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**Title**

Conservation lessons from taboos and trolley problems

**Permalink**

<https://escholarship.org/uc/item/2zm2x930>

**Journal**

Conservation Biology, 35(3)

**ISSN**

0888-8892

**Author**

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**Publication Date**

2021-06-01

**DOI**

10.1111/cobi.13618

Peer reviewed

## Conservation lessons from taboos and trolley problems

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Running head: Trade-Off Decisions

Article impact statement: Implementation may be improved by understanding psychological barriers in making tragic choices between biodiversity and human well-being.

**Abstract:** Governments pass conservation laws, adopt policies and make plans yet frequently fail to implement them. Implementation of conservation, however, often requires costly sacrifice: people foregoing benefit for the benefit of biodiversity. Decisions involve trade-offs whose outcomes depend on the values at stake and people's perceptions of those values. Psychology, ethics and behavioral science have each addressed the challenge of making difficult, often tragic, trade-off decisions. Based on these literatures, values can be classified as secular or sacred, where sacred values are those for which compensation may be unthinkable (e.g., freedom). Taboo trade-offs emerge from pitting secular values against sacred ones, and are difficult to discuss much less negotiate. Confronting taboo trade-offs in conservation may require discursive approaches to better

This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the [Version of Record](#). Please cite this article as [doi: 10.1111/cobi.13618](https://doi.org/10.1111/cobi.13618).

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understand particular attributes of decisions that place sacred human values at risk. Tragic trade-offs emerge from pitting sacred values against one another. The trolley problem - a challenge where one is forced to choose between the two unthinkable outcomes - is a simple heuristic illustrating ethical challenges of tragic trade-offs. Behavior studies illustrate that people have a strong aversion to active losses, resulting in a bias toward status quo decisions. Faced with tragic, trolley problem-like choices, people tend to avoid action responsibility, defer decisions, evade confronting opinions and regret unfortunate outcomes of actions. To help close the implementation gap, conservation actors may need to directly address the psychological, ethical and behavioral barriers created by the remorse, regret and moral residue of implementing conservation choices that have tragic outcomes. Recognition of these predictable features of the human psyche may foster better administrative structures to support action with durable outcomes as well as new research directions.

Conservation has an implementation problem (Knight et al 2008, Biggs et al 2011, Game et al 2014, Catalano et al 2017). Laws are passed, but not enforced (Collard et al 2020); policies are drafted, but not followed (Dale et al 2018); plans are made, but actions do not follow (Barr and Possingham 2013). There are myriad examples of conservation challenges (IPBES 2019) and reasons for failure (Catalano et al. 2017). Creating an environment where agency staff can faithfully implement laws, policies and collective decisions to achieve conservation gains is a significant challenge. Malcom and Li (2015) obtained the results of over 88,000 projects that were evaluated for their effects on endangered species between 2008 and 2015. They found not a single case where the agency (US Fish and Wildlife Service) either stopped or significantly altered a project because of a finding that it would “jeopardize” a species, despite many projects causing enough harm to species that the jeopardy definition would appear to have been met. Similarly, Collard et al. (2020) examined environmental assessments of impacts to caribou in Canada. They found frequent cause to deny actions, but few times actions were actually denied. These and other cases (e.g., failure to reach ACHI conservation targets – IPBES 2019) make it clear that many

government agencies are failing to enforce their own policies or achieve conservation goals stipulated by legislation.

Corruption, politics and economics, of course, may contribute to implementation failure (Smith et al 2003), but so might the psychology of taking action. Conservation is replete with difficult trade-offs where implementing a conservation action requires some people to forego a potential personal benefit, a win-lose bargain (McShane et al 2011). Implementing difficult win-lose conservation actions requires a sharp focus on creating conditions where individual sacrifice for some societal conservation goal is an acceptable outcome to those who sacrifice, those responsible for enforcing conservation governance, and to society.

This essay examines a literature on the psychology, ethics and behavior to identify challenges, propose simple strategies, and suggest research directions that may foster better implementation of difficult conservation decisions. Despite considerable growth in tools to help elicit values and incorporate divergent values into conservation planning (e.g., Game et al 2003, Schwartz et al 2018) there remains a considerable distance to go in understanding implementation challenges when conservation decisions confront strongly held values. Identification of these psychological, ethical and behavioral challenges may help focus research to identify tools and strategies to reduce barriers to action in knowledge – implementation gaps.

