How can the Santa Ana sucker be saved?

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1 Introduction

According to Kolbert 201X, we are in the midst of a dramatic extinction event that is rivaling major catostrophic extinctions in the past. The difference with the current situation is the cause: The dominance of human beings over the Earth's surface led to the extirpation of thousands of species, and counting.

It's easy to second guess various scientific and policy questions with respect to endangered species, but when we begin to evaluate what is actually being done on the ground for various species, we quickly learn that we are not just in a ecological web, but our policy and regulatory processes are embedded in a complex context of landuse history and economic agendas.

1.1 Driving Question

This project will attempt to answer the following question, "How can we save the Santa Ana sucker?" As we have seen, this type of generic question needs to be constrained, defined, and subject to what we already know or will learn about the topic. In addition, we need to define the terms used in the question, such as who is "we"? What do we mean by "save"? And finally, when we ask "how", what are the options avaible that might fit into the "how"?

2 Learing Goals

- Evaluate sucker habitat using the following tools:
  - Define Water Quality Goals
  - Characterize Hydrology and Geomophology
  - Analyze Community Profile of Periphyton
- Propose and evaluate options to improve Santa Ana sucker habitat.
- Prepare sets of pratical and effective measures that might protect (or increase) the extant populations of the Santa Ana sucker.

2.1 Why these learning goals?

3 Project Stages

- Session 1: Define 'Public Product'
- Session 2: Revise 'Driving Question' and list resources needed
- Session 3: Read, clarify, or develop appropriate SOPs
- Session 4: Field Work
- Session 5: Data Analysis
- Session 7: Development of Public Products
- Session 6: Presentation of Public Products

4 Defining the Public Product

For this project, each student will contribute one science brief that describes the knowledge available to "resore and protect" the Santa Ana Sucker.

Thus, we will be collating, organize, and summarize scientific resources that can be digested by a range of stakeholders to help "answer" the driving question. Each research brief, will address a different scientific issues associated with the Santa Ana sucker–where each issue addresses a specific driving question with respect to the sucker. And as the topics develop, we will bundle topics to produce 3-5 reports.

EA 30 Research Briefs are short (3-4 pages) descriptions of recently EA30 project results. These "briefs" highlights also include one image, a caption (50 words), and several publication citations. Each student scientists are invited to develop one to several breifs that will be made available to the public.

Each brief will include 5 sections:

- Problem definition
- Evidence of problem
- Scientific knowledge to address the problem
- Information gaps
- Next Steps (which could be translated by stakeholders as potential research needs)

Although the audience is the public at large, we will use several collaborators to help us define, refine, and evaluate our public products.

Our collaborators include:

- USFWS

- RCD of SB?
- ??

As the develop of individual topics forms, we will form into teams to facilitate field work, literature reviews, and evaluation of current or unpublished data. Hote: each student is responsible for an individual contribution.

Once we create topical themes, we will create teams to arrange and order of individual breifs based on the quality and potential interests for each of the sections.

Below is a list of possible themes, but this list in only one potential list and not meant to constrain how we decide to work as a group:

Issue 1: Habitat Loss

Issue 2: Food Quality

Issue 3: Water Quality

Issue 4: Hydrology

Issue X: Geomorphology

4.1 Examples

https://www.fws.gov/Endangered/esa-library/index.html

http://blogs.scientificamerican.com/extinction-countdown/

4.2 Stakeholders and Evaluation Criteria of Public Product

Working with stakeholders is a key component doing environmental science, which might be constrasted with regular scientific research. Although some make the distinction between applied and pure science, I don't find the divide all that useful.

Better that getting into the morass of these defintions, let's move on to figure out what it works with stakeholders:

Active Listening

Defining Success

Outlining a Process

Professionalism and Completion

5 Driving Question

5.1 Define and constrain driving question

As one of our first excercises, we will explore the meaning of the driving question. As we work to understand our driving question, we will create groups of students to act as research teams that will address a portion of the driving question.

5.2 Understanding the Recovery Plan of the Santa Ana sucker

In the XXX of 20XX, the USFWS release a Draft Recovery Plan for the Santa Ana sucker. Please read the Draft Plan before class and we will use this to help create the driving question and refine the public product.

5.3 Resources to answer driving question

Each team will determine what resources are avaialble and/or needed to address the driving question. Working with the instructor is key because these resources need to be made available for the following week.

5.4 Determine Required Resources and Methods

5.5 Answering the Driving Questions

5.6 Data Collection and Analysis

6 Create Public Product

To create pubic product, we will develop four/five pdf briefs, using LaTeX and Rstudio.

6.1 Selecting a Style

We will rely on the Tufte style that we can access in Rstudio.

6.2 Writing and Presenting Results

6.3 Evaluation of the Public Product

Our stakeholders will evaluate the public product using the criteria that we develop together that will likely include accuracy, scholarship, and clarity.