Stream Tender Magazine

September Issue 2014

Magazine Mission Statement | Publisher/Editor Information

Previous Issue

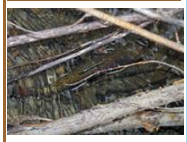
You can explore previous issues of this magazine back to its beginning, by clicking on the previous issue link on the cover of each issue!

Inside This Issue:

Willow plants and trees can be used effectively to achieve stream restoration projects. This method is called bio-engineering. Starting this year, a small spring creek will be restored in the Town of Cochrane, Alberta, using bio-engineering methodology!

See page 2 !

Above: *This is the Bow River in Cochrane, during the 2013 flood. How can old beaverdams help reduce the impacts of sudden floods such as this one? Check out Page 4 of this magazine!*



Above: *The struggle to protect the Ranch House Spring Creek trout continues. First, it was the urban run-off from a Storm Drain inflow and now it is too much water from a near by lake that is being pumped into the watershed! In both cases, it appears that the stream's trout population will be the "Sacrificial Lamb" in area development!*

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What Motivates Me?

- Clean Water !
- Good Habitat !
- Healthy trout !

Stream Tender Magazine is published quarterly!

Bow Valley Riparian Recovery and Enhancement Program Update for 2014 Season (So Far)!

Another great season of planting willows and trees to recover riparian habitat on three area streams is still in progress. So far, 8,613 willow and tree plants are in the ground, but there is more to do yet for this year! A fall planting program has been planned and by October, the full 2014 program will be completed.

Bow Valley Habitat Development is pleased to announce that **Canon Canada and Evergreen** have joined in for two fall planting programs. One is a Canon corporate event for two days of planting; the other is a sponsored program for 1,190 willow and tree plants!

By the end of the season, we should have over 10,000 plants in the ground!

Protecting the Westslopes Cutthroat Trout and Measures That Can Be Taken to Help Out!

Presently, much of Alberta SRD, Fish and Wildlife's attention and time is spent on protecting the threatened Weststlopes cutthroat trout. Since a new fishing regulation change came into effect in 1998, there are very positive signs that this beautiful member of the trout family is on the rebound!

On many of the areas cutthroat trout streams that I have fished for years, I have personally noticed a marked improvement in both the number and size of these fish!

Area streams, such as the Waiporous Creek, Burnt Timber and Elbow River, have all started to show an improvement in the fly fishing for resident cutthroat trout.

However, it isn't just the new regulations that will help protect this trout. Stopping the loss of fish habitat and the protection of what habitat exists, is a high priority to keep the recovery program producing positive results. There are also some other goals to achieve!

Read More -

Our Mountain Streams are Under Threat – Much Like the Trout that Live in Them !

In a time when the general consensus is that the oil, mining and the pipeline industry are the main focus for concerns regarding environmental impacts; there doesn't seem to be much time to think about anything else!

However, some thought should be given to the few irresponsible recreational off-roader's in this province and the impact that they have on our pristine mountain streams! As I said; **the few**! Most off roader's are pretty considerate of the natural environment that they enjoy and they don't feel the need to play in the water!

The main concern is keeping drivers of ATV's, 4X4's and dirt bikes, out of the water! Or at least confined to designated crossings, where the least amount of damage will be done.

It is not only the crossing of clear mountain streams with muddy vehicles that we should worry about, but some of the access trails to the crossings are eroding and flushing large amounts of silt into the stream systems! These erosion sites can be very costly to repair, if it is ever considered!

There are restrictions in place already, but I have to question if either enforcement is effective enough or whether the fines need to be increased. Furthermore, there are certain areas that need to be the focus of special attention. In particular, streams that support our wild trout populations and this includes spawning habitats!

I know of several areas where native cutthroat trout are barely hanging on, due to the negative impacts of off-road vehicles crossing their habitats. The spring of the year is the most critical time for these fish, because it is when they spawn.

Cutthroat trout require clean gravel beds, with aggregate of the right size, to lay their eggs. Once the eggs are laid down in the gravel, they require clean oxygen rich water which will percolate thru the gravel and allow the eggs to breath. Heavy silt loading in a spawning habitat will smother the eggs and destroy a new generation of wild trout.

These clean pristine mountain streams also support a diverse population of aquatic invertebrates that also require a silt free habitat to breath. This insect population provides food for the trout to survive. Clean water is a basic requirement for life to thrive!

Above: *A thoughtless off-roader drives right up the middle of the Waiporous Creek, as campers in the background watch with disgust! This vehicle's licence plate was partially covered with mud and a trailer hitch. This is typical on many ATV's!*

The 2013 Willow and Tree Plants are Growing More Noticeable!

" Some More Than Others!"

Every piece of ground provides a different soil make-up and willow and tree plants will grow at a rate of growth. Now and then the soil is just right for a particular variety of willow or tree plant, and the plant will grow very fast.

If I notice that one of the plants from a previous planting is going very fast, I like to take a photo and make note of the result. It is a good way to learn what varieties of Salix willows do well in a given environment.

By keeping records of this and possible rodent damage in a certain section of a planting site, it is beneficial in planning future plantings. Over time this information will help with the success and survival rate of the plants that you use.

Eventually, cuttings can be collected from the more hardy varieties of willow plants and used in future planting programs!

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New Restoration Project in the Works!

During the 2009 fisheries study on Bighill Creek, Bow Valley Habitat Development captured a juvenile brook trout in a small feeder spring creek, near the "Man of Vision" Statue, in Cochrane.

This small feeder spring that earned the name "Man of Vision" spring creek, is only a trickle of flow, when compared to other nearby feeder springs on the BHC. Yet, small young of the year brook trout that had hatched in the BHC were utilizing it as a safe nursery habitat, during the first months of their lives.

Since that first captured trout was discovered, the small spring has always been on my mind as a possible future restoration project.

Up until around 1970, there was a barn and corral located next to this small spring creek, with heavy concentrations of cattle and horses pounding down the stream banks over the years.

The result was that the stream channel had been widened and the spring water seeped thru a bog of mud and livestock manure. Not a pretty site at that time!

