

## Using Role-Play Simulations to Teach Environmental Decision Making and Conflict Resolution Techniques

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As competition has increased in the United States and elsewhere over the allocation, use, and preservation of natural resources, the number of environmental conflicts likewise has proliferated. There is growing recognition of the need for alternatives to reaching settlements—alternatives to protracted litigation, contentious administrative rule making, and controversial legislative actions (Emerson and Yarde, 1997). Environmental conflict resolution techniques—such as facilitated discussions, negotiation, and mediation—offer one such set of alternatives, especially for dealing with conflicts involving multiple stakeholders and interests.

Over the past several decades, a substantial body of research and practice has helped shape and inform a field of study focusing on environmental conflicts and their resolution (Bingham, 1986; Blackburn and Bruce, 1995; Crowfoot and Wondolleck, 1990; Moore, 1998; Susskind, 2000; Wondolleck and Yaffee, 2000). During the past four years, the Udall Center for Studies in Public Policy at The University of Arizona—in partnership with the federal Morris K. Udall Foundation and its US Institute for Environmental Conflict Resolution—has developed and operated a research and outreach program in environmental conflict resolution.<sup>1</sup> The Udall Center also has organized and facilitated several public forums and dialogues, such as the Arizona Common Ground Roundtable and Dialogue San Pedro, with the aim of providing neutral settings for face-to-face discussions on contentious environmental issues. As part of these efforts, and to instruct adult audiences in environmental decision making and conflict resolution techniques, the Center has created, enacted, and distributed several role-play simulations.

In this article, we describe these exercises and the processes we have used to develop them. We also discuss and analyze our experiences and outcomes enacting the games. Finally, though our simulations focus on environmental conflicts in the Southwest, we provide guidance for educators, government officials, and environmental professionals who might want to use such techniques in their own geographic or issue settings.

### Environmental Conflict Resolution Simulations

Simulations are devised scenarios—often based on real-world situations—in which participants assume the roles of characters (often different than their own real-life situations) to achieve an objective (Field, 1997). In the case of environmental conflict simulations, participants have the opportunity to role-play a variety of stakeholders in a dispute over water use, land management, endangered-species protection, facility siting, or other such topics.

At a basic level, environmental role-play simulations can serve as interesting, alternative methods to instruct about the range of scientific, political, social, and cultural issues present in a particular environmental conflict. Simulations also can be useful to teach participants about more complex processes, such as the dynamics of group decision making, intergroup and intragroup conflicts, political tactics, interest-based lobbying, and about the realities of developing long-term collaborations for natural resources management (Ergi, 1999).

The objective of a facilitated discussion or negotiation, as simulated by the role-play exercises we discuss here, is to arrive at a conflict resolution acceptable to all, or at the very least, to most of the interests represented. (We mention later, however, that for a number of reasons, achieving this goal is often not possible—nor is it essential to do so—in the context of a game.) By taking on specific roles and value positions, researching and learning about the roles in-depth, gaining access to relevant and up-to-date information, and making decisions based on those roles, participants can learn about an issue and other individuals' view-

points, and can develop a deeper appreciation for the sources of conflict and possible cooperation.

The gist of role-play simulations is relatively simple to explain. Each participant in the simulation receives in advance of the game a set of instructions that documents the setting and context of the simulated conflict, lists the stakeholders involved, and describes the background and motivations for the participant's particular character. Having reviewed those materials, the participants (in their character roles) are then led, in a roundtable format, by a facilitator through various stages in the game: to state positions and interests; to generate lists of issues, questions, or evaluative criteria that relate to the interests; to identify policy tools and other actions that might be used to address the issues; and to attempt to develop viable sets of solutions.

We describe in more detail below, using examples from the Udall Center experiences, the specific simulation components and the enactment process.

### Udall Center Simulations

The Udall Center has developed two types of exercises that focus on southwestern environmental conflicts. The first type are the games, *Trouble in Tortuga!* (Emerson, Movius, and Merideth, 1999), addressing ranching and land use issues, and *Conflict on the Culebra!* (Yarde, Merideth, and Moodie, 1999), dealing with a watershed-based controversy. These simulations are simple, yet flexible, in terms of the conflict, context, and number and types of characters.

