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# Are innovative bird species more able to use edge habitats?

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Kea (*Nestor notabilis*) opening and feeding from bin

## Introduction

- Humans are modifying habitats at high rates
- Fragmentation of natural habitats, such as forests, creates edge habitats
- Previous literature suggests that more cognitively capable species are better at coping in human-modified habitats
- One measure of cognitive capability is innovativeness (Lefebvre et al 2004)
- Hypothesis: birds that use edge habitats have more recorded innovations



European robin (*Erithacus rubecula*) fishing

## Methodology

- Data was collected on innovations and use of edge habitats for 3347 bird species and compiled into a database
- Innovation data came from Dr Louis Lefebvre's innovation database of food use-related innovations
- This database also included information on research effort (the number of papers published on each species)
- Edge habitat use came from Sibley and Monroe's Distribution and Taxonomy of Birds of the World (1990)

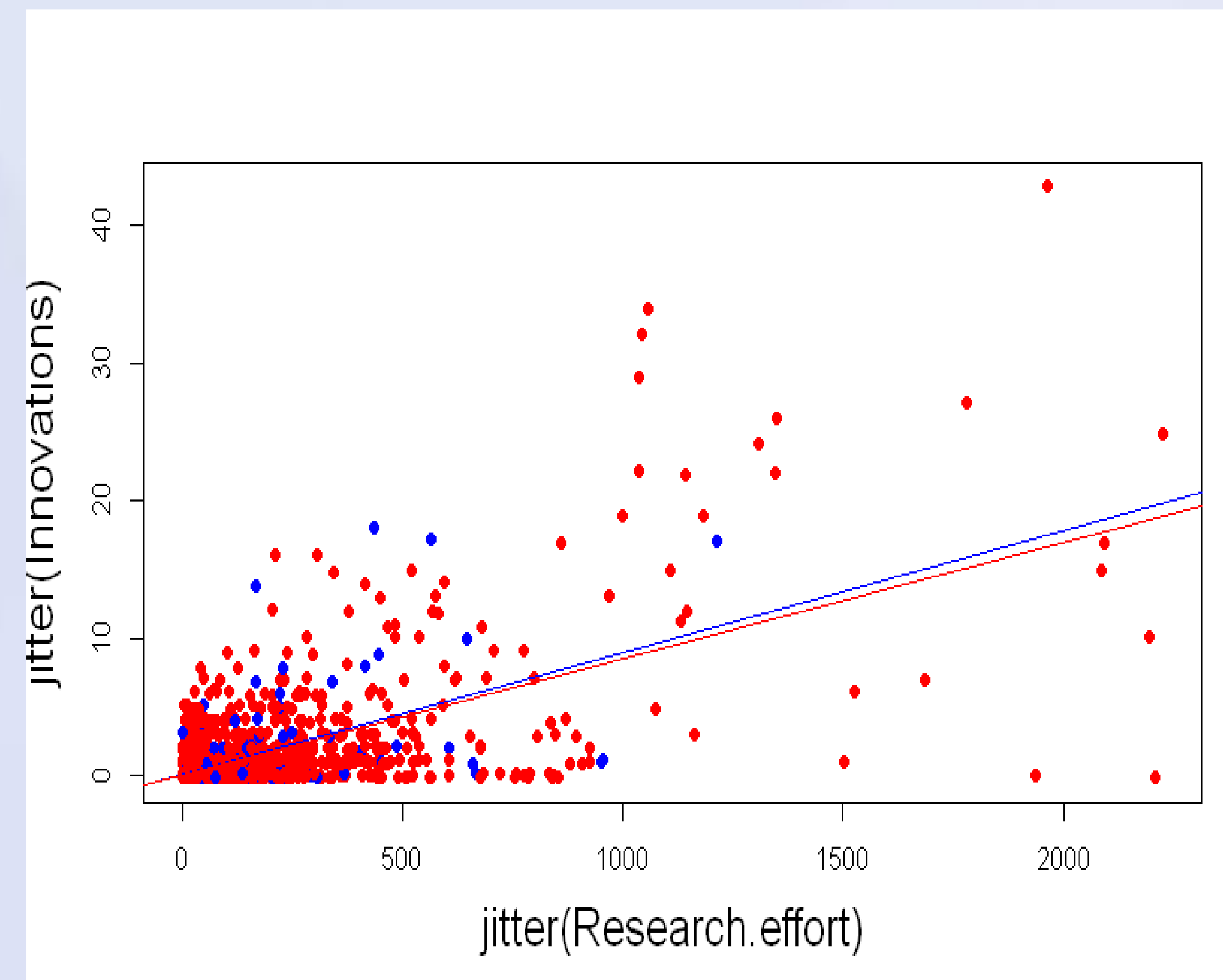


Figure 1. Jittered number of innovations as a function of jittered research effort for all species in the database. Edge habitat-using species are in blue, species that do not use edge habitats are in red.