When the land was finally turned over to the Town of Cochrane, the stream had a chance to recover somewhat, but the width of the channel remained wider than it should be. With a shallow flow of water thru a mat of sedge and grass.

There was not much of a normal stream channel left and even the remaining flow in the spring creek was hidden beneath a canopy of dead grasses. Hardly enough to be noticeable!

The Man of Vision Spring Creek needed some restoration work!

Above: *This is the first brook trout captured in Man of Vision Spring Creek, in July 2009. The juvenile trout was 51 mm in length and it was trapped approximately 30 metres upstream of the confluence of Bighill Creek (BHC).*

Above: *Since that first brook trout was trapped on the Man of Vision Creek, more trout have been spotted further up the stream, in shallow pond areas like this one.*

"Even the smallest of tiny spring creeks can hold trout. Years of trout trapping has confirmed this. Electro fishing surveys often overlook such small waters, because they are too difficult to electro fish in. However, trout trapping is far superior to electro fishing for tiny spring creeks such as Man of Vision Spring Creek! Brook trout are especially suited for occupying small trickles of flow!"

Above: *Looking downstream of the path system on Man of Vision Spring Creek.*

Recently, a friend of mine mentioned that she had observed small fish next to the path system on the spring creek. The size of the fish that she spotted (5 inches) indicated that they were possibly brook trout.

After hearing this important information about the presence of trout further up the system, I made a point of visiting the area a number of times, to confirm that the fish were trout. Finally, I spotted one, while slowly approaching the small ponds where they had been seen!

The first trout that I witnessed in the shallow pond was definitely a brook trout that was approximately the size that my friend described. When the trout realized that it had been spotted, it took off in a cloud of silt for the nearest undercut in the sedge grass.

I was very please to find this brook trout that day and I knew that this feeder spring creek was now confirmed to be an important component in the watershed's fishery! I also knew that the stream needed some work!

The area of the Man of Vision Spring Creek that could benefit from a little enhancement work, was the lower reach, downstream of the pathway. The area where the trout had been spotted could stay as it is.

The experience of spotting that first trout further up the spring creek was all that was needed to motive me into some immediate action. Since that first encounter, I have observed trout even further up from the shallow ponds. So a plan was in the works for the creek.

Right Photo: *This photo shows the middle reach of Man of Vision Spring Creek. In 2009, BVHD trapped the first brook trout next to the willow shown on the right hand side of this photo. As you can see, the creek is well hidden in a canopy of sedge and other aquatic grasses along the stream.*

The Restoration Plan and Approach!

Unlike the Millennium Creek Restoration Project, which required some heavy equipment and specialized silt containment measures, the Man of Vision Spring Creek restoration project will take a more simplistic approach!

Instead of completing any in-stream work, bio-engineering methodology will be utilized to achieve a similar end result. This approach is based on the objective of creating a narrow deep channel with constricted flows and plenty of in-stream and riparian habitat.

The plan is to plant willows and trees along the wetted perimeter of the existing stream channel and over time this riparian growth will encroach in from the water's edge.

Root systems from the willows and trees will elevate the stream banks and limbs and branches from willows will help to provide channel constriction and habitat for resident trout.

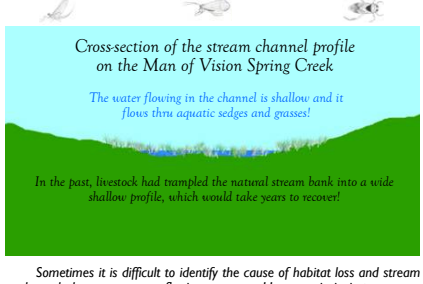
As a willow or tree plant grows into maturity, the root systems expand, lifting the ground surface and creating an elevated mound. When this occurs along the water's edge of a trapezoidal channel, the channel will eventually narrow.

The limbs and branches from the willows are weighted down into the edge of the stream channel by winter snow and come spring, they will stay in this position, providing added channel constriction and cover for resident trout in the small spring creek.

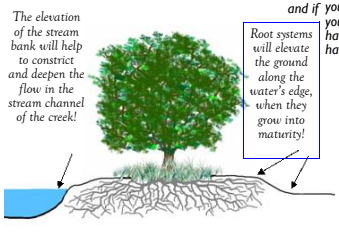
This is natures way of recovery on wide-low profile stream channels. By planting the willows in an advanced state of growth, we can help speed up the process!

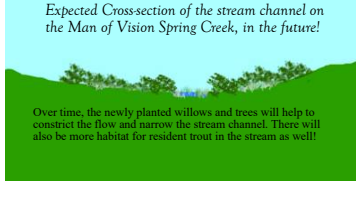
This bio-engineering method is also cost effective, when compared to more elaborate in-stream fish habitat enhancement projects.

A number of planting treatments will be required, but the first one will be completed this fall!



Sometimes it is difficult to identify the cause of habitat loss and stream channel damage on our flowing streams. However, it is important to realize that many streams have suffered major damage over the years, and if you can determine the cause, it is far easier to gain support for your restoration projects. Under natural conditions, all streams have historically flowed along narrow channels with good riparian habitat!





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"Ranch House Spring Creek Trout - Under New Threat!"

Ranch House Spring Creek is a small spring creek that flows into the Bighill Creek, in the Town of Cochrane, Alberta. The tiny feeder provides both spawning and nursery habitat for a resident population of brook trout and migrating trout from the Bighill Creek.

Once again, the Ranch House Spring Creek trout are under threat of being impacted by local development! First it was the storm drain inflow, from a nearby housing development and now it is coming from a source further to the north!

This new threat from further to the north, is a large volume of warm, polluted water that is being pumped out of a nearby shallow lake, which just last year had major problems with algae!

The spawning and successful incubation of brook trout eggs on Ranch House Spring Creek was first documented in Stream Tender Magazine, in the June 2014 issue. Having a new threatening situation to this newly discovered trout population, so soon after it has been first recognized, is a sudden and very disappointing matter!

A few years ago, the major threat was a new storm drain inflow on the creek, but now, having additional water entering the system will just magnify the problem. The primary concern is that all of this additional flow, is too much for the existing stream channel to handle, and major erosion problems are destine to occur.