### ***The Psychology of Taboo Trade-Offs***

The role of norms and values has been a concern in behavioral psychology for implementation of difficult choices. These include sacred values that can hinder difficult decisions by creating social taboos (Tetlock et al 2000). Tetlock et al. (2000) defines a sacred value one where a community sees no possible compensation commensurate with the loss of that value (e.g., freedom, independence, identity). Thus, a sacred value is infinite or transcendental to the holder (Tetlock et al 2000). This is in contrast to secular values where

one might be compensated for such a loss. While regular trade-offs occur amongst secular values, sacred values create taboo choices when faced off against a secular values and tragic choices arise by pitting sacred values against one another (Fig. 1) (Tetlock et al 2000, Daw et al 2015).

Understanding the nature of societal values can be important in finding conservation solutions (Daw et al. 2015). Taboo choices create a conservation challenge because monetary solutions may be politically possible, but socially distasteful. While conventional, expected utility based multi-criteria strategies (e.g., Cegan et al. 2017) may work amongst divergent secular values, sacred values can significantly alter the decision landscape. Striving for win-win conservation through strategies such as payments for ecosystem services may be a no-win solution for conservation when payment is offered to compensate for a value claimed as sacred. Conservation may invite social condemnation by offering secular compensation solutions in exchange for values agreed upon as sacred. Green grabbing (Fairhead et al 2012) and neocolonial conservation (Borgerhoff-Mulder and Coppolillo 2005) are, arguably, manifestations of what happens when conservation resolves a taboo trade-off with monetary solutions.

People do not, in general, grant individuals the right to tell others what they should hold as a sacred value. Land, for example, is routinely assessed and has a clear secular value. However, land can also be a sacred value when it is inextricably linked to the identity of a person or a culture (Dudley et al. 2009). Landowner and water rights have arguably become conflated with freedom and independence within sectors of the U.S. (Harris et al 2012). Deeply held values about land (Primmer et al 2019) and water (Cosens et al 2017) rights can create powerful taboos that may trump otherwise well-reasoned laws or policies for conservation. Understanding what distinguishes a secular from a sacred value can be difficult, yet vitally important to conservation success (Daw et al 2015).

Society consistently asks people for individual sacrifice for the greater good (e.g., soldiers, front line emergency personnel in disaster relief, pandemic health workers). Sacrifice for the broader good of society can place sacred values at risk – potentially costing

people their lives. Yet, people are willing to make significant sacrifice for causes that align with their core values. Further, environmental values are often nuanced and pluralistic (Jessup 2010, Lien 2017). Individuals potentially hold both their rights to use natural resources and the value of natural resource protection as sacred. Society may reflect divergent views of whether a conservation action is, itself, expressing a secular versus a sacred value, just as people may diverge and how these values compare to one another. Conservation may benefit from further exploration of the psychology of taboo trade-offs (Tetlock 2000) and the relationship between values and actions (Heberlein 2012).

### ***Tragic Trade-offs and Trolley Problems***

Tragic choices are those that force us to choose between two sacred values. The trolley problem is a well-known and often used moral dilemma in ethics (Foot 1967, Thomson 1985) that illustrates the psychological challenge of tragic choices. The classic version imagines a run-away trolley heading down a track toward several trapped people who will be killed unless the trolley is diverted (Edmonds 2014). A conductor may divert the trolley, saving these people, but in doing so, kill the one person on the other track. As experimental ‘conductors’, we control the track switch that will determine the fates of these trapped innocents.

Should a person prioritize the greater good by minimizing death, a utilitarian ethic? Should they prioritize the ethic of doing no harm and fail to take an active hand in achieving the utilitarian goal? What happens to our choice if we are confronted by a strong temptation to differentially value the potential victims (i.e., if a person on one of the tracks is your mother)? The tragedy is being forced to choose between murder and callous indifference to the broader societal benefit. Forcing us to choose one unthinkable outcome over another confronts our ethical values, emotions and our agency in action (Edmonds 2014). There is, of course, no correct choice. Hence our choice is likely to leave us with remorse and regret, or moral residue (Batavia et al. 2020). The best we can do is strive to minimize that moral residue.

By analogy, researchers and practitioners might consider a conservation trolley problem as the tragic choice between two terrible outcomes. Humanity may stand idly by while wolves are persecuted into extinction, or constrain the freedom and rights of ranchers to protect their wildlife. Society may accept as fundamental ethical values, avoiding both harm to people and species extinctions. In contrast to people facing death, conservation trolley problems may entail choosing between actions that displace people from their livelihoods versus preventing habitat loss or reducing extinction risk of conservation targets. Should society allow the trolley to proceed, diminishing biodiversity? Should society divert its course, saving valued biodiversity, but harming a sector of society? Does society view the values at stake as sacred? The argument that the conservation outcome of protecting biological diversity represents a sacred value endorsed by laws ranging from the Convention on Biological Diversity to the endangered species legislation (e.g., US's ESA, Canada's SARA, Australia's EPBC Act ) that *de facto* formalize that assertion.

