

E.coli in Public Land Streams: Patterns related to the presence of range-cattle. Dec 2016.

Keywords: E.coli. range-cattle, range-land, cattle contamination, Johnstone Creek, Ingram Creek, Ministry of Forests Lands & Natural Resource Operations, MFLRO, Forest & Range Evaluation Program, FREP, B.C. Cattlemen's Association, BCCA

Summary:

- This report covers monthly stream testing in 2015 and 2016 and is a follow-up to two previous reports: **Patterns of E.coli Contamination in Public Land Streams related to the presence of range-cattle. Sept 2013**
http://www.boundaryalliance.org/e.coli_report2013.pdf
- **E.coli Counts in Dryland Streams.....2009**
<http://www.boundaryalliance.org/ecolireport2009.pdf> in which four typical dryland streams in the Boundary area, BC were tested in 2007 through 2009.

This report covers the monthly testing in 2015 and 2016 of two of the four streams and confirms the patterns found in the earlier reports.

In 2015 & 2016 cattle grazed the areas of the sampling locations at different times of year than in previous years so no overlay graph of the whole period has been used for this report.

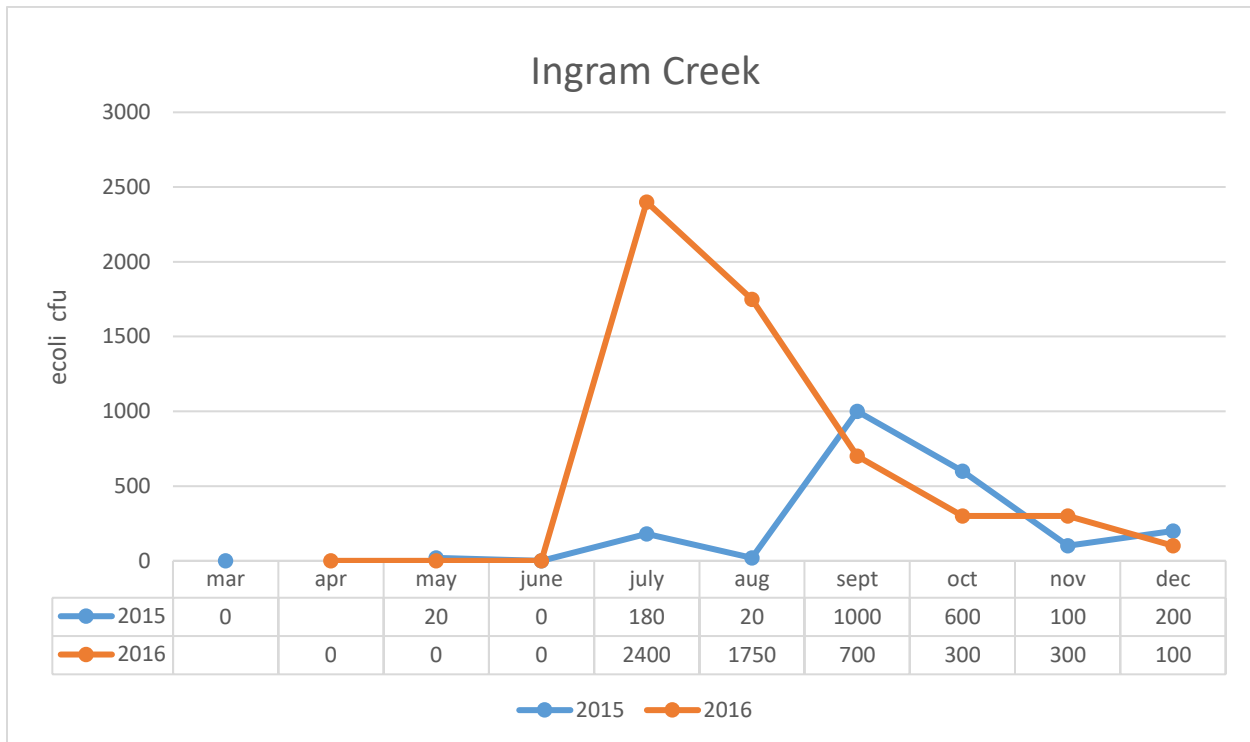
As in previous reports, the patterns show that E.coli counts are almost entirely related to range-cattle presence or absence and that E.coli counts that could be attributable to wildlife (in the absence of cattle) are negligible or frequently nil. In an example from Johnstone Creek, in 6 years of full testing with 25 monthly tests taken before the arrival of range-cattle, E.coli counts in the stream averaged 5.51 CFU. The peak (pre-arrival) counts included in this average might well have been due to drift from cattle in an upstream pasture.

