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EXPERIMENTS

The Floristic Relay Game: A Board Game to Teach Plant Community Succession and Disturbance Dynamics

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Students playing the floristic relay game.

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ABSTRACT

This lesson is designed to introduce students to the concepts of succession and plant community dynamics. It teaches that plant communities are dynamic, that is, they change over time and space, and that these changes result from interactions between plants, their biotic and abiotic environments, and chance events.

Students play a board game in which each student represents an imaginary plant species. Each time the game is played, the students are conducting a type of theoretical experiment or simulation. Students explore plant community dynamics by playing the game and interacting with each other (as different plant species) and responding to chance events. At the end of the game, students report on the results and discuss with the class what they have learned. To apply their new knowledge, students predict changes in the community and attempt to make the community change in specific ways.

We decided to teach this topic using a game for several reasons. Games are fun and students easily learn complicated sets of rules in order to play a game. Also, games are dynamic and so are an effective way to teach a dynamic subject. Third, it can take many years to observe succession in nature; the game condenses this time and allows students to watch plant community dynamics within a class period. Fourth, current curriculum about succession is limited in its applicability because it is designed to take advantage of regional examples such as old-field succession in temperate hardwood forests. Because it uses imaginary species, this game can be played anywhere in the world.

KEYWORD DESCRIPTORS

- **Principal Ecological Question Addressed:** How (and why) does ecosystem disturbance drive successional changes in plant communities over time?
- **Ecological Topic Keywords:** succession, disturbance dynamics, theoretical models, resource management, restoration ecology
- **Science Methodological Skills Developed:** theoretical thinking, model testing
- **Pedagogical Methods Used:** active learning, guided inquiry, simulation game

CLASS TIME

This lesson can take place over the course of one two-hour period, not including extension activities.

OUTSIDE OF CLASS TIME

One to two hours for students to write reports; extension activities require more time.

STUDENT PRODUCTS

Completed worksheets and a report on the results of management "experiments." In the extension activities, students write an opinion statement based on evidence from management experiments and/or create a local version of the game using local plants instead of imaginary plants.

SETTING

This is an indoor lab.

COURSE CONTEXT

Used for undergraduate non-majors in Biology and Environmental Biology courses. We have also used this activity with high school biology, middle school science students, and in-service teachers.

INSTITUTION

Four-year public university and community college

TRANSFERABILITY

The basic activity can be used with non-majors biology students and pre-college students. Extension activities add to the difficulty level and are appropriate for students who are ecology majors.

SYNOPSIS OF THE LAB ACTIVITY

What Happens

In this lab, students play a board game designed to introduce the concepts of disturbance dynamics and succession in plant communities. Students explore the dynamics of an imaginary ecosystem through the rules and outcomes of the game. Student randomly draw cards which present chance events and specific interaction scenarios to game players, the cards determine the path of succession taken by the plant community during the game. At the end of the game, students diagram the species composition and report on and discuss the reactions of different plant species to competition and disturbance events and the role of these interactions and disturbance events in shaping the plant community. Students can also discuss the veracity of the game as compared to real plant communities. To evaluate what they have learned, students play a version of the game where they play the role of land manager. They stack the deck to increase or decrease the occurrence of different types of disturbance events or directly control the sequence of events to produce a desired result, for example fire events simulating fire management. Because imaginary plant species are used to play the game, there are no regional constraints on where the game can be played. As an extension for more advanced students, students can design their own version of the game based on local plant communities.

Lab Objectives

Through playing the game, students will learn that:

- different plants respond differently to changes in their physical environment
- plants respond to each other, and
- both of these influencing factors can shape the way a plant community changes over time
- random processes play an important role in plant community succession
- all of these factors pose challenges to natural resource management of landscapes in different successional states

Specifically, at the end of the lesson, students will be able to:

1. Diagram the changes in the imaginary plant community as a function of time, in the presence of environmental disturbances.
2. Predict the most likely outcome of plant succession in the imaginary plant community, following environmental disturbances or during periods of no disturbance.
3. Predict the outcome of land management strategies that increase or decrease the frequency of disturbances.

