

Please find below our reply to comments and suggestions in bold and italics with reference to line numbers in revision where appropriate

Jean-Louis

Revision round #2

Decision for round #2 : *Revision needed*

Dear Dr. Martin,

We have received the evaluation of two anonymous reviewers and they seem very happy with the changes you have made to your manuscript. I agree with them; the manuscript is much clearer now.

One of the reviewers still has some valuable suggestions that I hope you will find useful. I think, however, that the line numbers the reviewer is referring to do not coincide with those in version 4 uploaded to Hal. Please check the suggestions made and let me know if you have questions.

I also have some minor suggestions of my own (just to clarify some small issues or improve readability).

Line 115-116: I suggest you simplify this hypothesis a bit. Maybe something like "...would reduce fear in deer causing them to reduce forest vegetation cover and diversity."

Good point ! done

Line 118: behaviour.

Done

Line 203: sometimes.

Done

Line 223: "to estimate".

Done

Line 356-358: Please revise this sentence.

Done. Reads now: We ground dry bone and plant samples to a granulometry of less than 0.7mm. We followed protocols defined by late F. Catzeflis based on DeNiro & Epstein (1981), Bocherens et al. (1988), and Bochérens, Hervé et al. (1991) to extract bone collagen from bone powder in the laboratory.

Line 402: parsimonious.

Done

Line 403: "each sample".

Done

Line 516: individuals captured.

Done

Line 547: deer diet.

Done

Figure 7: Some of the legends are not very clear (e.g., columns 1 and 2). Maybe you can use a single, and larger, legend, since colors are depicting the same categories for all graphs.

Good point, done

Figure 8: Can you also mention what the small dots represent?

Done, they represent the the 2.5% and 97.5% quantiles

Line 683: resources

Done

Line 689: When you start the section on stable isotopes maybe you can separate this into a new paragraph.

OK done

Line 745: understories.

OK, done

by [Gloriana Chaverri](#), 17 Oct 2024 17:08

Manuscript: <https://hal.science/hal-04381108>

version: 4

Review by anonymous reviewer 1, 28 Sep 2024 19:15

The authors worked well on the previous comments. I really like the paper and its contents. Yet the text (abstract, discussion) can be considered long.

In the revision we kept this comment in mind but with limited success. We revisited the abstract and got rid of some redundant wording and simplified some sentences (e.g. lines 28-30), abstract is now 389 words long. In the introduction we got rid of some text without losing meaning, and after taking into account remarks from Reviewer 2 that added some text we ended up with a revised introduction 6% shorter.

Does the title clearly reflect the content of the article? Yes

Does the abstract present the main findings of the study? Yes, but the text is long.

Are the research questions/hypotheses/predictions clearly presented? Yes, improved a lot.

Does the introduction build on relevant research in the field? Yes

Are the methods and analyses sufficiently detailed to allow replication by other researchers?
 Yes

Are the methods and statistical analyses appropriate and well described? [] Yes

Are the results described and interpreted correctly? [] Yes

Have the authors appropriately emphasized the strengths and limitations of their study/theory/methods/argument? [] Yes

Are the conclusions adequately supported by the results (without overstating the implications of the findings)? [] Yes, but more caution could be suited here and there.

***We kept this comment** in mind while revising the discussion. This led to minor changes in text.*

Review by anonymous reviewer 2, 05 Oct 2024 22:37

I thank the authors for their revisions. I believe the manuscript is much easier to follow in many places.

The manuscript feels a little lengthy. This is not a problem per se, but it makes it important for the authors to structure the writing in a way that help reinforce memory of the details (the sub-headers do help). Some of the thinking and writing still seemed a little disorganized.

***OK:** Based on this comment, and the following one, we quite extensively revised/reorganized the introduction trying to also to be more concise. Despite some additions the introduction is shorter by 6%.*

The key section of emphasis to me remains the introduction, which I find a little ineffective. Lines 50-80 or so focus on some broad ecological problems, and ultimately lead to the following questions: (1) whether different metrics of behavioral risk response vary under the presence of hunting and natural predators, and (2) whether behavioral shifts influence how deer affect forest ecosystems.

***Agreed** and incorporated in extensive revision – see lines 89 – 93 for the questions and below.*

What I broadly suggest is:

--I would condense much of Lines 50-80 into one brief paragraph. (“Hypotheses and evidence suggest that prey alter their behaviors in response to perceived risk, and also that shifts in prey behavior can have broader ecological impacts. Examples include...” [or “this is important because...”, etc.]

