Executive Committee
Addendum

Date:	Tuesday, March 7, 2023
Time:	10:00 am
Location:	Coast Bastion Hotel, Quadra Room, 2nd Floor 11 Bastion Street, Nanaimo BC

Pages

10. CORRESPONDENCE (for information unless raised for action)

10.6 ***R. Schuster re: Report "Carbon and Biodiversity Mapping and Assessment for the Islands Trust Area" from 2014 letter dated February 28, 2023*** *2 - 4*

February 28, 2023

Re: Report "Carbon and Biodiversity Mapping and Assessment for the Islands Trust Area" from 2014

Dear Islands Trust Council members,

I am submitting this letter for your consideration in light of recent discussions around a report I have written for Islands Trust back in 2014.

My name is Dr. Richard Schuster. I hold a PhD from UBC and the topic of my doctoral work was "Systematic conservation planning in human-dominated landscapes: maximizing efficiency in biodiversity conservation via carbon sequestration and land management". I am now the Director of Spatial Planning and Innovation at the Nature Conservancy of Canada. I am also an Adjunct Research Professor in the Biology Department at Carleton University.

At the time I wrote the report for Islands Trust, I was in the final stages of my PhD (I submitted the report in March of 2014 and defended my PhD in June of 2014). In the report I have used the best available science at the time.

Since the submission of the report I have published several peer reviewed papers on the topic ranging from local scales (e.g. CDF) to global scales (Hanson et al. 2019, 2022; Schuster et al. 2019, 2020; Rodewald et al. 2019; Lin et al. 2020; Proctor et al. 2022; Vincent et al. 2022; Wilson et al. 2022; Chaplin-Kramer et al. 2023). I am also part of the development team of software the allows for this kind of analysis (https://prioritizr.net/), and I am the leading expert on this topic at the Nature Conservancy of Canada where I oversee the development of user friendly tools to interact with the sophisticated methods in the systematic conservation planning field.

Below some specific comments about the report that I have led:

Carbon information

The basic methodology for this deliverable followed the "Evaluation of Carbon Storage within Forests in the Coastal Douglas-fir Zone" technical report prepared by Dr. Brad Seely a then researcher at UBC. Terrestrial Ecosystem Mapping (TEM) data provided by the Islands Trust was combined with TEM data for the CDF (MES 2008).

For the carbon modeling Seely used FORECAST (Kimmins et al. 1999), a stand-level forest ecosystem simulator that is one of two models approved by the BC Ministry of Forests for carbon budget assessments (Ministry of Environment 2011), and the only model calibrated for use in the CDF (Blanco et al. 2007) and linked to TEM (Seely et al. 2004).

Biodiversity information

The biodiversity information used in this report was produced through my PhD work. At the time, I was a PhD student in the lab of Prof. Peter Arcese at UBC. The biodiversity work used in the Islands Trust report has been published on in several peer reviewed publications (Schuster & Arcese 2013; Schuster et al. 2014, 2018).

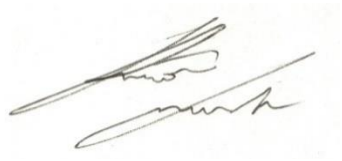
The methodology I and the group of Prof. Arcese have used is well established and the information the predictive models we developed is based on years of field observations conducted by Prof. Arcese and his research team.

Cost-effectiveness analysis of conservation in the CDF

The application of the methods used in the Assessment for the Islands Trust Area across the entire region, including altered ecosystems is a common practice in this type of work and allows for a full accounting of what's on the landscape and what's possible both from a conservation and development perspective. Restricting an analysis of this type to subsets of an area would bias the results and not allow for full accounting of the realities in said landscape.

Please don't hesitate to contact me for any further information. I would be happy to make myself available for further questions/discussion.

Sincerely,



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References:

Chaplin-Kramer R et al. 2023. Mapping the planet's critical natural assets. Nature Ecology & Evolution **7**:51–61. Nature Publishing Group.

Hanson JO, Schuster R, Strimas-Mackey M, Bennett JR. 2019. Optimality in prioritizing conservation projects. Methods in Ecology and Evolution **10**:1655–1663.

Hanson JO, Vincent J, Schuster R, Fahrig L, Brennan A, Martin AE, Hughes JS, Pither R, Bennett JR. 2022. A comparison of approaches for including connectivity in systematic conservation planning. Journal of Applied Ecology **59**:2507–2519.

Kimmins JP, Mailly D, Seely B. 1999. Modelling forest ecosystem net primary production: the hybrid simulation approach used in. Ecological Modelling **122**:195–224.

Lin H-Y, Schuster R, Wilson S, Cooke SJ, Rodewald AD, Bennett JR. 2020. Integrating season-specific needs of migratory and resident birds in conservation planning. Biological Conservation **252**:108826.

MES. 2008. Terrestrial Ecosystem Mapping of the Coastal Douglas-Fir Biogeoclimatic Zone. Madrone Environmental Services LTD., Duncan, BC. http://a100.gov.bc.ca/pub/acat/public/viewReport.do?reportId=15273, Mandrone Environmental Services LTD., Duncan, BC.

Ministry of Environment BC. 2011. Protocol for the Creation of Forest Carbon Offsets in British Columbia. British Columbia Ministry of Environment, Victoria.

Proctor CA, Schuster R, Buxton RT, Bennett JR. 2022. Prioritization of public and private land to protect species at risk habitat. Conservation Science and Practice **4**:e12771.

Rodewald AD, Strimas-Mackey M, Schuster R, Arcese P. 2019. Tradeoffs in the value of biodiversity feature and cost data in conservation prioritization. Scientific Reports **9**:15921. Nature Publishing Group.

Schuster R, Arcese P. 2013. Using bird species community occurrence to prioritize forests for old growth restoration. Ecography **36**:499–507.

Schuster R, Hanson JO, Strimas-Mackey M, Bennett JR. 2020. Exact integer linear programming solvers outperform simulated annealing for solving conservation planning problems. PeerJ **8**:e9258. PeerJ Inc.

Schuster R, Law EA, Rodewald AD, Martin TG, Wilson KA, Watts M, Possingham HP, Arcese P. 2018. Tax Shifting and Incentives for Biodiversity Conservation on Private Lands. Conservation Letters **11**:e12377.

Schuster R, Martin TG, Arcese P. 2014. Bird Community Conservation and Carbon Offsets in Western North America. PLOS ONE **9**:e99292. Public Library of Science.

Schuster R, Wilson S, Rodewald AD, Arcese P, Fink D, Auer T, Bennett JR. 2019. Optimizing the conservation of migratory species over their full annual cycle. Nature Communications **10**:1754.

Seely B et al. 2004. The application of a hierarchical, decision-support system to evaluate multi-objective forest management strategies: a case study in northeastern British Columbia, Canada. Forest Ecology and Management **199**:283–305.

Vincent JG, Schuster R, Wilson S, Fink D, Bennett JR. 2022. Clustering community science data to infer songbird migratory connectivity in the Western Hemisphere. Ecosphere **13**:e4011.

Wilson S et al. 2022. Opportunities for the conservation of migratory birds to benefit threatened resident vertebrates in the Neotropics. Journal of Applied Ecology **59**:653–663.