

## Using an Ecological Ethics Framework to Make Decisions about the Relocation of Wildlife

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**Abstract** Relocation is an increasingly prominent conservation tool for a variety of wildlife, but the technique also is controversial, even among conservation practitioners. An organized framework for addressing the moral dilemmas often accompanying conservation actions such as relocation has been lacking. Ecological ethics may provide such a framework and appears to be an important step forward in aiding ecological researchers and biodiversity managers to make difficult moral choices. A specific application of this framework can make the reasoning process more transparent and give more emphasis to the strong sentiments about non-human organisms held by many potential users. Providing an example of the application of the framework may also increase the appeal of the reasoning process to ecological researchers and biodiversity managers. Relocation as a conservation action can be accompanied by a variety of moral dilemmas that reflect the interconnection of values, ethical positions, and conservation decisions. A model that is designed to address moral dilemmas arising from relocation of humans provides/demonstrates/illustrates a possible way to apply the ecological ethics framework and to involve practicing conservationists in the overall decision-making process.

**Keywords** Biodiversity · Conservation · Decision-making · Ecological ethics · Management · Moral dilemmas · Relocation

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## Introduction

Largely because of the high rate of habitat destruction, relocation has become an increasingly prominent conservation tool over the last couple of decades (e.g., [1–6]). Here, ‘relocation’ is defined as any movement of individuals by humans (but see [7, 8]). Thus, use of the term ‘relocation’ subsumes a variety of conservation actions, such as moving individuals to establish a species outside its existing range, to reestablish a species within its existing range, to augment an existing population, to put individuals back into a population from which they were removed, and to transfer individuals between existing populations. To a large extent, ‘relocation’ also subsumes maintenance of collections of individuals for sustaining a species over some period of time (assurance colonies), or for restocking, or for some other conservation purpose.

A number of important questions accompany the use of relocation as a conservation tool (e.g., [7, 9–12]). Examples drawn from experience with desert and gopher tortoises (see Berry [13], Burke [14], and Tuberville et al. [15] for discussions of relocation of these two species) are presented in Table 1. Lax oversight or simple expediency often precipitates these kinds of issues and concerns. For example, substantial funds are sometimes provided for relocation projects that have no independent scientific review of the research design, the qualifications of researchers, or outcome. In some cases, apparent conflicts of interest arise when researchers requesting funds also participate as members of the committees that review potential projects for funding, judge the outcomes of funded projects, and offer recommendations for future funding. Researchers involved in such actions potentially violate the ethical principles of performing and presenting unbiased research and promoting the use of unbiased research by others [16]. For another example, the designs of relocation projects often are ad-hoc, and motivated by a need to “dump” unwanted tortoises. Too many cases exist in which the objective of relocation is simply to find a recipient site for tortoises displaced by development and to stock the site with as many individuals as possible, without much consideration of their future well-being. Researchers involved in such actions potentially violate the ethical principle of protecting environmental welfare [16].

Other questions reflect true conundrums. Upper Respiratory Tract Disease (URTD), which affects both desert and gopher tortoises, is an infectious disease caused principally by the pathogen *Mycoplasma agassizii* [17–19]. Often, individuals are certified for relocation based on the results of an ELISA test developed to determine the presence or absence of antibodies to *M. agassizii* [20]. Tortoises with positive tests typically cannot be relocated and many of them are killed directly (euthanization) or indirectly (called ‘incidental take’ for the gopher tortoise, which principally involves entombment in burrows; [21, 22]); tortoises with negative tests typically can be relocated. Like all diagnostic tests, the ELISA test has an associated error rate with both false positives and false negatives [17, 23]. Moreover, it is only one of several tests available, does not screen for other important diseases (see [24]), and does not necessarily indicate the current health status of individuals. Several important consequences follow from these facts. On the one hand, relocation, even of individuals tested for URTD, could pose a significant health hazard to other

**Table 1** Examples of issues accompanying the use of relocation as a conservation tool**Planning**

- Who should decide priorities and the proper course of action?
- What should be the role of conservationists in planning the relocation project?
- What should be the role of the persons or organizations providing funding in planning the relocation project and in influencing the presentation of findings?
- Is the scale of the project appropriate to available resources?