The similarity of the many difficult trade-off conservation choices to trolley problems highlights the role of ethics, values, emotions and agency in taking difficult actions (Bagozzi et al 2003). Nevertheless, that a law asserts a deep societal commitment toward biodiversity does not mean that all citizens agree with the sacred nature of that value even if they agree with the value itself. Thus, it may be difficult to determine whether a conservation challenge represents a tragic trade-off. Is it ethical, for example, to require ranchers to accept an unwanted payment for ecosystem services program in order to protect endangered species (Wollstein and Davis 2017); is it ethical to displace indigenous livelihoods in favor of a western science-driven vision for conservation (Barsh 2002)? Individuals may have mixed feelings about such questions; society, as a whole, will be represented by variation in viewpoints. Society constantly struggles with contrasting views on the acceptability of imposing costs, or harm, on people for the benefit of nature (McShane et al 2011).

Imagining governance of natural resources as trolley problems illustrates that implementation often requires individuals within agencies to make an active, sometimes tragic, choices between people and nature. Government agents, as conservation 'conductors', are people. Imagine the challenges, for example, facing government agents in

enforcing government policies that have tragic consequences to people who are petitioning them for an exception. These are difficult actions when they have consequences for specific attributes of biodiversity and specific people. Should a regional resource manager enforce grazing policy to protect fragile grassland ecosystems at the risk of putting a marginal ranch operation into bankruptcy? Striking implementation failures of government conservation policies (e.g., Ando 1999, Collard et al 2020, Malcom and Li 2015, Quetier et al. 2014) suggests a need to understand the motivations, concerns, and values of these actors (de Graaf et al. 2016). Similarly, these failures suggest a need to anticipate the capacity of people to accept governance decisions as legitimate and just (e.g., Borrini-Feyerabend and Hill 2015).

### **The Behavioral Psychology of Loss**

Some well-known phenomena from behavioral psychology may also be relevant to sacred values, tragic choices and loss in conservation implementation. Foremost among these are that humans predictably exhibit loss aversion and regret bias (Golivich and Medvec 1995, Kahneman 2011). Loss aversion means that people tend to regret unfortunate outcomes that result in the loss of something that we, as individuals, possess more so than something to which we aspire. Regret bias means that people regret outcomes of *actions* more than those of *inaction*. People may regret the damage we do to a friendship by having a difficult conversation more than the damage we may do to that same friendship by avoiding that conversation. Research on loss aversion and regret bias suggest that culpability for the human costs incurred by a conservation intervention may weigh on people's minds more than the loss and regret experienced in the demise of the natural world garnered through inaction.

An important consequence of loss aversion and regret bias is that people tend irrationally to favor status quo options (Anderson 2003, Eidelman and Crandall 2012). The current state might be poor, but it avoids the risk of culpability for what could be unexpected adverse outcomes achieved through action (Anderson 2003). We, as a society,



might be unhappy with the condition of the natural world, but prefer imperfection to taking an action that may risk making the problem worse. Status quo bias may be only part of the problem with endangered species protection programs, for example, where protections routinely are delayed until scientists can demonstrate that the best opportunities for success are past (Martin et al. 2012).

Status quo conservation challenges may manifest in the numerous ways by which people allow uncertainty over adverse outcomes of human action to inhibit biodiversity protection long after the need for change is recognized. Administrative delays in actions for endangered species (e.g., Bird and Hodges 2017) comes to mind as a common example. Public interest, for example, can influence the timing of actions on endangered species, often delaying listing action until long after opportunities for success have passed (Ando 1999). Similarly, delays are commonplace in banning trade in endangered species, long after the recognition of a threat (Frank and Wilcove 2019). Status quo bias is unlikely to be the full explanation, but risking the creation of social or political strife through actions that have uncertain likelihoods of success may drive favoring the status quo for many kinds of difficult conservation choices.

### ***Lessons for Conservation***

Combining lessons from taboo trade-offs, trolley problems, loss aversion and regret, I recognize several general issues of importance to conservation implementation. Contextualizing these as challenges for conservation may allow advances in strategies and administrative structures to leverage these predictable psychological attributes (Table 1).