Both games were developed over several months with the assistance of advisory committees.<sup>2</sup> The simulations made their respective debuts at two professional conferences held in Tucson, Arizona: *Tortuga!* in October 1996 at "The Future of Arid Grasslands" conference and *Culebra!* in September 1998 at the Arizona Hydrological Society meeting. In each case, the simulations were showcased as featured events before audiences of conference attendees. Since the initial enactments, the simulations have been used in undergraduate and graduate courses at The University of Arizona (including such disciplines as agricul-

tural economics, hydrology, planning, and public administration) and elsewhere, and in other community settings. In some cases, participants of the simulations have been inspired to develop their own role-play exercises.<sup>3</sup>

The second type is a game developed under the auspices of a six-day workshop, "Doorways to Dialogue," organized by the Udall Center and Tucson-based Environmental Education Exchange in August 1999. In that venue, the workshop participants assisted in the creation of, and then enacted, their own exercise that focused on an urban, land-use conflict, *Breaking Barriers in Black Mountain* (Yaseen, 2000). The idea behind this approach to simulation design and development is that it allows the participants to target a particular environmental issue and set of stakeholders that interests the group. In the "Doorways to Dialogue" workshop, this seemed to give the participants ownership in the actual simulation and to help them learn more rapidly how they might proceed to develop such games for classroom, workplace, or community use.

Based on our own experiences and on comments we have received from several individuals who have enacted the simulations in their university courses and in other community settings,<sup>4</sup> both organizers and participants have responded favorably to the role-play simulation process. One organizer indicated that the simulations give students a real-world experience in coping with divergent interests surrounding an environmental conflict and that they can give the classroom a stimulus to discuss in a manageable setting such concepts as interest-based bargaining, transaction costs, interdependencies, and economic impacts. The simulations also provide a situation in which participants could experience the effects of variations or inequities related to access to information, financial resources, or political influence.

Some participants have found the simulations too easily solvable, the roles too flexible, while others have found the exercises too complex. Some have thought the time deadline was helpful, but almost all have indicated more time and longer sessions

would be helpful. Many participants have said the simulations help build trust among players, and allow the players to see other perspectives and find common ground. Or as one participant informed the organizer, "I never thought about what the other side thought about this issue before having to play that role."

For use in the classroom, most of the organizers have found that simulations of this sort seem easier to manage in courses with relatively fewer students (30 or less) rather than large classes (50 or more), although, as we discuss below, there are several ways to involve more players. Simulations that are less technically detailed are easier to play than those that require quantitative solutions or special expertise, such as engineering or legal backgrounds. The simulations seem to work best toward the middle or end of a course—once students have acquired some knowledge of issues or processes, or both. As one organizer said, "It was a good capstone experience for the course."

For use in community settings, there is often more opportunity to engage participants with diverse backgrounds which brings more variety and, perhaps, reality into the role playing. In such settings, there is often more flexibility in scheduling the simulation to allow more time in which to enact the game and to achieve greater depth throughout the simulation's various stages.

All organizers have remarked that having participants learn about their characters in advance and develop an informed appreciation of the stakeholders' viewpoints and issues involved, is essential to ensuring a more lively and fruitful enactment of the simulation. When players participate in the simulation without sufficient depth of understanding of their character, there is often an inability on the part of those players to engage the other stakeholders or to articulate interests and negotiating positions. But, this also can become a quick lesson, at least to the less informed participant, of the value of information in a negotiation process.

Finally, almost all organizers have commented that while participants often feel frustrated when they have insufficient time

to achieve a settlement or to "end the game," there is widespread agreement that the real value of the simulation is in its ability to involve the participants in the processes of discussion and negotiation—often hearing and understanding other viewpoints, in essence, for the first time.

In the following sections, using the Udall Center's *Tortuga!* simulation as the principal model (and citing specific examples from the *Culebra!* and *Breaking Barriers* exercises as appropriate), we describe the processes for designing, developing, and enacting a simulation for persons who may want to create and use their own versions.

