COMMUNITY-BASED PARTICIPATORY ACTION RESEARCH IN A RESTORATION ECOLOGY CONTEXT
EXECUTIVE SUMMARY

INTRODUCTION

This summary identifies the most two critical elements of the Natural Cities program as UEI's *restoration ecology approach* and its *community based participatory framework* for action and research and outlines the salient points of each. Recommendations below are detailed and justified in the accompanying brief.

UEI'S RESTORATION ECOLOGY AGENDA

Restoration ecology is premised upon a belief that individual and collective human activity shapes ecosystems and also upon an ethic of human responsibility to preserve and enhance biodiversity. Ecologists interpret these two aspects in a variety of ways. This necessitates an explicit clarity of concepts and values when establishing the goals of a restoration agenda, but also the flexibility to accommodate the diversity of perspectives encountered. The major modes of restoration ecology are outlined in the brief. Because there is no overriding paradigm for restoration ecology goal setting, research or intervention restoration agendas should be given thee key considerations:

1. UEI must explicitly name and restoration goals for each site and Mystic watershed.
2. Goal setters must clearly separate and articulate beliefs and values about a site.
3. Respect and accommodate diverse beliefs and values, privileging none over another.

UEI'S COMMUNITY-BASED PARTICIPATORY SOCIAL AGENDA

Community-oriented participatory action research (COPAR) is a model to research and intervention integrating shared articulation of goals, planning for their realization, implementation and evaluation within a long-term, cyclic, community-based process. It is a widely used and well-understood model of partnership development and implementation benefiting both organizations with resources (including finances, organizational skills and expert knowledge) and local participants (including residents, small businesspersons, environmental advocates and land users). Although participatory models are sometimes engaged without attending to within and between community differences in knowledge, values and practice, they are nevertheless viable and sustainable in the long-term for ecological management. Six fundamental stages in the COPAR cycle, detailed in the brief, are presented here:

1. INITIATION—Technical elites (i.e. lawyers, regulators, scientists) identify and meet a community.
2. PARTNERSHIP DEVELOPMENT—Key and core players and forms of representation are identified.
3. VISIONING—Shared goals are identified. Also conflicting values and beliefs are identified.
4. PLANNING—Collectively deliberation and creation of an action/research agenda.
5. IMPLEMENTATION—Research and intervention are engaged.
6. EVALUATION—Collective assessment leading to repeat steps 2–6

Employing a COPAR approach is a natural choice for UEI's restoration program for many reasons. First, ecologies have histories that are undivorceable from social histories: especially watersheds. Second, elites such as UEI and its project partners and local participants legitimize one another's participation and capitalize on the strengths of one another's different knowledge. Third, community members benefit from the learned collective agency in shaping their local ecosystem. Fourth, restoration ecology provides new kinds of valuable ecological knowledge.

DIRECTIONS FOR UEI

What follows are the key recommendations for UEI to successfully implement its Natural Cities program. These are predicated upon UEI embracing a COPAR approach to restoration ecology and are detailed more fully in the brief.

1. Outreach is paramount. New participants must be engaged to reflect the general community.
2. Organization is likewise of key importance. The six stages must be facilitated, and participants coordinated.
3. Be explicit and articulate about goals, beliefs and values. Welcome all participant perspectives.
4. Stakeholder "at the table" must be partners "at the workbench." Planners must be doers.
5. Translation and dissemination of expert (legal and scientific) knowledge into the plain language(s) of the participants is a primary responsibility of elite partners, including UEI.
6. Be explicit and up front about UEI's incentives to partners and participants in the Natural Cities process.

COMMUNITY-BASED PARTICIPATORY ACTION RESEARCH IN A RESTORATION ECOLOGY CONTEXT
A BRIEF PREPARED FOR URBAN ECOLOGY INSTITUTE

PREPARED BY ALEXIS DINNO, FEBRUARY 2002

INTRODUCTION

The Urban Ecology Institute (UEI) has proposed a community-oriented ecological agenda for the Mystic River watershed as part of its Natural Cities program. This agenda includes two critical elements. First, the goal to "enhance the Greater Boston Harbor ecosystem" implies a *restoration ecology approach*. Second, UEI's desire for both collaboration "led by community partners" and "community support for this program through this research" imply some form of *community-based participatory framework*. This paper clarifies the most salient points of both restoration ecology approaches and community-based participatory restoration models in an outline grounded in the current scientific literature. The reader is introduced to the four major modes of restoration ecology, with attention given to the metaphors, guiding questions and intent behind their promoters. The paper then provides an outline of participatory action research models, bearing especially upon themes covered in the prior ecology section. Finally, this brief identifies methodological approaches for implementing the measurement and analysis of data collected within a framework of future UEI Natural Cities program activity.

