

This Year's Plants Experienced A Great Growing Season!

Upper Spring Spawning Tributary Provides a Banner Year For Spawning Brook Trout!

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This Year's Project Partners



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Another Successful Spawning Season in Millennium Creek This Year



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This is the seventh spawning season on Millennium Creek, since the restoration program was completed in 2008. It is also the fifth season of spawning in the spawning channel that was built in 2010. That is a lot of reproduction for this new spawning tributary to the Big Hill Creek. It is hard to say how many new trout the creek is providing each year, but this year there was a total of 32 trout redds in the stream.

There have been successful hatches of new generations of brook trout since the spawning habitat was created, so this raises the importance of Millennium Creek to the area's fishery. At least for brook trout, a brown trout was observed below the spawning channel this fall, so maybe brown trout will also start to spawn on the creek, if they haven't already. On most years, the number of redds exceeds 20, with this year's spawn setting a record.

Big Hill Creek Too High and Dirty for Survey!

This fall the Big Hill Creek was too high and dirty to complete an accurate spawning survey. However, the good news is that some trout spawning was observed in known spawning habitats.

Fortunately, a few of the spawning habitats that both brown trout and brook trout use, were shallow enough to make it possible to identify trout redds. Visibility was down to a

few inches for most of the fall, but on a few days, I could make out the unmistakable silhouette of spawning brown trout and a few clean gravel spawning redds.

It is hard to say at this point in time, whether the eggs in these redds will survive the winter months. I hope that some do and I may be able to tell in a few years time, by catching a few 4 to 6 inch trout.

This year, another spawning survey was completed by BVHD to determine the trend in recruitment of new trout into the Big Hill Creek system. In 2013, the survey results showed a total redd (egg nests) count of 15 brook trout redds on the Upper Spring Spawning Tributary.

Numbers of spawning trout on this important spawning tributary are up this year, with a total redd count of 21 trout redds. That is an increase of 6 trout redds from last years total. Hopefully, this upward trend will continue on into the future, with optimistic predictions of a recovery of trout populations in the entire Big Hill Creek system.

One of the highlights of this year's survey on this clear water spawning stream, was the presence of what is thought to be a brown trout redd, on the lower reach of the feeder creek. This suspicion was based on the size of the trout redd that was observed. However, until large spawning brown trout are actually seen spawning on the stream, this cannot be documented as such.

Starting in 2009, BVHD and a small group of volunteers opened up beaver dams on the lower reach of the Big Hill Creek, to allow trout to migrate further up the stream. I suspect that this activity may have helped out in re-establishing spawning trout on the upper most spawning habitat on the creek.

This is the second year that spawning has occurred on the upper tributary. The last observed spawning activity before 2013 was in the early 1980s. So it is evident that trout are now returning to this upper reach of the BHC system.

The stable clean water supply in small tributaries such as the upper spring tributary are of major importance to trout recruitment on the BHC system. The main stream of the BHC is often too dirty and laden with silt to depend on for recruitment of new generations of trout. This is where a number of small clean feeder springs come into play, providing all of the right spawning conditions, year after year.



Above: This beautiful brook trout shows its brilliant spawning color in the clear and clean water of the Upper Spring Spawning Tributary. In the spring of 2014, the first trout hatch was observed.

The 2013 Plants are Growing Fast!



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Bow River Fishing Should Be Back to Normal by Next Year!

The flood of 2013 did have a major negative impact on the Bow River fishery. Not only the fish suffered, but the food that they feed on was also impacted. When I say food, I am referring to the aquatic invertebrates that live beneath the rocks on the bottom of the river.

The good news is that there is a healthy population of small trout that are now present in the Bow River and they will be a good catchable size by next year.

This is the case in both the upper, middle and lower Bow River, where I fished a lot this past summer and well into the fall.



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2014 – A Great Year For Volunteer Participation!



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Above: Volunteers from Canon Canada's Calgary Office chip in to plant along the stream banks of West Nose Creek, in the City of Calgary, Alberta. The Calgary Office supplied a total of 22 volunteers for the event.

Trout Spawning Habitat Sacrificed in Cochrane Lake Dewatering!

It was very surprising and disappointing to learn that large volumes of water were being pumped into Ranch House Spring Creek this year, and I never observed a single spawning pair of mature trout in the creek.

