PROTECTION OF THE MORRISEY OLD GROWTH COTTONWOOD FOREST
CONTRIBUTION AGREEMENT REPORT
MARCH 9, 2006

INTRODUCTION:

A grove of Black Cottonwoods (*Populus trichocarpa*) located on lands owned by Nature Conservancy of Canada near Morrissey, B.C. have been identified as being the oldest Black Cottonwoods found to date in the world. The trees are exceptionally large and are situated on floodplain forest dominated by Western Red Cedar (*Thuja plicata*). The trees are up to 2.2 m. in diameter and although heart rot prevents precise aging, increment cores indicate ages of up to 400 years. Very old cottonwoods make distinctive contributions to habitat structure of riparian woodlands and reveal stable floodplain locations that have not been eroded by river channels for the duration of the trees' lives.

PROJECT GOAL:

The goals of this project are essentially three-fold:

1. To increase visitor awareness and appreciation of the Morrissey Old Growth Cottonwood Forest
2. To motivate community stewardship of this fragile forest ecosystem
3. To reduce negative impacts on the site by concentrating use patterns to a small area of the forest.

BASELINE INVENTORY:

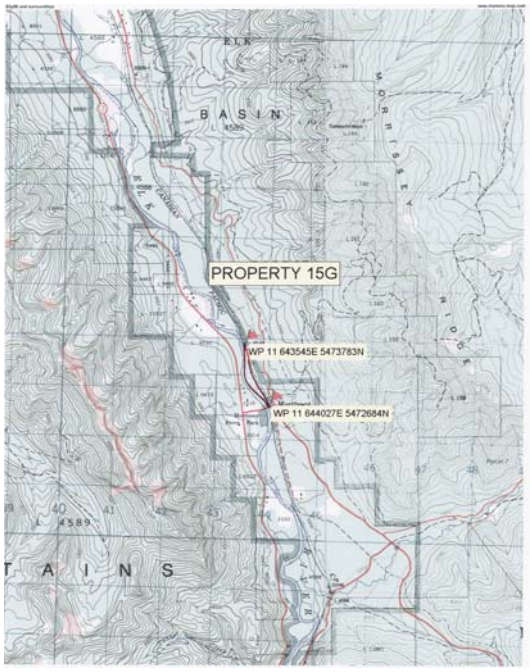

Figure 1 – Location, Configuration of Property Supporting Morrissey Cottonwoods

1. TOPOGRAPHY/LEGAL DESCRIPTION

SIZE: 12 ha.

LEGAL DESCRIPTION:

Parcel Identifier: 011-826-126
Part of Parcel 32 (see 85159I) District Lot 4588 Kootenay District
except parts included in plans 12154 and NEP19670

UTM LOCATION: SE Corner -11 U 0644027E 5472684N
NE Corner -11 U 0643545E 5473783N

This property is composed of a narrow strip of land between the CPR right-of-way and the Elk River. The terrain is level. One permanently flowing stream bisects the southern end of the property. In addition, an intermittent stream extends east-west across the southern part of the property. The site is remarkably stable from erosion and the presence of dated, very old trees suggests the property has not been significantly impacted by flooding for at least the last four centuries.

2. FLORAL DESCRIPTION

Forest Cover – AcS(C)5318

Stand overstory composed of Black Cottonwood, Spruce and significant components of Western Red Cedar. Most of the overstory is between 80 and 100 years old and stands between 20 and 28 meters in height. There are more than 76 mature trees greater than 28 cm. diameter breast height (DBH) per ha. Crown closure in the stand is 80% with very little direct sunlight reaching the ground. The shrub/woody understory in the northern part of the property is poorly developed because of canopy light interception. However, the shrub layer is well developed in the central and southern parts of the property, particularly adjacent to poorly drained areas.

There is abundant large woody debris (deadfall) and standing snag development present.

Due to the advanced seral stage of this unit, cottonwood is found in clumps or distributed along the riverbank. Dense stands of regenerating spruce (intergrades of white and Englemann spruce) and red cedar are starting to reach an age so as to displace the younger cottonwood, leaving only mature trees and veterans in place. Several veteran Black Cottonwood trees in the stand are exceptionally large and old (ie. >400 yrs.) and are described as “Champion Trees”.

3. ECOSYSTEM DESCRIPTION

ECOLOGICAL DESCRIPTION: Riparian

UNIQUE FEATURES:

The property lies within an identified large carnivore linkage zone across the Elk Valley.