Equipment/Logistics Required

For a class of 24 students working in groups of six:

- 4 Game boards
- 4 sets of game cards and
- 24 copies of handouts.

Pre-lab Preparation

The Materials and Methods section in the “Description” has a list of all of the PDFs that you will need to print out in preparation for this activity. For each group of 4-6 students, make one copy of the Game Board (Figure 1 and Figure 2) on card stock and tape the two sides together. Make copies of the game cards on card stock (you could use a different color for each of the three types of cards). Make multiple copies (5-7) of the Event (Figure 3: Disturbances; Figure 4: Non-Disturbances) and Interaction (Figure 6) cards, and one copy of the Character (Figure 5) cards, per group. Each group will also need six assorted nuts, bolts, or buttons to use as game pieces and a coin for coin tosses. You will also need to provide each group with one copy of the rules (Figure 7) and each student with copies of the worksheets (Figure 8 and Figure 9).

Summary of What is Due

As a minimum, completed worksheets, and a short report of findings of management “experiments.” Additionally, you could require a written report of students’ opinions on the scenario, and/or the students’ own version of the game using local or regional plants.

DESCRIPTION OF THE LAB ACTIVITY

Introduction (written for students)

An important and often misunderstood concept in ecology is succession. Succession refers to the series of changes observed in a plant community following a disturbance event (Connell and Slayter 1977). A disturbance event, such as a wildfire, flood, landslide or hurricane, is an event that changes ecosystem structure and resource availability (Pickett and White 1985). For an example of succession, think of a severe forest fire that kills many trees. What was once a closed canopy forest with very little light reaching the ground is now a very open and bright place. Plants and seeds that were in the shade can take advantage of the new available resources, including sunlight. The plant species that will thrive in the new, open environment may be different from those that grew under the closed forest canopy. These plants are called early successional plants because they thrive in recently disturbed environments. They are also called colonizers, ruderals or weeds. Over time, as colonizers grow, they change the environment again (by shading, or changing soil conditions), which creates opportunities for a different set of plant species. These plant species that establish after the early successional species are called late successional species. They are generally less tolerant of disturbance events. These species also often grow more slowly and live longer than early successional species and only become prevalent a while after the disturbance event. Plant communities can be thought of as going through cycles of disturbance followed by succession followed by disturbance and so on. This is not to say that these cycles, and the resulting communities, are ever identical or exactly repeatable.

In this lab, students explore the dynamics of plant communities, that is, how plant communities change over time and space as a result of interactions between plants, their biotic and abiotic environment, and chance events. The concepts of succession and disturbance dynamics are timely given the extent to which human-caused disturbances, such as logging and land development, are influencing global ecosystems and the extent to which natural disturbances, such as fires and floods, are actively managed. Informed voters and citizens should know about disturbance and succession in plant communities. Knowledge of these processes will help them make decisions about land conservation, wildlife habitat restoration and natural resource management practices.

Materials and Methods: Figures

- Figure 1: Game board, left side.
- Figure 2: Game board, right side.
- Figure 3: Event cards, disturbance events. Create a deck of event cards by making multiple copies of both disturbance and no disturbance cards.
- Figure 4: Event cards, non-disturbance events. Create a deck of event cards by making multiple copies of both disturbance and no disturbance cards.
- Figure 5: Character cards. Only one set of character cards is needed for each game.
- Figure 6: Interaction cards. To make a deck of interaction cards, make multiple copies.
- Figure 7: The rules handout. Handouts for students, include the rules, worksheet and sample community diagram.
- Figure 8: Blank Student Worksheet. Have student record their results in the blanks provided.
- Figure 9: Sample community diagram. Handout for students with instructions on creating their own community diagrams, and a sample diagram.

Overview of Data Collection and Analysis Methods:

In the game, each student plays the role of one of six different imaginary plant species. The student with the most plants of his or her species in the community wins the game. As students play the game, they learn that the six plants respond differently to the disturbances. They also learn that plants interact with each other. Each round begins with an event card randomly drawn from a deck of cards. All the players then move across the playing board based upon that one event and the response of their given plant species. When two or more players land on the same spot, they must draw an interaction card for each pair of interacting players.