Furthermore, not much consideration was given to the stream's resident trout population or the fact that these and other migrating trout utilize the small feeder spring creek for spawning.

As I suspected, the high volume of dirty water did prevent trout from spawning on the creek this fall. The added flow was just too much for the small stream's narrow channel, thus preventing brook trout from spawning.

I did a number of trips to monitor the stream during the spawning season, while completing my spawning survey. As I suspected, the high volume of dirty water did prevent trout from spawning on the creek this fall. The added flow was just too much for the small stream's narrow channel, thus preventing brook trout from spawning.

A considerable amount of time and money was directed to enhance this small stream, with no consideration for the resulting negative impacts, shown by area water and fisheries managers.



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Plastic Landscaping Mesh is a Deadly Juvenile Trout Killer!

In the late summer of 2014, while I was walking the banks of Millennium Creek, something caught my eye, just below the surface of the stream. Two small fish were tangled in what appeared to be a fine mesh net.

Upon closer inspection, I realized that the mesh was a plastic landscaping mesh that is used for stabilizing soil on sloped banks. I pulled the tangled trout free of the woody debris that the mesh had attached itself to and I noticed right away that one of the small trout, which was a brook trout was still alive.

I freed the brook trout that was weakly still struggling in the mesh and placed it back into the stream. The other small fish was a brown trout and it had obviously been dead for some time.

A few years ago, an interchange road project had been completed next to the creek, next to where I found the two trapped fish.

The landscaping contractor had used plastic mesh for reseeding the soil on the steep slopes that were present on the edge of the road and this piece

that had netted the trout was from that project. Somehow, the scrape piece of mesh had ended up in the creek.

I have encountered this type of mesh before on some of my riparian planting projects, in the City of Calgary. Some of it has extended from landscape slopes, right down to the water's edge, where it is exposed beneath the water and small fish are bound to get trapped.

I don't believe that much consideration is given to this potential hazard, when the mesh is used.



Above: This is a photo of the two netted trout that I first spotted in the water of Millennium Creek. The one on top is a brown trout and the one below is a brook trout.

Below: The brook trout was still alive and it was released that way. Whether it survived is unknown. The plastic landscaping mesh was only a small piece, but obviously deadly to small trout.



The Mountain Whitefish - A Sport Fish Often Overlooked in its Importance to the Fishery!

In my home town of Cochrane, the mountain whitefish was a common and important fishery when I was growing up. Years ago, anglers would travel from the surrounding area to fish this abundant sport fish every fall, during the run.

The whitefish is not as abundant as it once was on this upper reach of the Bow River. This has become especially apparent in recent years.

I have a theory that once the effluent treatment systems were improved in both Banff and Canmore, there was less nutrient in the Bow River and the result was less aquatic invertebrates for the fish to feed on.

In the early 1990's, the Town of Cochrane started to pump its effluent into the City of Calgary for treatment, so this clean up has also reduced

the nutrient enrichment on the Bow River. I personally noticed a decline in whitefish populations on the river, every fall.

It is a small price to pay for clean water, but it did impact the mountain whitefish populations. I would rather have a clean river than a nutrient rich soup, in which to fish on.

With the cleaner water in the river and noticeably less mountain whitefish, I feel the fisheries management strategy needs to be modified.

Presently, on the Bow River, anglers are allowed a daily catch of 5 whitefish, as long as they are over 30 cm in length. This may explain why there is such a shortage of larger mountain whitefish present on the upper reaches of the Bow River.

Mountain whitefish grow very slowly, so they take approximately 7 to 9 years to reach lengths over 30 cm. In Bow Lake, at the headwaters of the Bow River, they can live for 17 to 18 years, but on the river itself, they usually reach a maximum age of 9 years.

The mountain whitefish is very important in the overall fishery of the Bow River. Juvenile whitefish are a primary forage fish for the trout that occupy the Bow. The eggs of the whitefish provide forage for both trout and aquatic invertebrates, and plenty of nutrient for the river as well.

I really enjoy fishing for this sport fish, when the trout are not cooperating, so I feel they should receive the attention that they deserve.



Right:

The Lake Whitefish is a larger cousin of the Mountain whitefish. It is common on many area lakes.



Despite the Flood - There was a Hatch of Rainbow Trout on the Jumpingpound Creek in 2013!

