Cattle and Fish on the Henry's Fork

William S. Platts, Fred J. Wagstaff, and Ed Chaney

The history of the Henry's Fork of the Snake River recalls the cultures of the Shoshone and Nez Perce Indian Tribes, the exploits of trapper/explorers Henry, Russell, Colter, Syeth, and DeSmet, and during the past century, the intensive use of the area by domestic livestock. The Indians were attracted to the river because of the area's abundant terrestrial wildlife, including a variety of large ungulates. The non-Indian explorers were drawn to the Henry's Fork by beaver; the livestock operators by abundant, highly nutritious forage. These early resource users could not have envisioned that one day people from all over the world would seasonally migrate to the area in pursuit of yet another resource, the large rainbow trout that have made the Henry's Fork world famous.

The 4,000-square mile Henry's Fork watershed in eastern Idaho borders the west side of Yellowstone National Park (Fig. 1). The river drains one of the world's largest volcanic calderas (what's left of a volcano after it ceases to explode and drain), which is over 25 miles in diameter. Mountains formed by the caldera walls surround the Henry's Fork. The geomorphic form of the caldera, high precipitation—45 inches per year—mainly as snow, and porous volcanic geology create countless springs that constantly feed the Henry's Fork River. Big Springs alone delivers about a half million gallons a day to the river. These springs keep much of the river from freezing, thus providing good winter conditions for fish and wildlife, including the threatened trumpeter swan.

Bison, antelope, moose, elk, and deer grazed the Henry's Fork watershed for thousands of years. Bison were present in much smaller numbers than on the short grass prairies to the east and disappeared from the area soon after the advent of the horse; the last free-roaming bison in the area reportedly was killed about 1835.

Cattle and sheep have grazed the Henry's Fork watershed for the past century. As was typical of livestock grazing practices over other areas of the West, the Henry's Fork watershed was overgrazed from the turn of the century to the 1960's. During the grazing heyday more than 3 million sheep and cattle grazed the watershed (Brooks 1986). Federal agencies were planning to increase to 4 million grazing animals when information showed that a reduction was in order instead. Today, livestock numbers have been drastically reduced, but some grazing problems still remain.

In the 1890's, the Island Park Land and Cattle Company blocked out an area on both sides of a 6-mile reach of the Henry's Fork. This was the choicest area for production of both cattle and fish. This pastoral scene, filled with cattle against the backdrop of the volcanic caldera, formed breathtakingly beautiful vistas.

