

This manuscript reports the predictions of an extension to the marginal value theorem (MVT) model focussing on the distribution of patch quality in the environment. As the authors point out, models of the MVT typically focus on a single patch type, or a constant distribution of patch quality. It is important to understand how a change in the distribution of patch types may affect animal behaviour and fitness. One application that the authors highlight is in conservation, because anthropogenic degradation of habitats tends to be inconsistent, so increasing the proportion of patches that are poor quality, rather than reducing the mean quality of all patches. The authors take a very abstract approach, and whilst this provides some important general principles, the manuscript is probably of limited use to the general reader. Below, I highlight some potential improvements and some places where I found the working difficult to follow. I also suggest some revisions to the text and possible additional figures to aid intuition.

The abstract is rather short on results from the present paper, instead summarising the results of the previous paper in the series. The main insight (Figure 3) is not mentioned. The sentence starting “One expects” is not necessary, at least.

Line 2: The citations are not ordered numerically.

5: Here and elsewhere, the phrasing is in the active voice (“is to change”) rather than the passive voice (“is a change”), which suggests that a researcher is making the modifications in an experiment. I think the model is relevant to all changes, and the authors give an example of habitat degradation, so the passive voice would be preferable.

14: What is closed habitat? Good quality?

17: I find the term “habitat conversion” rather confusing; it implies the whole habitat is altered. Perhaps “local alterations” would be better?

22: This claim needs an explanation or a citation.

25: /i and /j are undefined.

41: Change to “previous negative effect of a change in foraging behaviour”

47: “For consistency” with what?

56: I would find it much clearer if the sum over j were in equation (1), rather than on line 60. Also, is the t_i necessary, given that we are differentiating w.r.t. t_i ?

59: Is “effectively” necessary?

63: Move “thus...leaves it” to the end of line 66.

71: Is there an assumption that Ω does not depend on p? If good patches become sufficiently rare, won't foragers add poorer patches to their exploited set (under at least some conditions)?

81: Can you add some intuition for the derivation of this? e.g. where do the t_i come from?

89: “remark that”?

90: What is the intuitive consequence of this?

91: I found the discussion about the two scenarios confusing. Good patches are those with high F/t and it seems odd to separate these terms. Whether good patches have low or high t^* depends on the rest of the patches: good patches may have large t^* if F^* is also large or T is large.

Figure 2: An intuition for this difference is that 2a shows a case where patches differ in how easy it is to find prey but have equal densities, whereas 2b shows a case where patches differ in prey density. What might cause the curves to be non-monotonic? The best patch should be shown thicker or dashed, rather than a different dark colour. What do the dotted lines indicate? Would it be helpful to show tangents from $-T$?

115: Should this be “change in E_n ”? What does “total variation” mean?

116: I don't follow this. Surely t^* alters when x alters? Does what follows assume that the forager does not respond to the change in p_i , but uses a suboptimal strategy?

117: I found it very difficult to work out how this is derived.

120: What does “variation” mean?

123: Does “metric” mean “positively relate to”?

136: See where?

139: See where?

139-141: I did not follow the derivation of this.

148: What is the insight from this?

152: “remark that”?

Figure 3: The axes seem very abstract. The general reader would be greatly helped by a figure that showed how E_n and t^* change in response to p or x at certain points (e.g. 1 value of x -axis, 3 values of y -axis) for some representative functions.

169: “curved enough”? What does this mean precisely?