In addition to being a well developed and stable riparian habitat, **the property exhibits a unique stand of Black Cottonwood trees**.

Black Cottonwood (*Populus trichocarpa)* is a tree species that thrives in the floodplain and riparian forest ecosystems of western North America. Many of the cottonwoods in this grove are exceptionally large and old, over 2 meters in

diameter and up to 400 years in age. These “Champion Trees” are the oldest Black Cottonwoods found to date in the world.

The formation and maintenance of cottonwood forests are closely related to the natural processes of flooding and disturbance. Black Cottonwood is very resistant to flooding and regenerates best on disturbed lands, like the bare sand and gravel found on recently disturbed floodplains. They are fast growing and relatively short lived and provide immense habitat values and food sources for wildlife of all sizes. This site is relatively unique in that it has not undergone a significant erosion event for several hundred years, which has allowed for the longevity of the cottonwoods present.

Cottonwood ecosystems are at risk in North America as they are located in areas of rich soil, flat land, abundant water and easy access. Many former Black Cottonwood forests have been completely cleared by human development.

4. CULTURAL FEATURES/HISTORICAL LAND USE

Cumulative human influence in the area is high. Grazing opportunities along the Elk River banks bordering the property were not exploited in 2004.

There is no fence between the property and the adjacent CPR right-of-way.

This property was selectively logged for conifers several decades ago. Cultural artifacts (ie. abandoned cabins, etc.) are absent. The presence of several ancient Black Cottonwood (*Populus trichocarpa)* trees on the parcel has contributed to unsanctioned public visitation of the site.

5. LAND TENURE

There is one (1) land use permit extant for the property.

6. SURROUNDING LAND USE

Cumulative human influence in the area is high. The property lies within an identified large carnivore linkage zone across the Elk Valley. There is some threat of undesirable plant (ie. noxious weed) introduction onto the property from the adjacent CPR right-of-way. Privately owned intensively farmed agricultural lands lie immediately west and south of the property; Managed Forest 27 lands owned by Tembec Inc. but under conservation covenant (subdivision development prohibited) lies to the east.

7. PUBLIC RECREATIONAL USE

There is foot and boat access to this property, only. There is no motor vehicle access within the property although it is immediately adjacent to well traveled, well-maintained gravel roads. This property is accessed from the south by the Morrissey Road, from the east along the Canadian Pacific Railway right-of-way bordering the parcel and from the west by boats and rafts traversing the Elk River. The site is under some level of threat from unsanctioned public use focused on viewing ancient Black Cottonwoods (*Populus trichocarpa)* occurring on the parcel. There is a measurable level of habitat degradation occurring as a result of these visits. In addition to terrestrial access to the site via the Morrissey Road and CPR right-of-way, unsanctioned visits from anglers floating the adjacent Elk

River are causing a small level of riparian damage on the riverbank portion of the parcel. There are no security features present. Casual recreation levels are high on this property because of its easy vehicle access and confined for the most part to viewing the unique cottonwoods present.

8. RESOURCE MANAGEMENT ISSUES

The site is secure from unsanctioned commercial resource use but is under some level of threat from public use focused on viewing ancient Black Cottonwoods (*Populus trichocarpa)* occurring on the parcel. There is a measurable level of habitat degradation occurring as a result of these visits. In addition to terrestrial access to the site via the Morrissey Road and CPR right-of-way, unsanctioned visits from anglers floating the adjacent Elk River are causing a small level of riparian damage on the riverbank portion of the parcel.

9. STEWARDSHIP RECOMMENDATIONS

Recreation –

This property has been moderately disturbed by human activity and is accessible by motor vehicle, foot and boat. Recreational use of the property is for the most part restricted to angling on the Elk River and hiking on a 0.5 km. trail constructed to visit a grove of ancient Cottonwood trees on the property. The density of vegetation throughout has generally discouraged public entry onto the property with the exception of trail access and boat access from the Elk River.

It is recommended that:

- **Informational signs be posted on access points to the site to advise the public that the land is private property and being managed for conservation purposes. The sign should request the public to use the property responsibly with respect for natural ecosystems and further advise the public that they enter the property at their own risk. Maintain foot and boat access, only**.

Education –

The site is fairly large and within relatively close proximity to the City of Fernie and Town of Elko. There is no motor vehicle access within the property although it is immediately adjacent to well traveled, well-maintained gravel roads. Its location lends it to exploitation of educational opportunities.