**Implementation**

- Are the motivations and short- and long-term objectives of the project well conceived?
- Is the project appropriately designed to determine “success” or “failure”?
- Are the risks associated with the project offset by its potential to generate valuable outcomes?

**Evaluation**

- Under what circumstances can a relocation project be declared successful?
- How long should post-relocation monitoring be continued, especially for long-lived species?
- Should a relocation project be initiated if it cannot provide a long-term solution?

**Disease and parasite transmission**

- What steps should be taken to minimize the potential of spreading infectious diseases or of transporting parasites from one locality to another?
- How much effort should be expended to reduce risks to existing wild populations?
- What should the standards be for determining health status, especially for emerging infectious diseases?

**Captive rearing and breeding**

- Should ex situ or in situ systems be used?
- Will rigorous husbandry protocols be employed?
- Will survival and reproductive output of released animals be determined?

**Individual welfare**

- What is the degree of threat or endangerment to the species and the remaining populations?
- Is each individual critical to the recovery of the species and overall persistence of remaining populations?
- Does the project take into account the welfare of individual animals, and appropriately weigh it against long-term survival of the species?

**Illness and euthanasia**

- What should be done with ill individuals that may compromise remnant or declining populations?
- Should ill individuals be adopted or placed in breeding programs designed to produce healthy offspring for release/restocking programs?
- Should decisions about euthanasia be placed in the framework of available resources?

individuals already resident at or near the recipient site. On the other hand, individuals could be killed based on the results of a single ELISA test, even though they may not pose a significant health hazard.

When questions concerning relocation are raised, even those conservationists motivated by a desire to protect non-human organisms do not necessarily maintain similar positions (see [25]). Some judge relocation to be a worthy conservation strategy, while others judge it, either in particular cases or in general, to be unacceptable, because they view relocation as improperly motivated or not

“natural.” These human values play a prominent role in the conservation decision-making process [26]. They include some of the values ascribed to non-human organisms, some of the positions that conservationists take concerning non-human organisms, and the consequences that taking those positions may have for decisions affecting translocation of non-human organisms (see [27]). Although consideration of values in this manuscript is from a largely subjectivist perspective, for practical reasons, it is not intended to contribute to the on-going subjectivist-objectivist debate concerning intrinsic value in Nature (see [28, 29]). Application of the ecological ethics framework developed by Minter and Collins [30] provides a tool for addressing the potential ethical dilemmas surrounding translocation of non-humans.

### Values, Ethical Positions, and Conservation Decisions

Values, as employed here, simply are elusive, abstract descriptions of what individuals believe to be important [31]. Persons make decisions about the use of natural resources, including non-human organisms, based on the values that they ascribe to them and the order of importance that they give those values. Most humans tend to favor values that provide direct material benefit; so, that when they make choices, their priorities are reflected in the following sequence: current direct material value (subsistence) → current direct material value (amenities) → current indirect material value → current nonmaterial value → future use value → intrinsic value [32]. The values ascribed to non-human organisms by persons in “developed” societies often fall toward the end of this sequence. Although many societies attribute current indirect material value (spiritual, aesthetic, scientific, recreational, etc.) to resources, especially non-human organisms [33, 34], this position tends to be under-rated in “developed” societies. Likewise, although many “less-developed” societies attribute future use value [35] to resources [36, 37], persons in “developed” societies tend largely to discount the future. Some conservationists have suggested that failure to value non-human organisms more highly typically comes from lack of both relevant information and appreciation of their significance; and that these values can be reordered simply by persuasion and/or education [38]. Other conservationists have tried to focus attention on values associated with non-human organisms that are nearer the beginning of the sequence. Many of these efforts have taken an economic approach, emphasizing the willingness of persons to pay to observe nature or the immense value of the services provided by non-human species and ecosystems (but see [39, 40]). Other efforts have taken a non-economic approach, emphasizing, for instance, “existence value” (i.e., the value to humans of the continued existence of things that may possess distinctive characteristics or symbolic importance) [40–42], which tends to rise with increasing rarity [43, 44].