The rules handout explains how to play, step by step. The game ends when a player reaches the Finish square. At the end of the game, students count the event cards that were played, and record the number of each event type on their worksheet (Figure 8). Students also record the position of the players on the playing board. Using the sample diagram (Figure 9), have students diagram what their plant community looked like at the end of the game (based on the premise that the further a player travels on the board, the greater the number of individuals of their species). If any players are at the Start box at the end of the game, their species has zero plants in the diagram. After an initial discussion following the first game, ask students to predict the results of a game played without the Disturbance Event cards. They can play again and test their prediction. To evaluate their learning, ask students to “manage” disturbance by stacking the event deck to favor a particular species. Then have them test the results of their management by playing a game with the stacked deck.

How to Play the Floristic Relay Game

Number of players: 6

Object of the game: First player to reach the "Finish" square wins.

Step 1: Choose a dealer.

Step 2: All players, including the dealer, choose a game piece. Place game pieces in the "Start" square.

Step 3: Dealer shuffles Event Cards and places them face down in Future Events spot on the playing board. Shuffle and place the Interaction Cards face down in their spot, and deal one Character Card to each player.

Step 4: The dealer draws the first Event Card and places it face up in the Current Event spot.

Step 5: Each player then plays according to the Event and Character Card directions, starting with the dealer and going clockwise.

Step 6: After all players have their turn, check the board for players who landed on the same square. These players are interacting.

- Interactions are played in the same order as Events (clockwise starting at the dealer)
- Two at a time, the interacting players draw one Interaction Card.
- Play according to the interaction card.

Step 7: Repeat Steps 4-6 until a player wins. Record the order of the players and the number of each type of event that occurred during the game.

Questions for Further Thought and Discussion

Some possible discussion questions include:

- How would you describe the diagram produced, is it more like a forest, a grassland or a shrubland?
- What happens during a fire? A landslide? Grazing? What about during no disturbance periods?
- Which species tend to increase in abundance during times of no disturbance? What traits do they have in common?
- How do early and late successional species differ from each other? Which life-history traits might allow a species to respond well to a fire event. Which traits might make a species a better competitor?
- What would happen if we stacked the deck to reduce the number of Disturbance Cards? Try it, was your prediction correct?
- Will the winner always be the same? Why or why not?
- How might changes in the plant community affect other properties of the ecosystem?
- How does this imaginary system compare to real ecosystems in the number of species?
- How would you change the deck to ensure that your species wins? Try it, did it work?

After initially diagramming their community and answering discussion questions within their group, you could have students share their results with the class. You could also jigsaw the teams and ask all the truffula trees to compare their data, all the lorax trees to compare their data, etcetera, to demonstrate that the same species don't always have the same successional outcome. With advanced students, you can introduce other concepts in plant population biology and community ecology. For example:

- In the game, events occur at random. Does this reflect how events, such as fires, occur in time in real ecosystems?
- The outcome of interactions in the game also has a random component, it depends on the draw of a card. How does this reflect real species interactions?
- In the game, demographic events, such as reproduction and mortality, are occurring independent of population size. Is this realistic?
- You could discuss the possible effects of order of arrival such as those described by Egler (1954). The point is that ecological factors and/or chance events that affect who colonizes first following a disturbance change the course of successional development by preempting space or other limiting resources. The season of the disturbance can be one of the major factors affecting the order of arrival (e.g., controlled burns in fall versus spring determine seedling establishment). You could challenge more advanced students to find a way to include this dimension into the game.

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Tools for Assessment of Student Learning Outcomes

You can have students turn in written answers to the discussion questions. I have also used the following questions to assess student learning. Specifically, we quizzed students before and after the lesson to see if they learned what we hoped they'd learn.

1. What effect might a disturbance, such as a wildfire, have on the plants in the affected area?
   - 5 point answer: Some species harmed, others benefit.
   - 1 point answer: All species harmed.
2. Describe several ways individuals of two different plant species might interact with each other. Will they always interact the same way?
   - 5 point answer: Competition, facilitation (providing nutrients, creating shade, attracting pollinators), tolerance. No, interactions depend on resource availability.
   - 3 point answer: Competition, facilitation, etc... Yes always interact the same.
   - 0 point answer: Don't know, no answer.
3. These pictures were taken at the same location 70 years apart.
   - Describe the changes in appearance.
   - What might cause a plant community to change in appearance?

