The Clearwater River Basin, Idaho, USA

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Introduction

The Clearwater River flows through forested mountains and grasslands in north-central Idaho before entering the Snake River at the Idaho—Washington border. Fault uplift, basalt lava flows, and glacial floods shaped the basin eons ago. As a result, flora and fauna of basin are diverse (USGS, 1964). The river was and still is the major population center of the Nez Perce. The present-day Nez Perce Reservation and the Nez Perce National Historical Park located in the basin. The Lewis and Clark expedition of 1805-1806 was the first European account of the river basin. Other early European explorers and fur traders used the Clearwater as a passageway to and from the Pacific Northwest. The first missionary, farm, and sawmill in Idaho were established on the Clearwater in the 1830’s and 1840’s.

Gold was discovered on tributaries of the Clearwater River in 1860, and the region experienced a massive influx of immigrants. The latter half of the 19th and early 20th century saw agriculture and timber production become the major sources of income to the basin. Several dams were constructed on the river and its tributaries in the 20th century for hydroelectric production and flood control. Because of these dams—and confounded with land use practices—runs of anadromous fishes declined rapidly in the latter half of the 20th century. Agriculture, mining, logging, and recreation provide the major source of income for the basin’s inhabitants in the present day. Efforts are in place to restore anadromous fish runs on the river (NPTI & IDFG, 1990).

Below, I reconstruct the ecological and cultural history of the Clearwater River basin from its geologic formation and native biological communities to its use by Native
Americans and exploitation by European settlers. I conclude by describing the current state of the economy and environment in the basin.

**Natural History**

The Clearwater River drains 27,000 km$^2$ in north-central Idaho (Figure 1). The headwaters originate in wet meadows on the western slopes of the Bitterroot Range at an elevation of 2,685 m. Average elevation for the basin is 1330 m (USGS, 1964). The Clearwater has three main forks: the South, Middle, and North. The South and Middle Forks join at Kooskia, Idaho, and form the main stem Clearwater River. The North Fork joins at Ahsahka, Idaho, as the river enters a 400-m deep canyon in the eastern Columbia Plateau. At this confluence, the river emerges from mountains covered with coniferous forests into semiarid grasslands similar to those of the lower Snake River (Sappington, 1998). Near Spalding, Idaho (24,845 km$^2$ drainage area; 19 km upstream from the confluence with the Snake River), annual mean flows from 1910-2000 have ranged from 240 m$^3$/s (1944) to 700 m$^3$/s (1997) (USGS, 2001). Comparatively, annual flows of the Willamette River near Albany, Oregon, have ranged from 240 m$^3$/s (1930) to 600 m$^3$/s (1896) for the period of 1895-1998 (USGS, 2001). The Clearwater River reaches its highest flow in the late spring—early summer and experiences its lowest flows during the early winter months (USGS 2001). It converges with the Snake River at an elevation of 225 m (USGS, 1964).

A combination of Pacific coastal air masses and interior continental air masses control the climate of the Clearwater River basin (NPTI & IDFG, 1990). Approximately 33 cm of precipitation fall on the lower river while over 150 cm fall at the headwaters.
Topography in the basin directs the amount of precipitation falling within the basin. Moisture from Pacific coastal air masses is forced to fall in the headwaters of the basin (USGS, 1964). Most precipitation falls October—May (USGS, 1964). Temperatures are mild in winter and hot in summer in the Clearwater River Valley, ranging from 4 °C to 35 °C (Sappington, 1998). Uplands in the basin experience much cooler temperatures both in winter and summer, ranging from –12 °C to 23 °C (USGS, 1964; Sappington, 1998).

The Clearwater River established approximately 13 million years b.p. (Reidel, 2001). The river cuts through batholithic rocks of the Bitterroot and Clearwater mountains in eastern Idaho before flowing west through Columbia basalts (Keeler 1973; Hooper, 1982). The oldest rocks in Idaho are found in the Clearwater Basin. Gneiss (a type of rock) has been found underlying pre-Cambrian rocks (>600 million years b.p.) in the basin (USGS, 1964). The lower Clearwater experienced basalt lava flows from 20 to 7 million years b.p., as did the rest of the Columbia River Basin (USGS 1964). Approximately 12 million b.p., the Pomona lava flow originated in the eastern flank of north-central Idaho and followed the course the Clearwater westward to the Columbia Plateau (Hooper, 1982).

