls of the Missouri to Traveler's Rest

Game became scarcer, and leaner times began in the mountain foothill country after the expedition's departure from the Great Falls. Lewis and Clark had been forewarned by the Mandans that the buffalo country would end at the Great Falls. Lewis acknowledged this in his journal on 3 July 1805, " the Indians have informed us that we should shortly leave the buffaloe that we shal sometimes be under the necessity of fasting occasionally." This proved to be correct as the last buffalo on the outward journey was killed on 16 July 1805, two days after leaving the Falls. The meat yielded by Drouillard's kill was the last fresh bison meat they would taste for 12 months, until their return to the high plains in July 1806 (Walcheck 2005). Although deer were fairly consistently harvested during the 62-day passage to Traveler's Rest, located just south of what is now Lolo, Montana, about 2 mi upstream from the Bitterroot River on the south side of Lolo Creek, kills of elk dropped off noticeably (Table 2).

Once the expedition entered the Shoshone country, game became exceedingly difficult to find in the Lemhi valley. "... my party," Clark wrote, " hourly Complaining of their retched Situation and [contemplating ?] doubts of Starving in a Countrey where no game of any kind except a few fish can be found ..." This statement was a prelude of deeper and more agonizing pangs of hunger that would soon stare them in the face.

Table 2. Harvest data recorded for 59 days of travel from the Great Falls of the Missouri to Traveler's Rest – 13 Jul - 11 Sep 1805

Species	Recorded kills	Ration units
Deer	98	24.5
Elk	23	17.7
Bison	1	1.0
Bear	6	4.6
Pronghorn	17	2.0
Bighorn sheep	1	0.25
Total ration units		**50.05 (0.84/day)**

During their 10-day stay with the Shoshone, 17 deer were killed allowing for a meager daily average of 0.43 ration units, less than one-half of the required amount.

On 30 August 1805 the expedition departed from the Shoshone village and headed northward following the Lemhi River and the Salmon up to its North Fork along the rugged and heavily timbered slopes of the Bitterroot mountains. They moved over a pass and descended following Camp Creek to its junction with the Bitterroot River and to Ross's Hole in the upper Bitterroot Valley meeting the Flathead, or Salish Indians. After trading for more horses, the party moved down to Lolo Creek and regrouped at Traveler's Rest before going over the Bitterroot Mountains. During the 10-day passage over some difficult mountainous terrain, 12 deer and two elk were killed providing for a daily average of 0.45 ration units.

Lolo Trail to Weippe Prairie—First Encounter with Nez Perce Indians

The harrowing mountain journey over the Lolo Trail, which began on 12 September and ended on 20-22 September 1805 (Clark and Lewis' separate contacts with the Nez Perce) would involve some of the most tortuous terrain in the Rockies and proved to be the most agonizing part of their entire journey. Pushing up steep mountain slopes, winding their way through thickly timbered country choked with underbrush and downed conifers, encountering blinding

snowstorms, losing the trail, and killing but one deer during the entire trek, totally erased any lingering thoughts that the land could continuously furnish a sustaining supply of red meat.

Adding to the nightmarish difficulties were a combination of sagging morale, fatigue, and unrelenting pangs of hunger. Total rations provided by wild ungulates for this 10-day travel period was a mere 0.25 ration unit (0.025/day). Servings of unappetizing portable soup supplemented with horseflesh and a few grouse barely kept the metabolic fires burning. Lewis wrote on 21 September, "I find myself growing weak for the want of food and most of the men complain of a similar deficiency and have fallen off very much."

Weippe Prairie to Canoe Camp on the Clearwater – 22 Sept - 6 Oct 1805

After contacting the openhanded Nez Perce, the party voraciously consumed dried salmon, berries, and dried cakes of camas roots, but many of the men became violently sick with active diarrhea and vomiting. Despite concerted efforts of the expedition's hunting parties, only 14 deer were killed between 22 September and 6 October. Three deer killed on 29 September would be the last taken until 25 October. The total ration count for the 15-day trip was 3.5 ration units or an average 0.23 daily ration unit, a daily deficiency level of 0.77 ration units. Clark's journal entry on 28 September 1805 "Nothing killed today" summed up hunting efforts for this part of their travels.