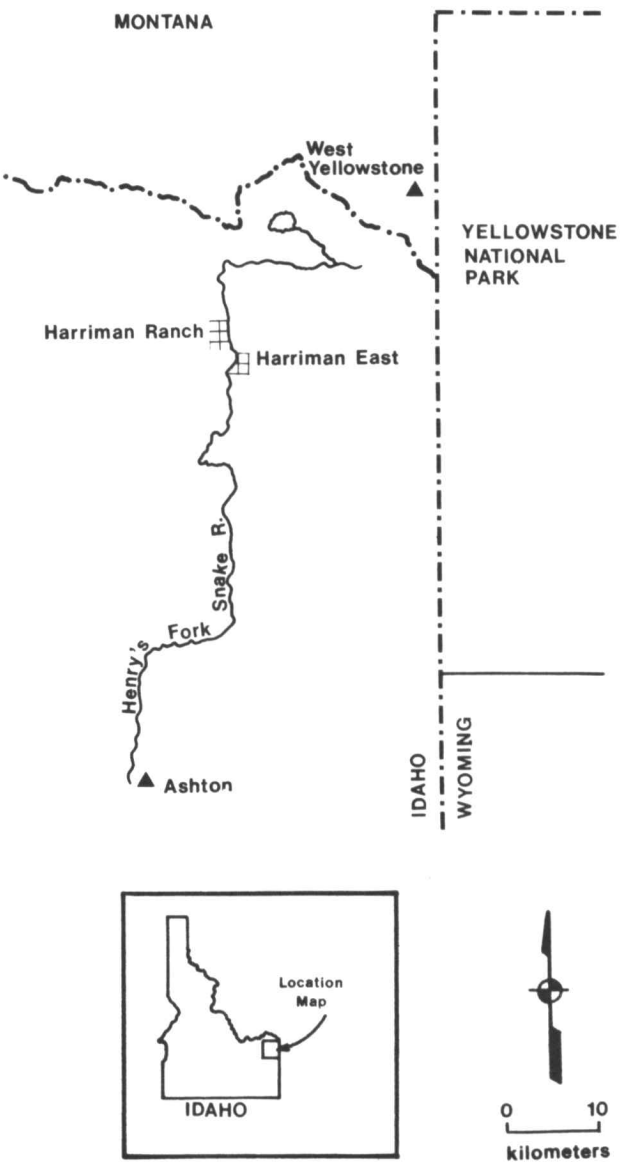

Fig. 1. *Location of the Henry's Fork, Harriman State Park, and Harriman East.*

This land was eventually purchased by the Harrimans, owners of the Union Pacific Railroad, and came to be known in international trout fishing circles as the Railroad Ranch. In the 1960's, the Harrimans began transferring this land to the state of Idaho for public use in perpetuity. The deeds had strong, permanent covenants to protect the environment and its wildlife. The Railroad Ranch is

Authors are, respectively, fisheries biologist and economist, Intermountain Research Station, USDA Forest Service, Ogden, Utah 84401; and consultant, Chinook Northwest, Inc., Eagle, Idaho 83616.