Although most humans have a moral intuition that living things are “special” (e.g., [45, 46]) and it can be argued that emotional attachment to living things is a normal response of a moral being [46, 47], even moral humans do not agree on whether all living things are equally deserving of special status (what ethicists term

“moral significance” or “moral standing”) (e.g., [45, 48, 49]). This is an important issue, because if something is morally significant, then its interest or well-being must be positively weighed in deciding what is permissible to do. At the risk of trivializing the debate, one can say that opinions on the possessors of moral significance run from the humanistic (homocentric), to the species-impartial (biocentric), to the holistic, to the Gaian; or, more precisely, from humans to humans and near-humans to rational animals to linguistic animals to sentient animals to living things to ecosystems to the Earth. For some persons who attach moral significance to certain non-human organisms, it is a logical step to accord equal moral weight to those organisms as to humans (what ethicists term “equal consideration”) (see [48]). And, for some persons, it is a further logical step to accord “rights” to those organisms that have been accorded equal consideration (see [50]).

At the other extreme are those persons who believe that equal consideration and rights apply only to organisms that can tell right from wrong and act accordingly (what ethicists term “moral agency”), which, under strict interpretation, excludes virtually all, if not all, non-human organisms (see [48, 49]). This position is best illustrated by the legalistic standing of non-human organisms. Under the laws of most countries, non-human organisms are regarded as property, which, arguably, cannot have intrinsic value [51]. Because under law non-human organisms are property, the benefits of exploitation of non-human organisms, like other natural resources, tend to accrue to the few individuals who possess them, and the expenses to be shared among those who do not. To justify their behavior, individuals who benefit from exploitation often invoke their property rights. They believe that property rights allow them to use, exclude, transfer, and destroy their property as they see fit. Societal values can curtail property rights, however. For instance, one cannot violate zoning restrictions, or engage in activities that adversely affect neighbors in certain ways, or demolish structures that a society has deemed of cultural value. The latter example is especially important, because it illustrates the fact that property rights end short of the right to destroy anything on one’s property that is of value to society (cf., existence value, above; e.g., [52–54]). Therefore, if the non-human organisms on personal property have value to society, their destruction cannot be justified merely by appeals to property rights. Thus, even from a legalistic perspective, the welfare of non-human organisms may take first priority in a variety of circumstances (e.g., [48, 55]).

Consider how differences in values could reflect the ethical position that a conservationist takes and influence the choices that he/she makes about relocation. Suppose that a conservationist’s ethic is individual-based. An individual-based ethic ascribes equal value to individuals, regardless of the groups to which they may belong, and does not allow duties to non-human organisms to be extended to groups of those organisms, such as populations and species. Therefore, any duties that one/society may have to non-human organisms cannot justify actions taken on behalf of the group that are contrary to the interests of the individual organisms, or justify treating members of vanishing species with more care than members of other species [30, 40].

Clearly, an individual-based ethic cannot provide support for many of the activities carried out in the name of conservation, including most relocations.

Because many of these activities tend to look past the welfare of individual organisms, and focus instead on the welfare of groups of organisms (i.e., populations, species, ecosystems), conservation biologists who support them implicitly subscribe to the “minimize harm principle” [50]. This principle states that in situations where all of the options at hand will produce some harm to those who are innocent, one must choose the option that will result in the least total sum of harm. Under this principle, gross harm to individuals, even their deaths, might be justified if such harm resulted in the perpetuation of a population or species. A conservationist who adopts an individual-based ethic must explicitly disavow the minimum harm principle, except when each affected individual is harmed in a *prima facie* comparable way [50]. By extension, disavowing the minimum harm principle precludes engaging in most of the compromises or “trade-offs” that increasingly characterize “practical” conservation.