Secondly, and by no means less important, is that the new inflow of water from the lake is too warm for the cold water brook trout population to cope with. On a recent tour on the small creek, I didn't see a single trout present in the stream. I suspect that they have all migrated downstream into the main stem of the Bighill Creek.

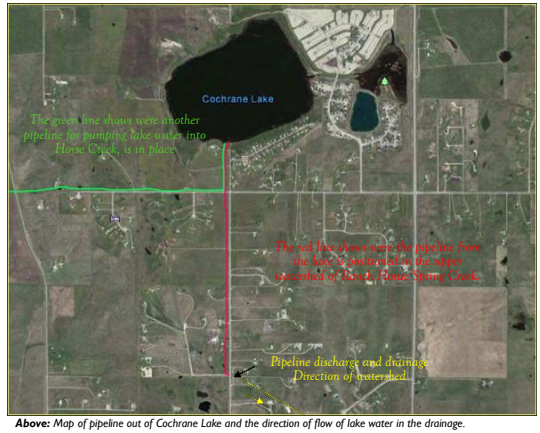
During my recent tour, I took some water temperatures on both the inflowing lake water and a ground spring just downstream, which would give me a reading of what the water temperature should be for this stream. The inflowing lake water read 68 degrees F and the ground water spring reading was 52 degrees F. The temperature reading on the ground water spring is ideal for brook trout, especially in July and August!

The lake water temperature was right at the upper limit of when brook trout will start to experience stress and stop feeding. This explains why I did not see any trout in the stream on that July 29th summer day. The temperature readings were taken at 1:00 PM, so there would have been even higher water temperatures from the lake, by late afternoon that day!

When I first observed the added flow from the lake, in the stream channel, I knew from previous years that the volume of flow was well over double of what normal stream flows were for the spring creek.

Another thing that caught my eye, was that there were large amounts of algae in the stream channel, more than I had ever observed before. What would all of this extra pollution do to the trout population, especially the "Young of the Year" brook trout?

Bow Valley Habitat Development started working on this small trout stream in 2009, by first conducting a trout trapping program. In 2010, a small waterfall was removed from the stream to allow Bighill Creek trout to migrate upstream into nursery and spawning habitats, which were just upstream of the waterfall.



Above: *Map of pipeline out of Cochrane Lake and the direction of flow of lake water in the drainage.*

"Polluted Water Travels Downstream into a Trout Stream with Water Temperatures Too Warm for the Resident Brook Trout to Cope With!"

Above: *The end of the pipeline discharge is located in a road culvert that is located on the Ranch House Spring Creek Watershed!*

Above: *You can see from the large amount of algae in the stream channel that the lake water is polluted with too much organics, such as nitrogen or phosphorus!*

Above: *This surface water temperature is of the lake water in the stream channel and it is measured in degrees F.*

Above: *This is a reading of surface water temperature on a ground spring that enters the creek channel at the same location as the lake water temperature was taken. This ground water spring represents the normal water temperature of the Ranch House Spring Creek!*

"Water Temperatures and Trout"

Trout require cold and relatively clean water to thrive. As previously mentioned, the brook trout will experience levels of stress when the water temperatures exceed 68 ^{0} F. When the water temperatures reach heights of 78 ^{0} F, the watery environment is lethal to trout!

Another major problem with excessively warm water is the lack of dissolved oxygen in the stream. Warm water does not retain oxygen as effectively as cold water, so this even worsens the ability of trout to cope and survive during hot summer months.

Trout will migrate up or down a stream system, looking for a more cool water habitat, when the warmth of the water makes them uncomfortable. Ground water springs are very important during long hot summers!

"Update on the Ranch House Spring Creek Issue!"

I contacted both the regional Provincial fisheries biologist and Alberta Environment, regarding the diversion of water from Cochrane Lake into the Bighill Creek watershed. It took a while to get a response, but eventually I found out some interesting, yet troubling news!

The regional biologist had not been informed about the pumping program! Apparently, no one had notified her during the permitting process! This was very unusual, because any work or water diversion permits require fish and wildlife office approval, before being granted to anyone.

This totally surprised me, because usually, regional fisheries biologists are well informed about potential impacts to the fishery that they manage! I know that she is aware of the importance of the Ranch House Spring Creek and Bighill Creek fall spawning event, for both brown trout and brook trout.

The really alarming news came from Alberta Environment's, compliance officer for this matter. He basically stated that this pumping was a priority, even if the spawning event on Bighill Creek was disrupted.

One sentence from his response, sums it up; I quote: *" It is recognized that this (the pumping of water from Cochrane Lake) will potentially affect brook trout spawning in Bighill Creek this year but we do not anticipate any long term effects to the ecosystems of Horse or Bighill Creeks or the Bow River".*

It is really too bad that our wild trout and their habitat are receiving such poor regard when it comes to potential impacts to the environment these days! You know that there is always an alternative to any situation, if the time and thought is spent investigating it!

A lot of time, money and volunteer effort has gone into the protection and enhancement of the Bighill Creek sport fish recovery program, with trout numbers on the rebound! This pumping issue is just another set back that the trout and those concerned, will have to unfortunately put up with!

Above: *Behind the leaves, you can see two brook trout spawning in the Ranch House Spring Creek, in the fall of 2013. The water in this small tributary to the Bighill Creek is crystal clear and just the right temperature for brook trout to spawn in.*

The added velocity of additional volume of flow in the creek, now that almost three times as much water is being pumped into it, will disrupt the spawning habitat and a generation of trout in the Bighill Creek will be lost!

Bow Valley Habitat Development will still monitor the creek during the typical spawning period in October of this year. Further reports on this matter will follow in the December issue!

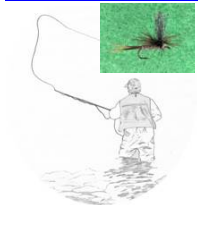
What is at Stake?

Please check out the following two videos–each is just over 2 minutes long!