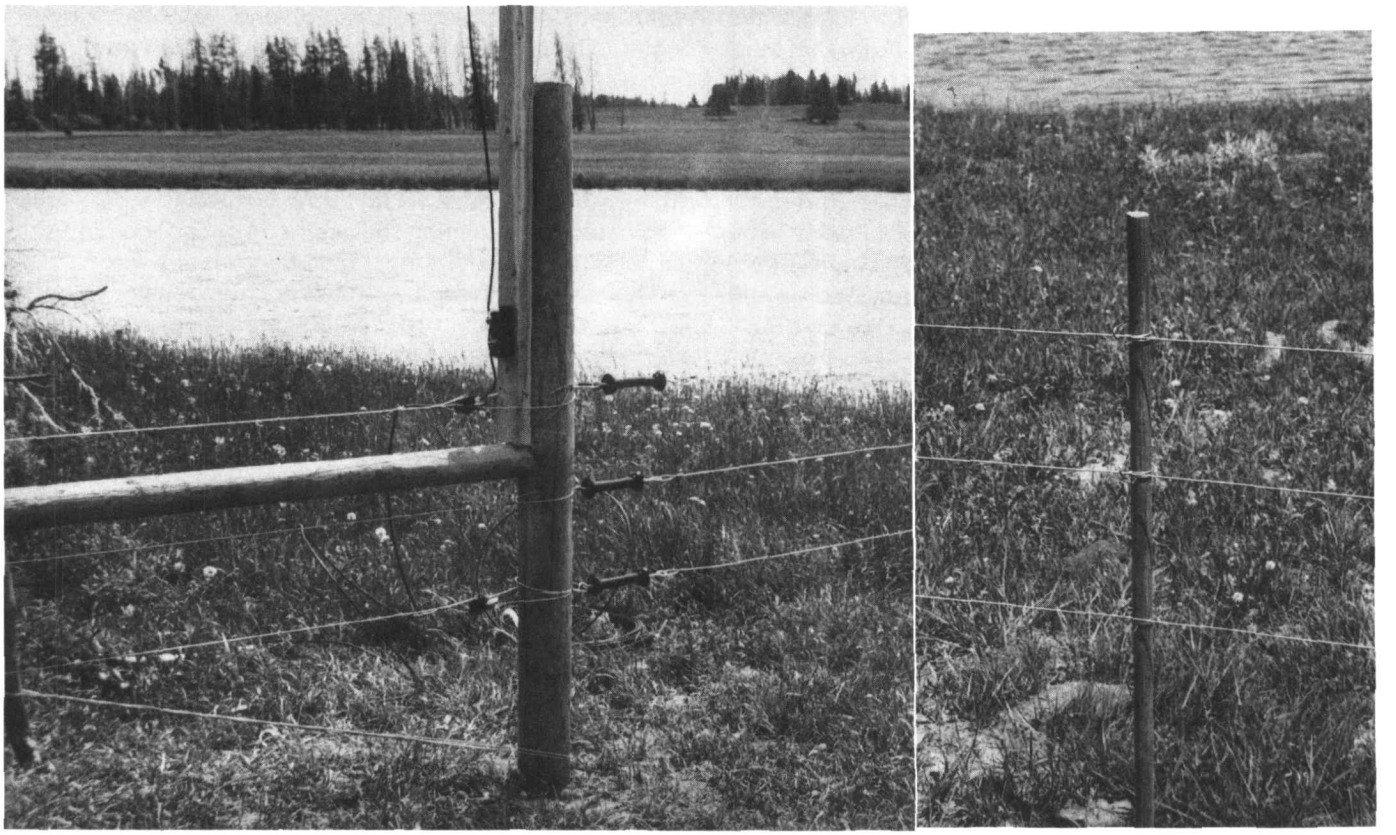

Fig. 2.*(left) A gate alongside the Henry's Fork for cattle access.*
Fig. 3.*(right) Fiberglass pole with spring clips for easy lay down and put up.*

now split into the 11,700-acre Harriman State Park under control of the State of Idaho, and the adjacent 1,000-acre Harriman East property managed by the Idaho Foundation for Parks and Lands. Together the properties continue to support a productive cattle operation. This requires domestic livestock management strategies responsive to the needs of large wild ungulates and a diverse mix of small mammals, birds, trout, and humans.

The 6 miles of the Henry's Fork River flowing through Harriman State Park and Harriman East support one of the most productive wild trout populations found anywhere in the Nation. June stonefly hatches and July mayfly hatches trigger fishing frenzies. An international coterie of anglers converge to ply the river with meticulously tied artificial flies, including favorites such as the Red Quill, Green Drake, and Pale Morning Dunn. According to a recent University of Idaho study (Sorg et al. 1985) the river generates an estimated 76,000 fishing trips yearly and contributes about $3 million annually to the local economy. On a typical trip an angler catches 6 trout with a large proportion over 16 inches long. Fish of 2 to 8 pounds are not uncommon.

Other fishers also depend on the productivity of the river and associated habitats. These include the bald eagle, osprey, kingfisher, blue heron, mink, and otter. The area provides summer habitat for sandhill cranes and year-round habitat for trumpeter swans. Covenants set by the Harrimans prohibit fishing until the waterfowl nesting season has run most of its course, coinciding with critical periods of the trumpeter swans' life cycle.

Because of Henry's Fork's outstanding recreation values, it has been considered for classification as a National Wild and Scenic River. A group of anglers and other conservation-minded citizens formed the Henry's Fork Foundation in 1984 to protect the river and associated resources. The foundation became quite concerned about the effects of cattle grazing on the 1,000-acre Harriman East property. In response, the Idaho Foundation for Parks and Lands brought in experts to identify problems to evaluate grazing practices and to recommend solutions. The two foundations then became the catalyst for bringing together the Idaho Fish and Game Department, Idaho Parks and Recreation Department, USDA Forest Service, recreationists, and Idaho State University in a coordinated approach to problem solving.

Livestock use was drastically reduced when the Idaho Foundation for Parks and Lands took over ownership and management of the Harriman East property in 1977. Nonetheless, the season-long (June 15 to October 15) continuous grazing strategy still resulted in poor animal distribution, uneven forage use, and improper timing of forage use. This combination of factors was also causing damage to the Henry's Fork riparian zone. To address this problem, in 1986 the grazing strategy was changed to a stuttered deferred rotation with selected rest (Kothmann 1974). In this strategy the deferred pasture is entered late

2 years in a row and selected rest is gained by the addition of another pasture. The original single pasture that made up the allotment was divided by fences into four pastures. Two pastures were for deferred rotation grazing to support the main herd, a third pasture to carry the nonbreeding heifers. A fourth pasture—a narrow set-back pasture[1] that included the river—allows a prescription of rest and grazing to protect and rehabilitate Henry's Fork streambanks. This set-back pasture is being rested until stream-riparian improvement objectives are met (probably a minimum of 3 to 5 years). This pasture will then be grazed under specialized prescriptions.

A combination of environmental, social, and economic criteria determined the type, design, and application of fencing employed to control livestock within the stream corridor. One of the principal criteria, of course, was cost, both in terms of the actual cost of fencing materials and the perceived cost of the forage forgone within the exclosure. Environmental constraints included long reaches of saturated streambanks (swamp) and patches of open water to be crossed, which virtually precluded traditional fence construction (Fig. 2). Other considerations included the presence of elk and moose—a potential source of maintenance problems—the need to lay the fence down in winter to avoid conflict with snowmobilers, and finally, the need to minimize visual obtrusiveness in a park area dedicated to protecting the aesthetic experience of fishing one of the world's most famous trout streams.