Canoe Camp to Columbia River – 7 - 16 Oct 1805

After departing from their 26 September–6 October stay at Canoe Camp, the expedition entered the Columbia Plateau country, a striking physiographic transition that differed from other regions. Also clearly apparent to the Corps was a noticeable lack of big game, unlike the Missouri River plains country that teemed with a wide variety and plentiful numbers of easily obtained game.

The Corps passage down the swift-flowing Clearwater and Snake Rivers to the Columbia, a distance of 250 mi, consumed 10 days with no game killed during their passage down the Snake. Hunters, when they could be spared from negotiating the rapids, were sent out to hunt only to return and report that, "they could not See any Signs of game of any kind." On the Snake River alone the canoes had to navigate 39 rapids and near-accidents were too numerous to record. Dogs, purchased from Indians on 10,11, and 16 October supplemented their diet of salmon and roots.

Meriwether Lewis and William Clark may have entertained thoughts that when they entered the Columbia Basin they would enter a pristine aboriginal setting. Such was not the case as pointed out by (Cebula 1999), "...the Indians of the Columbia Plateau whose economy was based on salmon had already experienced the profoundly disruptive effects of indirect white contact. Horses, epidemic disease, Euro-American trade goods, political realignment, and a steady flow of information had entered the region for nearly a century." With the arrival of the horse, the impact on wildlife increased significantly as native hunters traveled longer distances and transported more game.

The Columbia corridor—a game sink—offered a striking contrast to the Missouri plains country; Lewis estimated a permanent population of 80,000 Indians from which hunting pressure significantly depressed megafauna numbers. In addition, expanding trade networks due to the influx of trade goods from European and American ships added more travelers from neighboring tribes placing additional pressures on the wildlife landscape.

Mouth of the Snake River to Columbia River Cascades – 18 Oct - 1 Nov 1805

Hunting continued to be poor, and 40 dogs were purchased on 18 October. After spending two days at the mouth of the Snake during which the expedition investigated the Columbia River for about 10 miles

upstream, the explorer's canoes swept downstream on 18 October.

During the 17-day passage to the Cascades, 12 deer were killed during 25-30 October providing 0.18 of the average daily ration, a deficiency level that prompted trading for pounded salmon, roots, and 22 additional dogs.

Cascades to Gray's Bay– 2-7 Nov 1805

After leaving the Cascades rapids, the explorers once again penetrated into an abrupt environmental transition consisting of a marine climate and a true rain-forest vegetative association of fir, spruce, cedar, hemlock, ash and alder, which contrasted sharply with the treeless, semi-desert shrub-steppe country of the eastern Columbia Plateau. During the six-day passage poor hunting continued and only one deer was killed on 4 November (0.04 of the daily ration).

Gray's Bay to Fort Clatsop– 8 Nov - 7 Dec 1805

In 8 November, the explorers arrived at Gray's Bay, a conspicuous indentation on the north side of the Columbia estuary (Lewis and Clark's " Nitch Bay "). The next seven days brought incessant rain and high winds allowing no opportunities for hunting.

Numerous problems were associated with hunting in the coastal region. These included mist and fog, persistent rain, wind, and dense timber choked with tangled, jungle-like shrubbery that was difficult to penetrate. Transporting meat back to the fort, especially when carcasses were located several miles from the nearest water transportation offered further difficulty.

No elk had been killed since leaving Montana, however on 2 December, one elk was killed, and the following day six more were taken. No more elk would be bagged until 3 January 1806.

A total of 17 deer was killed between 16 November and 5 December. "The deer of the Coast," wrote Clark, "differ materially from our Common deer in as much as they are darker, deeper bodied, Shoerter ledged [legged] horns equally branched from the beem the top of the tail black from the rute [root] to the end. Eyes larger and do not lope but jump." With this basic description, Clark gave to the scientific community the first description of the Columbian black-tailed deer subspecies (*Odocoileus hemionus columbianus*)—a most significant discovery and documentation.

Harvested deer (17) and elk (7) furnished 9.6 rations for the 30-day period and a daily average of 0.32 ration units. Supplementary foods purchased included fish and roots.