### Designing and Developing a Simulation

In general, there are twelve steps to designing and developing the various components of a role-play simulation (Table 1).

The simulation developer first needs to identify the intended audience and to articulate the training or instructional objectives. For example, is the aim of the simulation to be university undergraduate students, a group of environmental professionals with similar backgrounds, or a diverse gathering of community participants? What particular issues, concepts, or processes are to be emphasized?

The next step is to determine the scope of the conflict, both in terms of issues (water use, land management, endangered species protection, facility siting) and geography (parcel, watershed, county, regional scale). Another preliminary step is to begin to identify the range of stakeholders involved in the conflict. The goal in the simulation should be to have a manageable number of participants, but also to include as many of the relevant interests as possible. In a real conflict-resolution process, all significant stakeholders need to be part of the discussion in order to achieve a viable and sustainable solution, but having too many participants in a simulation can become unwieldy.

Next, the developer needs to identify any legal, technical, social, environmental, or other constraints the game must address. Are there specific surface water flow patterns to consider, such as those associated

**Table 1.** Steps for developing a role-play simulation game (modified after Field, 1997)

1. Identify target audience and specify training or instructional objectives
2. Identify environmental conflict and geographic focus
3. Create list of potential stakeholders
4. Identify legal, technical, social, environmental, or other constraints game must address
5. Interview experts or stakeholders to gather details about various issues and character roles
6. Convene advisory group of experts to answer questions and brainstorm
7. Prepare simulation documents and supplemental materials
8. Edit simulation documents and materials with assistance of experts or advisory group
9. Hold trial run of simulation with consultants, educators, or professionals playing roles
10. Revise simulation documents as necessary based on trial run
11. Enact simulation with target audience
12. Prepare summary or analysis of simulation's outcomes and players' experiences

with southwestern, perennial streams? Or, are there particular laws, administrative rules, or legal doctrines that apply, such as the "first in time, first in right" rule for western surface water? The developer should interview and consult with experts and stakeholders (similar to those being portrayed in the simulation) to gather details about the various issues and character roles. Or the developer could convene a group of knowledgeable persons (as was done to develop the *Tortuga!* and *Culebra!* games) to meet and help answer questions and brainstorm collectively.

The developer should then prepare the game materials, including descriptions of the conflict, context, and character roles, as well as any supplemental materials, such as maps, tables, background readings, and other informational items. The overview for *Tortuga!* shows how one might weave environmental, social, cultural, and political issues within a narrative that also includes a historical background on the conflict, the present status of the situation, and possibilities for future outcomes (Table 2). In terms of character development, there are several components to consider: the character's name, profession, personality, values, priorities, alliances, competitors, previous interactions with other characters, attitudes, values, personal life, hobbies, and best and worst outcomes to a negotiated agreement (Table 3). Again, speak-

ing to actual stakeholders can be useful in capturing more realistically the various aspects of the characters.

The developer should then circulate the draft documents and solicit comments from the experts or advisory group. After this review and editing process, the developer should then prepare a version of the simulation document for use in a test run. For the test run, the developer should enact the game following the process outlined in the section below, using facilitators, consultants, educators, agency personnel, or other professionals to volunteer to play the stakeholder roles. This will be useful in being able to gather critical assessments of the various components, processes, and outcomes related to the simulation.

The developer should revise the game components based on these comments and experiences and distribute the revised version, as appropriate, to the target audience for which the simulation was originally designed and developed. The developer then should enact the simulation and prepare a summary or analysis of the simulation's outcomes and players' experiences.<sup>5</sup>