UEI'S ECOLOGICAL AGENDA: THE *WHAT* OF RESTORATION ECOLOGY

Restoration ecology is a collection of ecological disciplines guided by a core fundamental belief that individual and collective human activity drives changes in the composition, organization and function of ecosystems. Restoration ecology is therefore a facet of social ecology. (Bailey, 1998; Alcoze, et al, 2000; Davis 2000) Simultaneously, restoration ecology is an applied science motivated by an ethic of human responsibility to conserve, sustain and promote biodiversity. (Alcoze, et al, 2000) This basic combination of belief in human influence on ecosystems and human responsibility to act for biodiversity produces an inherent and irreducible variety of approaches falling under the label *restoration agenda*. To avoid confusion, and clarify communication, those pursuing a restoration agenda must set explicit goals but also exhibit flexibility both in setting them for specific ecosystems, and in approaching the generation of new knowledge via research.

Four principal approaches have historically defined the field of restoration ecology. These are conservation biology, ecosystem management, the ecosystem services approach and the "natural conditions" approach. (Ehrenfeld, 2000) Each approach entails its own mode of setting restoration goals, and its own methods for generation ecological knowledge. The conservation biology approach can be characterized by endangered or threatened species or endangered community conservation goals. Conservation biologists draw upon a richly detailed of a single organism (species, or community of species members) through inquiry into what parameters affect it. Typical conservation-biology interventions might entail predator control, habitat conservation or controlled introduction and establishment of new species communities. Conservation biologists argue that restoration goals must be guided by species because other goals (such as ecosystem functions or services) are difficult to evaluate scientifically or legally. (Goldstein, 1999; Ehrenfeld, 2000) However, interventions to improve the status of a single species are often critiqued as limited because they neglect the (often negative) effect of

interventions upon other species, the role of ecosystem-level processes and functions and biodiversity more generally. (Risser, 1999; Walker, 1999; Ehrenfeld 2000) This critique led to the ecosystem management approach.

Ecosystem management addresses issues of ecosystem degradation or damage. Ecosystem managers apply metaphors of healing or repair to interventions and research designed to bring system parameters back into a theoretical "envelope of variability." (Kloor, 2001) This approach operates at the level of landscape or ecosystem (a watershed, for example). The goals of ecosystem managers are based on system-level dynamics (nutrient flow, relative abundance across species, water quality, etc.) believed to be the driving factors in determining biological diversity. (Ehrenfeld, 2000, Kloor 2000) Ecologists employing this approach typically conduct research into biodiversity by asking whether changes in the relative abundance of component species will induce change in ecosystem processes and whether changes in one species affect the relative composition of other species in an ecosystem. (Risser, 1999; Ehrenfeld, 2000) Typical ecosystem management interventions are controlled forest burns, habitat creation or modification (i.e. de-channelization of streams), or orchestrated conservation of keystone species. Some ecosystem management ecologists believe that species-level knowledge such as that generated and employed by conservation biologists may be used to index ecosystem processes by species that are most sensitive to ecosystem-level process changes. (Palmer, et al, 1997; Walker, 1999)

Some ecologists, by contrast, reason that the application of restoration agendas are manifested only by collective human action, and therefore that goal setting should explicitly endeavor to account for the functions and services valued by the human "constituency" of an ecosystem or landscape. (Constanza, et al, 1997; Ehrenfeld, 2000; Pfadenhauer, 2001) Questions of how to identify and value ecosystem services (recreational use, water or air purification, etc.) are central to this approach. Some employing this approach have advocated for goal setting based on market or market-like valuation mechanisms explicitly integrating ecosystem services into economic and economics-influenced policy. (Constanza, et al, 1997; Ehrenfeld, 2000)

The "natural" conditions restoration approach is guided by responsibility on the part of the agenda setters for ameliorating a specific wrong thereby "turning back the clock" to a more desirable time. In this approach the goals are often not an actual "return" of the ecosystem to a previous state, but the establishment of a functional ecosystem that approximates the prior reality. (Davis, 2000; Ehrenfeld, 2000; Pfadenhauer, 2001) For example, a mining operation may desire to establish a sustainable forest stand or fish populated stream at its site regardless of its ability to mimic the actual species or habitat composition and organization. Pfadenhauer (2001) describes a clarifying framework for categorizing restoration goals that applies both to ecosystem services and "natural" conditions approaches. In this framework agenda setters evaluate the desire for a museum function (valuing past conditions in perpetuity), a reactivation function (recreating valued prior functions) and emergent functions (creating new functions based on articulated need or desire).

UEI'S ECOLOGICAL AGENDA: THE *HOW* OF RESTORATION ECOLOGY

There is no overriding paradigm for restoration ecology goal setting, research or intervention. However, those promoting a restoration agenda should consider three key points. First, restoration goals must be explicitly named and set for each UEI site and for the program as a whole.