Suppose instead that a conservationist’s ethic is group-based. The focus could be on any one of several groups, such as populations, species, and ecosystems, even to the exclusion of individual organisms (e.g., [56]). No consensus has developed as to which, if any, of the groups should be the exact target(s) of conservation (see [40, 57]). At least four reasons may underlie the lack of consensus. One reason is the scientific uncertainty about the precise definition of/criteria for either taxonomic units, such as species (e.g., [58, 59]), or ecological units, such as communities (e.g., [60]). A second reason is the inconsistency in the selection of groups as targets for conservation. For instance, in some cases the focus is on the species, while in other cases the focus is on the even more poorly defined subspecies or population segment (e.g., [61]). A third reason is the different implicit values attached to particular populations, species, and ecosystems, apart from their rarity. For instance, extraordinary effort has been expended to save the California condor, but none at all to halt the decline of the smallpox virus in the wild. A fourth reason is the different interests, assuming they have interests, of the various groups of organisms. For instance, the extinction of a particular species may have no obvious consequence for the functioning of the ecosystem of which it is a part (see [62]), and, therefore, that species rationally could be denied moral significance under a holistic ethic.

A principal dilemma concerning a group-based ethic arises from the biologically reasonable proposition that conservation should give primary importance to maintaining processes, both ecological and evolutionary (see [57, 63, 64]). If proponents of a group-based ethic accept this proposition, then they may be forced by circumstances (human population expansion) into the extreme position of demanding the preservation and/or re-creation of wilderness, where wildlife will be free from human interference as much as possible (see [41, 65]). Achieving such an end will be difficult. In the first place, if experience rings true, then any areas preserved for wildlife, even seemingly large ones (see [66–68]), inevitably will become too small, and/or too isolated, and/or too prone to human influence either to allow “natural” processes<sup>1</sup> or to prevent the need for management. In the second place, it seems shortsighted to demand that non-human organisms be moved away

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<sup>1</sup> See McCoy and Shrader-Frechette [69] and Grimm and Wissel [70] for discussions of the scientific uncertainty underlying the description of some of the key processes.

from humans at just the time when human appreciation of those organisms may be paramount to their survival. The alternative, and no less-extreme, position, that if species are to survive at all under the present circumstances, they must do so within the precincts of relatively small set-asides and with intensive management, is not appealing to many proponents of a group-based ethic (see [71]).

Finally, suppose that a conservationist's ethic is survival-based. In this case, the conservationist would assume the role of caretaker or guardian of non-human organisms [72] and would do whatever was deemed necessary to prevent organisms from going extinct (e.g., [73, 74]).

One of the many dilemmas that arise from a survival-based ethic is that its proponents have, of necessity, acquiesced to the sacrifice of much of what is "natural" about wildlife and much of what may have contributed value to wildlife in the first place. They have tacitly condoned the removal of ecological and evolutionary processes as the primary focus of conservation. One might even argue that they have run completely afoul of these processes by condoning the replacement of one form of insult to wildlife (human-caused decline) with others (genetic disruption, evolutionary stasis) (see [75–77]).

Another dilemma arising from a survival-based ethic is the high level of uncertainty involved with intensive management (see [7, 78, 79]). For instance, although some ethicists can see no justification for keeping animals in captivity (e.g., [80]), others see some justification if the goal of captivity is to protect the organisms until they can be released safely (e.g., [81]). So far, however, captive release programs have not had a great deal of success [82, 83]; but see [84], and, of course, if current trends in many places continue, we will shortly run out of places to release organisms [22]; an immediate example is the "long-term" release site for desert tortoises at Jean, Nevada, which will be affected by airport expansion). If animals were to be kept in captivity, rightly or wrongly, then all ethicists would agree that humans have a duty to treat them humanely. But, so far, what constitutes humane treatment is difficult to determine, because of the uncertainty about standard measures of well-being (see [85, 86]).