### Enacting a Simulation

#### *Participants*

The *Tortuga!* simulation is designed to involve eight participants, each assuming the role of a character (rancher, developer, lo-

cal government official, environmentalist, state and federal agency representatives, etc.), and including one or two facilitators. Ideally, the participants will play a character different than their own real-life situation. However, the role of facilitator is an essential one and there are certain skills that are critical.<sup>6</sup> Also, there is often a need to have one or more note takers to assist the facilitator. (The facilitator should discuss with the note takers, in advance of the exercise, any preferred format or procedures for note taking.) In exercises where technical or legal questions might arise, such as with a watershed-based exercise or complex land-use project, there may be a need for an objective expert (hydrologist, lawyer, or land-use planner) who can provide answers to specific questions as they might arise in the game. And although *Tortuga!* and the other exercises have a fixed number of characters, more or fewer persons can participate, depending on the interests or constraints of the organizers and participants.<sup>7</sup>

Each participant should receive, in advance of the simulation, a copy of the "Overview" (Table 2), his or her character's "Confidential Instructions" (Table 3), as well as any maps, summary sheets, or other supplemental information. Each facilitator should receive and review all materials, including the "Confidential Instructions" for facilitators and those for all stakeholders.

#### *Logistics*

A typical duration for the exercise is two two-hour sessions, with a 30-minute break between sessions, followed by a 30-minute discussion and assessment by the participants of what they learned from the simulation exercise. The two-hour sessions are meant to simulate two full-day meetings, ostensibly held on consecutive Saturdays, with the break simulating the intervening week. Obviously, the format of this exercise can be varied. Depending on time constraints, the backgrounds and prior knowledge of the participants, or other factors, the simulation sessions can be enacted within time periods ranging from 45-minute to full-day sessions. Much more time will need to be allocated if the participants will be developing all or part of a sim-

**Table 2.** Overview from the simulation game, *Trouble in Tortuga!* (from Emerson, Movius, and Merideth, 1999)

*There's trouble brewing in Tortuga—and how!*

*It all started with Ed Middleton's widow, owner of the 640-acre X-Bar Ranch—she up and died. Now the three Middleton kids, not interested themselves in working the ranch and needing the cash real soon to pay inheritance taxes, are determined to sell the X-Bar to the highest bidder. Developer Sidney Stone is eager to snap up the estate to build 400 clustered homes.*

*Neighboring ranchers, Gil Espinosa (La Rosita Ranch) and Toby Nunn (Bar Nunn Ranch) are keenly interested in these developments. Espinosa also wants to buy the X-Bar—and its grazing rights to 15,000 acres in the adjacent San Cristobal National Forest—but doesn't have the cash. Nunn wants to stay in ranching if possible, but a recent illness and a daughter in college mean that financial security has never been as important as it is now—and there already has been an offer to buy the Bar Nunn.*

*Meanwhile, Espinosa has been told by Pat Wright, the district ranger of the US Forest Service, that La Rosita's grazing allotments on the public land are to be reduced next year because of a recent drought in the area. And local firebrand Corey Flintlock, an activist with SAGE (Save the Arid Grassland Environment), wants to keep both cattle and condos out of the area to protect the grasslands and the habitat of the rare Gray Hawk. The status of the hawk also has interested Joey Waterstone of the State Game and Fish Commission, whose agency is considering the purchase of grassland conservation easements—including the area near Tortuga.*

*So while county planner Brady Euclid worries about the impact of the proposed clustered development on the small community of Tortuga—water, sewage, traffic, schools, police and fire protection—the bigger worry is what some other developer—Blake Worstcase, for example—might do if Stone walks, or is driven, away from the deal with the Middletons.*

*In response to Euclid's request and worries about the increasingly confrontational atmosphere building in Tortuga, the planning board has retained Jan Masters, a facilitator from an out-of-state conflict resolution firm to convene the major stakeholders. The board hopes that the stakeholders can develop a mutually agreeable solution that can inform the zoning board's need to make a decision regarding Stone's development plans at the board's meeting in two weeks.*

*With time so short, the facilitator quickly interviewed the parties privately and all have agreed to participate in a series of two day-long meetings to be held a week apart.*

ulation, as with the *Breaking Barriers* exercise developed in the “Doorways to Dialogue” workshop.

