Student Handout: "Are Eastern Fox Squirrels (*Sciurus niger*) 'good' or 'bad' for the greater Los Angeles, CA region?"[1] [2]

Scenario

It was an unusually hot and sultry day in the middle of July when I chatted in the small, barely air-conditioned chicken eatery with my folks. Besides bantering about what we planned to order as the physiological workings of our stomachs noisily betrayed to everyone our hunger, we also talked about plums. Plums in California ripen in July and my folks live on a large—at least by southern California standards—1-acre plot with twenty or so fruit trees. I had spent the past week plucking the soft, sweet plums from my folks' tree and began boasting about the delicious jam I had just canned in Mason jars—you know, the ones Pinterest has over 1 million ideas for, such as accouterments at an upscale, yet back-woodsy country wedding? The woman ahead of us in line, who had just finished paying for her to-go order, grabbed a plastic bag full of piping hot food from the restaurant owner, and promptly chimed in, "I used to enjoy fresh plums from my tree, but we have squirrels on our property in Phillips Ranch now, and we cannot keep them away from our fruit!" Somewhat indignant about such a loss, she pulled out her phone to show me a photo of the small, furry thief. Having just read countless articles in the popular news media about a supposed new LA area "invader"—the eastern fox squirrel—I glimpsed the photo and instantly recognized the reddish-brown fur and large, almost human-like paws tightly grasping a plum. Some Californians have deemed this squirrel an invasive "tree rat belonging on Skid Row" and others a welcome addition to the community conjuring a "cute acrobat who performs silly antics." Your task in this case is to tackle the question: "Are eastern fox squirrels 'good' or 'bad' for the greater Los Angeles area?

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General Background

Eastern fox squirrels (*Sciurus niger*) (EFS) were introduced to the greater Los Angeles, California region at various points beginning in the early twentieth century. It is believed that the first introduction occurred at the National Home for Volunteer Disabled Veterans in Sawtelle, CA sometime prior to 1904, which recent DNA evidence supports (Claytor, Muchilinski, & Torres, 2015). As Civil War and Spanish American War veterans headed out west from the Mississippi Valley, they toted the squirrels along with them, possibly as pets or companions, and possibly as food (Becker & Kimball, 1947). According to scant historical evidence, an administrator at the Sawtelle facility believed that caring for and feeding the squirrels was a poor use of state resources, so they were released. It is also rumored that Henry E. Huntington, founder of the Huntington Library in Pasadena, CA and nephew of the railroad tycoon, Collis P. Huntington, ordered a pair of EFS from New York in 1912. And finally, factory workers from Iowa apparently brought EFS to Long Beach, CA during World War II (Page, 2007).

The dispersal of the EFS from its initial entry points has occurred for a variety reasons, including relocation by residents and wildlife rehabilitation facilities and movement along utility lines and riparian corridors (King, Chung Sue, & Muchilinski, 2010). The EFS's success in the greater Los Angeles area has been attributed to its ability to take advantage of southern California's urban and suburban spaces, which offer a year-round food supply from exotic plants and other sources, including refuse (King, Chung Sue, & Muchilinski, 2010). Although biologists and local residents have reported that the EFS has replaced the native western gray squirrel (WGS) (also a tree squirrel, *Sciurus griseus*) in many locales during the last 30 years, it is not entirely clear whether this is due to a concept in traditional systems ecology called *competitive exclusion* or a complex combination of other factors, including lack of food availability and fragmentation of the western gray squirrel's habitat. Western gray squirrels, for example, tend to consume hypogeous fungi, pine nuts, acorns, California bay fruit, green leafage, and bark (Stienecker & Browning, 1970) and are less tolerant of urbanized/suburbanized spaces, whereas EFS willingly scavenge and find suitable nest areas in these urban/suburban locales (Fong, 2013).

Procedure

Step 1: Identify values/positions/stakeholders in popular media

Read the popular articles (links provided below) about the EFS and WGS and review the article "Transspecies Urban Theory" (Wolch, West, & Gaines, 1995), particularly the typology of attitudes toward animals (*naturalistic, ecologistic, humanistic, moralistic, scientistic, aesthetic, utilitarian, dominionistic, negativistic, neutralistic*) the authors discuss there.

First, identify as many components of this system you can find. Do not forget that since we are working from a transspecies urban theory and socio-ecological perspective, your system components will be human (e.g. gardeners, scientists), nonhuman (e.g. squirrels, rabbits, exotic fruit trees), nonliving materials (cages, electrical lines), places (Skid Row, Rancho Santa Botanical Garden, oak woodlands) and social/cultural constructs (laws, regulations, policies). Make a comprehensive list of them. Create a table and categorize the components as I have above (human, nonhuman, nonliving materials, social/cultural constructs, places).

