RCN Survey

Start of Block: Default Question Block

Q3   
I'm Randall Hughes, a marine ecologist from Northeastern University and a member of the Steering Committee for the Evolution in Changing Seas Research Coordination Network (RCN). On behalf of the RCN, I am conducting a survey to evaluate perceptions of the most important questions in evolutionary biology and marine science. As a member of the RCN listserv, your responses are essential for the survey's success. The entire survey should take less than fifteen minutes to complete.  
  
  
If you have any questions or would prefer to have a printed copy of the survey mailed to you, please email me at rhughes@northeastern.edu or call 781 581 7370 x.314.   Thanks in advance for supporting the RCN!   Randall Hughes Northeastern University   This study has been reviewed and approved by Northeastern University’s Institutional Review Board (Approval # XX-XX-XX).

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Q5 Before you begin, below is some information required by Northeastern University’s Institutional Review Board.   As a member of the Research Coordination Network Evolution in Changing Seas listserv, your perspective is valuable to us. The survey should only take about ten minutes and your responses are very important for our study. There are no direct benefits or risks for your participation.   Your part in this study will be handled in a confidential manner, and you must be at least 18 years old to participate. Any reports or publications based on this research will use only group data and will not identify you or any individual as being part of this study.   The decision to participate in this research project is up to you, and you can quit the survey at any time.   If you have any questions about your rights in this research, you may contact Nan C. Regina, Director of Human Subject Research Protection at Northeastern University. You can reach her at (617) 373-4588 or irb@neu.edu. You may call anonymously. **If you have any questions regarding electronic privacy**, please feel free to contact Mark Nardone, NU’s Director of Information Security via phone at (617) 373-7901, or via email at privacy@neu.edu.   Finally, we’ll be glad to share the results of the survey with you after the study is complete. If you have any questions about this study, please feel free to contact Randall Hughes, the Principal Investigator, at (781) 581-7370 x.314 or rhughes@northeastern.edu.

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Q13   
Provide a percentage (0-100%) for your research activities in the following disciplines. The total should sum to 100%.

Ecology : \_\_\_\_\_\_\_ (1)

Evolution : \_\_\_\_\_\_\_ (2)

Oceanography / Geoscience : \_\_\_\_\_\_\_ (3)

Other (please specify) : \_\_\_\_\_\_\_ (4)

Total : \_\_\_\_\_\_\_\_

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Q14   
Provide a percentage (0-100%) for your research activities in the following ecosystems. The total should sum to 100%.

Terrestrial : \_\_\_\_\_\_\_ (1)

Marine : \_\_\_\_\_\_\_ (2)

Freshwater : \_\_\_\_\_\_\_ (3)

Other (please specify) : \_\_\_\_\_\_\_ (4)

Total : \_\_\_\_\_\_\_\_

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Q16   
Provide a percentage (0-100%) for your research activities in the following taxonomic groups. The total should sum to 100%.

Plant : \_\_\_\_\_\_\_ (1)

Animal : \_\_\_\_\_\_\_ (2)

Microbe : \_\_\_\_\_\_\_ (3)

Other (please specify) : \_\_\_\_\_\_\_ (4)

Total : \_\_\_\_\_\_\_\_

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Q17   
Provide a percentage (0-100%) for your research activities in the following approaches. The total should sum to 100%.

Empirical : \_\_\_\_\_\_\_ (1)

Theoretical : \_\_\_\_\_\_\_ (2)

Other (please specify) : \_\_\_\_\_\_\_ (3)

Total : \_\_\_\_\_\_\_\_

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Q12   
Below we ask you to rate a series of questions in terms of their importance for advancing the fields of marine science and/or evolutionary biology. In these questions, "changing environment" could include abiotic changes (e.g., temperature, pH) or biotic changes (e.g., disease, predators, microbes). We acknowledge that there are many interesting questions to be asked, and this is not a comprehensive list. 