I got a big surprise this summer, while fishing the Bow River in the Town of Cochrane. There were a number of small 4 to 5 inch rainbow trout in the river, which meant that there must have been a partially successful hatch of these trout in 2013.

All of the recruitment of rainbow trout on this reach of the Bow River, occurs on the Jumpingpound Creek. So any rainbow trout found between the Ghost Reservoir and Bearpaw Reservoir are from that tributary. No rainbow trout spawning is documented upstream of the Ghost Dam, so it is an easy reach to monitor for rainbow trout recruitment.

Bottom line, this means that there was some rainbow trout reproduction on the JP Creek during the late spring 2013 flood. How would this be possible, you may ask? I have a theory about this!

My suspicion is that during the early part of the spring in 2013, rainbow trout did manage to deposit their eggs in the gravel on the JP. Once the eggs were deposited and

fertilized, any eggs that were washed free of the redds, or egg nests, would end up downstream somewhere and they would continue to incubate.

Trout eggs are heavier or more dense than water, so they would wash downstream and find a home in the more moderate flow of gravel or cobble downstream. As long as there is well oxygenated water circulating over their outer membrane, they will continue to survive. At least this is my theory on why some trout hatches occur after major flood events.

The key factor here is that the water and habitat was acceptable for reproduction, before the high flows moved the streambed gavels and cobbles further downstream. I also suspect that after the eggs are relocated, more freshly disturbed gravel is deposited over them.

In any case, it always amazes me how trout manage to survive under severely extreme natural events, such as major floods. The good news is that those trout from 2013 will be around next year, when I am fishing for them.



Above: This August caught 14 cm rainbow trout was hatched in the Jumpingpound Creek in 2013, after the big flood event. The rainbow trout in the JP Creek usually hatch in mid to late July, from their spawning gravel beds. They grow rapidly during the rest of the summer and into the fall.

Bow Valley Habitat Development Reaches a Milestone in Grass Roots Projects!

This year, Bow Valley Habitat Development reached a milestone in the total amount of dollars spent on area grass roots projects. All of these projects were riparian and fish habitat related programs.

Over the past 28 years, BVHD and its partners have completed a total of 45 major projects, with a total amount of \$511,916.00 being expended. Including in-kind contributions the total project value soars to \$663,957.00 worth of materials, equipment and volunteer time.

Having spent over one-half a million dollars on the area fishery is a milestone for such a grass roots effort. For in-kind contributions of \$152,041.00 shows that there is considerable interest in this

kind of cause. For the actual dollars spent, I know that BVHD has received some pretty good pricing on both equipment and services over the years, which would actually add to the total project value.

All of the work completed on these 45 local projects would not have been possible without the ongoing support of NGO's, municipal government and both corporate and small business dollars. This year, having the federal government involved adds to this list.

Besides the major projects over the past 28 years, countless hours of time has been invested by BVHD volunteers, completing small willow planting, garbage clean-up and maintenance work, on project streams.

A number of different Cochrane Scout Troops have chipped in on both willow planting and garbage collecting as well. Over time, it all adds up to be a major contribution towards taking care of both riparian and fish habitat on local waters. This additional work also has a dollar value, but I would not hazard a guess as to how much.

I suspect that many of these young and old volunteers will reflect on their contribution in future years, when ever the topic of the area sport fishery is discussed. Or they may even visit some of the old project sites to see how mother nature has transformed the area over time.

I have long believed that a grass roots approach is the best way to get things done, and it seems that it has worked out that way, at least in our area.

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For more information on some of the projects that have been completed over the years, please check out the two links below:

[Blog](#)

[BVHD Website](#)

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In 2013, There was a Total of 16 Trout Redds on Ranch House Spring Creek – This Year There are 0!



Above: This is a photo of what the creek looked like in 2013, during the spawn.



Above: This is what the creek looked like this fall (2014) and there was no spawning.



Far Left:

This photo shows how much volume of dirty water is flushed into the Ranch House Spring Creek during urban run-off events. The volume of flow is more than 20 times what the small spring creek can handle within its narrow stream banks.

Left Photo:

You can compare this storm drain run-off with what normally flows down the creek, by looking at the photo that is top left on this page. It is expected that over time, the natural stream channel width will be eroded away and the entire habitat in the stream will be changed forever. At this point in time, the native population of brook trout will vanish from the creek.