*Adopting Discursive Strategies.* A predominant conservation strategy for challenging issues is to rely on the law, seeking resolution in court. Alternatively, conservation has shifted toward negotiated agreements and stakeholder engaged decision support (e.g., Gregory et al 2012). Decision frameworks are typically explicit in confronting issues of competing objectives, dissonant value systems, and entrenched positions (e.g., Gregory et

al. 2012), but even good plans are vulnerable to social taboos that confront implementation. There are metaphors about using the wrong tool to solve a problem (e.g., “bringing swords to a gunfight”). Using expected-value in a taboo trade-off brings calculus to a humanist debate. This may not be viewed as a legitimate process, even if it is a logical one. Practitioners need to first understand what values stakeholders hold as sacred and what sacred values society broadly recognizes as inviolate.

As an example, the US federal government’s efforts to conserve biodiversity on publicly leased grazing lands in the southwest quickly moved into the realm of the sacred core value of a rancher’s identity (Svancara et al 2017). The so-called ‘sagebrush rebellion’ changed from ranching economics to the freedom and very identity of a western rancher. It is harder to ask people to sacrifice when values lost are sacred. Yet, these are complex environments. These very same ranchers, although often not supportive of government intervention, also place a high value on conservation (Lien et al 2017). By being prepared to enter the discursive debate about sacred values may facilitate the capacity of conservation to negotiate tragic choices for people and nature.

Taboo choices are a poor position from which to find conservation solutions. Sacred values do not, in themselves, preclude decisions, actions or compromise. However, opportunities for a socially defensible (legitimate *sensu* Clark et al 2003) outcome in a taboo trade-off might be through discourse rather than better science or planning. Engaging in discussions with stakeholders, a discursive process, on what constitutes a sacred value, what doesn’t and why, may be a necessary pathway toward conservation success. Striving to understand public sympathy toward arguments of stakeholders on the nature of sacred values may help elucidate the kinds of decisions that would engender broad public support, and which wouldn’t. For example, society generally recognizes the potentially sacred relationship indigenous people hold to the land, appreciate long land tenure of ranchers as increasing sacred value, but are unlikely to consider a land speculator who just purchased a property to have a serious claim to holding a sacred value in owning a piece of land. Further research on how, and with whom, best to engage in discussions over the nature of values

and the types of values society generally accepts as sacred may help conservation practitioners re-frame taboo decisions into either regular trade-offs or tragic trade-offs.

*Responsibility Avoidance.* Faced with a hypothetical trolley problem, People recognize the appeal of assigning someone else to be the trolley conductor. Avoiding responsibility can be far more comfortable than confronting it. The lesson is that planning for action should anticipate regulatory deflection from hard decisions and anticipate responsibility avoidance when actions to protect biodiversity impose costs on individuals. Delays in restricting trade in endangered species (Frank and Wilcove 2019) or endangered species listing (Ando 1999), failures to constrain exploitation of fished species (Daws et al 2019) and failure to meet the Convention on Biodiversity Aichi Targets for habitat protection (IPBES 2019) may all include examples of governing bodies avoiding responsibility for difficult action decisions.

Stakeholder participation in conservation decision-making is well-established (Reed 2008). Nevertheless, an emphasis in the shared governance literature has been on stakeholder participation in decisions, not necessarily their implementation (Pomeroy et al. 2008). The role of collaborative governance has been studied from an institutional perspective (e.g., Lubell 2015), but not so much from the psychological standpoint of implementation. Conservation research could advance our understanding of the potential for collaborative governance to increase acceptance of action responsibility by evaluating whether providing opportunities for shared implementation fosters the capacity for bureaucrats to make good on collective decisions.

Shared governance is clearly not a panacea (Koontz and Thomas 2006). However, sharing implementation on difficult actions may help alleviate responsibility avoidance. At the very least, the hypothesis that it is easier to implement an action when the responsibility of enforcing unwelcome restrictions is a shared, merits evaluation. Fully shared governance, however, presents its own set of challenges. Agencies managing public resources, for example, may be held legally responsible for actions (Gosnell et al 2017) making shared responsibility for implementation difficult. There are emerging models of

shared governance (e.g., Migratory Bird Joint Ventures, <https://www.fws.gov/mountain-prairie/migbirds/jointVentures.php>). Conservation needs additional models, further evaluations of their effectiveness, and to analyze their capacity for implementation on tragic trade-offs.

*Decision Avoidance.* Decision avoidance emerges from both reason (e.g., selection difficulty) and emotion (e.g., anticipated regret) (Anderson 2003). The metaphorical trolley passes the switch point without an active decision; proceeding onward causing the greater harm. Uncertainty on when a decision must be made amplifies this challenge. Imagine our trolley running down a track with an infinite number of switch points where the trolley may be diverted. Wanting to avoid making an active, tragic choice, and knowing that we can make the decision at any time, our tendency should be to wait until the last possible moment to decide. A rational person may want to wait to determine whether one set of people, or the other, can avert tragedy altogether by freeing themselves from the track.