The first video is of spawning trout on Ranch House Spring Creek and the second one is the trout hatch after a successful incubation of eggs!

http://youtu.be/C_m5tHy8Y3o?list=UUA28Cb11CXrhrshOItpYStg

http://youtu.be/eL5nT5bxgLU?list=UUA28Cb11CXrhrshOItpYStg



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"Old Beaver Dams– Natural Flood Control!"

In 2013, the City of Calgary and some surrounding communities, suffered the consequences of a record setting flood event on the Bow River.

The damage and personal suffering created by this disaster was significant! This historic flood initiated an immediate response by both local and provincial government to take action to deal with any similar future events.

For both the City of Calgary and the surrounding communities that were damaged by the flood, a team of River Engineers set about designing a plan to help control impacts from any similar future flood events.

The best approach was to design structures that could reduce the volume of flow entering these communities by holding it back over a longer period of time.

This could be achieved by increasing the storage capacity on dams across the Bow River, upstream of Calgary, and creating dry dams on some of the major streams on the watershed. A consensus was reached that this would be the most effective mitigation plan.

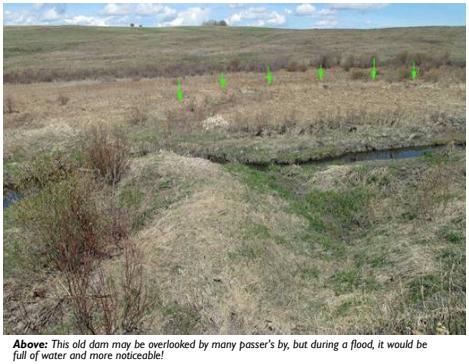
For those of you that don't know what a dry dam is, essentially it is a dam across a river or stream that has an opening in the stream channel, which allows a given volume of flow to pass thru.

During flood events, the constricted opening will create a reservoir of water to dam upstream of the structure. Large volumes of this stored water will seep into the ground or be trapped in low lying areas as the water levels recede.

In the natural ecosystem, these dry dams already exist on smaller streams and tributaries. They are created by beavers over many years of work and they come in the form of old beaver dams.

These old beaver dams are structures that have been long since abandoned by the beavers, and they remain intact for many years. There is always a breach in the dams, which allows normal annual flows to pass, but during floods, the old dams still hold water!

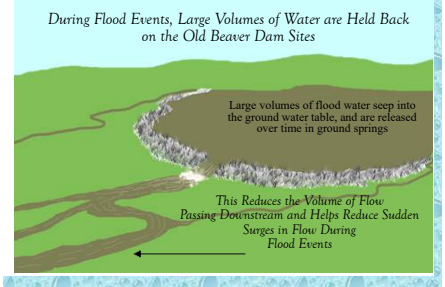
Above: *This is what an old beaver dam looks like, after approximately 10 years.*



Above: *This old dam may be overlooked by many passer's by, but during a flood, it would be full of water and more noticeable!*

"Old Beaver Dams Span Across Small Streams and They Are Mother Nature's Dry Dams for any Flood Events!"

During Flood Events, Large Volumes of Water are Held Back on the Old Beaver Dam Sites



Old Beaver Dams Produce New Willow Growth!

If you look at the photo to the upper left, you will see that there are willow plants growing on the top of the old beaver dam along its entire length.

These willows were grown from the cuttings that a beaver used to build its dam with. This recruitment of new willow growth is a common site on the top of many old beaver dam sites.

I will often use the height of the willow plants as a method of aging how old a beaver dam is.

Once a beaver dam is abandon, the willows are allowed to grow without active beavers eating them over the first few years of growth.

This regeneration of riparian growth is part of the natural process!

Above: *Beaver Dams on the lower reach of Bighill Creek have been opened up to allow trout to migrate upstream into areas of prime habitat for both spawning and residing!*

Dam Removal Program Continues on Bighill Creek!

A few years ago, Bow Valley Habitat Development obtained the necessary permits and permissions to remove some illegally built rock dams, on the lower reach of Bighill Creek.

The removal program would insure that migrating trout would have free passage up the system, to habitats further upstream. Especially during the spawning migration!

After removing one large rock dam that was totally blocking fish passage up the creek, the resulting increase in juvenile trout populations upstream of the old rock dam site, is significant!

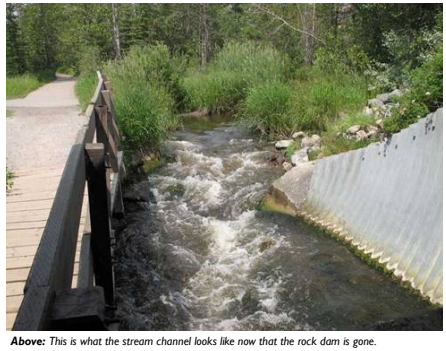
Now that the channel is negotiable for trout of all sizes, both trout and whitefish from the Bow River system can also move up into the creek to spend the winter months in a stable habitat.

Due to the fluctuating water levels in the river and winter ice pack movement, the Bow River is not a good place for sport fish to spend the winter! I had observed fish stacked up below the rock dam in the late fall, before the dam was removed.

Beaver dams have also been opened up during critical migration times for both brook trout and brown trout. In the spring and fall.

This dam removal program has been completed on the lower reach of Bighill Creek, by volunteers. Especially in the spring, when trout are known to migrate up tributaries, to spend the spring and summer months in a productive stream habitat.

Above: *This illegally built rock dam was blocking fish migration up the Bighill Creek!*



Above: *This is what the stream channel looks like now that the rock dam is gone.*

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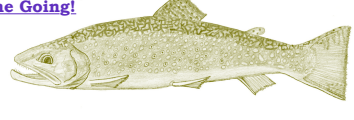

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"Willow Plant Scouring and Flow Constriction"

In the last issue, some of the benefits of planting willows along stream banks was covered in the article: "Willows Along the Water's Edge". In addition to the benefits that were mentioned in that piece, there are some other attributes that I would like to mention in this article.

Once willow plants are introduced along the stream banks of small streams, like the Bighill Creek, there structure will help to deepen the stream channel, cleaning silt from the cobble and gravel substrate. Their growth will also add shade to the stream channel and reduce weed infestation!