Yet a third dilemma arising from a survival-based ethic is the necessary, but unfortunate, involvement of conservationists in activities that they may not find easy to defend, either to others or to themselves. For instance, intensive management of wildlife, even endangered wildlife, may mandate culling or fertility control to make the population sizes of organisms compatible with the available resources. Or, the rush to acquire individuals for captive breeding programs may cause harm to organisms in the wild. Or, the small pool of available programs may force extraordinarily weighty, but largely baseless, decisions about which organisms will survive and which will slip away (see [21, 22]).

Based on this admittedly superficial comparison of ethical positions and values, there are at least four possible reasons why it is difficult even for conservationists to reach a decision about the correctness of relocation. The first reason is that a number of very different positions on humans' ethical obligations to non-human organisms exist, the second is that none of these ethical positions fully supports or fully negates conservation actions such as relocation, the third is that these ethical positions are hard to compare because they sometimes fall into different ethical domains, and the

fourth is that values—and even ethical positions, given enough time or enough pressure—can change, depending upon circumstances, or at least one’s perception of circumstances.

The malleability of the values and ethical positions concerning relocation adds yet another layer of complexity to the decision-making process. Values can change because they are contextual (e.g., [40, 57, 87–89]). The values that persons, including conservationists, ascribe to non-human organisms, wherever they draw the line between significant and non-significant species, depend upon the situations in which they find themselves. They are less likely to ascribe value of any kind when their most basic physiological and safety needs are not being sustained or when their material welfare is threatened by social or economic downturn, and more likely to ascribe immediate value when significant species are put at risk. Take an extreme example. If placed in the circumstance of having to choose between starving and killing the last individual of a species for food, any person, regardless of professed ethical position, is likely to choose the second option. Or, if placed in the circumstance of having to choose between allowing ones children to starve and degrading the environment for food, a person is likely, once again, to choose the second option. An old man in Zimbabwe expressed the point eloquently: “when we are hungry, elephants are food; when we are full, elephants are beautiful” [90]. Likewise, a conservationist may shift from, say, a group-based ethic to a survival-based ethic if he/she perceives that circumstances warrant such a change; and, in so doing, the values that the conservationist ascribes to procedures such as relocation, and the resulting actions that he/she takes, also can change. For example, if increasing human expansion has so narrowed the conservation choices that relocation has become more-or-less the only alternative to death (e.g., [22]), then a conservationist is likely to choose the former option, regardless of his/her prior position on relocation.

The breadth of values held by conservationists, not to mention other stakeholders, clearly can interfere with the decision-making process concerning relocation. How ecological researchers and biodiversity managers can move forward despite the dilemmas that they often face is of increasing interest (e.g., [16, 26, 30, 91]). Ecological ethics [30] provides practicing conservationists with an organized framework for addressing the many ethical questions surrounding conservation activities such as relocation.

## Ecological Ethics

To provide an organized framework for dealing with the dilemmas typically surrounding conservation activities, Minter and Collins [30] have developed an “ecological ethics” that encourages clarification and reasoning through the relevant principles and values that bear on problematic research and management situations. It emphasizes the contextual and situational dimension of decision-making in research and management, within the four ethical domains in which ecological researchers and biodiversity managers operate: theoretical (normative), research ethics, animal, and environmental. Identifying and organizing practical ethical



principles across the domains will help these professionals delineate the moral aspects of specific research and management dilemmas.

Ecological researchers and biodiversity managers have many duties and obligations within the various ethical domains [30]. For example, they have duties and obligations within the domain of research ethics arising from their roles as professionals [92, 93], scientists [94, 95], and/or field researchers [96, 97]. They have responsibilities for ensuring that the rights of other persons are protected, that their research has value to whomever is supporting it, and that research funds are used carefully. They also have responsibilities for ensuring that the planning, implementation, and presentation of the results of the research are conducted carefully, honestly, and openly; as well as for ensuring that research subjects and their environments are protected from unnecessary disturbances. Ecological researchers and biodiversity managers must, at a minimum, think thoroughly and consistently about the potential ramifications of their actions and behaviors when engaging in research, applying research findings to management, or discussing research and management with the public; pay attention to possible ethical pitfalls prior to getting involved in projects or accepting payment for their expertise; and become familiar with the variety of ethical standards that may apply at local, regional, national, and international levels, and in science, business, government, law, and other relevant human activities. Other sets of duties and obligations fall within the remaining three ethical domains (see [16, 30]), and included references).