The property lies within an identified large carnivore linkage zone across the Elk Valley and in addition to being a well developed and stable riparian habitat it exhibits a unique stand of Black Cottonwood trees. Black Cottonwood (*Populus trichocarpa*) is a tree species that thrives in the floodplain and riparian forest ecosystems of western North America. Many of the cottonwoods in this grove area exceptionally large and old, over 2 meters in diameter and up to 400 years in age. These “Champion Trees” are the oldest Black Cottonwoods found to date in the world.

It is recommended that:

- **Educational focus be directed toward wildlife habitat connectivity and the importance and function of riparian systems as well as human impacts to natural systems.**
- **The Ancient Black Cottonwood grove on the property be used to demonstrate cottonwood ecology and educate the public about cottonwood ecosystems at risk. A self-guided educational foot trail to the ancient cottonwood grove should be maintained to introduce/direct the public to the site, ensure public safety and minimize environmental impacts.**

Resource Use –

Resource use opportunities are very limited on the property. Timber and grazing values are low. Timber and grazing values are low. There is one (1) land use permit extant for the property (Trapping Permit T12). The permit holder for Trapping Permit T12 has never taken advantage of permit opportunities on this site and in 2005 voluntarily suspended his use of this area with an option to renew his permit at some future date should he desire to do so. The termination of this permit is not recommended in the interest of maintaining good relations between NCC and the local community.

It is recommended that:

- **The existing land use permit be reviewed annually and approved unless there are compelling biological or social reasons to deny its renewal.**
- **No permit renewals be contemplated subsequent to the voluntary termination of the permit by the current permit holder.**
- **Applications for commercial or recreational activities on the property be considered on their merits and in the context of Nature Conservancy of Canada's stewardship goals and objectives.**

Research –

Research opportunities include studies of structural complexity of old-growth cottonwood forests and the role of cottonwoods in maintaining healthy fisheries and wildlife habitat connectivity.

It is recommended that:

- **The site be made available for research purposes at the request of recognized scientific organizations or institutions.**

INTERPRETIVE PLAN:

Completed by: Lee-Anne Walker, Fernie Nature Tours For Wildsight – Elk Valley Branch, February 7 2006

Project Overview:
Between the CPR railway tracks and the east shore of the Elk River, directly north of the Morrissey Bridge over the river is an ancient grove of black cottonwood trees. They have likely been spared from the meandering of the Elk River by a shale/clay shelf that is exposed visibly under the river and juts out under the riverbed directing the river along a straight channel thereby reducing its erosion force that could topple the giants.

Although first brought to the attention of a few local people including the author by a contract timber cruiser for Tembec over a decade ago, the grove received international recognition in 2003 upon the publishing of a joint article in Canadian Journal of Botany by world renowned botanist and cottonwood expert Stewart Rood from the University of Lethbridge and his graduate student Mary Louise Poulzin who did some of her thesis work in the Morrissey cottonwoods.

With international and local media promoting the grove the Chamber of Commerce, local accommodators and tourism providers started to direct people to the grove of which the easiest access was along the CPR tracks then west toward the river into the grove of the largest trees. This posed great danger for the public walking along a very busy railway hauling millions of tons of coal annually to Robert's Banks near Vancouver, not to mention the annoyance to train engineers concerned for public safety. Additionally these social paths caused trampling and disturbance of many rare and fragile plants.

When the Nature Conservancy of Canada took over the management of the land after acquisition from Tembec in December of 2004, Bob Forbes met with local naturalist, Wildsight director and Ecotourism operator Lee-Anne Walker from Fernie Nature Tours to discuss solutions to the degradation of this rare and unique site. She engaged the COTR MAST students who were required to complete stewardship activity hours and they were more than eager to participate in the beginning construction of a boardwalk, bridge and trail system in May 2005.

NCC completed the trail through the summer of 2005, adding railing to channel people onto the trail and partnered with Wildsight Elk Valley branch to complete an interpretive plan and signage to increase visitor awareness and stewardship of the site. Together NCC with Wildsight along with engaged local citizens, the site will be maintained and cared for as a sanctuary for wildlife and place of education and renewal of the human spirit.