Above: This is a fall 2014 photo of the same spot on the creek where brook trout spawned in 2013. Note how turbid the water is and how fast it is flowing.

Below: A photo of a pair of brook trout spawning in 2013 at the exact same location as shown above.



Urban Trout Streams - Are They Worth Protecting?

In my home town of Cochrane, Alberta, we are very fortunate to have three trout streams, all of which are located within a kilometre of Main Street, at the centre of town. The Bow River, Jumpingpound Cree and the Bighill Creek provide adequate habitat for a resident trout population.

Besides the recreational opportunities of sport fisher's, these three streams also benefit native wildlife that still resides in riparian habitat along the stream banks. As well, town residents also appreciate the allure of walking along a natural habitat provided by each of these streams.

With the constant threats imposed by development of this growing community, it is important that we educate people about the not so obvious life that occupies the creeks and rivers of our surrounding area. After all, we are just short time residents of the millennium and future generations deserve the right to enjoy what little is left of the natural world, in our back yard.

I know that the young people that are aware of protecting the natural habitats in our area, would agree.

For me, the choice of becoming a steward of our area streams came naturally. From an early age, I loved to fish and experience the pleasure of just being somewhere along the water, with my fishing pole in hand of course.

When I witnessed the slow death of a few local trout streams, while growing up, I decided at that point in time that if I had the opportunity to do something about these losses, I would. This was further instilled in my mind by just knowing that no one else seem to be too interested in the loss, at that time.

Fortunately, when I first started to take measures to protect and enhance some local trout streams, I discovered that there were plenty of other people that were there to help me out. Over the years, the interest seem to keep growing and I am please to say that includes many town and city managers the allow us to do our work.

Are urban trout streams worth protecting? Yes, and there are plenty of people that are actively working toward achieving this challenge. For me, I will just keep forging ahead and loving every minute of it. At least while I have the ability to do so!



Millennium Creek Restoration - Before, During and After Photos of the Same Length of Stream Channel



Above:

This is a photo of the lower creek in 2004, before the restoration project was started. Note the wide shallow stream channel that was up to 7 metres in width at some cross sections. Only a few brook trout were present on the lower 50 metres of the stream in that year.



Above:

This is a 2006 photo of the same length of stream channel, after a new narrow channel was constructed in 2005. High pressure water was used to cut a new narrow channel down almost the entire length of the stream. Eventually, erosion would deepen the new narrow stream channel even further.



Above:

This November 16th, 2014 photo shows the same length of stream channel after the entire restoration program had been completed. You can see that the stream channel has cut deeper into the substrate. Now, there are not only trout in the entire reach of the stream, the trout are also spawning along its course.



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Canon Canada and Evergreen Event Brings Out Lots of Volunteers



Above and Right Photos:

In October of 2014, volunteers from the Calgary office of Canon Canada, planted over 600 willow plants along the stream banks of West Nose Creek, in the City of Calgary. It will be nice to return to the site years later, to admire the results of this two day program. The event is part of the Canon Canada's "Branching Out" program, in which a 1000 Canon Canada Staff, working on 26 national events across Canada, will plant 20,000 trees this year. The events are organized by Evergreen Brickworks.



Canon Volunteer Group - Canon/Evergreen Planting Event 2014
Calgary Office - West Nose Creek Planting Program

Small Groups of Volunteers are Always Well!



Above: A small group of volunteers plant willows on Man of Vision Spring Creek, in the Town of Cochrane, Alberta. The group are members of the "Millennium Creek Fly Fishers". The spring creek is a feeder tributary to the Bighill Creek and it has a small population of brook trout that live in the stream at certain time periods of the open water season. We may be able to create spawning habitat on the small spring creek, over time.

Single or Small Group Volunteers are Always Welcome!



Above: Volunteer Blake Porter, from Cochrane, Alberta chips in to help plant willows and trees on a small tributary to the Bighill Creek (Man of Vision). Small groups or single volunteers make a huge difference when there is a rather ambitious objective in play. Most of this year's riparian planting were completed by a few keeners. Hopefully, this type of enthusiastic participation will extend into 2015. I suspect that it will, due mainly to the interest expressed by these volunteers, most of which just happen to be fly fishers that are considered stake holders in the program.

Small Spring Creeks - Their Huge Importance to the Fishery!