A good example of weed infestation is a section on the lower reach of Bighill Creek. During some years, late in the summer, weeds will choke the stream channel and reduce the velocity of flow in the creek. This heavy weed growth will also accumulate silt and make the stream channel more shallow than it should be.

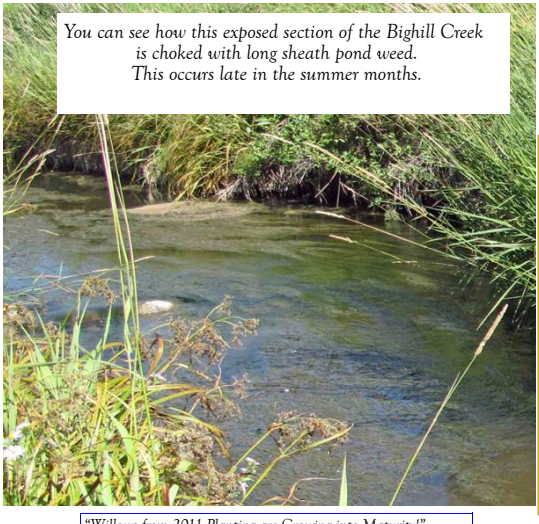
The heavy growth of long sheath pond weed occurs on this length of the stream, because the weeds are exposed to maximum sunlight and there is no shade to inhibit their growth. Also, having abundant silt on the stream bed encourages this particular type of weed growth.

When willows are planted and start to grow along the water's edge on this section of Bighill Creek, the constriction of flow that they create, will help to scour the silt away and deepen the stream channel.

The over hanging willow plant that droops down into the water will create a deflection of surface velocity that is deflected down to the bottom. This deflection creates turbulence which cleans the bed material, such as silt and exposes clean cobble and gravel.

You can see the up welling directly downstream of the willow, on the surface of the water! This shows the plant is creating a scouring effect and the plant is helping to keep the bottom clean!

Above: *This photo shows how the surface velocity is deflected down onto the bottom, to scour a deep channel with clean gravel and cobble substrate!*



You can see how this exposed section of the Bighill Creek is choked with long sheath pond weed. This occurs late in the summer months.

"A Little History of the West Nose Creek Fishery"

Not knowing anything about the history of sport fishing on West Nose Creek, I was interested in finding out about it, and if there was any! I was determined to find out what ever I could about this stream and past fishing stories or history of the trout populations that were once present in the stream. This is important information when you are conducting a restoration program!

Fortunately, while planting with the BP volunteer group on West Nose Creek this spring, Phil Unland happened to mention that a friend of his had talked to him about fishing the creek many years ago. I asked Phil if he could forward the contact information for his friend and I could talk to him, to find out some details.

Once I had a phone number for Paul Jackson, I called him to see what information he could pass on to me. Paul had fished the stream back in the 1960's, when Alberta fish and wildlife hatchery staff were stocking the stream with rainbow trout.

Apparently, West Nose Creek was a popular destination for area sport fishers at that time. Not only did Paul and his friends catch rainbow trout in the main stem of the creek, but they also caught rainbow trout in "Big Spring Creek", which is a small spring feeder tributary to West Nose Creek, just on the outskirts of the City of Calgary.

When the Province stop their provincial stocking program on many small area streams, back in the mid 1960's, the population of rainbow trout that still resided in West Nose Creek, slowly disappeared! The stream suffered the same fate as Bighill Creek, with lower volumes of flow, the streams could not sustain a trout fishery!

With the increase in volumes of flow, on many area streams, in recent years, there is no reason why these once popular sport fisheries, cannot support trout once again! This information was very helpful, and it adds credence to our efforts to restore West Nose Creek and other streams like it!

"Fallentimber River - The sacrificially Lamb!"

On a recent trip to fly fish a pristine mountain trout stream, Joe Thompson and I decided to drive back home on a road that crossed over the Fallentimber River. It had been a while since I had traveled the road and I was anxious to check out the stream on this upper reach, to see what condition the flow and water quality was in.

The last few times that I had traveled to fish this stretch of the Fallentimber, I was totally disappointed to find that the water was cloudy and the streambed was full of silt; from recreational ATV's that had started to frequent the area.

It was 4:00 PM when we came to the bridge crossing. Approaching the stream, I could see lots of campers packed in close to the stream on the upstream side of the road. The downstream side of the road had been blocked for access by large boulders and concrete barriers.

I asked Joe to come to a stop on top of the bridge so that we could have a good look at the creek and inspect the water clarity and silt loading that had accumulated on the streambed.

It was a very disappointing few minutes that we spent, looking down into the stream channel. You could hardly see the bottom of the moderately shallow section, just upstream of the bridge! All of this turbid water and silt loading had occurred as a result of recreational bikers, quad enthusiasts and 4X4 truckers!

I know that these people just want to have fun, but little do they realize that their activities while playing in the water of the Fallentimber, will actually destroy an entire ecosystem. Below the surface of the water, there is a vast chain of life that depends on the clean flowing waters of this mountain stream. Furthermore, countless furbearing animals and birds also depend on the life below the surface for their survival!

Witnessing things like this are very upsetting to me, knowing that special environments that I once enjoyed fly fishing on, are now headed for total destruction, which if efforts were started, would take many years for recovery. This will all happen in a single lifetime, which seems totally irresponsible to me!

Why can't our provincial government agencies, responsible for looking after these streams, do their job!!

Read about more on this topic!

"Willows from 2011 Planting are Growing into Maturity!"

Left: This willow plant was planted in 2011, along Bighill Creek, in the Town of Cochrane, Alberta. You can see that it is large enough to stand out in the tall grass along the creek.

Same Plant Close Up

Right: This is a close up of what the top of the cutting looks like after three years of growth. You can see the blunt top end of the cutting in this photo.

Above: This is what our clean mountain streams should look like! Not like a flowing mud puddle!!

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Above: *ATCO Pipelines volunteers pose for a group photo after the planting is done.*

Bow Valley Riparian Recovery and Enhancement Program 2014

What a great start to this program! Presently, we have planted a total of 8,613 willow and tree plants on the stream banks of three area tributaries of the Bow River! The plants, to date, cover approximately 10.5 kilometres of stream bank!