Media Selection: A hiking trail with boardwalk sections, bridge and entrance kiosk on the north side of the bridge crossing Morrissey Creek will be constructed. At the trailhead people pass under an entrance arch made of aging cottonwood stating the name of the trail and a map indicating the length, time and location of the trail, acknowledging sponsors and providing a safety disclaimer for trail use. The interpretive kiosk is strategically placed after visitors cross over Morrissey Creek to minimize its risk of vandalism.

Gravel, crush or woodchip surfacing and boardwalk along the first section of the trail is required to provide a hardened surface and prevent braiding of wet areas. For those visitors who want more technical botanical and wildlife information they will be directed to the NCC and Wildsight websites that could direct readers to scientific journals.

At the NGO websites, visitors will also be encouraged to donate to the partnering organizations, provide a link to other regional community conservation initiatives for people to get involved with including clean up and maintenance work bee dates for the Ancient Morrissey Cottonwood trail.

Target Audience: The primary audience is the residents of the Elk Valley. Secondary audience is visitors to the region. Of these visitors, some will be group tours of post-secondary students to the region including College of the Rockies, University of Lethbridge, University of Montana.

Visitors will be interested in the site due to its international significance. Expectations will be to see huge trees; to this end visitors will not be disappointed. Still there are less than ten giants that can be observed and they start close to the end of the trail. Emphasis will be placed on the fact that this is locally a very significant site with high national and international conservation values. The site requires a non-conventional interpretive approach due to its spiritual connections with people.

For academics who require more scientific information they should be directed to the Nature Conservancy website where there will be links to academic journal articles.

Interpretation Insight:
Interpretation is any communication process designed to reveal meanings and relationships of cultural and natural heritage to the public through first-hand involvement with an object, artifact, landscape or site. **Interpretation Canada 1976**

Interpretation is used as a management technique to inspire people to relate to and care for the site in a more environmental and sensitive way. For the Nature Conservancy of Canada, the owner and resource manager of the Ancient Morrissey Cottonwood site, effective interpretation can assist with:

- the conservation of the site by reducing negative impacts from overuse,
- increase public awareness, understanding and appreciation of the resource,
- promote community stewardship of the area, and
- promote the joint values of NCC and partnerships with other local conservation organizations e.g. protecting key areas as wildlife corridors for connectivity.

For visitors to the Ancient Morrissey Cottonwoods it will be, in most cases, a part of a recreational learning experience. Thus, learning must be enjoyable. Visitors will self-select to read and engage in learning opportunities that relates to them personally and they find interesting and worthwhile. With regard to the interpretation of the site, the selected interpretive media will provoke interest in the site by relating the messages to the daily lives of the visitors.

Interpretive Theme:
The site has a strong spiritual feeling of peacefulness, strength and wisdom. *The Ancient Morrissey Cottonwoods provide us an opportunity to connect with the natural values of old growth riparian forests - beauty, strength, variety, wisdom, and a bridge that connects natural history past to present.*

Goal:

1. To increase visitor awareness and appreciation of the rare ancient cottonwoods and old-growth riparian forest.
2. To promote and motivate community stewardship of this fragile, rare forest ecosystem.
3. To reduce the negative impacts on the site, concentrate use to a hardened trail, bridges and boardwalks minimizing the overall impact to a small area of the forest.

Objectives:

1. Understand the structural complexity of cottonwood forests.
2. Recall 4 amazing characteristics of cottonwood trees.
3. Observe the variety of plants supported in an old-growth cottonwood riparian forest.
4. Understand and appreciate that conservation of migration corridors along the Elk River requires a community effort.
5. State two ways that cottonwoods contribute to a healthy fishery on the Elk River.
6. State two historical uses of the forest.

Implementation and Operations – The trail was built with volunteers from the College of the Rockies (COTR) Mountain Activity Skills Training (MAST) Program, Wildsight Elk Valley members and NCC staff. Additional maintenance will be provided by community volunteer efforts coordinated by Wildsight Elk Valley Branch and NCC. The Ancient Morrissey Cottonwood entrance signage and kiosk will be installed by NCC staff April 2006 with a public unveiling and trail ribbon cutting ceremony on Earth Day Saturday April 22.

Evaluation Strategy:

- Press coverage for the Ancient Cottonwood Trail opening on Earth Day April 22, 2006.
- Nominate the trail to the Interpretation Canada Awards of Excellence for peer review summer 2006.
- Feedback in the guest book at the kiosk.
- Exit survey on the opening day of the trail.
- Level of community stewardship motivated by the trail and interpretive experience.
- Use of the trail by community groups and educational institutions.
- Monitoring of site impacts by visitors by Wildsight Elk Valley branch.