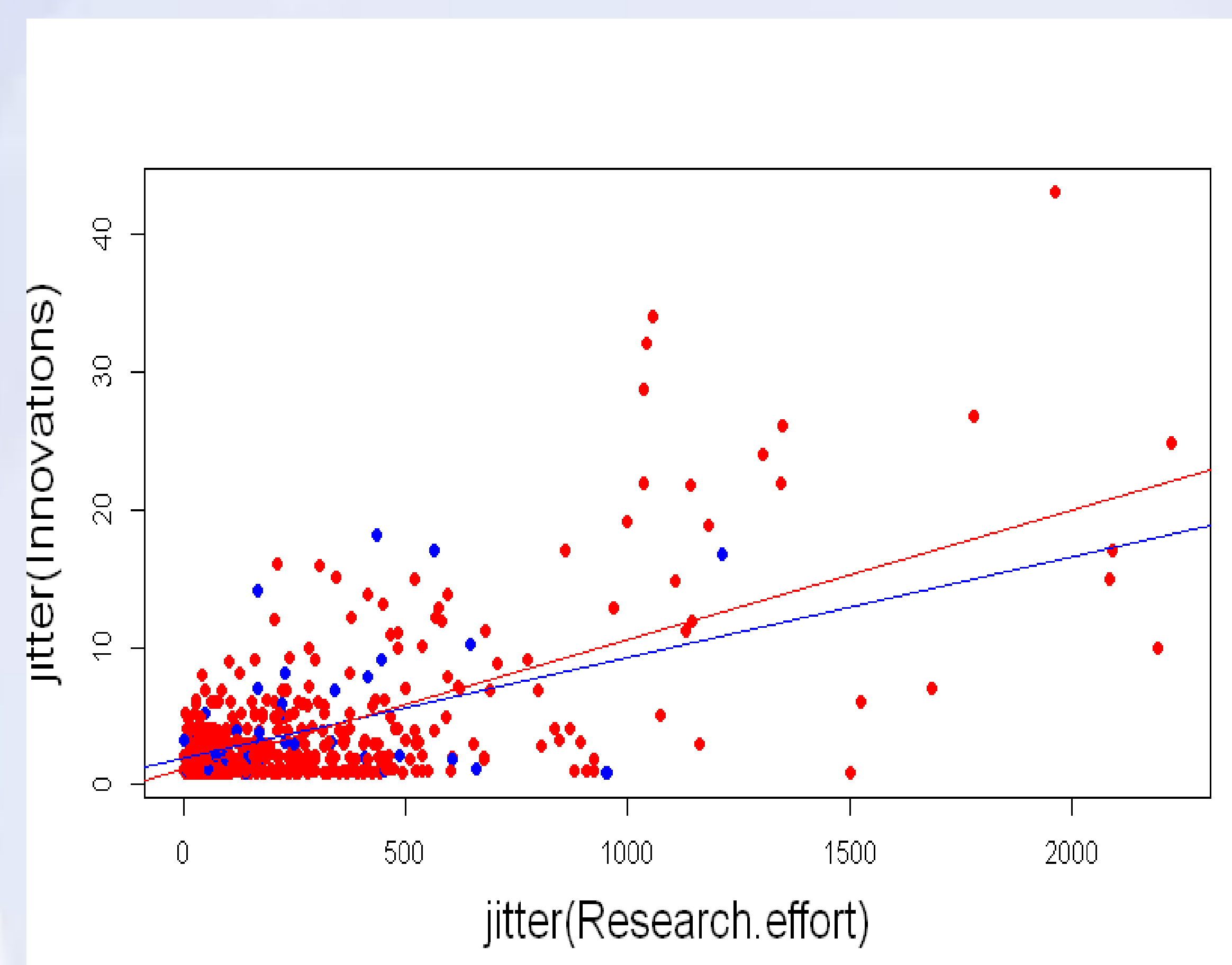


Figure 2. Jittered number of innovations as a function of jittered research effort for species in the database with one or more innovations. Edge habitat-using species are in blue, species that do not use edge habitats are in red.

## Results

- There was no significant difference in number of innovations between species that use or do not use edge habitats, according to a t-test ( $t = 0.34$ ,  $df = 359$ ,  $p\text{-value} = 0.74$ ).
- A linear model of the log-transformed number of innovations regressed on edge habitat use and research effort showed that edge habitat use was not a significant predictor of number of innovations ( $t=0.05$ ,  $df=3344$ ,  $p=0.96$ ). This can be seen in Figure 1.
- For species with one or more innovations, a linear model of the log-transformed number of innovations regressed on edge habitat use and research effort showed that edge habitat use was not a significant predictor of number of innovations ( $t=1.55$ ,  $df=776$ ,  $p=0.12$ ). This can be seen in Figure 2.

## Conclusion

- We found no relationship between number of innovations and edge habitat use
- Next steps would include accounting for phylogeny and using a more precise measure of edge habitat use (for example, as in Desrochers et al 2010)

## References

- Desrochers, A., Renaud, C., Hochachka, W. M., and Cadman, M. (2010) Area sensitivity by forest songbirds: theoretical and practical implications of scale-dependency. *Ecography* 33: 921-931.
- Lefebvre, L., Reader, S. M., and Sol, D. (2004) Brains, innovations and evolution in birds and primates. *Brain, Behavior and Evolution* 63: 233-246.
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