Figures 10 & 11 (see next page): Photos for formative evaluation pre and post activity quizzes. From: Hastings and Turner, The Changing Mile, 1968.

   - 5 point answer: Environmental changes from external sources (i.e., disturbance) and inter-specific interactions
   - 3 point answer: Only environmental changes from external sources (i.e., disturbance) or Inter-specific interactions mentioned
   - 1 point answer: Plant growth
   - 0 point answer: Don't know, no answer

4. Could these changes have been predicted? If so, what information would you need to know in order to predict community changes?
   - 5 point answer: Predictions can be made, but there will be some uncertainty in that prediction. To make a prediction, you need to know how species respond to disturbance, and how the species interact.
   - 3 point answer: NO predictions can be made. To make a prediction, you need to know how species respond to disturbance, and how the species interact; or Yes, but answer only includes disturbance or interactions.
   - 1 point answer: NO predictions can be made. No info will yield a prediction; or Yes, with no explanation.

Other assessment options include having students apply what they have learned by asking them to try to stack the Event Cards deck to favor a specific species. Have students report their findings. You could have students decide on the grading standards for this report. By creating their own grading rubric, students feel more ownership in and take more responsibility for writing a good report. Ask them what a good report should include, and what parts of the report are essential, without which the report is not satisfactory. These criteria provide the scale from A to F.

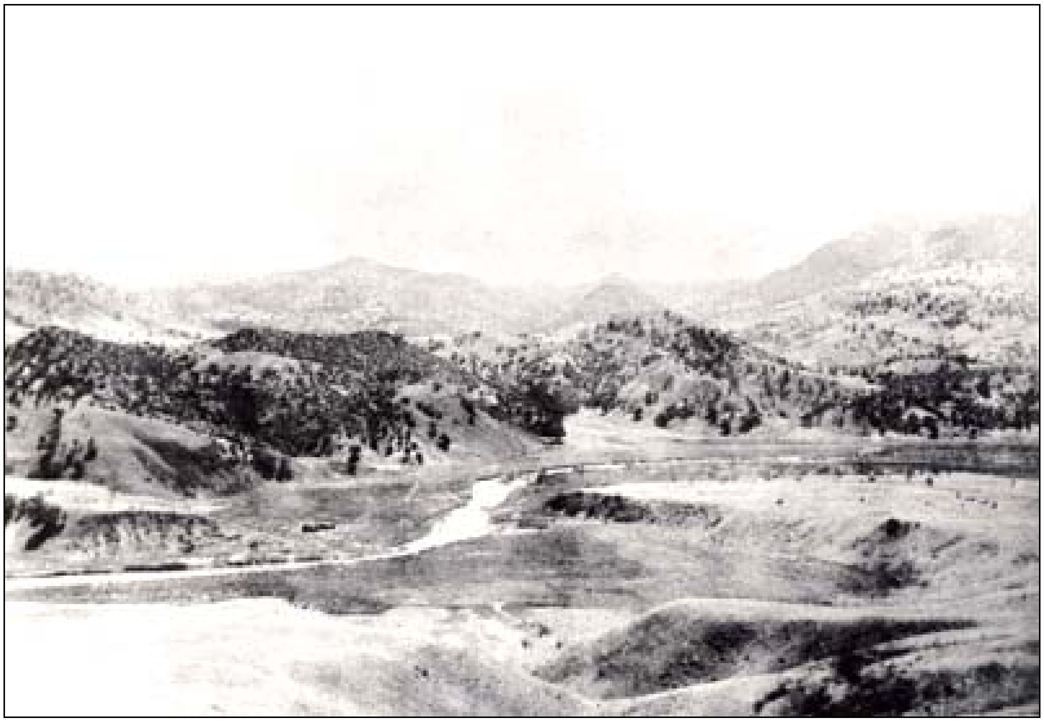


Figure 10: Red Rock Canyon, Patagonia, Arizona 1895.

Figure 11: Red Rock Canyon, Patagonia, Arizona 1965.