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Q18   
Rank the importance of this question for advancing the fields of **marine science** and **evolutionary biology.**

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|  | Marine biology | | | Evolutionary biology | | |
|  | Very important (1) | Somewhat important (2) | Not important (3) | Very important (1) | Somewhat important (2) | Not important (3) |
| What are the reasons for genetic divergence in the sea within and/or among species? (1) |  |  |  |  |  |  |

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Q29   
Rank the importance of this question for advancing the fields of **marine science** and **evolutionary biology.**

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|  | Marine biology | | | Evolutionary biology | | |
|  | Very important (1) | Somewhat important (2) | Not important (3) | Very important (1) | Somewhat important (2) | Not important (3) |
| How will environmental change interact with different reproduction strategies (e.g. broadcast spawning, brooding, sex determination) to alter reproductive success? (1) |  |  |  |  |  |  |

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Q30   
Rank the importance of this question for advancing the fields of **marine science** and **evolutionary biology.**

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|  | Marine biology | | | Evolutionary biology | | |
|  | Very important (1) | Somewhat important (2) | Not important (3) | Very important (1) | Somewhat important (2) | Not important (3) |
| How can we quantify additive genetic variance (e.g., heritability) effectively in systems where pair-mated cross designs or pedigrees are not feasible? (1) |  |  |  |  |  |  |

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Q31   
Rank the importance of this question for advancing the fields of **marine science** and **evolutionary biology.**

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|  | Marine biology | | | Evolutionary biology | | |
|  | Very important (1) | Somewhat important (2) | Not important (3) | Very important (1) | Somewhat important (2) | Not important (3) |
| How can an understanding of adaptation to multiple stressors be used to predict responses to multivariate environmental change or novel environments? (1) |  |  |  |  |  |  |

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Q32   
Rank the importance of this question for advancing the fields of **marine science** and **evolutionary biology.**

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|  | Marine biology | | | Evolutionary biology | | |
|  | Very important (1) | Somewhat important (2) | Not important (3) | Very important (1) | Somewhat important (2) | Not important (3) |
| When high genetic drift (e.g. sweepstakes reproductive success), strong selection, and high gene flow all occur at the same life stage (e.g. larval dispersal), what are the relative importance of each process to evolutionary outcomes? (1) |  |  |  |  |  |  |

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Q33   
Rank the importance of this question for advancing the fields of **marine science** and **evolutionary biology.**

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|  | Marine biology | | | Evolutionary biology | | |
|  | Very important (1) | Somewhat important (2) | Not important (3) | Very important (1) | Somewhat important (2) | Not important (3) |
| What is the role of hybridization/introgression in range expansion (or lack thereof) to new habitats? (1) |  |  |  |  |  |  |

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Q34   
Rank the importance of this question for advancing the fields of **marine science** and **evolutionary biology.**

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|  | Marine biology | | | Evolutionary biology | | |
|  | Very important (1) | Somewhat important (2) | Not important (3) | Very important (1) | Somewhat important (2) | Not important (3) |
| How and which dispersal traits are evolving in response to environmental change? (1) |  |  |  |  |  |  |

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Q35   
Rank the importance of this question for advancing the fields of **marine science** and **evolutionary biology.**

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|  | Marine biology | | | Evolutionary biology | | |
|  | Very important (1) | Somewhat important (2) | Not important (3) | Very important (1) | Somewhat important (2) | Not important (3) |
| What is the relative importance of rapid evolution versus acclimation via plasticity to environmental change? (1) |  |  |  |  |  |  |

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Q36   
Rank the importance of this question for advancing the fields of **marine science** and **evolutionary biology.**

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|  | Marine biology | | | Evolutionary biology | | |
|  | Very important (1) | Somewhat important (2) | Not important (3) | Very important (1) | Somewhat important (2) | Not important (3) |
| For restoration and assisted evolution efforts, can we use genomics to predict fitness of genotypes in particular environments (with limited knowledge of the underlying genetic architecture)? (1) |  |  |  |  |  |  |