The Clearwater Basin experienced glacial scouring during the Pleistocene glaciation epoch, but not during the Wisconsin period (Keeler, 1973). Loess deposited on the plains of the lower river following the Wisconsin glaciation (Keeler, 1973). These wind-blown deposits are virtually absent in the upper part of the basin (Keeler, 1973). Granite boulders near Lewiston, Idaho, indicate that the Missoula Floods penetrated the lower Clearwater River (Landeen and Pinkham, 1999). At the confluence of the
Clearwater and Snake Rivers, backflows from these floods reached 180 m in depth (Landeen and Pinkham, 1999).

Several coniferous trees are present in the upper basin. Douglas fir (*Psuedotsuga menzeei*), western redcedar (*Thuja plicata*), western white pine (*Pinus monticola*), grand fir (*Abies grandis*), western larch (*Larix occidentalis*), and western hemlock (*Tsuga heterophylla*) are the most common species (Sappington, 1998). Low in the basin, ponderosa pine (*Pinus ponderosa*) and bluebunch wheatgrass (*Agropyron spicatum*) are the dominant vegetation types. Historically, fires occurred regularly within the basin (Quigley and Cole, 1997). An estimated 25 major fires occurred between 1535 and 1928 (Sappington, 1998).

Historically, millions of Chinook salmon (*Onchorhyncus tshawytscha*), Coho salmon (*Onchorhyncus kisutch*), and Sockeye salmon (*Onchorhyncus nerka*) migrated upstream from the Pacific Ocean to spawn on the Clearwater River and its tributaries beginning early in the summer and ending early in the fall (Landeen and Pinkham, 1999). Other fishes native to the basin include the Pacific lamprey (*Lampetra tridentate*), White sturgeon (*Acipenser transmontanus*), Bull trout (*Salvelinus confluentus*), Largescal sucker (*Catostomus macrocheilus*), sculpins (*Cottus spp.*), (*Prosopium williamson*), Cutthroat trout (*Onchorhyncus clarki*), Rainbow trout (*Onchorhynchus mykiss*), and Northern pikeminnow (*Ptychocheilus oregonensis*) (Landeen and Pinkham, 1999).
Native American Cultures

Humans have lived in the Clearwater basin for at least 10,000 years (Sappington, 1998). Native peoples moved from semiarid grasslands of the lower river through the coniferous forests up to the alpine meadows of the headwaters over the course of a year (Keeler, 1973). These aboriginal peoples collected roots from the grasslands, hunted game in the upland plains and forests, and fished on the river and its tributaries. The geographic center of the Nez Perce culture lies within the Clearwater drainage, and the prehistory of the region is related to the Nez Perce culture (Sappington, 1998).

The Clearwater region—except for the extreme eastern watershed boundaries—lies with the 1855 boundaries of the Nez Perce reservation (Figure 2). The present-day reservation is still within the region (Landeen and Pinkham, 1999). Over 300 Nez Perce villages have been found within the Clearwater drainage, with most settlements located either below 460 m in elevation or at the confluence of mid-sized streams with the larger streams (Sappington, 1998). These villages had their greatest occupation September through June, but were occupied to some extent year-round (Sappington, 1998). Camps at the headwaters of large tributaries and small streams were used for short periods of time and for specific purposes (e.g., collecting roots in the early summer). Specific parties occupied these camps for relatively long periods of time. Permission was required for outside peoples to use these camps (Sappington, 1998).