If you have been following this website for any amount of time, you will know that much of the content is directed at updates, reports and opinions regarding small spring creeks. Numerous projects have been carried out on local spring creeks to benefit the fishery.

In particular, there has been a lot of coverage on Millennium Creek, Ranch House Spring Creek, Man of Vision Spring Creek, and the Upper Spring Creek. All of these spring creeks are vital tributaries to the Bighill Creek and its fishery!

There is an important message to the readers here. This is that small spring creeks play a major role in the health of a main stem fishery. Small spring creeks are utilized by trout for both a nursery habitat and a reproductive spawning habitat.

For those of you that have never heard of a "nursery habitat", it is a safe and productive habitat that supports juvenile trout during the first months or years of their lives. In these nursery habitats, young trout can thrive without the threat of predation from larger trout.

Once juvenile trout have outgrown their nursery habitats, they

move on to the big water of faster and deeper streams, with a larger volume of flow.

Most of these spring creeks are limited in length, and they flow only a short distance before the enter the main stem. This usually makes them less vulnerable to the negative impacts of storm drains, and silt loading from development.

However, if there is any type of human development that has a negative impact, the total fishery of the small spring creek will suffer or be destroyed. This is where the protection of fisheries managers comes into play. If they are not protected the fishery in the system will be damaged or lost.



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Above: A photo of a willow plant along West Nose Creek, in the City of Calgary, Alberta. This photo was taken in late September of 2014.

This Year's Willow and Tree Crop Were in Good Shape in the Fall of 2014!

The past two growing seasons have been great for our planting program. Lots of precipitation and plenty of sunny days resulted in substantial growth for the new plants.

This year, in total, 10,524 willow and tree plants were put into the ground along the three tributary streams, to the Bow River. The plantings covered approximately 11.5 kilometers of stream bank. This scope of riparian plantings is a major achievement and hopefully, next year will be as good, if not better.

The program could not have been completed as such, without the great partnership's and volunteer support that we were so fortunate to have this year. In total, 364.5 volunteer person hours were contributed to getting the job done. The partners involved were as follows:

**Cochrane Foundation
Walmart/Evergreen
Inter Pipeline
Department of Fisheries and
Oceans Canada
Cochrane Community Grant
Program
ATCO Pipelines
Canon Canada/Evergreen
Evergreen Brickworks
Bow Valley Habitat Development**

It will take approximately 4 or 5 years of growth before the plants stand out on the landscape, but when they do, the benefits of the riparian recovery work will become more apparent. With more habitat for wildlife and the direct benefits to both stream bank stability and enhanced fish habitat.

In the mean time, the root systems from the plants that were planted right along the water's edge, will help to stabilize the stream banks. This will be especially beneficial on some erosion sites along the streams involved.

By the state of the plants during the late fall of 2014, I am confident that our winter survival rates will be very high, by next spring. The most crucial time for survival usually comes in the late summer and early fall, when the plants are sometimes stressed by the reduced amount of precipitation.

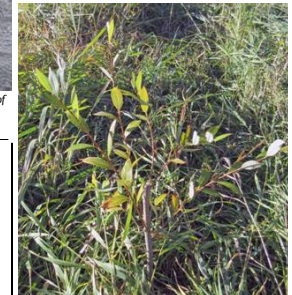
Fortunately, because most of the plants are close enough to the edge of the stream, there is sufficient moisture to sustain growth and survival. The other negative impact on plants is rodent damage, but with the lush growth this year, the rodents had plenty of other things to feed on. If the snow is deep enough over the winter, the survival rates will be even better.



Above: A photo of a few willow plants along West Nose Creek, just outside of the City of Calgary. This photo was taken in early October.



Above: A willow plant along Nose Creek, in Airdrie, Alberta. The photo was taken in October of this year.



Above: A willow plant along the stream banks of Bighill Creek, in the Town of Cochrane, Alberta. In September.

The Best Approach to Enhancing Fish Habitat on Small Streams!

Undoubtedly, the most cost effective way to enhance fish habitat on a stream that lacks a healthy riparian buffer, is the planting of native willow and trees along the stream banks.

- Willows and trees that grow right along the water's edge provide the following:
 - Shade to help keep the water temperatures cooler.
 - Stream bank stability from the root systems.
 - Organic bio-mass that enters the water and enhances nutrient and invertebrate populations.
 - Willow and tree limbs that bend down into the water helping to constrict the flow and maintain a narrow-deep channel.
 - The creation of fish habitat by adding overhead cover and submerged cover.