The representative streams tested are all Public Land (Range-land) streams where the Ministry of Forests & Range oversees and regulates range-use.

This project began testing a number of streams in 2007, sampling monthly when access was possible starting March or April each year, through November or December. The testing on the two streams covered in this report now has data in this and prior reports for :

Ingram Creek: 2016, 2015, 2009, 2008 plus partial in 2014

Johnstone Creek: 2016, 2015, 2013, 2009, 2008, 2007, plus partial in 2011,



In 2015 small signs of cow in early august (strays from above pasture?) then large numbers in early September, cows mostly out by early October.
 In 2016 cows reportedly in June 11, large numbers in July and reducing numbers to early November

Ingram Peak counts in 2016 hit 2400 cfu per 100 millilitres.

When we calculated all of the months sampled prior to arrival of range cows and examined the results from those 16 months we found an average E.coli cfu count of 19.4 cfu. Most months prior to cow arrival had zero E.coli counts and the 19.4 count is largely due to counts on July 2015 prior to the arrival of cows in the pasture. The result in July however may well be in whole or in part the result of drift from cows upstream in another pasture, approx 1.7 km upstream although parts of that pasture may be even closer to the sampling point.

Calculating the average increase in E.coli counts that occurs in the presence of cows we can quantify same as:

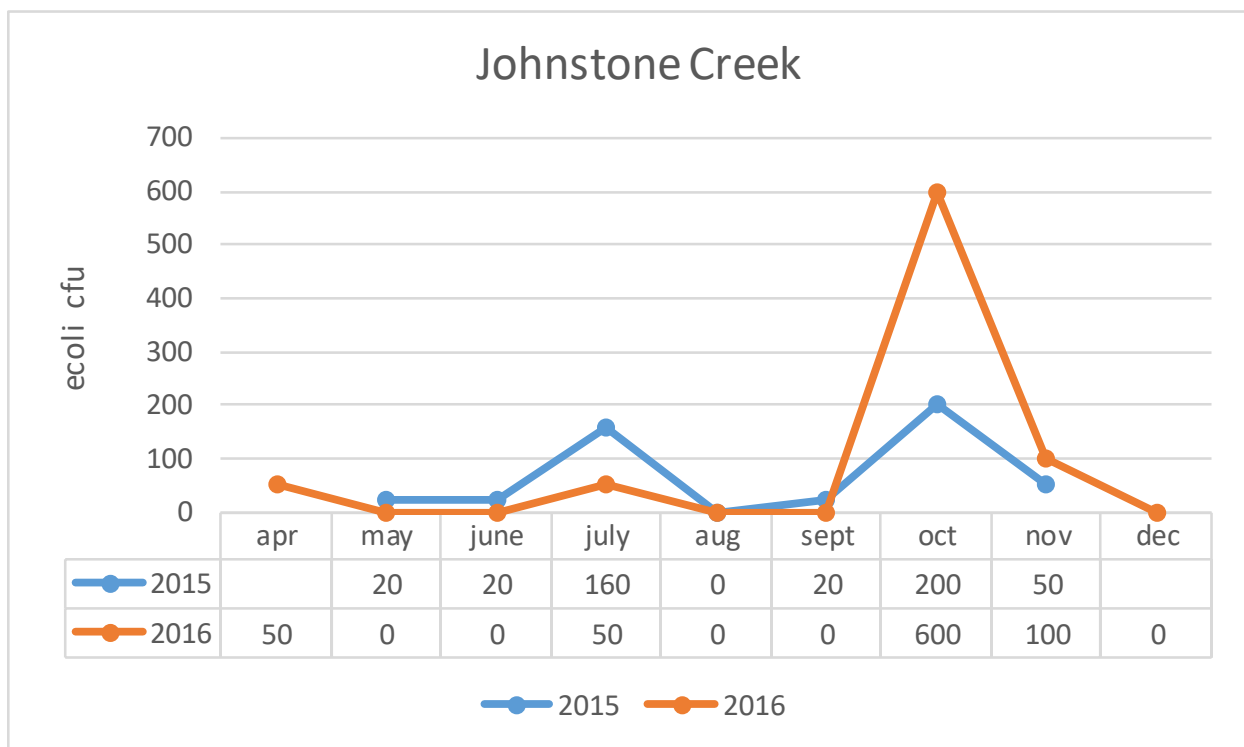
2015 50.5 X or 5,054 % increase over the average background E.coli count.