Major food staples of the Nez Perce were wild camas (*Camassia quamash*)—a root of the upland plains—and salmon (*Onchorhyncus* spp.) (Krawczak, 2001). These foods were collected at different times of the year and dried for year round consumption (Sappington, 1998). Over 50% of the Nez Perce diet consisted of anadromous fishes.
Anadromous fish arrived to the Clearwater from May to September. Proper respect and prayers were given to salmon before harvests began so the fish return the following year (Landeen and Pinkham, 1999). Fish were harvested with nets, harpoons, and hooks (Sappington, 1998; Landeen and Pinkham, 1999). Lapwai Creek—near the confluence of the Clearwater with Snake and the site of the first mission on the Clearwater (see next section)—was an important fishing location for the Nez Perce (Landeen and Pinkham, 1999).

Many Nez Perce legends describe how landscape features of the Clearwater River were created. Most involve Coyote, a major figure in Nez Perce religious beliefs. For example, one legend tells of the story an unsuccessful fishing trip by Coyote. Frog—a companion of Coyote—appears and asks why Coyote he is not catching any fish. Frog and Coyote get into an argument, and Coyote eventually throws Frog across the river and turns him to stone. In a fit of anger, Coyote throws his net to the bank across from Frog where it also turns to stone (Landeen and Pinkham 1999). The stone frog and Coyote's stone fishnet can still be seen 19 km upstream from the confluence with the Snake River (near the confluence of Lapwai Creek).

**Arrival of Europeans**

Captain Merriwether Lewis and William Clark were the first Europeans to see the Clearwater River basin. The United States Corps of Discovery—led by Lewis and Clark—traveled through the Bitterroot Mountains and Salmon River drainage before entering the Clearwater River basin late in the summer of 1805 (Arrington, 1994). They first met the Nez Perce at Weippe Prairie on September 20th, 1805 (Ambrose, 1996).
Lewis and Clark were in desperate need of help after traversing the Bitterroots: many of the expedition were sick, they were without food, and their Shoshone guide had deserted (Ambrose, 1996). Fortunately for the expedition, the Nez Perce were harvesting camas roots from the prairie (Landeen and Pinkham, 1999). The Nez Perce supplied them with dried buffalo and salmon, berries, and bread made from camas (Arrington, 1994). Twisted Hair—leader of this Nez Perce band—agreed to hold the expedition’s horses until Lewis and Clark returned from the Pacific the following spring (Ambrose, 1996).

The Corps of Discovery next traveled to the confluence of the North Fork Clearwater and main stem Clearwater River, where they camped for several days and constructed canoes for the journey down the Clearwater, Snake, and Columbia Rivers (Ambrose, 1996). Lewis and Clark named the river the Koos-koos-ke, similar to the Nez Perce name of the river (Thompson, 1974). Upon their return the following spring, the Lewis and Clark expedition camped at the previous-year’s canoe-building camp for nearly a month as they waited for snow to melt in the mountains. The expedition spent considerable time with the Nez Perce and outlined future hopes for relations between the Nez Perce and the United States (Ambrose, 1996). Lewis and Clark were the first to describe the Nez Perce as a friendly people and referred to the Clearwater country as paradise (Ambrose, 1996).

Donald MacKenzie of the Pacific Fur Company and the Northwest Company established a trading post at the confluence of the Clearwater and Snake Rivers in the August of 1812 (Thompson, 1974). The MacKenzie party named the river the Shahaptin, after one of the Nez Perce tribes that dwelt in the basin. This post was
abandoned early in 1813 because beaver pelts were almost non-existent (there were not many beavers present in the Clearwater River) and because natives stole from the traders (Thompson, 1974). These thieves were not members of the Nez Perce, though; they were members of a tribe visiting the region from the Snake River plains. In the following years, fur traders and mountain men began to use the Clearwater as a passageway to and from the Pacific Northwest. Some of these individuals settled with the Nez Perce, including the famous mountain man Kit Carson (Arrington, 1994).

