

## **Introduction**

I present the results of an information and training needs assessment of potential audiences for a planned Climate Smart Riparian Restoration workshop. These results are meant to inform prioritization of objectives and subject matter for this workshop, which is being led by Pt. Blue Conservation Science and convened and facilitated by Elkhorn Slough Coastal Training.

## **Methodology**

This assessment was designed to prioritize learning objectives and workshop format to support the workshop goal for a proposed 'Climate Smart Riparian Restoration' workshop:

*"Increase the knowledge of riparian restoration practitioners about ways to improve riparian restoration to account for anticipated climate change."*

The learning objectives that support this goal are as follow.

Participants will increase their knowledge about:

1. All of the principles of climate-smart restoration
  - a. Show your work
  - b. Look forward but don't ignore the past
  - c. Consider the broader context
  - d. Build in ecological insurance
  - e. Build evolutionary resilience
  - f. Include the human community
  - g. Research and Monitoring
2. How to apply the principles
  - a. Tools created to assist in climate-smart riparian restoration
    - i. Restoration Checklist
    - ii. Riparian Restoration Design Database
    - iii. Selected Resources: Climate change Predictions
    - iv. Selected Resources: Riparian Restoration
3. How specific species are affected by the climate-smart riparian restoration framework
4. How human communities benefit from climate-smart restoration

The survey included questions designed to elicit general, open ended responses about the subject matter as well as a question to assess the knowledge level of the respondents. I sent the survey to ~2200 potential audience members on January 13, 2016 and closed the survey after the deadline on January 20, 2016.

For analysis, I filtered responses to include only intermediate and advanced audience members, as these were the ones targeted for the training. For open-ended questions, I coded answers to summarize results and present only answers with more than a few responses.

**Results**

Eighty three people responded to the survey. Eliminating the novice respondents resulted in 68 answers for the analysis.

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Question 1: *What information or training needs are you most interested in to improve your work with riparian restoration considering climate change?*

The first question was open-ended about respondents’ general interest in the training subject, as it pertained to their work (Table 1). The top three priorities were: 1) interaction between anticipated climate change with riparian restoration or on riparian areas, in general; 2) impacts of anticipated climate change on riparian hydrology; 3) how to integrate anticipated climate change with restoration planting schemes.

*Table 1: Priority information or training needs (n=51)*

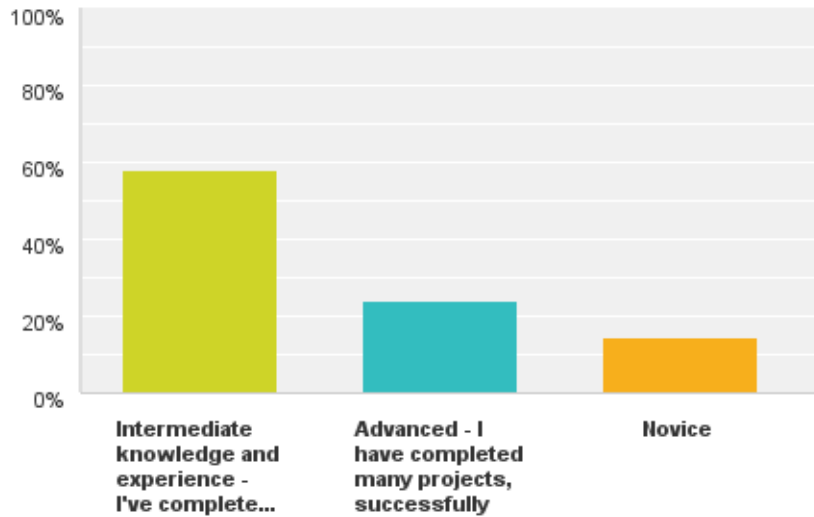
Bins of answers	# responses
Climate x riparian restoration/impacts	15
hydrology	11
planting schemes	9
specific plants to choose	7
planting in and accommodation for drought	7
monitoring methods	6
restoration (general)	5
measures of success	5
plants x hydrology	5
success stories	5

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Question 2: *How would you describe your familiarity with riparian restoration?*

The second question helped me to eliminate answers of non-intended audience members, asking respondents to self-identify their level of expertise. Twelve people (14%) answered “novice,” and so these respondents’ answers were eliminated from this analysis. The majority of respondents (58%) indicated that they had completed only some aspects of riparian restoration, an intermediate expertise level (Figure 1).