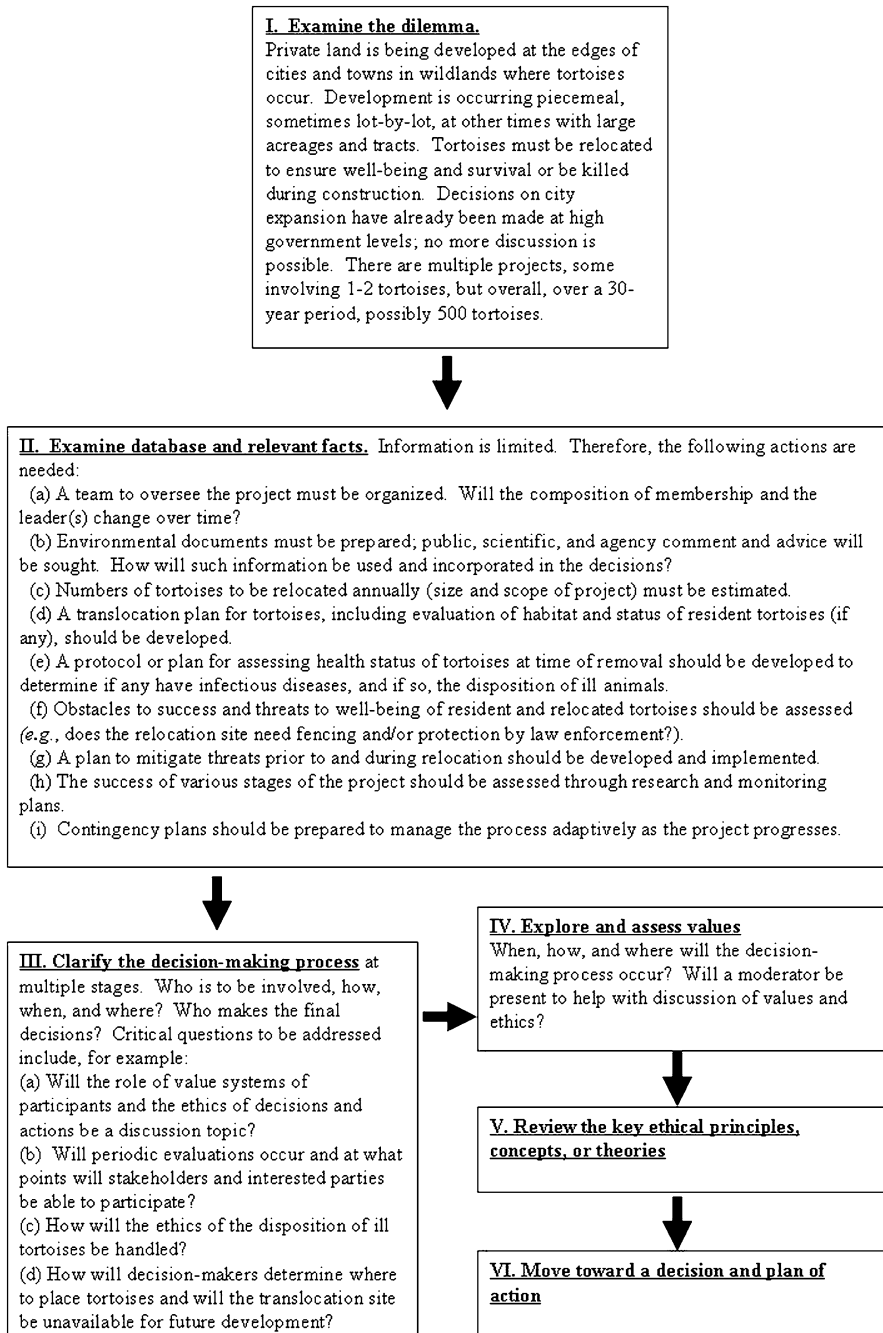
Based on experience with relocation and other conservation activities, we suggest that the current ecological ethics framework [30] could be modified in at least two ways. The first is by making the ethical reasoning process more transparent and user-friendly. Minteer and Collins [30] anticipated that potential users might not respond favorably to their framework because it "...will not produce absolute and definitive answers to the specific moral quandaries encountered in environmental research and management settings..." In our experience, ecological researchers and biodiversity managers feel ill-equipped to reason through the variety of principles and values often accompanying conservation activities, and indeed hope to be provided with absolute and definitive answers to moral quandaries. If ecological researchers and biodiversity managers could be convinced both that absolute and definitive answers are not forthcoming, and that the ecological ethics framework is a useful tool to address moral quandaries, then such quandaries might not be ignored or become grounds for inaction.