Extension Activities for Advanced Students

1. Have students conduct experiments with the game and write an opinion on the following scenario:

   "Environmentalists of the group Earth Brigade are asking the government to ban all grazing in Lorax National Forest. They believe that if the park manager continues to allow cattle to graze in the forest, that soon there will be no Borogrove grass in the forest. The rancher who owns the cattle that are in the forest has told the government that grazing is good for the forest. Grazing encourages the Grickle grass to grow, and the Grickle grass helps the Borogrove grass. The park manager at Lorax National Forest has been telling his boss and others in the government, that grazing makes no difference. Who is right? What happens if we remove grazing? If the decision is made to allow grazing, how often should it happen?"

2. Have students research local ecosystems, learn what disturbances occur, and what adaptations the plants have to those disturbances. Students then create their own game based on the plants and disturbances in their local ecosystems.

Tools for Formative Evaluation of this Lab Activity

The evaluation of this activity is tied to the assessment. Specifically, we quiz students before and after the lesson to see if they learn what we hope they learn, and see how to revise steps in the instruction for next time.

To see results of our evaluation, go to the <u>Comments on the Evaluation of the Activity</u> in the "Notes to Faculty" section.

An extensive discussion on Evaluation appears in the Teaching section of this site.

NOTES TO FACULTY

Challenges to Anticipate and Solve

Overcoming student statistical misconceptions:

Through evaluation we have discovered that some students develop the misconception that plant community changes are unpredictable due to the randomness of the environment. It is important to explain what predictability means. Given knowledge of the probable changes in the environment, and knowledge of how species may respond to these changes, it is possible to predict changes in the community with some degree of certainty. You can remind students of the example of playing the game without disturbance cards. In that case you can make two predictions: 1) there will only be three species in the community, and 2) all three will be late successional species.

You could also discuss this type of ecological forecasting using the example of weather forecasting — the goal is to predict a statistical likelihood of a particular weather pattern such as will it rain or not. If the most likely event is rain, but it then turns out not to rain, that does not mean that the weather forecasting model was wrong. Many students do not understand this distinction, and this simulation is a good way to teach about statistical thinking.

Another way to address this would be to deliberately stack the decks of Event Cards among groups, if one has a larger class. Give some groups very few disturbance cards and give some groups lots of them, but don't tell them ahead of time. Then, at the end when the among group discussion occurs, educe from them the suggestion that disturbance frequency may have differed to account for why one set of groups led to Early winners and in the other set the Late species won out.

Bringing students back to learning mode after playing:

This seems to be a common challenge when doing fun activities. The transition from game playing to filling out worksheets seems to work well in focusing students on the learning aspects of the game, it will work better if each student fills out their own individual worksheet. You could also use a cycle of guided discussions at this stage. First, have students discuss and write responses within groups, drawing their community diagrams on overheads or on the board. Students could then report their results to the class (2 mins/group). Then, you could lead a class-wide among group discussions to compare results.

Translating from the model system to real systems:

The game overstresses the role of chance in plant community dynamics. Be sure to discuss this with students. In real systems, disturbance regimes tend to have some level of predictability. Fire regimes, for example, can be tied to cycles of precipitation and lightning seasons. Periods of high rainfall, which result in high productivity, are followed by dry periods during which plants dry out and become easier to ignite when lightning strikes.

Comments on the Lab Description

Introducing the Lab to Your Students:

This activity has been used as an introduction to succession with little or no introduction to the activity. Simply distribute materials, read the rules with students, and walk them through the first round of playing. At the end of game playing, ask students to fill out worksheets. Distribute discussion questions for students to answer and use these to introduce the main concepts of succession and disturbance dynamics.

Activities in the Lab:

The following comments could be shared with students, as part of their introduction to the lab.