2016 122.7 X or 12,268 % increase over the average background E.coli count.

In previous years this pasture was grazed for approx 5 weeks with the principal tenure holder grazing 546 AUM's over the whole range unit. The principal tenure holder now has authorization for 1257 AUM's, a 230% increase, which likely accounts for the grassland portions being cropped down to the

quick. Cows in numbers for at least 12 weeks and still some fresh evidence into November. A logging tenure holder reported that cattle “ had been spread around” various pastures.

On or before the 2014 grazing season a fence of approx 1 km was constructed at public expense along Ingram Creek, possibly in response to our earlier concerns. The fence was placed at the dropoff to the stream bank, making it a significant hazard to wildlife and was not constructed as wildlife friendly fencing. The fence was presumably constructed to prevent cattle access to the creek and gravel was placed in the creek at a heavily used cattle access point. The fence has not worked as intended as cows bypassed the fence and accessed the stream from the unfenced steep side. In addition cows developed additional stream access points below the fence and “works”. 2015 & 2016 testing showed that the new fence and “works” had no beneficial effect on water quality. This location was well suited to provision of an off-stream waterer as was suggested by the logging tenure holder however most poorly located & poorly planned waterers make little difference to stream damage and access, particularly where range tenure holders fail to set up or maintain them.



In 2015 a few cows in by mid sept and mostly out by mid oct.

In 2016 a few arrived by end of august, many moved out by early oct, with some until end of oct.

Johnstone Creek peak counts in 2016 hit 600 cfu per 100 millilitres vs previous higher counts including a maximum count in 2012 of 3600 cfu.

When we calculated all of the months sampled prior to arrival of range cows and examined the results from those 25 months we found an average E.coli cfu count of 5.51 cfu. Most months prior to cow arrival had zero E.coli counts and the 5.51 count is largely due to counts on July 2015 and 2016 prior to the arrival of cows in the pasture. The result in July however may well be, in whole or in part, the result of drift from cows upstream in the Summer Pasture, approx 1.7 km upstream.

Calculating the average increase in E.coli counts that occurs in the presence of cows we can quantify same as:

2015 35 X or 3529 % increase over the average background E.coli count.

2016 107.8 X or 10,789 % increase over the average background E.coli count

The pasture immediately upstream of the Johnstone Creek sampling point, the Spring Pasture, was the location of a so called “Ecological Restoration” process which started in Feb 2013. Government advertised the process as a project for the benefit of wildlife however in our opinion it was a “grass for cows” project masquerading as one for the benefit of wildlife. Government “sold” the public and funding sources on the notion that the project was for the benefit of wildlife and obtained social licence and funding under false pretences. More detail is available on the issue in our article: **Grasslands Conservation Council Award, Beyond Baffling** www.boundaryalliance.org/award.pdf

To facilitate prescribed burning and hoped for recovery of the damaged area, cows were kept out of the pasture until fall 2015. The previous spring grazing schedule of earlier years was changed to fall grazing in 2015 and 2016 as cows drifted homeward over time to the pasture adjacent to the home ranch. By 2015 several other changes occurred including publicly funded off-stream waterers supplied by a hydraulic ram pump. The installation was possibly a response to our earlier reports on cow damage and E.coli contamination in the Creek. The installation is an elaborate setup that required trail cutting, tree removal, trenching for supply and duplicate buried supply and return pipes travelling approx 650 meters, plus pump. The full public cost of this water supply installation is not known but would include most of a week by two Government staffers arranging on-site pre-planning plus car rental & accommodations.

In 2015 only one of the waterers was filled, no flow through was evident (which keeps water fresher, cooler) so cows preferentially returned to the stream to drink.

In 2016 neither of the waterers was activated.

As of 2015 however a waterer was also installed at the border of the Spring Pasture and the home ranch. Cattle drifting back from upstream pastures gathered in this location and mostly fed in the immediate surroundings until increasing returnees put some pressure on the wider area including Johnstone Creek. This waterer had some beneficial effect on reducing activity in the creek and it appears to be reflected in the 2015 & 2016 E.coli counts. It is notable that even with reduced grazing pressure in 2015 and 2016 E.coli counts are still high.

Conclusions:

The multi-year, multi-month scope of this study is unusual in that most studies monitor over shorter periods. Our 2015-2016 results together with our other reports going back to 2007 provide compelling evidence that E. coli contamination in streams relates directly to the presence or absence of range-cows.