Then, identify the various values that drive the positions represented in the articles. As a group, set up a table that includes the various typologies of attitudes each article invokes and the justifications for each position (citing quotations or passages from the text). Are there perspectives not represented? Based on the limited information you have thus far, do you think the EFS are good or bad for the greater Los Angeles area? Do you think they qualify as invasive species?

"Dam Cute Menace": http://articles.latimes.com/2007/jun/03/magazine/tm-squirrel22/2

"Much Ado about Nuttin'": http://laverne.edu/laverne-magazine/2012/05/much-ado-about-nuttin/

"Wildlife Center Cares for Displaced Baby Fox Squirrels": http://www.simivalleyacorn.com/news/2015-04-24/Community/Wildlife_center_cares_for_displaced_baby_fox_squir.html

"Rambling LA: Native Gray": http://chanceofrain.com/2009/09/rambling-la-native-gray/

"Palos Verdes/South Bay Audubon Society" Apr/May 2003 (pp. 1 & 3) "Squirrels will be squirrels": http://www.pvsb-audubon.org/hummin-45_2003.pdf

"Riverside: City Solves Squirrely Problem with OK to Kill, Trap Rodents" (read comments, too): http://www.pe.com/articles/squirrels-763347-squirrel-fox.html

The petition against Riverside's legislation:

"Don't Allow People to Kill Squirrels for Pest Control!" (read comments, too): http://www.thepetitionsite.com/863/550/122/dont-allow-people-to-kill-fox-squirrels-for-pest-control/

"Riverside: Petition Opposes Killing Squirrels" (read comments, too): http://www.pe.com/articles/squirrels-764399-petition-killing.html

Step 2: Charting disciplinary perspectives

Refer to articles, blogs, and petitions you've read in the popular media (links provided above), the "Disciplinary Perspectives" handout, and other readings in the course. Fill in the table below, indicating which disciplines are relevant to this case and how each perspective illuminates the issue/subject as a whole.[3] Briefly identify a weakness of each discipline. Feel free to add additional rows, as needed.

[3] Adapted from *Introduction to Interdisciplinary Studies* (Repko, 2014).

Disciplines Relevant to the Problem	How the Perspective Illuminates the Case/Subject as a Whole

To prepare for a class discussion, also consider the following and jot down your group's responses.

- Which disciplines are not represented in the Disciplinary Perspectives Handout?
- Are they represented in the online materials or in other course readings?
- What kinds of information about the case would you like to know that seem to be missing?

Step 3: Concept mapping and disciplinary integration: A systems perspective of the EFS case
Now that you have: (1) identified some of the stakeholders and values in this case and (2) charted how different disciplinary perspectives illuminate the case, you are going to put together a concept map that represents relationships among the various stakeholders. You can do this using the online tool, "Mental Modeler" (http://www.mentalmodeler.org/). When you do this, refer to articles, blogs, and petitions you've read about in the popular media (links provided above), the "Disciplinary Perspectives" handout, and other readings in the course (You may also wish to consult the research articles cited here and in the "Disciplinary Perspectives" handout).

As you build your map, be sure to include a narrative description (~2-3 sentences) describing each linkage in your map. Your description should include how: (1) the system components are linked; (2) which typologies of attitudes influence the relationship; and (3) how at least one disciplinary perspective illuminates the relationship (Feel free to include more than one disciplinary perspective).

As you build your relationships and write your descriptions, consider:

- How are these relationships influenced by scientific evidence?
- How are these relationships scalar?
- How are these relationships influenced by policy decisions and legal requirements at the state level? See the websites below.

- UC Statewide Integrated Pest Management Program: http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn74122.html

- California Department of Fish & Wildlife: https://www.wildlife.ca.gov/Conservation/Invasives/About

- Executive Order 13112: http://www.invasivespeciesinfo.gov/laws/execorder.shtml

Reflecting back on Step #2, answer each of the following questions (3-4 sentences each answer):

- How does each of the broad disciplines bring valuable understanding to bear on these relationships?
- What are the weaknesses in each disciplinary approach and how do the other perspectives fill in these gaps?

Step 4: Group synthesis presentation

To do this group synthesis project, prepare a 10-minute presentation for the class. In your presentation, you'll want to start with the items listed below and explain to the class how you organized your findings.

- List of stakeholders and the table of typologies of attitudes you created in Step #1
- Your disciplinary perspectives chart from Step #2
- Your concept map

Then, take all of the information you pieced together in your concept map, synthesize it, and answer the questions below, which are related, yet distinct. Be sure to share with the group how you define "invasive species" and provide multiple sources of evidence and perspectives when you characterize the EFS as "good" or "bad" for the greater Los Angeles area.

- Is the EFS an invasive species, according to the legal definition? Is there evidence to warrant interventions to stop the spread of the EFS? If so, what kinds of interventions would you suggest? Do you agree with the interventions currently being implemented?
- Is the EFS good or bad for the greater Los Angeles area?
- Reflect on your experience. How would your decision have been impacted if you only considered one disciplinary perspective?

References

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