With all of the partners involved in this year's program, by the end of the planting season, we will have planted over 10,000 plants. This is a substantial number of native plants on any watershed restoration project!

This 2014 program may be the largest watershed recovery project in the country! Based on the little research that I have done regarding this topic!

It has been a great growing season once again this year. We have had really decent rainfall this spring and early summer. The survival rates are still relatively high, considering the damage done by rodents.

I have been keeping a close watch on all of the planting sites this summer and you have to search thru the tall shoreline grasses to find the plants, but they are there to find, if you look carefully.

For me personally, I have enjoyed working with the volunteers that helped out this year. This year's planting with ATCO Pipelines and the BP volunteer group is the second one that we have completed together and their abilities at planting are improving!

This year, we didn't have to deal with any major floods, such as those high flow conditions in 2013. The freshets that happened on all three of the planting stream sites, only wet the ground and made planting easier! There was also plenty of moisture from the snow melt this spring!

Along with inspections of this year's crop of plants, I visited last year's sites and I am please to report that we have some good survival on the 2013 planting program!

What started as a few stream specific riparian programs, has now transformed into a watershed riparian recovery and enhancement program. The title "Bow Valley Riparian Recovery and Enhancement Program" encompasses the Bighill Creek, Nose Creek and West Nose Creek.

There are also a number of small tributaries to these streams that fall under this same watershed program!

Above: *Volunteers plant on the lower end of the Bighill Creek, near the mouth of the Bow River.*

Above: *There have been spruce trees planted along this section of Bighill Creek, but the stream channel lacks the native willows that are indigenous to the stream's historic native riparian habitat. A group of volunteers will take care of this natural deficiency!*

This Year's Partners So Far!

Spring Program

Cochrane Foundation ——— *502 plants*
Walmart/Evergreen ——— *1,273 plants*
Inter Pipeline ——— *977 plants*
Recreational Fisheries Conservation Partnership Program (Department of Fisheries and Oceans Canada) ——— *5,221 plants*
Cochrane Community Grant Program ——— *406 plants*
ATCO Pipelines ——— *234 plants*
Total willows planted this spring ——— *8,613 plants*

Fall Program

Canon/Evergreen – Planting in progress –1,790 plants

Additional support from City of Calgary, Airdrie and the Town of Cochrane, Alberta!

Distribution of plants so far:

Streams:
Big Hill Creek ——— *2,335 Plants*
West Nose Creek ——— *4,623 Plants*
Nose Creek ——— *1,655 Plants*

" So far- volunteers have spend over 260 volunteer hours on this year's planting program! "

" So far–A total of 8,613 willow and tree plants have been planted on approximately 10.5 kilometres of stream bank!"

Above: *A group of retired BP volunteers ready themselves for a morning's planting on West Nose Creek.*

Right Photo: *Volunteer planter, Blair Porter, of Cochrane, plants willows along the water's edge of the "Man of Vision" Spring Creek.*

This spring creek is a small tributary to the Bighill Creek and it is utilized as a habitat for juvenile trout.

The planting program is part of the Canon/Evergreen partnership planting program for Bighill Creek and surrounding streams!

2014 Willow and Tree Crop is Growing Very Nicely!

Hidden beneath a canopy of tall canary grass and sedge, this year's crop of plants is growing very nicely! On many areas of the three main streams that were planted in the spring, you need to search thru the tall grass to find the plants.

For some of the ones that I decide to take a photo of, I usually trample down the surrounding grass to make the plants stand out in the photos. The tall grass provides support for the growing willows and helps to retain moisture in the soil by shading the ground from the hot sun.

The canary grass will sometimes crowd out the willow plants root system and the plant will die, but this is just part of the process. Planting willows and trees in a natural environment is totally different from propagating domestic plants, where the owner will weed, water and fertilize the soil!

There seems to be an abundance of muskrats on all of the streams that have been planted this year, so I expect a certain amount of loss due to these cute but pesky critters! Fortunately, the muskrats primary food source during the summer months, is the Western Water Sedge and other native grasses and sedge plants.

Earlier this spring, I tried applying a mix of ground hot pepper and linseed oil, which I brushed onto the stem of the plants, in hopes of discouraging the rodents from taking a snack on the plant's bark. Unfortunately, the muskrats must have a tolerance for "hot sauce", because they still chewed the stems, after the mixture was applied!

Maybe I will try something else in the future, to try and dissuade the little buggers from causing this damage! If all else fails, we will just have to accept the loss and persevere!

Country Hills Golf Course - Interested in Completing Riparian Plantings on West Nose Creek, in Calgary!

On August 21st, 2014, I met with Country Hills Golf Course Superintendent, Scott MacArthur. Scott was interested in getting some information on my planting system, to use it for a riparian program for West Nose Creek, where it runs thru the Golf Course, in Calgary.

I was more than happy to help him out, because this would fit in very nicely with The "Bow Valley Riparian Recovery and Enhancement Program" that was already underway on West Nose Creek, in the City of Calgary!

There is just over 4 kilometres of stream channel on the Calgary golf course, so any recovery work would be very beneficial to the future heath of the stream's riparian zone!

Also of benefit to the stream, Country Hills Golf Course is completing some back stabilization projects to prevent erosion on their golf course. This will also help reduce silt loading into the stream channel.

The willow planting is primarily a "best method approach" to preventing future erosion problems on the golf course. However, from our watershed restoration perspective, it will be a huge benefit to the stream's riparian zone and water quality!

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What Responsible Off-Roader's are Doing to Reduce Their Impacts on Our Streams!

On page 6 of this magazine, I wrote an article on the devastation that has been occurring on a section of the Fallentimber Creek. The cause of this damage is due to irresponsible off-roader's causing heavy loads of silt to enter the stream.

The problem is ecreational riders that either don't know how their activities are impacting the environment of the stream or they just don't care! These activities are jeopardizing future access to this and many other areas of the province.

I wanted to give you, the reader, an example of what a responsible group of recreational riders do to reduce the impact of their activities, by completing projects that help to protect the areas that they use!