Range Management and practices claim to follow a number of essential guidelines. The guidelines for water and forage resources require that **practices implemented maintain or improve the resources**. These guidelines are supposedly specifically addressed in the Range Plans for each tenure. It has been the practice of Forestry & Range Management to refuse to provide Range Plans to interested and affected people and to refuse to have interested/affected parties have any opportunity to review or have input into new or renewing Range Plans as is required of other tenure holders using public land, e.g. Forest Companies and Wood Lot tenure holders.

A few years ago, Government moved from “prescriptive” Forest & Range Management to “Results Based” management. It may seem redundant to suggest that a ‘results based’ system needs to measure results. In the case of the water resource that means monitoring, however no Government Agency including Min of Forests & Range, monitors the water resource. Were they doing so, we expect that they would find the same results we have found in our (easily replicable) testing program. It is likely that Government is well aware that, range use will not, cannot and has not led to **“Maintenance or improvement of the resource,”** and is avoiding any information contrary to its preferred belief.

While this report deals primarily with water quality impacts, degradation of water quality is frequently associated with degraded riparian zones, grasslands and pastures. Clearly, Range Management Objectives that require water and forage and other **“resources be maintained or improved”** are failing and that failure is evident in numerous range tenures.

A giant ‘elephant in the room’ (or floating over compromised public land) is the public cost of maintaining range use.

The Ministry of Forests and Range were asked to address the question of Range Use Costs in <http://www.boundaryalliance.org/rangecattleproblem.pdf> The Ministry responded by indicating that their guiding legislation required they provide range tenures. In other words, MOFR has no intention of assessing the true cost of B.C. Range use.

Observations during the 2015 2016 sampling also showed evidence of several disturbing trends in range management. These trends became apparent over various tenures (see following pictures and Resource Links at the end of this report) in recent years and are likely a consequence of Range Branch moving from a “prescriptive” management model to one that allows tenure holders the freedom to determine their own practices. The “results based” model mentioned above, that fails to measure or adequately monitor actual range-use.

Now common problems are:

- The failure of tenure holders to set-up or maintain waterers built and provided at great public expense. Failure to maintain waterers, is an old complaint, (see page 7, **The Problem with Range Cattle** www.boundaryalliance.org/rangecattleproblem.pdf) the excuses offered by ranchers and Range Branch are no longer relevant with the type of waterer installed in recent years.
- Cattle drifting through various pastures on tenures, contrary to supposed Grazing Schedules. Once strict requirements as to grazing numbers and duration on various pastures no longer appear to apply. Tenure holders can therefore reduce their effort in maintaining pasture fencing or herd movement or oversight.

This loose management results in longer use of cattle preferred areas, usually sensitive riparian

zones and makes any worthwhile oversight evaluation of cattle effects on water quality and forage, unlikely.

- Range Branch installation of infrastructure (at public cost) that is not subsequently utilized or in the case of riparian fencing, fails to prevent damage as intended while increasing hazards to wildlife. See our article on fencing: Lost Lake, Gilpin Grasslands and a Random Act of Public Good www.boundaryalliance.org/lostlake/pdf



Figure 1 Stagnant, mosquito filled waterer as seen at Ingram & Johnstone Creeks. Cows avoid such water and go back to creeks.

A full discussion of potential factors affecting stream contamination (in addition to tenure holders) including the roles of:

Ministry of Forests Lands & Natural Resource Operations (MFLRO)

Forest & Range Evaluation Program (FREP)

B.C. Cattlemen’s Association (BCCA)

Is contained in our 2013 Report: www.boundaryalliance.org/e.coli_report2013.pdf

We would now add the “contribution” or lack thereof, of the Kettle River Watershed Management Plan. The KRWMP began in 2010 and largely wound up in 2014. The process failed to engage with the issue of cattle related contamination in the watershed, or with other water quality issues. That they did not do so, was the direct result of “leadership” that ‘did not want to go there’.

A broader critique of the KRWMP is upcoming on our website.

Al Grant, writer/researcher for Boundary Environmental Alliance

RESOURCES:

E.coli Counts in Streams Related to Cattle Presence. Our 2013 Report

http://www.boundaryalliance.org/e.coli_report2013.pdf

E.coli Counts in Local Streams. Our 2009 Report

<http://www.boundaryalliance.org/ecolireport2009.pdf>

Range Cattle Problems

<http://www.boundaryalliance.org/rangecattleproblem.pdf>

Cattle Impacts: Global & Local

http://www.boundaryalliance.org/cattle_impacts.pdf

Cattle as an Invasive Species?

<http://www.boundaryalliance.org/invasives.pdf>