Second, in goal setting, there needs to be a clear separation of beliefs (i.e. what has historically happened in an ecosystem, what is happening now, and what is likely to happen) and

values about sites (what ought to have happened, and what ought to happen) among all participants of the agenda setting process.

Third, flexibility—as opposed to a cookie-cutter approach—is necessary to address the social and ecological vagaries of the Mystic Watershed. A primarily scientific and technical elite group of university-based researchers and public-sector managers articulates these diverse values and methods. But Palmer, et al, have noted that very often the people actually *doing* the restoration are not ecologists. (1997) So, while the assumptions and values of the outlined frameworks are translatable into different sub-populations of non-elite scientific/technocratic human experience and endeavor (urban residents, members of different race/ethnicity groups, farmers, amateur bird watchers, etc.), those undertaking restoration ecology must be aware that diverse beliefs and values are at stake.

UEI's Social Agenda: the *What* of Participatory Action Research

Participatory action research (PAR) is a model for research and intervention, integrating shared articulation of goals, planning for their realization, implementation and evaluation within a long-term, cyclic, community-based process. PAR developed out of community-based methods in both public health and rural development including rapid rural appraisal, participatory rural appraisal and action-research modes. (Parkes and Panelli, 2001) Community-oriented participatory action research (COPAR) explicitly names, defines and locates the constituency of participants as a fundamental unit of goal setting, intervention and analysis. There are six fundamental stages in this cycle:

1) Initiation—Technical elites (i.e. lawyers, regulators, scientists) meet a community; participant groups and individuals identify one another; the community identifies a shared problem/crisis/project; commitment is made to partnership and process.
2) Partnership Development—Key players are identified, and forms of representation and communication are established; the core research/reference/coordinating group is formed.
3) Visioning—Shared goals are identified. Also conflicting values and beliefs are identified.
4) Planning—Collectively deliberate over fields of inquiry/design, create an action/intervention agenda.
5) Implementation—Research and intervention are engaged.
6) Evaluation—Collective assessment of the COPAR process in this iteration (including evaluation of who is considered a participant in the community) leading to repeat steps 2–6. (Parkes and Panelli, 2001)

Four assumptions underlie much of the literature advocating the COPAR model. 1) Community needs for local environmental resources will remain fixed over time. 2) Communities possess more knowledge about local ecosystems than anyone else. 3) Absent community-based ecosystem management, communities have incentives for unsustainable land-use behavior. 4) Community involvement in conservation provides incentives for sustainable land-use. (Agrawal and Gibson, 1999) While such assumptions have considerable psychological and strategic appeal, representing the "community" as homogenous ignores within and between community difference in knowledge, values and practice.

Clearly, COPAR models will not solve all problems, and have been limited in describing diversity among different communities. However, they are widely used and well understood models of partnership development and implementation that benefits both organizations with resources/elites and local participants

UEI'S SOCIAL AGENDA: THE *WHY* OF PARTICIPATORY ACTION RESEARCH

Employing a COPAR approach is a natural choice for UEI's restoration program for many reasons. The first has to do with the social ecological orientation of restoration ecology and watershed management. Ecologies have histories that are undivorceable from human action. Therein lies the need to recognize the unavoidably social nature of watershed management. (Agrawal and Gibson, 1999; Rhodes, et al, 1999) Today's Mystic Watershed ecosystems embody the rich and still relevant social histories that created the residential neighborhoods in Somerville, the Logan Airport and the modes and patterns of transit still employed today.

Second, elites involved in ecosystem management (including scientific and legal elites) benefit from community involvement in two ways. Local non-elites often have rich, experiential beliefs and values about their local environment. These bodies of knowledge can, through effective collaboration, be tied into scientific research on Mystic Watershed sites. Locals may be able to identify problems or variables of interest that do not appear in UEI's GIS database. For example, a resident may identify noxious odors associated with stream processes, or wildlife kill events. (Calheiros, et al, 2000; Luz 2000) UEI and its elite partners in the Natural Cities program may also benefit from buy-in on the part of locals who feel they have made a contribution to realizing both ecological and social goals. Such legitimacy may imply increased participation in, decreased resistance to and improved trust in the Natural Cities program. (Calheiros, et al, 2000; Luz, 2000) Morover, newly emerging research indicates that qualitative assessments and knowledge produced by participatory appraisal models (incorporated into the COPAR cycle) correlate with quantitative survey appraisals administered within the same populations. (see Temu and Due, 2000 for further references on this topic)