A second modification of the Minteer-Collins framework is to weight the various ethical domains, or elements within those domains, by the degree to which humans "care" about them. An ecological researcher or biodiversity manager may, for example, be able to approach research ethics dispassionately, but not address animal ethics similarly. Ethical issues involving non-human organisms—and, also, environmental welfare—often stir deeply-held sentiments, and special consideration of these sentiments may need to be part of the framework. Although respect for the dignity and/or moral and legal rights of animals is an element of ecological ethics ([30], Table 1), this principle rarely is given adequate weight in making decisions about conservation actions. Deeply-held sentiments about non-human organisms often are suppressed in favor of a more "relevant" and "practical" set of principles.

## Applying Ecological Ethics

The ecological ethics framework for decision-making, although a valuable tool in its current form, could profit from some modification in order to enhance the adaptation of moral principles to practical problem solving [30]. As indicated above, one way is to enhance its appeal to the persons who should use it and another is to weight ethical domains differently in cases involving significant non-human organisms. Clearly, these suggestions are not easily implemented, but the ethical framework developed for dilemmas related to relocation of humans to or within a care facility [98] may serve as a possible model. Although a framework dealing with displacements of entire human cultures might parallel tortoise relocation more closely, this framework for relocation of humans is relatively simple and easy to understand, and has much in common with the ethical framework for relocation of non-humans [30]. Although human relocation has been dubbed “an ethical minefield” [99], the troublesome nature of relocation often leads to a reduction in the amount of attention paid to ethical issues in the decision-making process. Decision-makers (case managers) operate in multiple domains: they must simultaneously maintain the honor and independence of the individual, assure that the individual is well cared for and not substantially at risk, and avoid legal and financial liabilities. The decision-making process is clarified and supported by several ethical principals: a duty to ensure autonomy and competency; an obligation to avoid paternalism; a duty to do good and avoid harm; an obligation to institutions, laws, fiscal limitations, and regulations; and a duty to act fairly and tell the truth (cf. [30], Table 1; also see [16]).

The particular aspects of the ethical framework for relocation of humans that are particularly applicable to relocation of non-humans are its strong focus on duties and obligations to the affected individual(s) and its explicit model for how the decision-making process can proceed effectively. Examination of the various ethical positions concerning autonomy (freedom to decide among the options available and to carry out the chosen course of action), competency (ability to think, deliberate, and choose a course of action), and paternalism (overriding of autonomy and/or competency according to self judgments) held by all parties should form a significant element of the decision-making process surrounding any conservation action, as it does for the process associated with relocation of humans. It would seem that, by definition, at least the vast majority of non-human organisms cannot possess competency, but the same may not apply to autonomy. The relevant question to ask about autonomy is not “Can non-humans be autonomous?” but rather “Can non-humans be autonomous if “self-determination” is couched in an evolutionary context?” “Deciding among the options available and carrying out the chosen course of action” not only defines ‘autonomy’, but also captures the evolutionary process in a nutshell. If one accepts this viewpoint, then similar reasoning applies to paternalism. The relevant question in this case is not “Should actions taken on behalf of non-humans be based solely on the values of the decision-makers?” but rather “Should actions taken on behalf of non-humans be based solely on the values of the decision-makers, if non-humans have evolutionary ‘interests’?”