The recommended room arrangement for the exercise is a roundtable format, with nameplates for each character. The table should accommodate all participants (all characters, facilitators, and note takers), with additional seating made available around the room for any observers or persons playing the roles of constituents. Flip charts, blackboards, or overhead projectors to document the points of discussion should be easily accessible and visible to all participants. This also applied to any enlarged maps, posters, or other graphical displays.

#### *Preparation*

Sometime before the date of the simulation enactment, the organizer or person who will play the character of facilitator should talk individually to the participants to see if they have any questions about their charac-

ters or about the general format and process for the exercise. The organizer or facilitator should encourage each participant to learn as much as possible beforehand: about the issues involved in the conflict, the type of character the participant will be playing, and about what perspectives that character might realistically bring to the table. The organizer might provide news clippings or other readings on issues similar to that dealt with in the simulation, or ask the participants to interview persons similar to those whose character they will assume in the simulation. As appropriate (and without getting too corny), the participants should feel free to use props (maps, charts, books), articles of clothing (such as hats, jackets, t-shirts, vests), or whatever else might help them portray and project the “image” of their character.

On the day of the simulation and immediately prior to the exercise, the facilitator should meet with the participants (as a group) for a brief discussion about how the

simulation will begin and proceed. If a group of stakeholders needs to select a representative to sit at the table, or if a character needs to meet with his or her constituents, they should do so prior to the beginning of the game. The facilitator begins the simulation with a brief overview, such as restating the history of the conflict, outlining the reasons the stakeholders have agreed to gather, elaborating the rules for procedure that the stakeholders have agreed to in advance (i.e., participants must wait until being recognized by the facilitator to speak; all persons will show respect for the others at the table, with no name calling, profanity, or incivility; for groups, only the representative at the table can participate in the discussion, and so on). The facilitator then guides the simulation through its various stages.

#### *Facilitated Discussion*

The first stage of the facilitated discussion solicits verbal positions from the various

**Table 3.** Stakeholders from the simulation game, *Trouble in Tortuga!* (from Emerson, Movius, and Merideth, 1999)

Brady Euclid, county planner  
 Corey Flintlock, coordinator, Save the Arid Grassland Environment (SAGE)  
 Toby Nunn, rancher, Bar Nunn Ranch  
 Gil Espinosa, rancher, La Rosita Ranch  
 Sidney Stone, developer, Sierra Grande  
 Joey Waterstone, State Game and Fish Commission  
 Pat Wright, San Cristobal district ranger, US Forest Service  
 Jan Masters, facilitator

Middleton children (heirs to the X-Bar Ranch; not participating in the simulation)

Blake Worstcase (another developer; not participating in the simulation)

Example of Confidential Instructions for Gil Espinosa (La Rosita Ranch)

*Cattle ranching sure isn't what it used to be. Your grandfather started up La Rosita Ranch nearly 60 years ago. For the past ten years—ever since Ed Middleton died—you have managed the X-Bar, and it's a beautiful old place. Such a shame that the Middleton kids are selling out. And the timing couldn't be worse! With cattle prices dropping, the only way to survive seems to be to sell more cattle, which means increasing the herd. If district ranger Pat Wright's plan to drastically reduce grazing allotments goes through, you'll have to reduce the herd. How in the world can anyone expect you to make a decent living again as a rancher if this happens? This reduction must not go through! To make sure it doesn't, you have organized the district ranchers and retained an attorney to fight the reduction tooth-and-nail if necessary. But adding to your headache is this crazy new development proposal, which you adamantly oppose. A massive new influx of residents to Tortuga will bring nothing but trouble. They will ask for a new school, a new library—all those expensive improvements that city folks insist on. Your taxes will skyrocket! And most importantly, there will be recreational demands placed on the San Cristobal National Forest, threatening the continued practice of grazing on that prime piece of public land. But you have come up with a plan of your own. You and your neighbor Toby Nunn—always a good friend in a pinch—have agreed to approach Sydney Stone with a proposal to buy 100 acres of the X-Bar Ranch at the full per-acre price paid to the Middleton estate. In exchange, you are prepared to support Stone's plan (especially if fewer cluster units are planned). This way you and Toby can qualify to buy the old X-Bar allotment. While you only need 40 acres to qualify, you would like some of this land to include Las Culebras Wash as a water source for your cattle.*