My example is a well established club that has been working on projects for many years now, to insure that their sport and the public land they utilize, is maintained. This includes the protection of our clear mountain streams!

The club is called the "Rocky Mountain Dirt Riders"! I know this because my brother was a long time member of the club. Yes, my brother is a dirt biker! However, he is a responsible individual that is well aware of how important trout streams are to me and all those other fly fishing fanatics.

The mission statement of the club, pretty much says it all:

- Encourage responsible trail use.
- Organize and complete trail maintenance.
- Provide education to others on proper trail use and etiquette.
- Keep our sport alive.
- Have Fun!

As you can see, their whole attitude about their approach to the sport of off-roading is very responsible in nature! They also have realized for many years now that there are other outdoor enthusiasts that share in this responsibility to protect the environment on this public land!

One of the most important programs that this club has undertaken, for many years now, is to build rustic bridges over small flowing streams. They recognized very early on that it was of major importance to protect the water quality in these waters and the existing fisheries of wild trout!

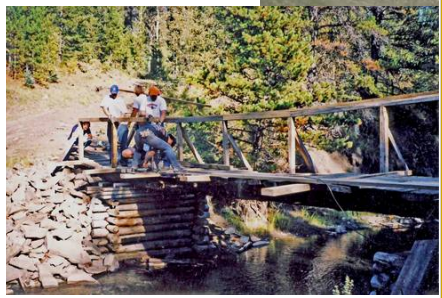
Off Roader's that abuse the environment, especially water crossings and stream banks, should be aware of something that is very important to them. They have a place to ride their expensive toys!

Organizations such as the RMDRA are also looking out for these irresponsible rider's interests, as far as being able to have a destination of public land to ride their machines on. The club has lobbied for many years now to keep this access open to the general public!

Sometimes this lobbying to maintain access can be very difficult when you find instances of land abuse, especially on streams that hold the threatened West Slopes cutthroat trout and the bull trout! If you witness abuse, you should report it immediately!

Photos by : Gail Salvage

Above: *Members of the Rocky Mountain Dirt Bikers Association volunteer their time to build a rustic bridge over the Fallentimber Creek, in the headwater's area, to support their motorcycles.*



Above: *As the bridge nears completion, you can see that the structure can also be used by hikers and mountain bikers. The bridge took a lot of hard work to complete!* Photos by : Gail Salvage

Above: *Young Alex Woods, looks on as his dad Craig helps out with the construction crew of volunteers. This is the best way to educate young future off-roader's of how important it is to look after the environment!*

Bull Trout Recovery Well Underway Since the Early 1990's!

Since the early 1990's, the Alberta bull trout has received special protection in a province wide recovery program. This native member of the char family resides in most eastslopes mountain streams, where it reigns as the dominant predator over other native and non-native sport fish.

The bull trout grows to a very large size, in part because of its diet of other fish and its long life span. They are often easily spotted lying on the bottom of deep pools in the crystal clear water of mountain streams. They are easy to see because of their large size.

I have had large bull trout chase a cutthroat trout that was on the end of my fly line in the past, and this is a common story told by many a fly fisher! The bull trout is known to feed on a big meal and then retreat to the protection of the deep water after it has satisfied it's appetite!

In recent years, while fly fishing some of the eastslopes streams, I have noticed that the bull trout numbers have started to increase, along with the average size that I catch.

The best way to catch a large bull trout is by using a streamer fly pattern. However, I have caught some very nice sized bulls on large dry fly imitations, such as the stonefly and hopper patterns.

I once caught a 26 inch bull trout on the Wild Hay River, using a large dry Stonefly pattern. The big trout was feeding on insects in relatively shallow water, close to a fallen spruce!

Bottom Left: *Fly Fisherman Joe Thompson holds a nice bull trout for a photo, before it is safely released.*
Below: *Bull trout are known to grow to a very large size in many mountain streams. Large streamer flies work well!*

Protecting the Westslopes Cutthroat Trout

On the May long weekend, in 1998, I set off from my home town in Cochrane, Alberta, to head into the mountains, to a particular cutthroat trout stream. My goal that day was to get some video of spawning cutthroat trout!

I normally avoid traveling into the back country on a long weekend, but the schedule at that time made it impossible to do the trip on a week day. When it comes to video of spawning cutthroat trout or any trout, timing is critical!

It had been a number of years since I had driven into the Waiporous Creek watershed, during a long weekend, so the shock of what I was about to experience that day, was "a real eye opener"!

As I drove along the access road towards the small tributary stream where I expected I might find some spawning trout, immediately I was surprised to find that there was more traffic on the road than there would be on the main street of my home town on a normal week day.

There were 4X4 trucks, quad ATV's and dirt bikes in a continual stream, coming out of the timber and camp areas and up and down the road. One idiot was driving right down the centre of the stream channel on the Waiporous Creek main stem.

I quickly grabbed my video camera and jumped out of my truck. I was able to catch just a little footage, as the blue 4X4 disappeared around a bend in the stream channel, approximately 1 kilometre downstream of my position on the stream bank.

Above: *This is a typical mature Westslopes Cutthroat trout for the area of the Waiporous Creek Watershed. Other cutthroat trout streams will produce larger trout, but this small stream strain is very pretty!*

After video of the idiots was completed, I traveled up the road to where the creek that I was traveling to, entered the main stem of the Waiporous. Immediately, I noticed that the creek's water was muddy and too discoloured to allow any video of spawning cutthroat trout that day, so it was time to head home in disappointment!

Fortunately, I managed to get some video of spawning cutthroat trout, the following week. The location where I found the spawning cutthroat was a gravel bed that was almost completely covered in silt from all of the off-road vehicles that had crossed the stream channel, just upstream of the spawning bed.

With the cutthroat trout on the threatened species list, I could not understand why this type of recreational activity around a critical spawning habitat would even be allowed!