In 1836, Reverend Henry Spalding and his wife Eliza established a Presbyterian mission near the confluence of Lapwai Creek and the Clearwater River (approximately 19 km upstream from the confluence with the Snake River) (Arrington, 1994). The first European child born in Idaho was a daughter of Henry and Eliza, born the same year the Spaldings arrived to the Clearwater basin (Idaho Mining Association, 1940). In 1838, the Spaldings moved their mission to the banks of the Clearwater River. Henry Spalding introduced potatoes, onions, corn, cattle, and pigs to the Nez Perce (Arrington, 1994). Starting in 1838, over 8,000 bushels of potatoes were produced annually from the Spalding mission (Arrington, 1994). Henry Spalding was the first person to use irrigation in Idaho in response to an especially dry summer in 1839. The Spaldings constructed the first sawmill in along the Clearwater, and in Idaho, in 1840. The primary goal of the Spaldings, though, was to Christianize to the Nez Perce. They did so from 1836 to 1847. The mountain men and fur traders that had settled with the Nez Perce did not like the Christianizing of native peoples, and some of these individuals—including Kit Carson—felt that the Spaldings owed rent to the Nez Perce (Arrington, 1994). Nothing came of threats made by these individuals, though, and events outside
the Clearwater basin forced the Spaldings to abandon their mission in 1847. That year, Cayuse Indians massacred Dr. Marcuss Whitman, his wife, and 12 other individuals at a Presbyterian mission on the Walla Walla River of Washington (Arrington, 1994). The Spaldings left their mission at this time for safety concerns and traveled to the Willamette Valley. Henry Spalding (Eliza died in 1851) returned to the Lapwai mission in 1863 and resumed teaching the Nez Perce Christianity and farming techniques (Arrington, 1996). Henry lived to 1874. Among his accomplishments were his introduction of farming to the Nez Perce and baptizing a native by the name of Tuekakas, who was the father of the famous Chief Joseph of the 1870’s (Arrington, 1994).

The United States government and the Nez Perce signed a treaty in 1855 that created a 300,000-km\(^2\) reservation in the lower Snake River country and the Clearwater River country (Landeen and Pinkham, 1999; Figure 2). This treaty gave exclusive rights of the Clearwater River to the Nez Perce (Landeen and Pinkham, 1999). E. D. Pierce discovered gold on the North Clearwater in 1860, and shortly thereafter gold was discovered by W. F. Bassett on the South Fork of the Clearwater (Battien, 1989; Figure 3). With these discoveries—coupled with the outbreak of the Civil War—the region experienced a rapid influx of prospectors from 1860 to 1866 (Campbell, 1864; Idaho Mining Association, 1940; Battien, 1989). The major population centers during this time were Elk City, Orofino, and Pierce City (Campbell, 1864). Lewiston, Idaho, was founded at the confluence of the Clearwater and Snake Rivers in 1861 as hordes of gold-seeking individuals flooded the region (Campbell, 1864). The region was publicized heavily in the early 1860’s, with allusions to El Dorado made by several
guides (e.g., Campbell, 1864; Leland, reprinted 1972). Alonzo Leland, a Portland journalist of the time, wrote a guide in 1862 that publicized the region’s resources (Leland, reprinted 1972). Leland also describes the “…unfortunate diplomacy which ceded back to the Nez Perce nation so much of the country which embraces these rich mineral districts. But patience and skill, we doubt not, will soon devise means whereby the most valuable mineral lands will be treated for with these Indians by the general Government, and so much of the agricultural lands as may become necessary adjuncts to the mining district” (Leland, reprinted 1972). Legally, individuals who mined for gold on the Clearwater in 1860 were trespassing on the Nez Perce reservation (Landeen and Pinkham, 1999). Instead of enforcing the 1855 treaty, though, the U.S. government reduced the reservation to 30,000 km$^2$ in 1863 (Landeen and Pinkham, 1999; Figure 2). In 1887, the U.S. government further reduced the reservation to 10,000 km$^2$ (Arrington, 1994).