stakeholder (one by one) and attempts to tease out the implicit interests and concerns driving these positions. The note takers list these points for all to see on the flip charts, blackboard, or overhead transparencies. For example, in the *Tortuga!* exercise, rancher Gil Espinosa's interests and positions (Table 3) might be expressed as: wanting to maintain or expand the herd size for La Rosita Ranch, opposing the proposed reduction in grazing allowed on public lands, avoiding additional taxes that might result from the increase in services needed from the development, and fearing potential conflicts with new residents seeking to recreate on the nearby public lands.

The second stage of the process generates from the stakeholders a list of issues for consideration, often in the form of open-ended questions that relate to the interests expressed in the first stage. For example, some questions that might emerge from

the discussion of Gil Espinosa's interests in *Tortuga!* are: How will the income and lifestyle of ranchers in Tortuga be preserved? Who will hold the X-Bar Ranch's public-land grazing permit? How many cattle per acre will be allowed on the US Forest Service land? How much will additional services and infrastructure cost as a result of the new residents in the planned development? And who will pay for these? How much additional recreational use will there be in on the public lands, and how will this affect the nearby ranches and their cattle operations?

The end of the second stage is a good point for a break. If time permits, the break might be extended, especially to allow for caucusing among stakeholders (who may want to develop joint proposals of solutions for presentation later) or for meetings between stakeholders and their constituents (if any). In addition, the break is the time to introduce a surprise, a late-

breaking development, or a significant change in the structure of the situation. For example, in *Tortuga!*, a news flash is introduced during the break that reports one of the ranchers has been offered a substantial amount of money to sell the ranch to another developer (Table 4). The break is also the time for the facilitator and note takers to organize and compile the notes (from the flip charts, blackboards, note cards) for use in the next sessions, and for the facilitator to gather any information to answer questions or clarify points that might have arisen during the earlier sessions. After the break concludes, the facilitator then resumes the simulation.

The third stage allows the stakeholders to discuss actions or policy tools that might be used to address the issues or questions generated in the previous stage. (If there has been a surprise or late development during the break, the facilitator may want to allow the participants to deal with this first, such

Table 4. News Flash from the simulation game, *Trouble in Tortuga!* (from Emerson, Movius, and Merideth, 1999)*The Tortuga Times**Developer Offers to Buy Local Ranch*

by Sam Storybored

*Land developer Blake Worstcase has reportedly offered a substantial sum to Tortuga rancher Toby Nunn to purchase the Bar Nunn Ranch. Worstcase intends to turn the ranch into 160 four-acre ranchettes.*

*Neither Worstcase nor Nunn were available for comment today, but one source close to the deal was quoted as saying, "Toby's a good person, but Blake is making it awfully hard to say no. It's a big chunk of money."*

*Fran Townelder, chairperson of the County Board of Supervisors, added, "If Sydney Stone's option expires, Worstcase will buy the X-Bar too. Then we'll be looking at over 300 ranchettes and the end of ranching in Tortuga as we know it."*

as by revisiting some of the items discussed in the earlier stages.) Some examples of the types of actions or policy tools that might be used in *Tortuga!* include the use of easements, green space dedication, zoning changes, tax credits, state or federal funds allocations, grazing allocation changes, water rights purchases, land buyouts, and lawsuits, to name a few. An alternative or additional task at this point, depending on the type of simulation exercise, might be to define criteria with which to evaluate various proposals or plans that might emerge later. For example, in the *Breaking Barriers* exercise—with its focus being the preparation of a land-use plan acceptable to a wide variety of stakeholders—the participants listed some two dozen evaluation criteria, such as: impacts on traffic, noise, crime, and streetlights; sensitivity to cultural and heritage factors; ability to enhance economic growth in blighted areas; impacts on water, wildlife, archeological sites; involvement of citizenry in decision making; and others.