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Q37   
Rank the importance of this question for advancing the fields of **marine science** and **evolutionary biology.**

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|  | Marine biology | | | Evolutionary biology | | |
|  | Very important (1) | Somewhat important (2) | Not important (3) | Very important (1) | Somewhat important (2) | Not important (3) |
| Do species with large effective population size have unexpected outcomes for population genetic processes? (1) |  |  |  |  |  |  |

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Q38   
Rank the importance of this question for advancing the fields of **marine science** and **evolutionary biology.**

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|  | Marine biology | | | Evolutionary biology | | |
|  | Very important (1) | Somewhat important (2) | Not important (3) | Very important (1) | Somewhat important (2) | Not important (3) |
| What will nearshore climates be like in the future? (i.e., if we lack good predictions of ocean climate, how can we experiment under future conditions if we don’t know what those are?) (1) |  |  |  |  |  |  |

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Q39   
Rank the importance of this question for advancing the fields of **marine science** and **evolutionary biology.**

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|  | Marine biology | | | Evolutionary biology | | |
|  | Very important (1) | Somewhat important (2) | Not important (3) | Very important (1) | Somewhat important (2) | Not important (3) |
| What oceanographic and biological processes contribute to genetic load, and how does the geographic distribution of load affect adaptation? (1) |  |  |  |  |  |  |

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Q40   
Rank the importance of this question for advancing the fields of **marine science** and **evolutionary biology.**

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|  | Marine biology | | | Evolutionary biology | | |
|  | Very important (1) | Somewhat important (2) | Not important (3) | Very important (1) | Somewhat important (2) | Not important (3) |
| How does variation in selection or plasticity across different life history stages constrain or promote adaptation? (1) |  |  |  |  |  |  |

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Q41   
Rank the importance of this question for advancing the fields of **marine science** and **evolutionary biology.**

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|  | Marine biology | | | Evolutionary biology | | |
|  | Very important (1) | Somewhat important (2) | Not important (3) | Very important (1) | Somewhat important (2) | Not important (3) |
| What is the relative contribution of temporal fluctuating selection to maintaining variation in populations for short vs. long generation times? (1) |  |  |  |  |  |  |

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Q42   
Rank the importance of this question for advancing the fields of **marine science** and **evolutionary biology.**

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|  | Marine biology | | | Evolutionary biology | | |
|  | Very important (1) | Somewhat important (2) | Not important (3) | Very important (1) | Somewhat important (2) | Not important (3) |
| How do the genetics and geography of local adaptation interact with oceanographic processes to predict (or not) future evolvability? (1) |  |  |  |  |  |  |

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Q43   
Rank the importance of this question for advancing the fields of **marine science** and **evolutionary biology.**

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|  | Marine biology | | | Evolutionary biology | | |
|  | Very important (1) | Somewhat important (2) | Not important (3) | Very important (1) | Somewhat important (2) | Not important (3) |
| Can epigenetic or plastic responses to environmental stress be inherited and alter evolutionary processes? (1) |  |  |  |  |  |  |

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Q44   
Rank the importance of this question for advancing the fields of **marine science** and **evolutionary biology.**

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|  | Marine biology | | | Evolutionary biology | | |
|  | Very important (1) | Somewhat important (2) | Not important (3) | Very important (1) | Somewhat important (2) | Not important (3) |
| How do eco-evolutionary feedbacks alter productivity and biogeochemical cycles in the ocean? (1) |  |  |  |  |  |  |

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Q45   
Rank the importance of this question for advancing the fields of **marine science** and **evolutionary biology.**

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|  | Marine biology | | | Evolutionary biology | | |
|  | Very important (1) | Somewhat important (2) | Not important (3) | Very important (1) | Somewhat important (2) | Not important (3) |
| Under what conditions will evolutionary processes accelerate (e.g. mutational meltdowns or Allee effects) or prevent (e.g. evolutionary rescue) extinctions? (1) |  |  |  |  |  |  |