***Response:** Initial wording has been condensed (e.g. first paragraph of Introduction) and suggestion incorporated in the first sub-header (e.g.in line 66 – 68)*

--The next couple of paragraphs should set up the problem/uncertainty that motivates the research. Essentially, what is the story about? How deer behave on different islands in this

region and what drives it? Some conceptual uncertainty or a question that extends upon previous work? Trying to summarize the results of many different sampling efforts? Reconciling information across disparate methods? I can't be very prescriptive here because this is the authors' work and I can't tell what they want to achieve, but this part is critical.

OK: *Comment addressed in line 84-93 (Questions to address) on what motivates the research, and in lines 94 to 104 (A life-size laboratory) on how seeking answers to these questions built on previous work.*

--Then, the authors conclude with the specific objectives and an extremely brief overview of how they resolve the motivating uncertainty ("we use X data from X islands to [test Y, describe Z, whatever]").

OK: *This comment on specific objectives is dealt with under the three sub-headers (Fear- and vegetation / Fear and behavior / Fear and habitat selection).*

The authors are obviously free to craft the section as they choose. Regardless of how they proceed, it would be helpful to present a clearly defined problem that motivates the research and a quick description of how the problem is going to be solved. (In short, try to make sure readers can intuit what is going to be discussed later). The problem could be theoretical, or descriptive/system-specific, or applied, or methodological...any of these might work.

Agreed. *Addressing this comment prompted us to use sub-headers in the Introduction with the intent to help readers identify the problem we address and to have a clear idea of the 3 main elements we study in the light of presence or absence of risk: vegetation, behavior and habitat selection, and how they interact.*

As it stands, the introduction and discussion feel disconnected: the former briefly summarizes a few very broad topics, and then the latter introduces new concepts.

Good point. *See in particular lines 79-83 and 92-93 revised to avoid that disconnect.*

Line comments pf reviewer 2 below.

Important note: *for reason we failed to identify the line references in the comment do not match with line numbers in revised manuscript and we could not find a systematic way to correct for it. We nevertheless feel that we were able to "guess" what was meant and correctly address the comments.*

L97: "contrasts in deer 97 behavior modify how deer affect the forest ecosystem...".

Consider alternative phrasing. What is largely presented here is a comparison of vegetation

characteristics across different islands, and there is an extra bit that has to be inferred (that these differences are attributable to deer) to make this connection.

Making the connection: *We assume that lines 66-70 in the current revision address this comment.*

L127: It would be great to add some additional columns to the table—where the flight distance info is available, where some of the other behavioral data was collected or not—rather than have this solely in the text. Don't have time as a reviewer to go through each subsequent section and try to figure out the specific contrasts that are testable for each analysis, and probably most casual readers will not either. Is there a “natural predators, no hunting” strata? If not, is it possible to distinguish between hunting and natural predation as sources of risk, or should these be acknowledged and discussed as confounding?

OK Good point: *comment fully addressed in revision of Table 1.*

L166: Consider moving this to the end of the section...the later sub-headers all broadly focus on deer behavior, while the focus is vegetation here (and the presented questions are ordered as deer behavior -> ecosystem patterns).

OK we understand the rationale *of this comment and it came up in the comments on the original submission. However, changing the order would come with other difficulties in putting the manuscript together. What we did instead in this revision is to further adjust text so as to better justify the order we chose, this especially in the introduction, and in particular in lines 89-90 and lines 105-110 and also 68-70.*

L176: Is there an analysis that could be used to test the sub-header question given the seemingly very unequal variances (I can think of ways that would be easy to code from scratch, but not sure about standard r packages)? Otherwise, this seems a little fuzzier relative to the other sub-headers.

L176 *is very early in text and deals with the description of study sites. So not entirely clear which sub-header is referred to but we assumed it referred to “Response to traps”.*

Done: *This is indeed a result for which we did not provide a formal statistical analysis. We corrected this and provide the results in lines 501 – 511 (text and legend of Table 3) of Welch two sample t-tests (see line 301-302 in methods). To limit the effect of extreme values on variances we capped at five the number of recaptures during a capture session (see Table 3) (some were captured up the 23 times! In a session, with several captures within a single day). This was the case for 11 deer on East Limestone,*

6 on Kunga and 1 on Reef. This also reduced the contrast between islands with and without risk. It was therefore a conservative change.