The so-called New Zealand-type, high tensile smooth wire electric fencing technology was employed in the Henry's Fork riparian management project (Fig. 3). It employs smooth, high tensile wire, typically 12.5 gauge, and electrical "barbs." Because it relies on pain avoidance, rather than structural strength, to repel animals, and because it is a suspension fence, the wire is tied off only at ends and plays freely past line posts, the amount and size of line posts are minimized. The fence tends to be far more resilient than barbed and net wire to impact by livestock, wind-fallen trees, snow loads, etc., thereby reducing maintenance.

[1]A pasture that is larger than a corridor but does not meet the requirements for a riparian pasture; an area set back on both sides of the stream to form a separate pasture.

Fig. 4. *Henry's Fork streambank in 1985 under season-long continuous grazing.*

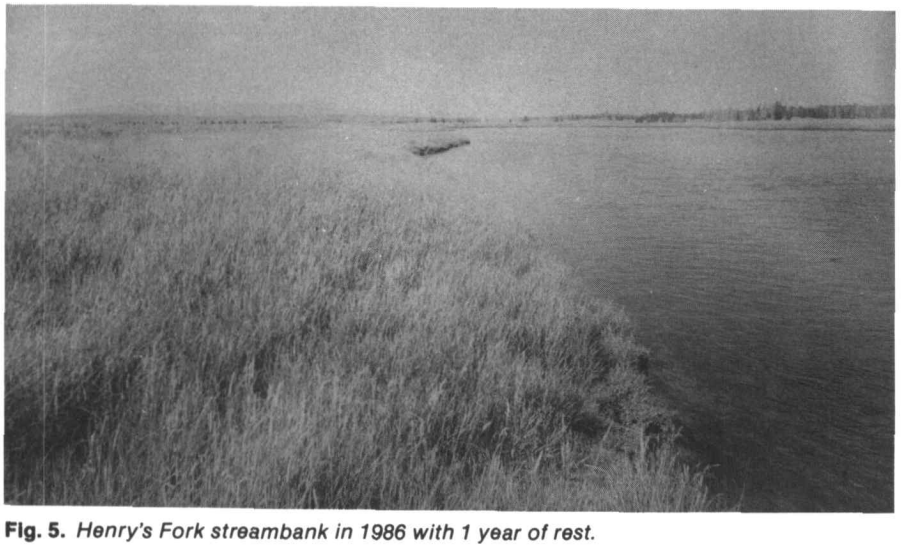

Fig. 5. *Henry's Fork streambank in 1986 with 1 year of rest.*

High tensile smooth wire electric fences typically cost less than half as much installed as comparable traditional barbed wire fences. In addition, once perimeter fences are in and electrified, inexpensive cross fences—typically 1 to 2 wires with steel or fiberglass line posts on 60- to 80-foot centers—can be added to dramatically improve livestock distribution and forage use.

The heart of high tensile smooth wire electric fencing systems is the high-energy output fence energizer. The technology is produced worldwide and ranges from microchargers that produce 6,000 volts for 5 weeks from 2 D cell flashlight batteries, to large, suitcase-sized plug-in models that will energize more than 100 miles of 12.5 gauge wire.

The Henry's Fork stream-riparian project fence line was established in a spirit of compromise with traditional livestock use of the area and the cooperative livestock permittee who has understandable concerns about loss of forage. The result was a narrow set-back pasture, much of which traverses swampland unsuitable for any kind of fence.

Approximately 6 miles of fence was built with unskilled volunteer labor under skilled supervision. Maximum participation, not efficiency was the goal. The cost of the materials and supervision was subsidized by the sup-

plier (Chinook Northwest, Inc. of Eagle, Idaho[2]) as part of the company's nonprofit program to promote improved riparian management.

For perspective, it would have cost an estimated $2,700 per mile in labor and equipment and $1,860 per mile in materials for a total of $36,500 for a contractor to build a traditional 5-strand barbed wire, lay down riparian fence on the same fence line because of the swampy, open-water conditions. The weight of a nonsuspension fence would have had the tendency to pull line posts over or into saturated soils, necessitating extraordinary preventative measures and drastically increasing construction costs. In addition, the structural mass of traditional nonelectric lay down fence designs would have presented unacceptable aesthetic impacts.