The fourth stage attempts to cluster possible actions and policy tools into sets of options that all stakeholders could agree upon. An example of such a clustering for *Tortuga!* might be that the developer (Sidney Stone) also buys the Bar Nunn Ranch from Nunn, designs the development with fenced-in clustering and green spaces, maintains grazing on certain portions of both ranches, provides allotments and grazing options to Espinosa, provides assurances of no further development other than what already has been proposed,

maintains access to public forest lands for recreationists, sets aside a swath along the wash as a riparian corridor for hawk habitat preservation, sells development rights on a portion of the land to the state as an open-space buffer, and shares some infrastructure costs. If agreeable to all parties, this set of options then becomes a condition to Stone's receiving a favorable report from the stakeholders on Stone's zoning amendment request. The evaluative criteria identified in stage three could also be applied to the sets of options developed in this stage, especially if there is a need to prioritize two or more sets of options. (And for a more experienced group of participants, there could be an added complexity in the simulation—something that might actually happen in a real negotiation—namely the refusal of one or more constituents to go along with their representative in ratifying an agreement, or for one or more parties at the table to be obstructionist by refusing to negotiate further, thus undermining a possible resolution.)

The game proceeds through the four stages described above and continues through the time allotted, or earlier if a conclusion is reached or the discussions become stalled. However, a complete solution is not likely to be reached under these simulated conditions (i.e., there may not be enough time or there may not be enough information available on some key issues). The real importance of the simulation is in learning the process of how to deal with conflicts and how to develop possible solutions.

The final stage is the debriefing and discussion to give the players, now back in their real-life personalities, a chance to describe and evaluate their experiences during the simulation. The facilitator should solicit comments from each participant (and from members of the audience, as appropriate) about the simulation exercise, their roles, and any insights or lessons they might have learned from playing their respective characters. The debriefing and discussion is an important part of the simulation and therefore the facilitator should ensure that the time allocated for that activity is guarded and not consumed by the earlier stages. And, to complete the documentation process, either the organizer, facilitator, or both, will need to summarize these comments in a report that could be distributed to the participants and any other interested observers.

### Summary

Role-play simulations can offer innovative and interesting means to teach about environmental conflicts and approaches to achieve resolutions. Simulations can be used in a variety of settings and can involve a range of participants. And, as we have attempted to describe here, based on our own experiences and those of several colleagues, though simulations can require a lot of detail and care in their design, development, and enactment, the results are well worth the effort.

### Notes

1. For more information about these organizations, please consult their respective Web sites:

Udall Center for Studies in Public Policy, The University of Arizona, [udallcenter.arizona.edu](http://udallcenter.arizona.edu); Morris K. Udall Foundation, [udall.gov](http://udall.gov); US Institute for Environmental Conflict Resolution, [ecr.gov](http://ecr.gov).

2. Each simulation relied on its own advisory committee, but both drew upon the membership of the Environmental Dispute and Resolution Group (ENDRIG), now known as the Conflict Analysis, Research, Mediation, and Management Alliance (CARMA), an informal group of faculty, students, practitioners, agency personnel, non-governmental organization representatives, and interested members of the community. CARMA meetings are convened and hosted regularly by the Udall Center to discuss research and practical issues related to environmental conflicts and approaches to resolution.

3. A recent example is that undertaken in March 2000 by Melanie Seacat, public participation manager for the Pima Association of Governments in Tucson, AZ. Her simulation, *Gridlock in Granite Roads*, is aimed at using the role-play technique as a supplement to the public-participation process related to the allocation of Pima County's transportation improvement funds. Seacat participated in an enactment of the *Tortuga!* simulation in July 1999.

4. The respondents include: Christopher Brown, assistant professor of geography, West Chester University, PA; Joan Calcagno, roster manager, US Institute for Environmental Conflict Resolution, Tucson, AZ; and two faculty at The University of Arizona, James Washburne, assistant professor of hydrology and water resources, and Paul Wilson, professor of agricultural and resource economics.

5. The developer may want to incorporate a research component into the simulation, measuring such variables as pre- and post-simulation attitudes of the participants or audience members. Or the developer may want to use the simulation process to generate actual policy recommendations or as a mechanism to gather public comments on a particular issue or proposed project. These outcomes could become part of the final report also.