Winter at Fort Clatsop – 8 Dec 1805 - 23 Mar 1806

Construction of Fort Clatsop commenced on 8 December and was not completed until 30 December. Persistent daily rains, accompanied by chilly, fog-shrouded weather and gunpowder damaged by dampness, made hunting difficult. Over a 106-day period from 7 December to 23 March, it rained every day but twelve, and only six days proved to be fair. Local Indians had assured Lewis that elk were plentiful on the Columbia's southern shore, and that elk being larger than deer provided better meat and better hides for making clothing.

During their cold, wet, and thoroughly miserable winter at Fort Clatsop, elk, even though many were lean and in "pore" shape, probably made the difference in survival. Between 2 December 1805 and 20 March 1806, 113 elk and 11 deer were killed. George Drouillard was the most productive hunter during the expedition's stay at Ft. Clatsop. On 26 January 1806, Lewis mentioned in his journal that Drouillard had killed seven elk. "I scarcely know how we should subsist were it not for the exertions of this excellent hunter." Despite his exemplary success at hunting, not enough game was harvested to adequately feed the party. The 108 elk and 11 deer furnished 86 ration units for the106-day period for an average of 0.81 of the daily ration, a little better than 80 percent of the total ration required. Berries, roots, dried fish and dogs

purchased from the Indians continued to supplement their diet.

Homeward Bound– 23 Mar 1806

Even though a tentative departure date from Fort Clatsop of 1 April was established, difficulty in finding elk called for a re-evaluation of the selected departure date. On 5 March 1806 Lewis wrote, "if we find the Elk have left us, we have determined to ascend the river slowly and indeavour to procure subsistence on the way..." At 1300 hrs on 23 March1806, the expedition, accompanied by windy, rainy, and disagreeable weather, paddled a few miles down the river they knew as the Netul and turned up the Columbia heading home. Later that day two elk were killed.

Hunting continued daily and required the full-time services of the expedition's hunters. After leaving Fort Clatsop, no deer were killed until 28 March 1806 when seven white-tailed deer (*O. virginianus*) were bagged on Deer Island in present Columbia County, Oregon. Of these, only three were salvageable as reported by Clark due to probable scavenging by California Condor (*Gymnogyps californianus*). Later that evening, three additional deer were killed.

On 1 April 1806, the expedition received disturbing news from Indians floating down the Columbia from fishing camps on the Cascades and Dalles concerning an upstream food scarcity; the salmon run was not expected to reach the fishing camps until 2 May. "This information," wrote Lewis, who expected to purchase pounded salmon at the falls, "gave us much uneasiness with rispect to our future means of subsistence. Above falls or through the plains (Columbia) from thence to the Chopunnish there are no deer Antelope nor elk on which we can depend for subsistence ...under these circumstances there seems to be but a gloomy prospect for subsistence on any terms." The captains decided to change travel plans and to remain in the Willamette Valley until enough game could be obtained until reaching the Clearwater and the Nez Perce. Lewis was right in his prognosis as no elk or deer would be killed during the passage of the Columbia plains. During their 1 April–6 April 1806 stay before proceeding upriver, hunters killed 16 elk, 10 deer and one black bear with most of the meat being jerked. The 6 April elk kill would be the last elk taken until 10 July. Resuming their journey, Lewis and Clark were optimistic that the jerked meat and purchases of dogs, berries, roots, as well as additional game kills would tide them over until they reached the Clearwater. And, if this was not sufficient, there was also the "fallback" reservoir of horsemeat. Between 10–17 April, 13 deer were killed. No additional deer would be taken until 1 May when the expedition camped in the vicinity of Waitsburg in eastern Walla Walla County, Washington. On 1 May 1806, one deer was killed.

During the passage of the Dalles on 15-18 April and Celilo Falls on the 21st, 10 horses were purchased to serve as pack animals to transport baggage not carried by canoes. Six additional days of travel would place them in contact with a party of Walla Wallas, including Chief Yellert, who graciously supplied the men with firewood and food, and sold them numerous dogs during their three-day visit. Yellert also supplied valuable information on a shortcut route to the Clearwater. As reported by Lewis on 26 April, "there was a good road which passed from the Columbia opposite to this village to the Kooskooske [Clearwater] ... they also informed us, that there a plenty of deer and Antelopes on the road ...a road in that direction...would shorten our rout at least 80 miles." As a precautionary measure, 10 additional dogs were purchased – a precaution well taken as the six-day trek from the Columbia to the Clearwater would take six days and net only one deer to supplement a continuous menu of skimpy meals.