Other supporting resources: A plant inventory and map was completed by Wildsight Elk Valley volunteers for the Elk Valley Community Stewardship Atlas in August 2004. The public can access this information through: www.shim.bc.ca/atlases/elk_valley/elk_public.cfm

Sponsors (logos to appear on the introductory sign): Nature Conservancy of Canada,Wildsight, Tembec, COTR Fernie Campus, CBFWCP

Resources Used:

Egan, Brian; Cardrin, Carmen; and Cannings, Syd. **Cotton Riparian Ecosystems of the Southern Interior.** Ecosystems in British Columbia at Risk brochure. BC Ministry of Environment, Lands and Parks. August 1997.

Kinnear, John. Weekly Column: **The Ents of Morrissey**. Fernie Free Press.

Nature Conservancy of Canada. **Ancient Black Cottonwood (Signtext).** Ancient Morrissey Cottonwoods. 2005.

Parish, Roberta. **Tree Book: Learning to Recognize Trees of British Columbia**. Canada-British Columbia Partnership Agreement on Forest Resource Development. Canadian Forest Service and BC Ministry of Forests.

Parish, Roberta; Coupe, Ray; and Lloyd, Dennis. **Plants of Southern Interior British Columbia.** BC Ministry of Forests and Lone Pine. 1996

Rood, Stewart B. and Polzin, Mary Louise. **Big Old Cottonwoods**. Canadian Journal of Botany 81: 764-767 (2003 NRC Canada).

PROPOSED SIGNAGE:

Entrance Arch -

Construction: Archway made of cottonwood, roughcut boards scribed with the name of the trail.

Text:

- On the first archway board **Ancient Morrissey Cottonwood Trail.** On the second cross board will read - ***Experience. Connect. Appreciate***
- Map showing location of the trail. Length 500 metres. Time to hike – 30 minutes. Level of Difficulty - Easy.
- Note of the sponsors using logos.
- **Caution:** Cottonwoods are also known as 'widow makers'. Large branches can break off in high winds and heavy snows. For your personal safety DO NOT hike the trail under these conditions.

Interpretive Kiosk Text -

Construction: Install a salvaged cedar log or stump. Insert metal "branches" coming out to support banners that look medieval like, constructed of vinyl but looking like linen, perhaps secured between plexiglass. It needs to look natural and fitting for the site, importantly unobtrusive. Eventually the cedar will look like a natural weathered stump, preserved only by its natural oils.

Graphic Art/Design Style: Ancient symbols that look like stylized woodcuts with black and sepia coloured ink.

Font: Bookman Old Style

Kiosk Text:

Panel 1 – Introductory Sign: **Values of Old** (Graphic Symbol – Tree of Life with a stylized Cottonwood)

Enter this enchanting forest. Connect with arboreal giants that have watched over the living creatures here for hundreds of years. Ahead are the oldest living cottonwood trees in the world. Discover a story of survival, strength, beauty, wisdom and connection to natural history. Admire and be inspired by the virtues of old.

Panel 2 – Theme **Beauty** (Graphic Symbol – Trilium)

A nobler want of man is served by nature, namely, the love of Beauty. *Ralph Waldo Emerson*

Walk slowly and quietly. Listen carefully. Open your eyes to the beauty of the forest. See it in the details.

- *Stroke gently the velvet moss covering the ancient tree trunks.*
- *Notice the many shades of green.*
- *Hear the birds and squirrels scurrying for berries and seeds of survival.*
- *Take a deep breath and fill your lungs with clear, mountain air circulated and cleaned by the forest eternal.*

- *Smell the sweet aroma of the sticky resin from the cottonwood buds warming in the sun.*
- *Watch downy seeds from beadlike catkin flowers appearing like snow in June.*

Panel 3 - Theme **Strength** (Graphic Symbol – Boar Grizzly Bear)

These ancient cottonwoods are stronger and luckier than most in the Elk Valley. Between 232-401 years old, most never reach more than 125 years. Here their bases measure 2.9 to 9.8 metres around, four adults holding hands. Nearly 15 stories or 50 metres high they are the same distance apart to avoid shade cast by their neighbours. For centuries they shoot up 2 metres each year, making it the fastest growing tree in BC.