Above: *This is a photo of the cutthroat trout spawning tributary on that May long weekend in 1998. You can see how dirty the water is!*

Above: *Off roader's will often play in mud holes like the one in this photo, and then they cross small streams with their muddy vehicles. This is a big problem!*

Right Photo:
The sign reads :

Environmental Protection is Everyone's Concern

This sign along the Waiporous Creek was intentionally rammed by an irresponsible driver of a large 4X4 truck. The good news is that he was caught and heavily fined for his dastardly deed!

On that 1998, May long weekend, thousands of dollars of damage was done and we the tax payer footed the bill!

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A look Back at the Millennium Creek Program –Ten Years Later!

It has been 10 years since the Millennium Creek Restoration Program was first started. The first movement on the four year restoration program started in 2004, with survey, design, permitting and collecting baseline data. The actual in-stream work did not begin until the following year of 2005.

In the beginning of the in-stream project, which was classified as "Phase One", the channel cutting was completed on the stream. This involved the creation of a new narrow stream channel with constricted flow to create velocity in the creek.

High pressure water jets were used to cut the new stream channel in the creek. A series of silt fences downstream of the work area, were installed to capture the silt during the cutting project.

After the channel cutting was completed in 2005, the next three years were dedicated to the creation of fish habitat structures and other enhancement measures. Finally, in 2008, the program was completed.

It has been very rewarding and also interesting to watch how "Mother Nature" has put the final brush strokes on our restoration project on the new Millennium Creek! Native willows and water sedge and grasses have complemented the enhancement structures over the past 8 or so years.

Now, in 2014, the creek appears as if there were never any man-made structures built on the stream. Everything looks perfectly natural!

This is exactly what the primary objective was, when the project was first designed! To create enhancement structures and complete the work without it appearing that the hand of man was involved in the restoration!

Mission accomplished!

Above: *This photo was taken in November of 2005, only a few months after the new stream channel was created on Millennium Creek. Prior to the channel cutting project, the water in the channel went from the edge of the trees on the left, to the edge of the willows on the right. On this reach, the wetted perimeter of the creek was approximately 3 to 4 metres wide. Now it is approximately 50 cm!*
Below: *This is a photo of the same length of channel, from the same position, taken today! The pool habitat was constructed in 2007. You can hardly see the stream channel upstream, thru the willows!*

You can see from the photo above, the pool habitats have maintained good depth and the cover habitat around the perimeter of the pools still provides good cover for the resident trout. In the low gradient of the Millennium Creek's channel, the ability of the Log V-weirs to keep the pools scouring and deep is very impressive! The pools are quite natural in appearance as well, considering that they were built in 2006, 2007 and 2008, they are under a decade old!

The Millennium Creek Volunteers

Above: *The Cochrane Scout Troop finishes off there hard work on cleaning pool habitats on Millennium Creek, by taking an ice cream break. You can tell by the laundry, these kids don't mind a little mud on their cloths! We might describe their work efforts as playing in the creek!*

There were hundreds of hours of volunteer time spent on the Millennium Creek Restoration Project, over the four year program! I enjoyed working with all of them, both adults and kids.

I always find working with kids a lot more entertaining. The Cochrane Scout Troop not only helped out with the in-stream habitat enhancement part of the program, but they also completed two stream clean-up projects and a willow planting event!

It is amazing how much work can be completed when you give the troop a task and turn these young people loose to complete it! The kids were rewarded with ice cream, hot dogs and refreshments!

The scouts earned a few environmental badges for their efforts!

Above: *Kids from a Cochrane Church group help out with the landscaping on a pool habitat on Millennium Creek in 2008. The team of helpers applied native grass sod over the exposed muddy stream banks, on the east side of the pool that had been constructed.*

The Millennium Creek Project Sign was Retired Today!

Above: *The Millennium Creek Project sign has been positioned on the stream bank of Millennium Creek for 8 years now. It was always intended to be a temporary sign informing the passers-by that the stream had undergone a major make-over.*

The sign was located right next to the path system and lower bridge on the creek, so plenty of people have noticed it over the years. However, it had come time to remove the old sign and today I did just that!

I will probably keep the old sign around the house as a memento and keepsake to remind me of that part of my life. On my many trips to the stream, the old sign was always there to greet me and I only had to replace it in position once, when someone decided to pull it out of the ground and chuck it into the trees.

Fortunately, the sign post will be reusable at some point in time, in the future, if needed!

"A Before and After Look at One of the Pool Habitats on Millennium"

Above: *This 2007 photo shows one of the pool habitats under construction on the lower reach of the creek.*
Below: *This is a 2014 photo of the same pool habitat, from the same position, looking upstream at the pool. The depth in the pool is approximately one metre, the same as when it was constructed on the creek in 2007!*

Above: *For the heavier construction work, local volunteers chipped in to construct pool habitats, such as this log V-weir and pool. The habitats are still intact and providing a home for the resident trout populations in the creek, six years after they were built!*

Lots of Trout in Millennium Creek These Days!

Prior to the start of the Millennium Creek Restoration Program, in 2005, an electro fish survey was conducted on the stream to determine if the creek had a resident population of trout.

Only 5 brook trout were captured on the lower 50 metres of the stream. Upstream of that small stretch there was nothing! The creek was too shallow and full of silt to support trout!

Starting in 2007, electro fish results started to show more trout were moving up into the system, despite the fact that the stream was still in the middle of being restored!

By the time the project was completed in 2008, there was already a resident population of trout in the entire reach of the creek! As a matter of fact, trout were spawning in the constructed spawning habitats in the fall of 2008, only a month after the spawning habitats were completed!

In 2010, an additional spawning habitat was constructed at the top end of the creek and it was also now being utilized by brook trout. This season is the fourth year of a successful hatch of trout on the creek!

Left Photo:

There are two trout in this photo, can you find them? The large one is a brook trout, which are the most common trout found in Millennium Creek. The other trout is a small juvenile trout which type I am not sure of. There are rainbow trout, brown trout, Mountain whitefish and brook trout that use the stream as a nursery habitat. Electro fishing surveys have confirmed this in 2007 to 2009!

The Major Partners in This Restoration Project Were:

The Town of Cochrane
The Alberta Conservation Assoc.
TransAlta Utilities
Inter Pipeline
The Cochrane Foundation
The Cochrane Volunteers

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