L193: I think “hypothesize” (or posit/speculate or similar) rather than “conclude”.

***We guessed** that this comment referred to “concluded” in line 214 of version 4. We changed it to “posited” in line 206 of current revision.*

Wondered if Darimont et al.’s 2003 paper (<https://doi.org/10.1139/z02-246>) might be more appropriate to cite here than Darimont and Reimchen 2002. Also wanted to note again that these citations tend to focus on wolves undertaking marine-based foraging (salmon, otters, whatever).

***We still prefer** citing the 2002 paper as better suited to our topic. The 2003 paper relates observed preying of wolves on Salmon in Salmon streams which we totally acknowledge. The 2003 is more generic about salmon in the diet of wolves. Our point here is the use of shorelines by wolves.*

I think what the authors are assuming (conceptually) is that wolves can quickly/effectively switch from one hunting state (i.e., looking for marine resources) to another (i.e, hunting ungulates).

***True.** Note also that feeding on salmon is a seasonal resource (Darimont and Reimchen 2002) whereas deer are in principle available year-round.*

If so, the authors should lay out their thinking clearly.

***OK:** we tried to be more specific: lines 130-135.*

Note, there are other conceptual assumptions that could be made and these might be equally plausible: for example, a pulse of summer marine resources might make wolf space use more predictable (and thus easier for deer to avoid); broader availability of forage for deer during summer (at the same time that wolves are anchored to dens) might make such avoidance easier/less costly, and so forth.

Yes

L297: Might note some assumptions here associated with the sampling (i.e., via hunting, or looking < 1000m from shore).

***OK:** see change of wording in line 333-335 to clarify that sampling was restricted to the vicinity of the shore whatever method used.*

L345: I think that with 2 markers and 4 sources, the results will be heavily dependent on the specified priors (multiple combinations of p_k , can produce the same observations given μ_{jk} and σ_{jk}). It might be good to report these (or perform some sort of sensitivity analysis), or potentially even compress the sources into fewer groups. (I think that really only the marine and terrestrial groups are of interest?)

OK: *Although what is meant between parentheses is not entirely clear, we addressed the point about dependency on priors by re-running the analysis, as suggested, by compressing the sources in only two groups: marine and terrestrial. The results remain rigorously identical. But we kept the splitting of terrestrial resources in 3 categories because it adds valuable information to the interpretation of the results. Please see lines 681-686 in discussion.*

Fig 3.: It would be great if this was compared in a testable way (i.e., does composition statistically differ?).

True *and we did this extensively in Stockton et al 2005, Martin et al 2010, and Chollet et al. 2016 for the Haida Gwaii samples, studies that are cited and listed in references. This is why we restricted ourselves to the ACP (Fig.2) and its graphical illustration in Figure 3.*

L639: I think the submission should set up these sub-header questions more clearly in the introduction. Some of this text reads a little like post-hoc storytelling, and some of the topics like bold/shy deer (I suppose these are something like behavioral syndromes?) & the attenuation of behavior influencing densities seemed distinct from what the authors presented as the goals previously. I.e., if a main hypothesis of the paper relates to behavioral syndromes, this needs to be mentioned much earlier.

Good point: *This comment prompted the current revision of the entire Introduction, to use sub-headers in the introduction that are consistent with the specific questions posed and consistent with sub-sub-headers in the body of the manuscript. See lines 79-83 and lines 92-93 specifically about "behavioural syndrome" hypothesis.*

L746: These few sentences weren't entirely clear to me. Can the authors present their thinking further?

We made the assumption *that this comment referred to lines 738-762 of the revision and indeed they could benefit from clarification. See revision of lines 730-734.*

L753: While it wouldn't surprise me if natural predators also played a key role, it seems to me that the immediate evidence is that hunting is more strongly associated with reduced seaweed consumption?

Point well taken: *We indeed do not have enough data to rigorously assess the relative weight of the two.*

Additional note: *given the striking parallel existing in a study we did on plant chemical defenses (= response of plants to risk) with what we document in this manuscript we could not resist adding the following in lines 764-768:*

“Vourc’h et al. (2001, 2002) documented similar shifts in population profiles in redcedars exposed or not to browsing by deer on Haida Gwaii. Trees with low levels of chemical defenses dominated in populations not exposed to browsing, while individuals with high levels of defenses dominated populations exposed to deer. These defence levels were under genetic control (Vourch et al. 2002; Vourc’h et al. 2002).”