Lewis' 1 May comment on the lack of game in the plains region is of interest, "I see very little difference between the apparent face of the country here and that of the plains of the Missouri only that these are not enlivened by the vast herds of buffaloe Elk..." On 7 May, he further mentions the landscape's pasture of thick

grasses, herbaceous plants, and a dark rich soil "which afford a delightfull pasture for horses." Total recorded kills and ration units for this trip segment are shown in Table 3.

Table 3. Harvest data recorded for 39 days travel from Fort Clatsop to the Touchet River camp (Vicinity of Waitsburg, WA) – 23 Mar – 1 May 1806.

Species	Recorded kills	Ration units
Deer	31	7.75
Elk	18	13.46
Bear	1	0.77
Total ration units		**21.98 (0.56/day)**

Touchet Camp–Camp Chopunnish–Weippe Prairie–Traveler's Rest – May - 30 Jun 1806

During the Corps' 14-day transit from their 1 May campsite on the Touchet to Camp Chopunnish on the Clearwater, only six deer were killed. The expedition selected the Chopunnish site on the recommendation of the Nez Perce because it offered the best hunting in the region. Also, the salmon run was expected in a few days. From their 14 May to 10 June1806 stay at Chopunnish, daily efforts to harvest game became a primary objective not only for their daily requirement but also to stock up on their supply of jerked meat for the trek over the Lolo Trail where little or no game would be available. Despite concerted hunting efforts, they killed only 20 deer, i.e., < 1 deer/day or a meager average of 0.18 daily ration units, < 80 percent of the required amount.

Due to the acute shortage of game and a failure of the salmon to arrive as anticipated, a decision was made to move their camp to the Weippe Prairie, which would afford better hunting. On 10 June1806, the Corps abandoned Camp Chopunnish and ascended the north side of the Clearwater canyon and traveled northeastward about 8 mi to the Weippe Prairie. Here, they stocked up on game meat until the morning of the 24 June 1806 when they embarked on their passage over the Bitterroots. The seven-day passage over Lolo Pass would provide only one deer killed on 29 June.

During their stay at the Weippe Prairie site, 29 deer were harvested in addition to eight bears (of which two were grizzlies) furnishing 13.5 ration units for the 20 day period between 10 June and 30 June and an average daily ration unit of 0.68. During the trip from Fort Clatsop to Traveler's Rest, large wild game supplied only 0.42 of the average daily ration unit requirement (Table 4).

Table 4. Ration unit summary for the departure from Fort Clatsop – 23 Mar to Traveler's Rest 30 Jun 1806

Species	Recorded kills	Ration units
Deer	86	21.5
Elk	18	14
Bear	9	7
Total ration units		**42.5 (0.42/day)**

Traveler's Rest to the Reuniting of the Two Separated Lewis and Clark Contingents – 3 Jul - 12 Aug 1806

The two-day stay at Travelers' Rest allowed Lewis and Clark to further firm-up travel details previously formulated at Fort Clatsop for the forthcoming exploration of present-day Montana, which would differ considerably from the 1805 westbound route. Lewis and a party of nine would take an 8-day shortcut route following the Blackfoot River, cross the Continental Divide over Lewis and Clark Pass, and then down the Sun River to Great Falls. Lewis and a party of three would then explore the Upper Marias, leaving behind six men who would be joined by Sergeant Ordway and party of nine. After exploring the Marias country, Lewis would then rendezvous with the Gass – Ordway detachments and descend the Missouri to reunite with Clark on the Missouri 12 August 1806.

Clark and the remainder of the detachment left Travelers' Rest and headed south up the Bitterroot Valley, crossed the Continental Divide at Gibbon's Pass, then into the Big Hole country, reaching Camp Fortunate, at the forks of the Beaverhead (Horse Prairie Creek and Red Rock River) on 8 July. From here the party set out for Three Forks where Sergeant Ordway took

nine men and joined Sergeant Gass at Great Falls. Clark and the remainder of the party and crossed over Bozeman Pass to the Yellowstone and followed the river down to the Missouri, eventually rejoining Lewis on 12 August 1806 in present Mountrail County, North Dakota, some 30 mi upstream from the mouth of the Little Missouri River. The following is a listing of the expedition's big game kills:

a) Expedition's 3-day stay at Traveler's Rest (30 June-2 July 1806). Deer harvested (21); total ration units (5.3) with an average of 1.8 the daily ration,

b) The 8-day trip (Lewis unit) from Traveler's Rest to the Great Falls of the Missouri (3-10 July 1806): Deer kill (18); bison (1); elk (3); grizzly (1). Total ration units (8.6) for an average of 3.44 times the daily ration for ten men. The bison killed on 9 July was the first killed since July 16 of the previous year.