- The constricted flow scours silt free from a cobble and gravel substrate on the streambed, which improves water quality and enhances invertebrate populations.

- The plants filter surface run-off and collect harmful organics and silt during run-off events, both in-stream and from the surrounding ground surface.

Also, during floods, both trees and willows or parts of them, get flushed down into the stream, creating fish habitat and woody debris that provides great invertebrate habitat.

Even the leaves from the fall are beneficial as they fall or get blown into the stream channel. The fallen leaves also enrich the stream's nutrient levels, which benefits the stream's fish populations, in directly.

Planting both willows and trees is a great approach to enhancing fish habitat in a stream. However, it will take some time before you are able to witness some of the benefits of any program that is completed.

There is no immediate result, which may be a problem for those that expect an instant improvement in the objectives. You can rest assured that if you are in no big hurry, the benefits will start to show, over time.

The first thing that you will observe or that you can count on, is the stabilization of the stream banks, from the new root systems. This will usually occur within the first 3 to 4 years after planting. It will be especially apparent on unstable eroding slopes along the stream's course.

The constriction of flow in the channel will happen when the first limbs from the plants are bent down into the water, by winter snows or ice build up. Just be patient and enjoy the transformation.

New willows and trees provide shade over the stream channel.

This helps keep the water temperature cooler.

Riparian cover helps to filter surface run-off, especially organics like fertilizer (Phosphorus and Nitrogen) from both urban and rural land.

The weight of early snow falls will bend willow branches down into the stream channel.

Submerged plant limbs or branches help to constrict the flow in the channel and increase scouring on the bottom, keeping it silt free

Limbs or branches, both in and above the water, provide vital fish and invertebrate habitat

The increased velocity of flow and scouring exposes cobble and gravel on the streambed



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2015 Bow Valley Riparian Recovery and Enhancement Program - In the Works!

Bow Valley Habitat Development is presently working on putting a 2015 program together. With the successful planting of over 10,500 plants on 11.5 kilometres of stream bank this year, a similar program for next year holds promise.

A major bonus during the 2014 program, was the involvement of the Department of Fisheries and Oceans Canada (referred to as DFO). DFO's Recreational Fisheries Partnership Program contributed roughly half of the costs of the 2014 program. This type of partnership is a real bonus in the fund raising end of things.

Recently, I completed a site tour with some DFO representatives and they seem to be pleased with the results of this year's riparian restoration work. Knowing this in advance of applications for next year, is very comforting on our end of things.

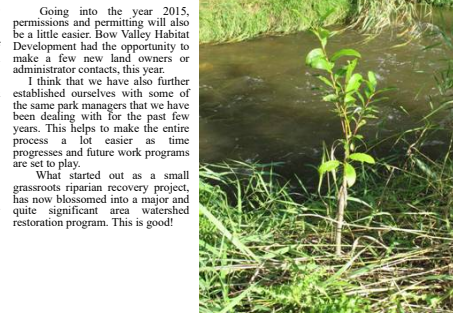
I believe that a partnership with the federal government will help in finding new program partners for 2015, and insure continuing support for those partners that have already been involved for a few years.

The proposal for next year's riparian recovery work will involve plantings on some of the same areas that we worked on

this year, as well as a few new locations on the same streams.

Riparian recovery involves establishing a significant crop of willows and trees along area streams, so multiple plantings are required. After all, once a section of stream is completed, you want to show a significant result.

After this year's program was completed, a lot of information was gathered to make next year's planning projects that much more effective. Things such as access and the system of planting used in 2014 will be a definite benefit in making another program over the same ground, run a lot smoother and more efficient.



Going into the year 2015, permissions and permitting will also be a little easier. Bow Valley Habitat Development had the opportunity to make a few new land owners or administrator contacts, this year.

I think that we have also further established ourselves with some of the same park managers that we have been dealing with for the past few years. This helps to make the entire process a lot easier as time progresses and future work programs are set to play.

What started out as a small grassroots riparian recovery project, has now blossomed into a major and quite significant area watershed restoration program. This is good!

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Last Year's Willow and Tree Crop Show Good Growth—One Year Later!