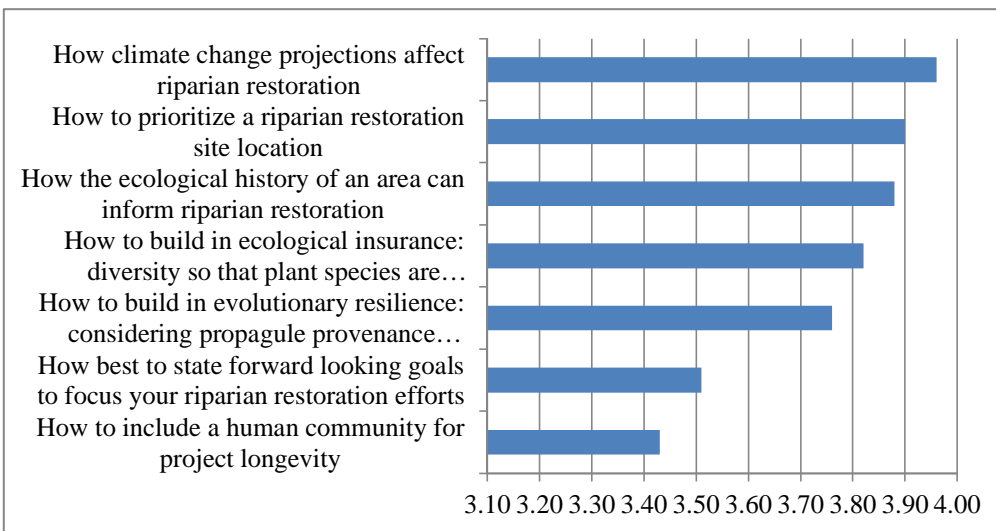
*Figure 1: Survey respondent expertise (n = 84)*  
 Intermediate response include “I’ve completed some aspects of riparian restoration projects”



Question 3: Please rate your level of interest in the following topics

Most topics received ratings indicating good interest (Figure 2). The priority topics were: 1) How climate change projections affect riparian restoration; 2) How to prioritize a riparian restoration site location, and; 3) How the ecological history of an area can inform riparian restoration.

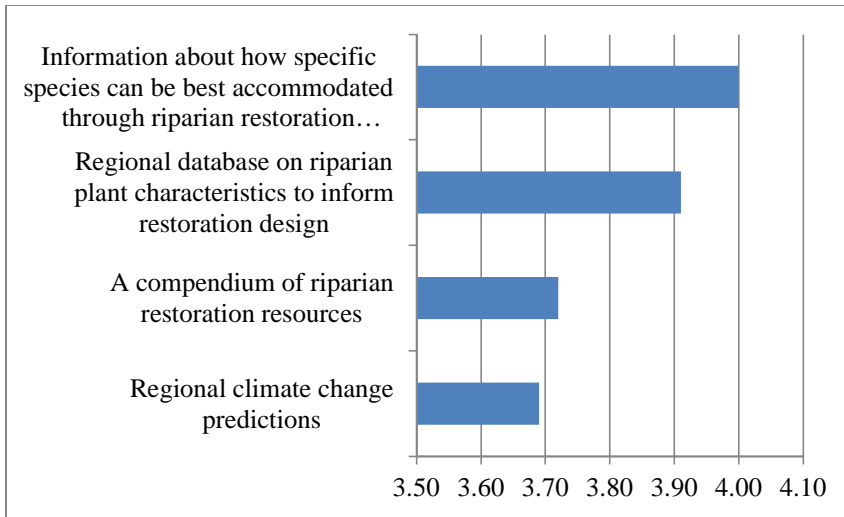
*Figure 2: Priority training topics (n=69)*



Question 4: *Please rate your interest in learning more about the following*

Again, participants rated a high level of interest in all the things we offered (Figure 3).

*Figure 3: Priority interests (n=69)*



Question 5: *If you attended a one day "climate smart" riparian restoration workshop, how interested would you be in that workshop including a field component, where participants learned about a relatively recent riparian planting area?*

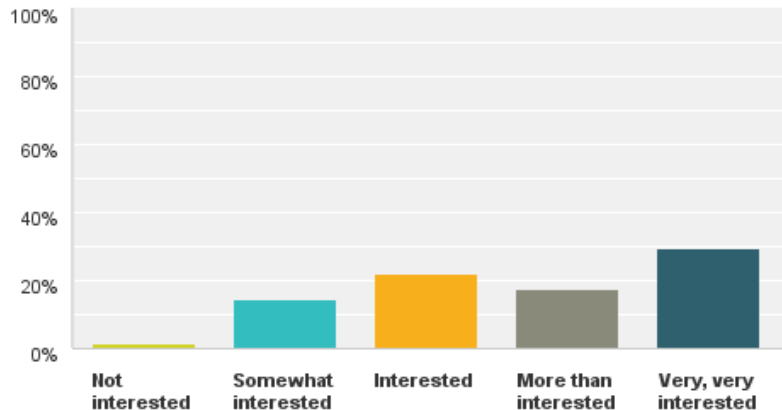
This question assessed interest in a field component for the workshop. In prior needs assessments of this audience, there was strong support for workshop formats that included both indoor and field components. The results in this survey were more mixed, perhaps reflecting variability in adult learning styles- visual, auditory, or kinesthetic (Figure 4). Some optional, open-ended comments included with responses reflected the variability of learning styles, but some comments also emphasized the need for a field site to be relevant to their restoration sites.