On teaching succession: A common misconception of succession is that it always progresses the same way towards the same end community. That is, if a plant community is disturbed and then left alone, it will always return to its initial condition. In textbooks, succession is often depicted in this way, as a directional, deterministic process (Gibson, 1996). This view of succession as a singular pathway of progression from a cleared, recently disturbed site to mature climax vegetation is outdated. Current theories suggest that succession will not always create the same community that existed before the disturbance. There are multiple possible outcomes, depending on many factors including the order of arrival of colonizing species, which varies over time and space and can depend on chance (Diamond and Case, 1986). Also, because disturbances can re-occur frequently, the plant community might always be in a state of flux, never reaching a climax state (Pickett and White, 1985). This lesson attempts to address this misconception, and teach succession as a dynamic process that can be reasonably, but not completely, predictable. By teaching about succession through its mechanisms we can avoid teaching some of the misconceptions about climax communities.

On using a game to teach succession: This game is a dynamic way to teach a dynamic subject. There is a body of literature on the use of games in learning (for a review see Ellington et. al., 1998). Games have been shown to increase student motivation, increase retention, and in some cases, shorten the time to teach concepts to naïve students (Randel et al., 1992). We decided to teach this topic using a game for several reasons. Games are fun. Students easily learn complicated sets of rules in order to play a game. We can use this to our advantage by making analogies between game rules and the theories and concepts we want to teach (Kaplan and Kaplan, 1982). As students play the game, they learn the rules, which are analogous to the mechanisms of succession. Students begin building their own conceptual model of the mechanisms of succession through game play. Also, even though games are no better than traditional teaching methods at teaching factual information (Randel et al., 1992), they seem to be more effective in teaching dynamics (Monroe, 1968). Third, it can take many years to observe succession in nature; the game condenses this time and allows students to watch plant community dynamics within a class period. Fourth, current curriculum about succession is limited in its applicability because it is designed to take advantage of regional examples such as old-field succession in temperate hardwood forests. Because it uses imaginary species, this game can be played anywhere in the world. And last, we wanted to create a system where students could interactively explore the plant community dynamics, rather than just observe them. They can experiment with the plant community by manipulating the disturbance processes, and observe the changes that occur as a result of their actions.

Questions for Further Thought

There are many ways to discuss the activity. After comparing the results of each group's game, you could discuss what the movement across the board represents (the farther a character travels, the more individuals it has in the community). You could also talk about what made the different group's game sequences and outcomes different from each other.

Essentially, the outcome of the game is greatly affected by chance events.

Discussion Questions:

- Which species tend to get ahead during times of no disturbance? What life history traits do they have in common?

Answer — The species that tend to move ahead, i.e., become more abundant, during no disturbance in the game are all "Late Successional" types.

- How do early and late successional species differ from each other?

Answer — The outcome of interactions in the game is different for early and late species.

- Which life history traits might allow a species to respond well to a fire event? Which traits might make a species a better competitor?

Answer — Early successional plants thrive in recently disturbed environments; some traits they share include small seeds, fast growth, and tremendous dispersal capacity. They are also called colonizers, ruderals or weeds. Late successional plants often grow more slowly, live longer, are more shade tolerant, produce fewer and larger seeds, tend to allocate fewer resources to seed production than do early successional species. Late successionals generally only become prevalent long after the disturbance event.

- What would happen if we stacked the deck to reduce the relative number of Disturbance Cards?

Answer — By removing the Disturbance Cards, the total number of species in the diagram at the end of the game is reduced from 6 to 3. Without disturbances, none of the disturbance-adapted species leave the Start box, and you end up with a less diverse system, with only three species. The same happens if you remove all the periods of no-disturbance. You could then talk about what effect these outcomes might have on the birds or other animals that live in different plant communities.

- How might changes in the plant community affect other properties of the ecosystem?

Answer — Changes will affect wildlife; animals with different habitat preferences will prefer different plant communities. Changes may affect soil properties and movement of water and nutrients through the ecosystem; different types of plants have different nutrient-uptake and soil-stabilizing capacities and can affect infiltration rates differently.

- How does this imaginary system compare to real ecosystems in the number of species?

Answer — Six as opposed to tens or hundreds.

- In the game, events occur at random. Does this reflect how events, such as fires, occur in time in real ecosystems?

Answer — The disturbance regime of a particular environment describes disturbance timing, frequency and intensity (Pickett and White, 1985). Disturbances occur with some predictability, rather than completely at random.

- The outcome of interactions in the game is also random. How does this reflect real species interactions?