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Q46   
Rank the importance of this question for advancing the fields of **marine science** and **evolutionary biology.**

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|  | Marine biology | | | Evolutionary biology | | |
|  | Very important (1) | Somewhat important (2) | Not important (3) | Very important (1) | Somewhat important (2) | Not important (3) |
| At spatial scales below the dispersal distance, how do spatial patterns of selective gradients create patterns of local adaptation (microgeographic adaptation)? (1) |  |  |  |  |  |  |

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Q47   
Rank the importance of this question for advancing the fields of **marine science** and **evolutionary biology.**

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|  | Marine biology | | | Evolutionary biology | | |
|  | Very important (1) | Somewhat important (2) | Not important (3) | Very important (1) | Somewhat important (2) | Not important (3) |
| Under what conditions does the evolved plastic response predict the evolutionary response? (1) |  |  |  |  |  |  |

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Q48   
Rank the importance of this question for advancing the fields of **marine science** and **evolutionary biology.**

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|  | Marine biology | | | Evolutionary biology | | |
|  | Very important (1) | Somewhat important (2) | Not important (3) | Very important (1) | Somewhat important (2) | Not important (3) |
| How do microbial symbiont(s) or microbiomes affect the adaptation or acclimation of their hosts to a changing environment? (1) |  |  |  |  |  |  |

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Q34 Choose up to 3 questions you think are most important for advancing each field. Questions can be important for more than one field.