c) Lewis' 7-day stay at the Great Falls area (11-17 July 1806). Bison kill (13); total ration units (13) for an average of 5.44 times the ration for ten men. Bison hides were utilized for canoe and "bullboat" coverings and for shelter and gear coverings.

d) Lewis' exploration of the Marias (18-28 July 1806). Deer kill (2); bison (2); elk (2); pronghorn (2). Total ration units of 4.3 for an average of 3.13 times the daily ration for four men. Lewis' 22 July comment, "We have seen but few buffaloe today no deer and very few Antelopes; gam(e) of every discription is extremely wild which induces me to believe that the indians are now, or have been lately in this neighbourhood" suggested that hunting pressure may have been a factor for the lack of game.

e) Lewis moves down the Missouri (29 July) with the Gass and Ordway detachments to meet with the Clark contingent on 12 August 1806). Total harvest for this trip segment: Deer kill (58); elk (23); grizzlies (6); bison (10); bighorn sheep (20); total ration units (51.8) for an average of 5.53 times the ration for 20 men.

Clarks's Exploration of the Yellowstone

a) Traveler's Rest to Camp Fortunate (3-10 July 1806). Deer kill (9); bighorn sheep (1); pronghorn (2); total ration units (2.75) for an average of 0.50 of the daily ration for 22 men.

b) Camp Fortunate to Three Forks (11-13 July 1806). Deer kill (13); grizzly (1); pronghorn (1); total ration units (4.3) with an average of 2.08 times the daily ration for 22 men.

c) Three Forks to Pompey's Pillar (14-25 July 1806); deer kill (17); elk (10); bison (8); bighorn sheep (2); pronghorn (2); total ration units (20.7) with an average of 4.60 times the daily ration for 22 men.

d) Pompeys Pillar to reuniting with Lewis and party on the Missouri (26 July–12 August 1806); deer kill (32); elk (11); bison (12); grizzlies (2); bighorn sheep (2); pronghorn (13); total ration units (32.1) with an average of 4.76 times the ration for 22 men.

Ordway and Gass Detachments Three Forks to Great Falls of the Missouri – 13-28 Jul 1806

On 13 July 1806 Sergeant Ordway and nine men separated from the Clark party and pushed down the Missouri from the Three Forks to rendezvous with the Gass detachment of the Lewis party at the Great Falls on July 20. During the eight-day trip 13 deer, five elk, four bison, four sheep, and one pronghorn were killed for a total ration unit count of (12.2) and an average of 4.88 times the ration for ten men.

The united Ordway-Gass units (20-28 July) killed four deer, 14 bison, and one pronghorn for a total ration unit count of 15.1 and an average of 3.36 times the ration for 10 men. Needless to mention, both groups feasted "high on the hog" while making up for lost calories. Both groups reunited with Lewis and his three-member party on 28 July.

Discussion

The journals provide a wealth of information about the game-rich upper

Missouri plains with its numerous feasts of buffalo hump, elk steaks, and Charbonneau's white puddings contrasted with that of a semi-desert Columbia Plateau region of game scarcity, malnutrition, adjusting metabolisms, and a shared, dedicated personnel effort in coping with the needs of subsistence and of survival. It was a determined band of men who endured hardships, uncertainties, hunger pangs, dwindling supplies, and constant dangers; a Corps of Discovery who through cooperation, teamwork, and a dogged, unrelenting determination made the most of every day. A frequent, three-worded journal entry that a reader frequently encounters, "We proceeded on" adequately summed up their efforts to courageously reach out each day for that distant horizon.