Above: These willows along the Nose Creek, in Sierra Springs, Audrie, are showing exceptional growth since they were planted in 2013. Soil conditions were ideal for this variety of Salix willow. Note all of the plants will do as well and in some areas the willow plant growth is considerably slower. However, this is normal when planting along many area streams that have been barren of riparian cover for many years.

Soil chemistry plays a major role in the success of re-establishing native plants along flowing streams such as Nose Creek. Over time, a healthy riparian zone will border this prairie stream and contribute to both the fish and wildlife that depend on this type of habitat. I look forward to taking a picture of this same area of the stream in a few years from now to share the results with you.



Above and Far Right: Willows that were planted on unstable stream banks are now creating a root mass that will help to reduce bank erosion and over time the plants will provide shade and good overhead cover. This part of the planting program will eliminate a considerable amount of silt loading into the stream channel, resulting in cleaner water and streambed substrate.

Bank Stabilization Sites are a Major Part of the Riparian Recovery Program

Over the past few years of willow and tree planting on Bighill Creek, Nose Creek and West Nose Creek, willows have been planted on a large number of stream bank erosion sites on all three streams. These plantings are the most cost effective method of stabilizing stream banks as well as providing other important benefits.

The erosion sites occur on the outside banks of meanders and oxbows in the stream channel, where during high flow events, scouring occurs which undermines the base of the stream bank. Where grass is the only riparian growth, erosion exposes the soil beneath, allowing tons of silt to load into the stream channel.

By planting willows in the disturbed soil of sloping, steep banks, root systems will soon establish stability for the loose soil and the bank will recover. Some sites require a number of plantings, before stability is achieved. This system of bank stabilization is much less expensive than other stream bank stabilization methods.



More Brown Trout Spotted on Millennium Creek During the Fall Spawn!

A few years ago, while conducting a spawning survey on Millennium Creek, I spotted a mature brown trout. The brown was holding directly below the spawning channel that had been constructed in 2010.

This was an exciting discovery for this small spawning tributary that was known as exclusively a brook trout spawning tributary, at that time, or since the channel construction.

I thought that the brown trout was interested in spawning on the creek, but it needed a partner to complete the act. Only one brown trout could be seen during that year's spawning.

This year, once again, a brown trout was observed below the spawning channel. This time it was a hen or female and it appeared to be spent, which means that it had already laid its eggs in a redd, possibly in the channel.

Unfortunately, I could not verify this, without actually seeing the trout in the act of spawning in the channel. However, this second sighting is very encouraging for future brown trout spawning on the stream.

I suspect that it is just a matter of time before this happens. When it does, the resulting generations will return to the creek, to do the same. Great news, even if it is based on speculation.



Planting Willows on Unstable Eroding Stream Banks



Above: This is an eroding stream bank before it was planted with willows to reduce toe erosion.

Below: This photo of the same bank was taken in November 2014, two years after willows had been planted at the base of the slope. You can see the willow tops growing above the ice. Zoom in.



One of the most promising components of the riparian recovery program, on some of our area streams, is that of planting willows on highly eroded sections of stream bank.

These areas of the channel lack the natural stability of willow and tree root systems and they are vulnerable to toe erosion along the water's edge.

Starting in 2012, a number of these erosion sites were planted with primarily willow plants over

exposed slopes where the soil was loading silt into the stream channel annually.

I am very please to report that this effort to re-vegetate the loose soil has proven very effective, in the first few years.

Once the newly planted willows and trees make it through the first growing season and spring high flow events, they are destined to survive and grow into maturity.

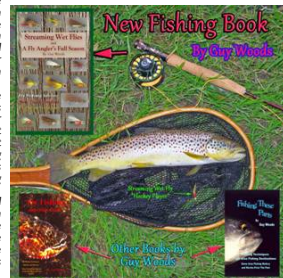
You can look forward to future updates on this part of the program.



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Above: This is a close up of the photo of the site to the bottom left. I took this when the sunlight was a little better for the site. You can see the willow plants will soon be covered by winter ice. This photo was taken on November 16th, 2014.

The cover of winter ice helps to protect the plants from rabbit and deer browsing over the winter. It does not effect the plant survival. In the growing season of 2015, these plants will be well established along the base of the slope.

This will prevent a total bank collapse on this erosion site and eventually stabilize the stream bank. Future photos of this site will be published in a few year's time.