Answer — This can lead into a discussion of the effect of resource availability on interaction strength. The outcome of species-species interactions can be affected by the availability of resources, such as sunlight, water or nutrients (Diamond and Case, 1986). Also, you could discuss the mechanisms of species interactions, other possible interactions such as inhibition (Connell and Slayter, 1977.). Additionally you could discuss scenarios in which more than one type of interaction can occur simultaneously or at different times in the life history of plants (Quinn and Dunham, 1983). Maybe you could challenge more advanced students to create additional interaction cards or discuss how interactions could be made more realistic.

- In the game, demographic events, such as reproduction and mortality, are occurring independent of population size. Is this realistic?

Answer — You could discuss density dependence, i.e., the idea that populations behave differently at different population densities. The game actually sets the stage for density dependent effects since the further a plant type advances the higher is its relative density. Thus, the Event and Interaction Cards could take this into effect by for example forcing a consequence to be a fixed % of the spaces advanced rather than a fixed number of spaces, e.g. Grazing Disturbance: go back halfway to Start. Or, you could challenge your students to come up with other solutions to incorporating density dependence in the game as a separate activity.

- The game can also be used to talk about the concept of scale. In the game we are only observing a small space, as opposed to a larger landscape, which typically is composed of many vegetation types. By assigning each student group to be a specific land area, and aggregating the results of each group, one could simulate plant community outcomes for a larger landscape mosaic.

Assessment of Student Learning Outcomes

See the section on Tools for Assessment in the "Lab Description." In addition to writing opinions on the scenario, you could also have students debate the scenario using evidence they gathered by playing the game.

Evaluation of the Lab Activity

To evaluate the activity, we have quizzed students before and after the lesson to see if they learned what we hoped they would learn. A total of 39 non-majors were tested (28 in Bio 100 and 11 in Environmental Biology for non-majors) in the spring of 2003. The questions used for the evaluation are listed in Tools for Assessment section of the "Description" of the Experiment. Data was analyzed using pairwise t-tests. On average, students' scores improved after participating in the activity from 7.6 out of 20 pts to 12.1 out of 20 pts (See Figure 12). For some questions, the scores improved more than for others (Figure 13). Students seem to learn more about how plants respond to disturbance and each other. They are less certain about applying concepts to real community changes, or predicting outcomes.

Translating the Activity to Other Institutional Scales

This activity can be used with pre-college and college students in introductory courses as is, without including the extension activities. Extension activities add difficulty and depth and are appropriate for advanced undergraduate students. The main difference in conducting the activity with pre-college students as opposed to college students is in the depth of the post-activity discussion. For middle school students, we generally only discuss what happened during the game and how that relates to some examples of successional processes in local plant communities. We include more ecological concepts for high school and college students in the discussion. So far, we have only conducted the activity with non-science majors, but it could easily be adapted for science majors by adding some of the extension activities.

STUDENT COLLECTED DATA FROM THIS LAB ACTIVITY

Example of a completed student worksheet

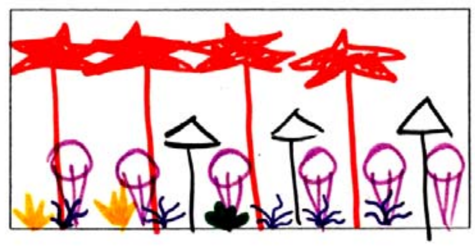
Game 1

Event	Number of cards	Order of players	Name of character	Number of plants
Fire	4	1st place	Grickle grass	6 plants
Landslide	2	2nd	Homerath herb	5 plants
Grazing	4	3rd	Mimsy bush	4 plants
No Disturbance	7	4th	Borogrove grass	3 plants
		5th	Lorax tree	2 plants
		6th	Trufula tree	1 plant

Community diagram for Game 1

Game 2

Event	Number of cards	Order of players	Name of character	Number of plants
Fire	0	1st place	Mimsy bush	6 plants
Landslide	3	2nd	Borogrove grass	5 plants
Grazing	2	3rd	Trufula tree	4 plants
No Disturbance	8	4th	Lorax tree	3 plants
		5th	Grickle grass	2 plants
		6th	Homerath herb	1 plant



Community diagram for Game 2

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