Cottonwood roots draw up hundreds of gallons of water daily along with minerals from the soil feeding its rapid growth. Their massive trunk is a highway of tiny pipes slurping water up while pulling sugary sap produced in the broad, thin, wide flat leaves to feed the tree. Water transpires into the air providing a cool relief to summer heat.

Deeply grooved thick armor protects the tree while sticky buds tightly wrap the leaves of spring waiting for the warmth of the sun to trigger swelling and giving off an unforgettably sweet fragrance. First Nations used the reddish sap in ointments for small cuts, to treat sore throats and as makeshift glue.

Lightning and windstorms that sweep up the valley can decapitate these giants. It is not uncommon for branches the size of neighbouring trees to break off and catapult to the ground causing foresters to refer to them as 'widow makers'. Have the willpower to resist entering the forest if it is windy or snowfall is heavy.

Panel 4 - Theme **Variety** (Graphic Symbol – Elk)
The variety of life depending on cottonwoods is a clue to their virtue as healthy ecosystems. :
- *Beavers eat the inner bark and use the stems and smaller trunks for dams.*
- *Woodpeckers nest in cavities of old and decaying or dead trees leaving holes for other animals like owls, squirrels and other birds.*
- *Moose, deer and elk browse on buds and twigs especially on the young saplings down by the river in winter.*
- *Leaves fall into the Elk River, feeding the food chain of bacteria, invertebrates and fish like westslope cutthroat trout.*
- *Broken off tops make nesting platforms for eagles, osprey and great blue heron.*
- *The forest provides protective cover for migrating elk, deer, moose, black and grizzly bear.*
- *Cottonwoods stabilize the riverbanks securing them for people who want to live next to the river yet we are the only animals that treat cottonwoods like weeds.*

Panel 5 - Theme **Wisdom** (Graphic Symbol - Westslope cutthroat trout)

Healthy Cottonwoods=Healthy fishery. Cottonwood trees enhance wildlife habitat from birds, browsing mammals but especially fish. Leaves fall into the river and sink providing places for insects to hide. Decaying leaves are nutrients for caddis flies, mayflies and other insects, important food for trout.

Today the Elk River supports rare and wild, native westslope cutthroat trout population. Kokanee, a species of land locked salmon, spawn in the clean, clear lower Elk River, and its major tributary the Wigwam downstream of here.

Bald eagles, osprey and great blue heron feed on fish not to mention grizzly and black bear and other species that gorge on the Kokanee salmon run in the fall.

Wise are those who can see the connections in nature.

Panel 6 - Theme **A Bridge to Natural History** (Graphic Symbol – Spiral like a curled fiddlehead fern that implies Rebirth)

You are walking in an ancient forest with almost half a millennium of history. Upstream is an outcrop of shale/clay that pushes the river to the west and down a straight channel preventing a meandering of energy that would typically topple these giant cottonwoods.
For at least four centuries the forest has supported populations of species that eat, drink, find secretive cover and the space to reproduce – a bridge for generations past and future.

Think of the many human memories stored in the growth rings of these trees:

- *For thousands of years Ktunaxa may have visited in late summer to collect the inner cedar bark for baskets and devil's club for cures to many ailments.*
- *Michael Phillips walked the shore in 1873 looking for gold, discovering coal that eventually leads to the recording of the Crowsnest Pass.*
- *Chinese railway workers lay track in 1898 that will transport coal to fuel smelters in Trail.*
- *Loggers in the early 1900's perched on springboards saw through thick butt ends with of neighbouring spruce trees with a two-man Swede saw.*
- *Some of the 400 internees walk through the forest from the Morrissey Camp, where enemy aliens from the Austrian-Hungarian Empire were housed in mid 1916 during the First World War.*

History surrounds you but this forests' future is in your the hands. Care for the old and future generations will be inspired.

COTTONWOOD INTERPRETIVE TRAIL:

Activities:

An interpretive trail alignment was prepared for the site in October, 2004. Field notes pertaining to the alignment are as follows:

Trail Start – East end of Elk River Bridge on right bank of Elk River. Trailhead will require steps from road to facilitate access.

37 meters – Transects wet area. May cause difficulties in spring. Requires 7 m. footbridge across flowing stream.

107 meters – No grade. Flat, straight alignment. Requires 10 m. footbridge across intermittent stream.

175 meters – No grade. Dry. Reach first grove of ancient cottonwoods – 12 in total at site.

532 meters – No grade. Dry. Reach last grove of ancient cottonwoods. Trail ends.