Environmental Changes

On the Harriman East section of the Henry's Fork, 8 study areas were established covering 2.5 miles of stream. One pair of study sites was established within each quarter section. At 20-ft intervals, 31 transects were established in each site to record streambank and riparian conditions (Platts et al. 1983 and 1987).

The information in Table 1, although preliminary at this time and only representing 2 data points, suggests the Henry's Fork has good rehabilitative potential (Fig. 4, 5).

Table 1. Average streambank and riparian environmental conditions for 1985 (grazed) and 1986 (rested) for 8 study sites on the Henry's Fork. Confidence Intervals (CI) in parentheses.

Variable	Grazed 1985 (CI)	Rested 1986 (CI)
Streambank alteration (percent)	63 (58-67)	0 (0)
Streambank angle (degrees)	161 (151-172)	149 (136-163)
Streambank undercut (inches)	0.03(.0-.1)	0.04(0.0-0.1)
Shoreline water depth (feet)	0.0 (0-0)	0.0 (0-0)
Vegetative habitat type (units)	6 (5-7)	9 (7-11)
Streambank stability (percent)	20 (9-31)	37 (21-53)
Streamside vegetative cover (units)	1.3 (1.0-1.6)	1.6 (1.3-1.8)
Streamside vegetative overhang (inches)	0.0 (0-0)	0.0 (0-0)
Vegetation use (percent)	75 (66-85)	8[1] (0-20)

[1]Mainly by geese or loss from past overgrazing.

Most environmental conditions improved. Some existing morphological conditions such as streambank undercut, shore line water depth, and streamside vegetative cover show that streambanks were not in synchronization with the water column. During low summer and winter flows the banks are too far removed from the water column for the rearing of younger fish. Only time will tell if the Henry's Fork is capable of building the desired streambank form and location and if cattle were the principal or contributing cause of the present situation. Initial streambank vegetative response to the rested treatment was spectacular.

[2]The use of trade or firm names in this publication is for reader information and does not imply endorsement by the U.S. Department of Agriculture of any product or service.

Economic Feasibility of the Project

Economic analysis of this project looked at its benefits and costs. One thing was apparent: the concentrated recreational use and national prominence of the area demanded that the problem of cattle damage be solved. A fence separating the riparian zone and a special grazing plan for the remainder was one alternative. Another was elimination of grazing from the entire unit. But all reasonable solutions seemed to involve both fencing and continuing some rate of livestock use. To analyze the benefits and costs, then, the difference in grazing between the standard fence and the electric fence is used. Additional benefits from fisheries and wildlife are expected as the vegetation along the riverbanks improves.

Grazing benefits were given a value of $9.19 per animal unit month (AUM), the actual lease amount. The difference between the fence locations saved an estimated 200 AUM's per year for a yearling grazing benefit of $1,838. Using a 6 percent interest rate the net interest worth of 20 years grazing would be $21,081 ($1,838 $\times$ 11.47).

Assuming the value of grazing equaled the value of the installation cost, we concluded that the high tensile smooth wire electric fence technology provided the most cost-effective approach to achieving the environmental, social, and economic objectives of the Henry's Fork riparian management project. By achieving improved riparian vegetation and improved livestock distribution, the investment in fencing would pay substantial long-term private and public dividends. With the major costs behind us, comparatively minor additional investment ($\pm$1,000 per mile installed) in cross fencing could yield disproportionately large returns in improved productivity to the permittee and landowner. The cost of the electric fence at this site was about $2,700 per mile compared to $4,000 to $6,000 per mile for a standard let-down type of fence.

During the first 2 years of operation there were few operational difficulties with the solar-supported energizer. There have been no problems with wildlife, and even moose have respect for the fence and are careful to avoid contact with it.

Whether this fence system or any fence is desirable depends upon local conditions. Proper location of fencing may permit more intensive grazing management and actually increase production and use of forage. One narrow point of view holds that any fencing costs must be paid for or justified by an increase in fisheries benefits. But this position rests on a precedence of grazing use under permit or private property rights and ignores potential for also improving forage production and riparian conditions. Thus, this view can be successfully challenged.

At the Henry's Fork area, fishing benefits will occur, but it will take time for them to become evident. But because of the trophy class of this fishery, the values are high and justify considerable investment.

