

## ***Interactive comment on “Terrestrial liming to promote Atlantic Salmon recovery in Nova Scotia – approaches needed and knowledge gained after a trial application” by S. M. Sterling et al.***

**Anonymous Referee #2**

Received and published: 12 January 2015

General comment: I recently reviewed the manuscript “Terrestrial liming to promote Atlantic Salmon recovery in Nova Scotia – approaches needed and knowledge gained after a trial application” by Sterling and others, and found it to be technically sound and relatively well written. There were only a small number of grammar and some minor organization issues that should be addressed with relatively minor revision. Several of the more important technical and editorial issues, along with several specific comments, are listed below. My overall impression is that this manuscript provides valuable information and that it will be acceptable for publication after minor revisions.

Important technical and editorial comments: 1. Meaningful objectives are not appar-

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ent in the abstract and introduction. I recommend that focused/clear study objective(s) be summarized in the abstract and described more fully in the introduction. Objectives should address the “so what” question, and be stated so they help advance the state of knowledge and fulfill crucial research, conservation, or management needs. Objectives should be statements that are related to scientific understanding based on interpretation of data analysis and identify a pattern, process, or relationship among variables to be described, and should be worded to reflect the research questions to be answered, the hypotheses to be tested, and the processes to be described. Objectives are not methodological steps (e.g., collect data, conduct experiments, analyze data, and write a report). The title of the paper actually contains a fairly good study objective; especially if the points were merged with key “goals” listed at P7L18-20 and P8L1-4. The questions at the end of P7 would also form good hypotheses or specific goals.

2. Several single-sentence paragraphs exist throughout the paper (e.g., P3L6-9, P19L7-10). This practice demonstrates a general lack of organization and illustrates the poor use of topic sentences. The commonly yields paragraphs that are fragments, sometimes duplicative, or which ramble (address multiple topics) with no focus on a single topic or progression of ideas (data and citations) to make a point or develop a logical inference(s). Thus, the authors should inspect/revise all paragraphs – mainly in the introduction and discussion - to ensure each have appropriate topic sentences and that all content within each paragraph relates back to the topic sentence. A good practice is to include a general thesis statement as a topic sentence at the start of each paragraph; search the web for more information on topic sentences and paragraph organization.

3. The use of a model (P10L23) to estimate a key toxic parameter – inorganic Al (Ali) - is not sensible. Basing their model on water samples from 92 streams across the region is questionable because of similar or variable deposition chemistry, precipitation, runoff, and forest and soil characteristics can result in unique geochemistry interac-

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tions and surface-water quality within streams of different (even adjacent) watersheds. Although the authors have few options to improve this shortcoming, at a minimum they should either (a) use Ali data from their system to generate a watershed specific model or (b) validate the model they used with Ali data (measurements) from their watershed. Regardless, Ali is a central factor and should have been measured in all water samples from this study. At a minimum, one of this study's recommendations should be to improve Ali accuracy by making direct measurements of Ali chemistry vs. use of regression models that can only estimate 68% of the variability in Ali.

4. The hydro-geochemical mechanism that causes an inverse relation between stream flow and Ali concentration (P17L9-11) needs to be explained in some detail, not just identified as "needs more investigation". If the authors are not able to provide such a description, a regional geochemist should be able to do so.

5. As per P20L24-P21L6; if weekly or biweekly samples are not sufficient - why not recommend collecting storm-event water samples with stage loggers and programmable automated samplers? The USGS has been doing so in NY State for several decades.

Specific comments:

P2L11 The authors note 10% of the watershed was limed here, whereas they cite 4.5% in the conclusions P23L8. Clarify or correct as needed.

P11L3 Please provide rational (citations) for using powdered lime.

P12L8-10 Did stream chemistry in the cited study respond in a meaningful way? Explain how results from the cited study (or others) were used to estimate/define the percentage of the watershed, and the application rate, that was used to lime parts of the watershed in your study.

P12L24 typo "organiz".

P18L9 typo "of of".

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P19L11 Is "lowlying" a real word?

P20-P21 The six "considerations" should begin with complete sentences, not fragments.

P23L13-16 This sentence is awkward; the 3 or 4 phrases should be reworded to make a clear point or two. Consider making it into two sentences.

Table 2, consider placing unit in parentheses instead of following a "/" symbol.

Figure 2. There are too many details/method listed in the caption that should be only provided in the methods section.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 10117, 2014.

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