Also in his 1862 guide, Alonzo Leland (reprinted 1972) notes that the richest agricultural lands east of the Cascades lie within between the Clearwater and Salmon Rivers. The major sources of income in Idaho—and the Clearwater region—during the latter half of the 19th century and most of the 20th century was agriculture (Arrington, 1996). In 1964, the USGS reported that dry farming was the dominant form of agriculture in the Clearwater Basin (only 1,500 km$^2$ of approximately 7,000 km$^2$ were irrigated at the time). Major crops of the basin included—and still include—potatoes, winter wheat, and sugar beets (Arrington, 1994). Cattle and sheep also became important in the basin, especially lower in the basin, during the latter half of the 19th century (Arrington, 1994).
Henry Spalding constructed the first sawmill in Idaho on the banks of the Clearwater River in 1840 (Arrington, 1996). Other sawmills were constructed in the basin, and forest products became the second most important industry in Idaho by the end of the 19th century. Fredrick Weyerhaeuser moved operations to the Clearwater country at the turn of the 20th century as the forests in the Great Lakes region were exhausted (Arrington, 1994). In a business deal with John A. Humbird, Weyerhaeuser purchased 1,600 km$^2$ of timberlands on the Clearwater River from the Northern Pacific Railway in the summer of 1900 (Arrington, 1994). The finest stands of western white pine in the western United States were located within the Clearwater basin, and were quickly exploited by Weyerhaeuser and Humbird's newly formed Clearwater Timber Company. Another venture by the Weyerhaeuser group in the Clearwater basin was the Potlatch Lumber Company, which was formed in 1903 and harvested lands in the north Clearwater basin (Arrington, 1994). Potlatch quickly established itself as an important lumber supplier to major eastern cities: rail connections to Chicago, Milwaukee and St. Paul were established by 1907. These timber companies were extremely harsh on their lands, completely clear cutting forests and selling the harvest areas as quickly as possible. These policies devastated the basin's landscape as well as local communities. Harvested timber was drifted down the Clearwater for processing in Lewiston (Arrington, 1994; Figures 4 & 5).

In 1910, almost 70,000 km$^2$ of timberlands burned in northern Idaho and Montana—including portions of the Clearwater basin (Arrington, 1994). Besides devastating the timber industry, mines and community centers were also destroyed. Thus began a downturn in the economy of the Clearwater basin, as well as for the rest
of Idaho. In the 1920s, timber and mineral prices dropped (Arrington, 1994). For example, lumber produced from white pine—the most important timber tree in the Clearwater basin—dropped from 438 million board feet in 1929 to 169 million board feet in 1933 for all of Idaho (Arrington, 1994). After several years of declining profits and losses from fires, the Clearwater Timber Company, Potlatch Lumber Company, and the Edward Rutledge Timber Company merged in 1931 to form the Potlatch Yards, Inc. The Great Depression of the 1930’s only accelerated drops in production and prices within the basin, and many families left to look for work in California and Oregon. The New Deal of President Franklin D. Roosevelt reversed the economic plight of the Clearwater region, as well as for the rest of Idaho. Relief programs and the establishment of works programs (e.g., the Civilian Conservation Corps) resulted in a massive immigration of young men from eastern cities to work camps in the Clearwater basin. By the start of World War II, most of the economic troubles of the Clearwater basin had been reversed (Arrington, 1994).

In the early 20th century, the U.S. Forest Service created 12 Forest Reserves in Idaho (renamed National Forests in 1907). Two of these National Forests encompass the eastern Clearwater drainage—the Clearwater National Forest and the Nez Perce National Forest (USDA, 2001). These lands cover 171,000 km² of the eastern Clearwater basin, from the Bitterroots to the western prairies (USDA, 2001). Senator Frank Church of Idaho initialized wilderness legislation in Idaho during the 1950’s and 1960’s. In 1964, the Selway-Bitterroot wilderness area was created in the Clearwater basin. The Middle Fork of the Clearwater River was designated a Wild and Scenic River in 1968 (Arrington, 1994).
Development of industry and creation of works programs brought construction of dams on the Clearwater and its tributaries during the 20th century (NPTI & IDFG, 1990). In 1910, a dam was built on the South Fork of the Clearwater River (NPTI & IDFG, 1990). A hydroelectric dam was built at Lewiston in 1927 to supply power to a recently constructed Clearwater Timber Company sawmill (Arrington, 1994). This dam almost exterminated Chinook salmon runs on the river (NPTI & IDFG, 1990; Landeen and Pinkham, 1999). These dams were removed in the 1960’s and 1970’s. Dworshak Dam was constructed for flood control on the North Fork of the Clearwater River in 1969 (NPTI & IDFG, 1990). This dam blocked all anadromous fish passage; Chinook salmon production in the Clearwater basin has been reduced by 26% as a result (NPTI & IDFG, 1990). Currently, 22 dams are in place on the Clearwater’s tributaries (NPTI & IDFG, 1990). Most of these dams are on headwater tributaries and are used for agriculture purposes.