A comparison of the total game kills and average daily ration units accumulated on the east-west sides of the Continental Divide show a marked difference between the Columbia River Corridor and the Upper Missouri region (Fig. 2). The 1805 westward trek west of Travelers' Rest to the Pacific and winter stay at Fort Clatsop provided an average 0.5 of a daily ration unit, one-half the needed requirement. Foods such as salmon, berries, roots, and dogs purchased from the Indians were necessary for survival. If it were not for the 108 elk harvested at Fort Clatsop, the average daily ration unit would have dropped to starvation levels. The 1806 return trip from Fort Clatsop to Travelers' Rest provided a meager average 0.42 of a daily ration unit.

East of Travelers Rest, we have a completely different picture, with an abundance of wild game including bison, pronghorn, and bighorn sheep which were not harvested west of Travelers' Rest. The accumulation of surplus ration units averaged well above the Expedition's daily needed requirement. Although the role of Indian hunting and game differences between the regions might be speculative (Martin and Szuter 1999, Cebula 1999, Kay1994, Schneiders 2003), little or no attention has been directed toward

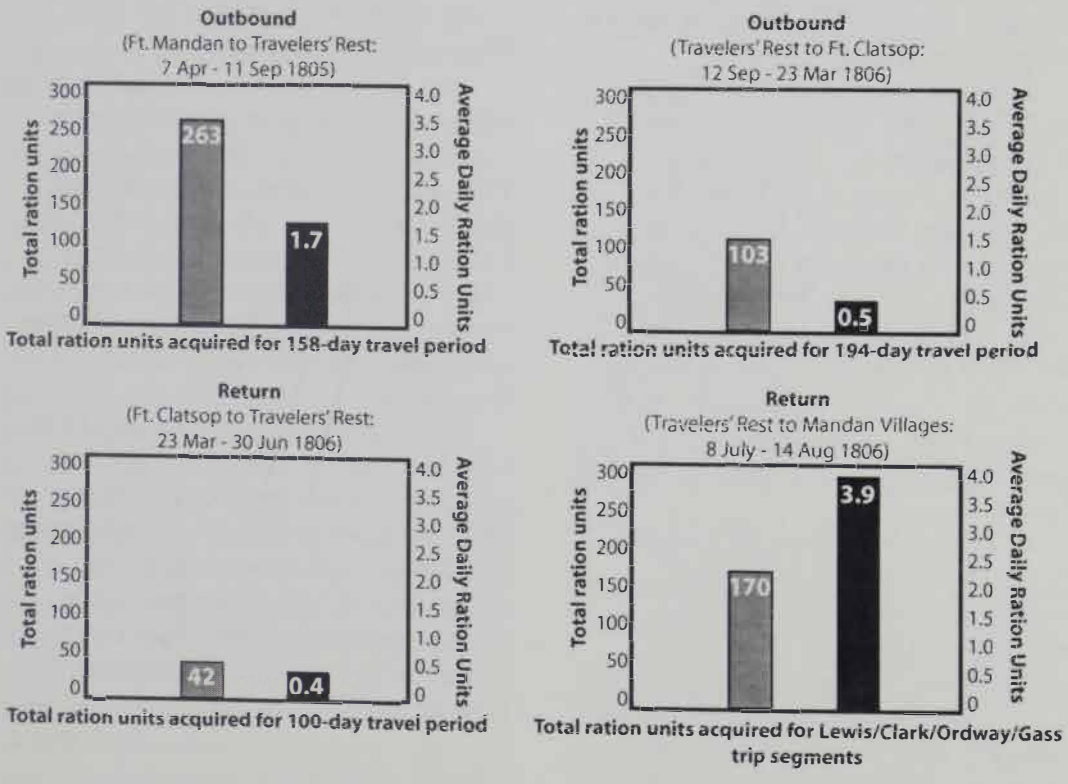


Figure 2. Comparison of total and average daily ration units accumulated for the Expedition's travel segments east and west of Traveler's Rest (1805-1806)

a comparative analysis of physical and biotic habitat and productivity differences between the two regions. An important question, then, remains as to how much of the difference in game abundance can one attribute to human intervention, regional habitat productivity and carrying capacities, or other factors. Even though a study of historic habitats for the Missouri plains region and the Columbia River Basin east of the Cascades poses its share of problems due to a complexity of variables involving climatic shifts, land fertility differences, geological changes, and other environmental influences, we should not rule out the importance of doing so. No realistic assessment of wildlife can be made without first assessing the habitat.

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