Trail Construction:

Trail construction operations were implemented May 14th, 2005. Volunteer labor for the construction phase of the trail was provided by:

- College of the Rockies (Mountain Activity Skills Training) – 15 volunteers
- Wildsite (formerly East Kootenay Environmental Society, EKES) – 2 volunteers

The three main tasks involved in building the trail were bridge construction, stair construction and trail grubbing.

Bridge and Boardwalk Construction

Two 20 ft. long by 48 in. wide bridges were constructed along the trail to span an intermittent stream and an area saturated by spring runoff. 8x8 in. timbers and treated 2 in. x 4 in. bridge decking were transported into the bridge construction sites by hand. 4 in. stainless steel nails were used for assembly.

Five boardwalks were also constructed over soft and swampy sites along the trail. The walkways were constructed using treated 4 in. x 4 in. pilings set four feet into the ground. Two 4X4 in. rails were bolted horizontally to the pilings and 2x4 in. treated decking was nailed to the rails.

Figure 1: Footbridge across an area saturated by spring run-off.

Figure 2: Boardwalks across soft ground.

Step Construction

Along the trail there were places that were excessively steep and would be subject to erosion from foot traffic. The installation of stairs on these sites prevented erosion and facilitated access for less capable hikers. The stairs were constructed by creating a 6 in. X6 in. framework of rises and runs that were subsequently filled in with material removed from the bank. In addition to steps leading on and off bridges and boardwalks a set of steps consisting of four 6-inch rises and three 6-inch runs was constructed to access the route to a bridge on the trail.

Figure 3: Steps leaving creek bed.

Trail Grubbing

The entire length of the trail was grubbed to a width of four feet and scraped down to mineral soil. This was accomplished using hoes, fire-rakes, axes and chainsaws. Large woody debris removed from the trail was placed at the head of other sub-trails to deter usage and prevent the creation of more trails. A trail loop was configured at the trail terminus. Gravel was added to parts of the trail to harden sections that become soft and muddy during rain events.

Signage:
A series of signs were created and placed along the trail in order to better educate the public about this unique ecosystem:

Figure 4: Trailhead map and introduction sign describing area and identifying trail components.

Figure 5: Interpretive sign displaying historical and ecological information.

Figure 6: Warning signs advising of falling tree limb hazard.

Fence Construction:
A visitor-friendly fence was constructed along the trail through the Cottonwood grove in order to keep people a safe distance away from potentially dangerous trees and to reduce the potential for vandalism and soil compaction around individual trees. This fence consisted of six-inch fence posts driven to a height of three-and-a-half feet with a single twelve-foot treated rail nailed to the top. The fence encloses the trail and has an overall inside width of eight feet. Fence construction took several days and was completed by NCC staff.

Figure 7: Protective fence enclosing Ancient Cottonwood Trail.

Infrastructure Installed:
Bridges – 2 @ 48 in. wide x 20 ft. long
Boardwalk panels – 6 @ 48 in. wide x 8ft. long
One set of steps – 1 set, 24 in. high
Signage:
- Trailhead map sign - 1
- Interpretive sign (4ft.x 8ft.) - 1
- Warning signs (2ft.x 2ft.) - 4

Protective fencing – 300 m.
Mineral soil trail – 500 m.

Equipment Used:
- Hammers
- Shovels
- Pulaskis
- Hand Saws
- Brace & Bit
- Ratchets & Sockets
- Chain Saws
- Post Hole Auger
- Brush Axes
- Fire Rake, Hoe & Shovels
- Garmin GPS unit

Project Summary:
The Ancient Cottonwood Trail in Morrissey is an excellent tool for educating the general public about the importance of riparian cottonwood ecosystems and the critical contribution they make to our landscape.
The construction of the Ancient Cottonwood Trail was completed on time and on budget. All goals described in the project application were met or exceeded. Media coverage of the process was extensive and positive in every respect, creating greater public awareness and appreciation for this unique ecosystem.
Negative impacts to the ecosystem from public visitation have been greatly reduced by centralizing human use patterns and minimizing ground disturbances. In addition, public safety has been enhanced on the site by channeling activity away from unstable and dangerous trees and educating visitors regarding the potential hazards of the forest.
The project provided the opportunity for enhanced community involvement in the site with potential future implications for continued stewardship.

Signed,

R.D. Forbes, R.P.Bio.
Elk Valley Project Manager
Nature Conservancy of Canada