**Fig. 1** Example of the application of the relocation model (Table 2) to multiple small projects at the urban-wildland interface (Note that the opportunity for ethical considerations is limited when decisions are “pre-made” by local governments)

The explicit model that is part of the ethical framework developed for relocation of humans [98] could be useful in addressing the dilemmas surrounding relocation of non-humans, specifically tortoises. The components of the model are listed in Table 2, and related as much as possible to relocation of non-humans. Using some version of the model can provide a standard way of incorporating ethical reasoning into the overall decision-making process that may appeal to conservationists. Figure 1 provides an illustration of how the model can be employed in a realistic situation. Although a model such as this one can improve critical thinking and ethical reflection, it cannot eliminate ethical dilemmas [98]. Having an organized way to move forward will not relieve the agony of ethical decision-making.

**Table 2** The components of the explicit model of Schneider and Sar [98] applied to the dilemmas surrounding relocation of non-humans

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Examine the dilemma

The dilemma in question is examined and laid out in such a way that all parties involved in the decision-making process have a shared view of the nature of the dilemma

Examine the data-base and relevant facts

Relevant facts are gathered, including facts about the organism, time frame, resources, institutional constraints, and legal requirements. Even if the data and facts are incomplete, the decision-making process is strengthened by using as much factual information as possible. It is here that the practical realities involved are introduced

Clarify the decision-making process

The way in which the decision-making process is to proceed is set out. Important considerations are addressed, such as who will contribute to the process (in particular, how will the views of the variety of stakeholders, which are demonstrably influential in the management of land and wildlife, be included), what criteria will be considered, who will make the ultimate decision, how ethical and moral principles will be incorporated, how individual values will be incorporated, and whether the ultimate decision will be subject to appeal

Explore and assess values

The value systems (*sensu lato*) of all parties involved in the decision-making process are brought before the group. General societal values, values shared among conservationists, and personal and professional values of the decision makers all should be presented for scrutiny. In situations involving human relocation, the object is not to change values, but to make the values relevant to the dilemma at hand as transparent as possible. In situations involving non-human relocation, however, the object may be to change values as all parties are forced to justify their claims and learn from the commitments and beliefs of others. It is here that the deeply-held ethical positions that decision makers may take concerning non-human organisms become part of the process.

Review the key ethical principles, concepts, or theories

Once the underlying values are known, then they are placed within the context of ethical principles (concepts, theories, rules) that have already been identified ([30], Table 1). This component prevents the decision-making process from degenerating to mere specification of personal opinions, and promotes a consistency among the variety of related decisions that must be made. At least two methods for integrating the multiple principles that accompany a pluralistic ethical framework are available [16, 26]<sup>a</sup>

Move toward a decision and plan of action

A decision is made and an accompanying action plan developed.

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<sup>a</sup> The Shrader-Frechette and McCoy [16] approach advocates a two-tier method of ethical decision-making in conservation science that includes both utilitarian and deontological principles, and Mumford and Callicott's [26] approach adopts a multi-scalar model that accounts for a range of environmental and community values

As Minter and Collins [30, p. 1810] put it: "...moral models are notoriously messy; principles can and do often come into significant conflict despite our best attempts to achieve either conceptual or pragmatic integration. In such cases, hard decisions will undoubtedly have to be made." Conservationists, like other professionals [100], must come to accept this point, and not fail to consider ethics appropriately even though no easy and completely satisfying solution is likely to emerge from the difficult, but essential, process of ethical decision-making.

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