Third, the participant community benefits from this process. Individuals and groups engaged in long-term COPAR processes obtain learned agency, including skills, networks and meaningful local and community-wide histories in addition to the realization of restoration agenda goals in the Natural Cities program. (Calheiros, et al, 2000; Luz, 2000, Parkes and Panelli, 2001). Community participants are also imbued with a degree of ownership in the process, implying the commitment of local resources necessary to generate sustainability. The history of the various participatory approaches is rooted in an ideology of democratizing once top-down, short-term, colonial processes, to produce locally responsive, long-term sustainable community processes. (Agrawal and Gibson, 1999; Parkes and Panelli, 2001) Bringing the point about the interleaved relationships between ecology and society into the language of diffusion of innovation theory: *ecological change* is *social change*, of which UEI is an agent though the channel of the Natural Cities program. (Rogers, 1983)

Fourth is the small but important point that participatory restoration ecology is a fundamentally new source of ecological knowledge, because the social and ecological have been long segregated in environmental research. (Niering, 1997; Palmer, et al, 1997)

UEI'S SOCIAL AGENDA: THE *HOW* OF PARTICIPATORY ACTION RESEARCH

This brief is intended primarily as background and justification for a community-based participatory restoration ecology approach to the Natural Cities program. While it does not detail

the implementation of these recommendations, it does offer a series of critical points to guide UEI in the process of establishing Natural Cities. The first of these points is to embrace the participatory restoration process, and consider UEI's role in that process. Second, in the role of a technical elite (and, perhaps, facilitator) in this process UEI must actively promote the following:

1) Outreach is paramount. The entities referred to as "Project Partners" in the text of the UEI grant (Lord and Toffler, 2001) cannot be presumed to reflect the general community with interests in the social ecology of the Mystic Watershed. New participants must be sought, especially if Natural Cities' agenda is to reflect those whose lives are most proximate to the sites of interest. All participating groups and persons should be encouraged to invite new community members into the process, and this outreach should be understood and presented as a valid and critical component of the COPAR process. Resource-holding participants (such as UEI itself) may even go so far as to make demonstration of such outreach a requisite for their input into the process.
2) Organization is likewise of key importance. The six stages of the COPAR model describe segments of a schedule. Establishing Natural Cities along these lines will require careful attention to questions such as What stage are we at now? When and where will participants meet to engage in visioning? etc.. Successful engagement will probably entail the creation of a paid position to facilitate the communication and time management required to proceed through these stages.
3) Explicit articulation and communication of all participants' goals (UEI's included), with attention to distinguishing between participant beliefs and values. If trust and meaningful social and ecological change are to be mobilized, all participant beliefs and values must be welcome in the visioning process.
4) Planners must be doers. Those "stakeholders" who have been "brought to the table" during planning stages, must also be "brought to the workbench" during the implementation phase.
5) Research findings produced by the COPAR process needs to be accessible to all participants. To this end, it is incumbent upon technical and scientific elites to translate and disseminate technical information (scientific, legal, etc.) to the widest possible audience of participants.
6) Make the nature of UEI's contributions explicit to partners and participants in the Natural Cities process, people need incentives… (Haughton, 1999; Rhodes, et al, 1999; Calheiros, et al, 2000; Luz, 2000; Parkes and Panelli, 2001)

Finally, some comments about the survey produced by Catherine Guimond and myself. This survey is designed to provide UEI and the Natural Cities program with several kinds of information. The survey is predominantly qualitative in nature, flexibly tapping a rich range of respondent experience. (Neuman, 1991) The absence of quantitatively measured constructs reflects the theoretical diversity of the restoration ecology approach (i.e. creating a quantitative measure such as Species Importance would imply the pre-selection, and thus privilege of the assumptions and theories underlying conservation biology or ecosystem management approaches).

Elsewhere, Ms Guimond and I have argued that identifying the qualities of the participant population is the best available option for obtaining a meaningful sample. The role in identifying

this population for sampling has, I hope, been further clarified by this paper. First, demographic questions provide UEI with the ability to characterize the sampled population, and provide insight into both issues of exclusion and the nature of the community.

Second, the survey entails a structured series of elicitation questions designed to characterize both ecological values (positive "valued attributes" and negative "areas of concern") at different levels and scales within the Mystic Watershed.

Third, the survey includes a number of expectancy/value formations designed to elicit articulated beliefs and values about sites of concern within the watershed. This formation, in addition to being supported both by the restoration ecology literature and the participatory research literature, is a classic approach towards measuring attitudes in survey instruments. (Ajzen and Fishbein, 1980)

Fourth, keeping in mind both staging and the key considerations of the COPAR, the survey provides information about participants' evaluation of the process, information relating participants ecological goals, information about willingness to participate in implementation and, perhaps most importantly, information about the definition of participant, and therefore, of community itself.

A Final Comment

By engaging in a process of social and ecological change, UEI is undertaking a grand experiment. But if one accepts that ecological processes are inextricably tied to social processes, then *any* restoration approach is likewise engaging in experiment of a social nature. However, by choosing to do so in a participatory framework, UEI has the opportunity to make the process an ethically sound and empirically valid one, one that, while not assured of success in attaining its goals, is nevertheless fair, and adaptable over the long term.

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