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| Most important for advancing marine science | Most important for advancing evolutionary biology | Most important for advancing conservation and management |
| \_\_\_\_\_\_ What are the reasons for genetic divergence in the sea within and/or among species? (1) | \_\_\_\_\_\_ What are the reasons for genetic divergence in the sea within and/or among species? (1) | \_\_\_\_\_\_ What are the reasons for genetic divergence in the sea within and/or among species? (1) |
| \_\_\_\_\_\_ How will environmental change interact with different reproduction strategies (e.g. broadcast spawning, brooding, sex determination) to alter reproductive success? (2) | \_\_\_\_\_\_ How will environmental change interact with different reproduction strategies (e.g. broadcast spawning, brooding, sex determination) to alter reproductive success? (2) | \_\_\_\_\_\_ How will environmental change interact with different reproduction strategies (e.g. broadcast spawning, brooding, sex determination) to alter reproductive success? (2) |
| \_\_\_\_\_\_ How can we quantify additive genetic variance (e.g., heritability) effectively in systems where pair-mated cross designs or pedigrees are not feasible? (3) | \_\_\_\_\_\_ How can we quantify additive genetic variance (e.g., heritability) effectively in systems where pair-mated cross designs or pedigrees are not feasible? (3) | \_\_\_\_\_\_ How can we quantify additive genetic variance (e.g., heritability) effectively in systems where pair-mated cross designs or pedigrees are not feasible? (3) |
| \_\_\_\_\_\_ How can an understanding of adaptation to multiple stressors be used to predict responses to multivariate environmental change or novel environments? (4) | \_\_\_\_\_\_ How can an understanding of adaptation to multiple stressors be used to predict responses to multivariate environmental change or novel environments? (4) | \_\_\_\_\_\_ How can an understanding of adaptation to multiple stressors be used to predict responses to multivariate environmental change or novel environments? (4) |
| \_\_\_\_\_\_ When high genetic drift (e.g. sweepstakes reproductive success), strong selection, and high gene flow all occur at the same life stage (e.g. larval dispersal), what are the relative importance of each process to evolutionary outcomes? (5) | \_\_\_\_\_\_ When high genetic drift (e.g. sweepstakes reproductive success), strong selection, and high gene flow all occur at the same life stage (e.g. larval dispersal), what are the relative importance of each process to evolutionary outcomes? (5) | \_\_\_\_\_\_ When high genetic drift (e.g. sweepstakes reproductive success), strong selection, and high gene flow all occur at the same life stage (e.g. larval dispersal), what are the relative importance of each process to evolutionary outcomes? (5) |
| \_\_\_\_\_\_ What is the role of hybridization/introgression in range expansion (or lack thereof) to new habitats? (6) | \_\_\_\_\_\_ What is the role of hybridization/introgression in range expansion (or lack thereof) to new habitats? (6) | \_\_\_\_\_\_ What is the role of hybridization/introgression in range expansion (or lack thereof) to new habitats? (6) |
| \_\_\_\_\_\_ How and which dispersal traits are evolving in response to environmental change? (7) | \_\_\_\_\_\_ How and which dispersal traits are evolving in response to environmental change? (7) | \_\_\_\_\_\_ How and which dispersal traits are evolving in response to environmental change? (7) |
| \_\_\_\_\_\_ What is the relative importance of rapid evolution versus acclimation via plasticity to environmental change? (8) | \_\_\_\_\_\_ What is the relative importance of rapid evolution versus acclimation via plasticity to environmental change? (8) | \_\_\_\_\_\_ What is the relative importance of rapid evolution versus acclimation via plasticity to environmental change? (8) |
| \_\_\_\_\_\_ For restoration and assisted evolution efforts, can we use genomics to predict fitness of genotypes in particular environments (with limited knowledge of the underlying genetic architecture)? (9) | \_\_\_\_\_\_ For restoration and assisted evolution efforts, can we use genomics to predict fitness of genotypes in particular environments (with limited knowledge of the underlying genetic architecture)? (9) | \_\_\_\_\_\_ For restoration and assisted evolution efforts, can we use genomics to predict fitness of genotypes in particular environments (with limited knowledge of the underlying genetic architecture)? (9) |
| \_\_\_\_\_\_ Do species with large effective population size have unexpected outcomes for population genetic processes? (10) | \_\_\_\_\_\_ Do species with large effective population size have unexpected outcomes for population genetic processes? (10) | \_\_\_\_\_\_ Do species with large effective population size have unexpected outcomes for population genetic processes? (10) |
| \_\_\_\_\_\_ What will nearshore climates be like in the future? (i.e., if we lack good predictions of ocean climate, how can we experiment under future conditions if we don’t know what those are? (11) | \_\_\_\_\_\_ What will nearshore climates be like in the future? (i.e., if we lack good predictions of ocean climate, how can we experiment under future conditions if we don’t know what those are? (11) | \_\_\_\_\_\_ What will nearshore climates be like in the future? (i.e., if we lack good predictions of ocean climate, how can we experiment under future conditions if we don’t know what those are? (11) |