Conclusions

The Clearwater basin remains an important cultural and economic center in the Columbia River system today. Revenue for the basin is still generated primarily by agriculture, timber production, and mining (Arrington, 1994). Recreation has become an increasingly important economic source in recent years. Hunting, fishing, river travel, and gambling are the most popular forms of recreation in the basin (Arrington, 1994; Nez Perce Tribe, 2001; Lewiston, 2001). The city of Lewiston, Idaho—at the confluence of the Clearwater and Snake Rivers—is Idaho’s eighth largest city (USCB, 2001). In
fact, Idaho’s only paper and pulp mills are on the Clearwater River (Arrington, 1994). Located in Lewiston, it is owned by the Potlatch Corporation.

The present-day Nez Perce reservation lies entirely within the Clearwater basin. The headquarters for the tribe is in Spalding, Idaho (Nez Perce Tribe, 2001). From the treaty of 1855, the Nez Perce tribe has rights to harvest salmon from the Clearwater River. These rights were solidified in case of *U.S. versus Washington* (1974) when judge George Boldt ruled that half of the potential fish catch for a site must be reserved for tribal use (Landeen and Pinkham, 1999). Archeological sites continue to be discovered along the Clearwater and its tributaries (Sappington, 1998). Recent findings suggest the basin has been colonized for 10,000—11,000 years (Sappington, 1998; Nez Perce Tribe, 2001).

Most of the basin is in fair to good ecological condition (Quigley and Cole, 1997). This condition means that the basin is resilient to natural and human-caused disturbances (Quigley and Cole, 1997). However, risk of stand-replacing fires has increased dramatically as a result of fire suppression. Dam removal on the river and its tributaries during the 1960’s and 1970’s allowed anadromous fish runs to reestablish on the river, but several other dams constructed in the mid-20th century—coupled with land use practices—have influenced fish populations. Dams on the lower Snake and Columbia Rivers reduce the numbers of salmon returning to the Clearwater River. Dams on the river’s tributaries reduce available spawning habitat (e.g., Dworshak Dam on the North Fork of the Clearwater) (NPTI & IDFG, 1990). Stocking programs have been created to supplement the river’s salmon and steelhead populations (NPTI & IDFG, 1990).
Human history in the Clearwater region has been rich, from the Nez Perce culture to the arrival of European settlers. The ecological integrity of the basin remains fair to good in the present day, even with invasions of exotic vegetation—i.e., cheatgrass (*Bromus tectorum*), bulbous wheatgrass (*Poa bulbosa*), and Kentucky bluegrass (*Poa pratensis*), extensive land use, and fire suppression (Quigley and Cole, 1997; Sappington, 1998). The Clearwater basin encompasses an environmentally, socially, and politically diverse region of the Pacific Northwest.
Literature Cited


Lewiston.  2001.  Welcome to the city of Lewiston, ID.  
http://www.cityoflewiston.org/  
[Visited 05/27/01].

http://www.nezperce.org/  
[Visited 05/28/01].


Figure 1. Clearwater River basin, Idaho, USA (Sappington, 1998).
Figure 2. Nez Perce Reservation boundaries 1855-1863, Pacific Northwest (Landeen and Pinkham, 1999).

Figure 3. Gold discoveries in 1860, Clearwater River basin, Idaho (Battien, 1989).
Figure 4. Log drive on the Clearwater River, Idaho, at the turn of the 20th century (Courtesy: Paula Minear).

Figure 5. A wannigan dislodging logs on the Clearwater River, Idaho, at the turn of the 20th century (courtesy: Paula Minear).