6. The person who plays the character of facilitator (this could be the organizer of the simulation or somebody else) should have some background and skill at facilitating a group negotiation process. If the person is not a trained facilitator, they should at least know how to lead and manage a group discussion and be familiar with group discussion and information-gathering techniques, such as nominal group technique, story boarding, idea writing, or other such approaches (Moore, 1994). The critical aspect of this is that the discussion should be structured, that everyone should be allowed to speak in turn and without interruption, and, given the likelihood of there being participants with various personalities and communication styles, that both verbal and written communications (i.e., asking participants to write their comments on note cards) be used together or alternatively to

give everyone a chance to say something in the manner in which they can best express themselves. The facilitator has six primary goals: 1) to make sure that each party is given a chance to speak and have his or her concerns acknowledged; 2) to keep the parties committed to working toward a solution that everyone can live with; 3) to acknowledge institutional, legal, and technical constraints that might exist but to keep the parties focused on an interest-based solution; 4) to help the parties generate several possible alternative options before focusing on any one option for too long; 5) to identify and seek to generate objectively any technical information that may be needed regarding either the assumptions on which different plans are based or the implications of proposed plans; and 6) to remind the parties as necessary that failing to reach an acceptable solution may lead to an outcome that is less satisfactory to all. The facilitator may need, from time to time, to stop the game and break back into real life if there is a point where play ceases because of some obstacle (such as an unresolved question, lack of information, or uncontrollable behavior or unresponsiveness on the part of one or more players). In this case the person playing the facilitator role stops the game, everyone momentarily breaks character, and the facilitator and group deal with the stymie. Once the obstacles are resolved, the game continues and the participants resume their character roles.

7. There are several strategies for adding characters or participants to a previously designed simulation. The *Tortuga!* and *Culebra!* simulations lend themselves easily to including additional stakeholders, such as government officials, various types of environmentalists, members of the chamber of commerce or other business leaders, Native American tribal representatives, or other relevant individuals that might have an interest in the issue. The roles for these additional persons would need to be developed in advance. However, if the intent is to involve observers or members of an audience, an easier option is to ask them to play the roles of constituents of the preexisting characters. Throughout the game or during the break, the characters can consult or seek advice from their assigned constituents, who are seated around the room (not at the table). Another variant is that used in the *Breaking Barriers* simulation, where there are eight character types (an environmentalist being one type), with two or three different persons or groups (three different environmental groups, for example) included within that type. Only one person of that type sits at the table and the others are seated around the room.

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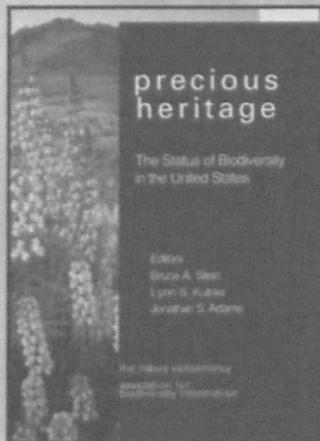
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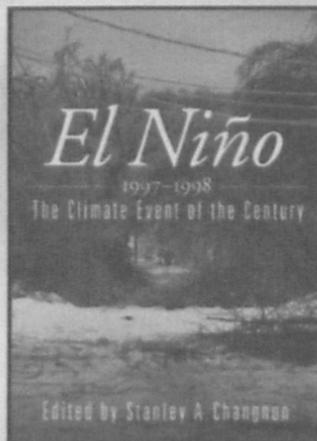
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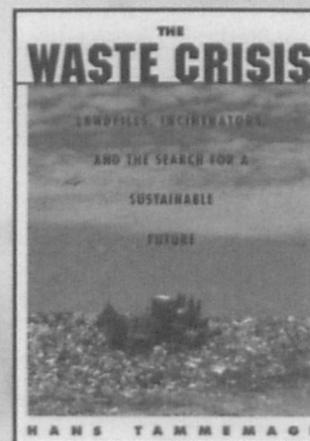
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