| \_\_\_\_\_\_ What oceanographic and biological processes contribute to genetic load, and how does the geographic distribution of load affect adaptation? (12) | \_\_\_\_\_\_ What oceanographic and biological processes contribute to genetic load, and how does the geographic distribution of load affect adaptation? (12) | \_\_\_\_\_\_ What oceanographic and biological processes contribute to genetic load, and how does the geographic distribution of load affect adaptation? (12) |
| \_\_\_\_\_\_ How does variation in selection or plasticity across different life history stages constrain or promote adaptation? (13) | \_\_\_\_\_\_ How does variation in selection or plasticity across different life history stages constrain or promote adaptation? (13) | \_\_\_\_\_\_ How does variation in selection or plasticity across different life history stages constrain or promote adaptation? (13) |
| \_\_\_\_\_\_ What is the relative contribution of temporal fluctuating selection to maintaining variation in populations for short vs. long generation times? (14) | \_\_\_\_\_\_ What is the relative contribution of temporal fluctuating selection to maintaining variation in populations for short vs. long generation times? (14) | \_\_\_\_\_\_ What is the relative contribution of temporal fluctuating selection to maintaining variation in populations for short vs. long generation times? (14) |
| \_\_\_\_\_\_ How do the genetics and geography of local adaptation interact with oceanographic processes to predict (or not) future evolvability? (15) | \_\_\_\_\_\_ How do the genetics and geography of local adaptation interact with oceanographic processes to predict (or not) future evolvability? (15) | \_\_\_\_\_\_ How do the genetics and geography of local adaptation interact with oceanographic processes to predict (or not) future evolvability? (15) |
| \_\_\_\_\_\_ Can epigenetic or plastic responses to environmental stress be inherited and alter evolutionary processes? (16) | \_\_\_\_\_\_ Can epigenetic or plastic responses to environmental stress be inherited and alter evolutionary processes? (16) | \_\_\_\_\_\_ Can epigenetic or plastic responses to environmental stress be inherited and alter evolutionary processes? (16) |
| \_\_\_\_\_\_ How do eco-evolutionary feedbacks alter productivity and biogeochemical cycles in the ocean? (17) | \_\_\_\_\_\_ How do eco-evolutionary feedbacks alter productivity and biogeochemical cycles in the ocean? (17) | \_\_\_\_\_\_ How do eco-evolutionary feedbacks alter productivity and biogeochemical cycles in the ocean? (17) |
| \_\_\_\_\_\_ Under what conditions will evolutionary processes accelerate (e.g. mutational meltdowns or Allee effects) or prevent (e.g. evolutionary rescue) extinctions? (18) | \_\_\_\_\_\_ Under what conditions will evolutionary processes accelerate (e.g. mutational meltdowns or Allee effects) or prevent (e.g. evolutionary rescue) extinctions? (18) | \_\_\_\_\_\_ Under what conditions will evolutionary processes accelerate (e.g. mutational meltdowns or Allee effects) or prevent (e.g. evolutionary rescue) extinctions? (18) |
| \_\_\_\_\_\_ At spatial scales below the dispersal distance, how do spatial patterns of selective gradients create patterns of local adaptation (microgeographic adaptation)? (19) | \_\_\_\_\_\_ At spatial scales below the dispersal distance, how do spatial patterns of selective gradients create patterns of local adaptation (microgeographic adaptation)? (19) | \_\_\_\_\_\_ At spatial scales below the dispersal distance, how do spatial patterns of selective gradients create patterns of local adaptation (microgeographic adaptation)? (19) |
| \_\_\_\_\_\_ Under what conditions does the evolved plastic response predict the evolutionary response? (20) | \_\_\_\_\_\_ Under what conditions does the evolved plastic response predict the evolutionary response? (20) | \_\_\_\_\_\_ Under what conditions does the evolved plastic response predict the evolutionary response? (20) |
| \_\_\_\_\_\_ How do microbial symbiont(s) or microbiomes affect the adaptation or acclimation of their hosts to a changing environment? (21) | \_\_\_\_\_\_ How do microbial symbiont(s) or microbiomes affect the adaptation or acclimation of their hosts to a changing environment? (21) | \_\_\_\_\_\_ How do microbial symbiont(s) or microbiomes affect the adaptation or acclimation of their hosts to a changing environment? (21) |

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Q33 Drag and drop to rank the role of the following factors in determining your perception of the importance of the research questions above (1 = has the most influence on your perception)

\_\_\_\_\_\_ Novelty of the question for the field (1)

\_\_\_\_\_\_ Relevance to my research (2)

\_\_\_\_\_\_ Potential for funding (3)

\_\_\_\_\_\_ Potential for high profile publication (4)

\_\_\_\_\_\_ Potential for applications to management / conservation / society (5)

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Q32 Are there any questions that you think should have been included in our list but were not? Please specify.

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Q7 What is your highest degree?

* High school diploma or GED (1)
* Bachelors (2)
* Masters (3)
* PhD (4)

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Q9 How old are you?

* 20-29 (1)
* 30-39 (2)
* 40-49 (3)
* 50-59 (4)
* 60-69 (5)

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Q11 What is your gender?

* Male (1)
* Female (2)
* Other (3) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Prefer not to answer (4)

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Q19 How many years have you worked in the field?

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Q31 In which country do you currently reside?

▼ Afghanistan (1) ... Zimbabwe (1357)

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