*Figure 4: Interest in field component (n = 69)*

## Audience Needs Assessment: Climate Smart Riparian Restoration Training

Grey Hayes, PhD

January 26, 2016



Question 5: *Are there any other comments you would like for us to hear concerning training on riparian restoration that is informed by climate change projections?*

Respondents included some interesting and supportive comments, but nothing was repeated more than once or twice, so I could not identify trends useful to inform program design.

### Conclusions

- Target audience of intermediate expertise
  - Workshop description
  - Marketing
- Prioritize topics/interests in program design
  - Interaction between anticipated climate change with riparian restoration or on riparian areas, in general;
  - Impacts of anticipated climate change on riparian hydrology;
  - How to integrate anticipated climate change with restoration planting schemes.
  - Information about how specific species can be best accommodated through riparian restoration considering climate change
  - Regional database on riparian plant characteristics to inform restoration design
- Carefully consider case studies/field sites for relevance to audience

## Appendix 1: Various interesting specific comments

**Question 1: What information or training needs are you most interested in to improve your work with riparian restoration considering climate change?**

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Info I'm already keenly aware of that I wish would be more broadly promulgated/emphasized: simply, that riparian zones, among their other attributes, offer important runoff detention functions that are mostly overlooked, despite two decades+ of supporting science. Two good references:

*Ponce, V. M. 1989. Baseflow augmentation by streambank storage. Environment, Health, and Safety Report 009.4-89.13, Pacific Gas and Electric Company Department of Research and Development, San Ramon, California, USA. [online]: [http://ponce.sdsu.edu/baseflow\\_augmentation.html](http://ponce.sdsu.edu/baseflow_augmentation.html)*

*Kondolf, G. M., L. M. Maloney, and J. G. Williams. 1987. Effects of bank storage and well pumping on baseflow, Carmel River, Monterey County, California. Journal of Hydrology 91:351-369.*

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i don't see climate change impacting how projects are done right now. CA climate is subject to huge swings regardless.

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Before we rush forward in anticipation of projected changes, we need to analyze past restorations and look at long-term success and failures. We have failed miserably at tracking restoration efforts.

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Appreciating the leadership that Point Blue, TNC, and Elkhorn Slough take in these topics:

1) Estimating/quantifying carbon storage in riparian restoration -- age of the trees matter -- and how to participate in carbon markets or programs to fund the restoration. I'd estimate/model at the beginning of a project to inform clients or partners, and then I'd like to use field measurements and/or models to quantify during a project. Virginia Matzek wrote a great paper in Restoration Ecology about carbon markets funding restoration ecology and concluding that current policy in the US means carbon payments won't cover restoration: what's coming up, policy-wise?

2) Climate-smart restoration: are there patterns to which riparian areas are most sensitive to climate and will need a climate-smart suite of species? How do we mainstream climate-smart work (and not have to convince clients it's a good idea)? In practice, willows will continue to be the workhorse tree species (whether we announce "climate-smart" or not), but I'd still like to discuss theory-meeting-implementation.

**Question 5: If you attended a one day "climate smart" riparian restoration workshop, how interested would you be in that workshop including a field component, where participants learned about a relatively recent riparian planting area?**

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It may be hard to fit in enough time for both lecture and field components, depending on the size of the class. I assume many riparian sights look similar once restored, so schematics of a site during the process of restoration might be more helpful.

## **Appendix 1: Various interesting specific comments**

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I have seen and participated in many restoration projects. Looking at one, even a good one, won't be particularly helpful. I need overall information. It would be useful to have a portion of the presentation that presented, in slides, many different restoration projects and how things are and are not working in each.

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My interest (*in a field component*) would depend upon how closely the site resembled the site I work on, as I only work on one.

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I would be more interested to tour a mature, successful project

**Question 6: *Are there any other comments you would like for us to hear concerning training on riparian restoration that is informed by climate change projections?***

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Most riparian projects, if they have a veg component, only have a 10-15 yr horizon. Do we expect that much change in climate over this timeframe? Seems not. Even long lived tree species will do just fine once established, even if the climate changes to move that species out (e.g. redwood)

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It'll be important to have informed discussion of:

1. Hydrologic variability - surface flow and groundwater fluctuations.
  2. Adapting to changing stream conditions and what those conditions might be.
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Any advances on the policy front, so that conducting legislatively-mandated mitigation means you can not only replace species taken out by development, but have options for experiments that are climate-smart and support resilient landscapes (and have funding or heft to encourage clients to choose that route). Thank you!

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Suggested partnerships, for increasing work done and contributing to demonstration areas for public and officials, not just class attendees.