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History of the Cattle Industry in British Columbia

Judy Steves and Alastair McLean

Foreword

Alastair McLean, retired range scientist for the Agriculture Canada Range Research Section in Kamloops, is the Kamloops Chapter host for the 1989 SRM summer meeting and tour. Alastair has been recording the history of range management and the cattle industry in British Columbia. Following is a compilation from his publications on this subject.

Gold

The British Columbia (B.C.) Cattle Industry basically started with the 1858 "Cariboo Gold Rush" in central B.C. Previous settlements in the area had been discouraged by the Hudson's Bay Company, which held an exclusive licence over B.C. to trade with the native Indians. This trading license expired the same year as the gold strike, opening the province for settlement.

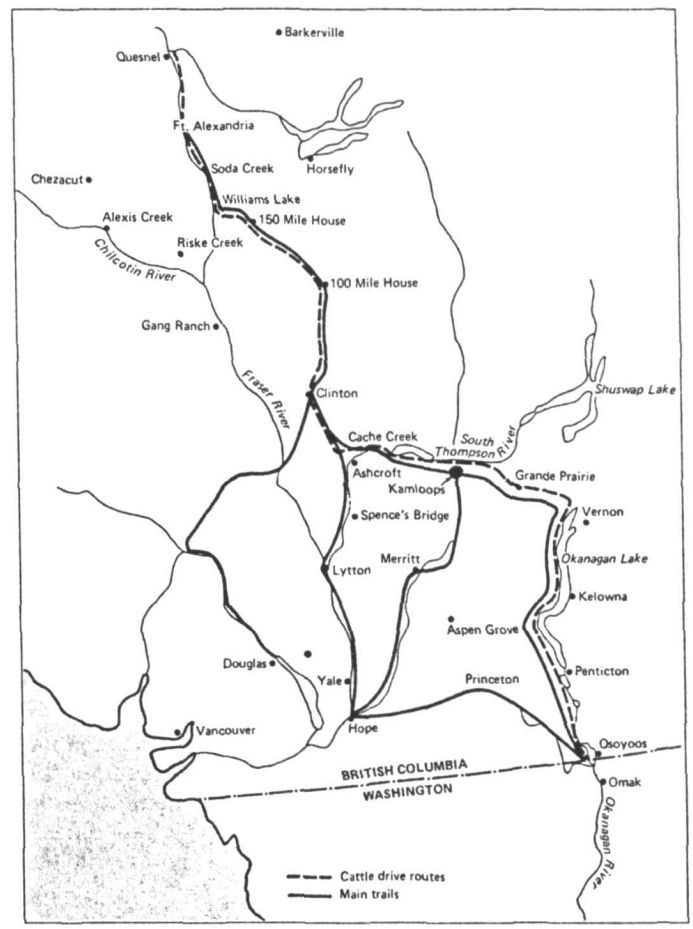
Drovers herded cattle into the Region to provide meat for the multitudes of gold seekers. From 1859 to 1870, about 22,000 head of cattle were driven from Oregon Territory to Osoyoos in southern B.C. and 450 miles north to Barkerville (50 miles east of Quesnel).

Settlement

The early settlement patterns in the interior of B.C. were determined by the fur trading and gold rush trails. Most ranches were established by adventuresome European immigrants. Settlement centres developed at watering sites and good pasturage along the Brigade Trail, Cariboo Road and other trails in the early 1860's. Examples of these towns are Lilloet, Cache Creek, Clinton and 100 Mile House. Kamloops was not settled until the late 1860's since it was off the main route to the Cariboo gold fields. By the early to mid 1880's, most of the main ranches had become established in the six rangeland areas of B.C.: the Okanagan, Similkameen, Nicola, Thompson, Lower Cariboo and Chilcotin regions.

Cattle Drives

By the late 1860's the cattle market provided by the gold rush had almost dried up. Ranch managers had to find beef markets outside the B.C. interior—primarily Vancouver and Victoria. Cattle trails generally followed those established by the fur traders along water courses through the main valleys. Most cattle drives ended on the Fraser River at Yale or Hope where cattle were shipped to the coast by river boats. When the Canadian Pacific Railway was completed in the late 1880's, the drive routes ended at shipping points, such as Kamloops.



Many of these trails still form part of B.C.'s main highway network. An example is the Coquihalla Freeway, a