Similarly, uncertainty may be a good justification for delaying a decision. As the trolley conductor, we can't tell how many potential victims are strapped to each track, or know their chances of getting free from the trap. Allowing time to study a problem and reduce uncertainty can be good decision-making. However, emphasizing decision uncertainty can also be an effective argument to inappropriately delay or avoid decisions (Anderson 2003). Difficult trade-off conservation choices are plagued by uncertainty (Game et al 2015).

Much work has been done on how to integrate uncertainty into decisions (e.g. Gregory et al 2012). But, this work does not factor in the psychological barriers people may face as a consequence of uncertainty. Uncertainty, itself, magnifies decision discomfort (Grantham et al 2009). This decision discomfort can compound delaying action until the damage is severe, consequential, and possibly too late; a feature noted in some conservation decisions (Martin et al 2012).

Conservation may also need more research on how uncertainty impacts the moral residue of decisions. As examples, conservation frequently faces a perceived need to alter

resource extraction practices for biodiversity. These actions, for example, may displace ranchers, farmers, fishers and loggers from their livelihoods to reduce endangered species extinction probabilities. Increasing uncertainty in extinction risk might be predicted to increase societal remorse for those lost livelihoods. This may be true no matter what subsequently happens to the protected species. The thought that imposing this cost to individuals is perhaps unnecessary is likely to haunt a government agent responsible for delivering imposing a decision on people displaced from their way of living.

It may seem intuitive but labelling deferred decisions as actions is crucial. Recognizing our status-quo bias, suggests that the default orientation of the trolley switch matters. Behavioral psychology teaches us that conservation-favorable decisions may be more likely if the status quo decision action favors protecting nature. An example would be using the precautionary principle to invoke blanket prohibitions on damaging actions, with permit approval required for an action. There are several examples where a shift in policy could significantly change likely conservation outcomes. The default position in the US for example, is that landowners retain the decision rights for land conversion whereas in Latin America a landowner does not (<https://www.hoover.org/research/consequences-land-ownership>). The application of the Endangered Species Act requires demonstrating risk to the species in order to halt the land use change. Imagine the altered decision landscape if this were the other way around and landowners were required prove a lack of harm before being permitted to convert land. Similarly, many governments maintain a default position of allowing private enterprise to introduce new species, whereas only a few maintain a default position of needing to prove biological safety prior to introduction (Burt et al 2007). Examples of government policies to shift the burden from nature to the landowner seeking change have been fraught with difficulty (e.g., Quetier et al 2014). Nevertheless, changing the set position on the conservation trolley track may be necessary for improved conservation outcomes

*Uncomfortable Opinion Avoidance.* Managers making decisions on public trust resources often have an obligation to gauge public sentiment toward resource management actions (Decker et al 2016). Using the “best available science” often includes assessing social

values (Charnley et al 2017). Trolley problem thinking suggests that it may be difficult to assess public sentiment on issues that require an explicit recognition of tragic trade-offs. People empathize with complex, and often competing, value sets. Freedom, landowner rights, jobs, poverty alleviation, and economic growth all enjoy strong positive attitudes and often compete with conservation interventions. Conservationists ought to have, at best, mixed feelings about the ethics of displacing peasant farmers, for example, to create ecotourism reserves (Fairhead et al. 2012).

Faced with the overwhelming evidence of biodiversity loss, people may remain reluctant to explicitly express their concerns in terms of the painful trade-offs needed to achieve their vision of a world that balances their competing values. Conservationists should expect people to be strongly invested in remaining neutral; keeping their hand far from the trolley switch. Partisans with a strong interest in the outcome are dependable lobbyists for one or the other switch position. Nevertheless, general public sentiment may remain difficult to determine if it forces people to confront uncomfortable trade-offs in dearly held values.

Recognizing the challenge in eliciting opinions on uncomfortable choices is critical to accurately gauging public sentiment. Informing decisions with a representative account of public sentiment may require proactive solicitation of opinions. For example, much has been made regarding the difficult public relations surrounding managing carnivores and people on the landscape (e.g., Lute and Carter 2020). Yet, a survey of U.S. residents shows that programs for controversial endangered species has not eroded the overall level of support for endangered species conservation (Bruskotter et al 2018). The realm of applied ethics focuses on gauging values as a normative process (Batavia et al 2018). Conservation research could follow this lead and go further in understanding the ethical spectra of people's views on conservation (e.g., Minter and Collins 2008, Batavia et al 2018). Shifting the tenor of conflict in conservation from taboo to tragic decisions, and after all, may require being able to assert the societal acceptance of a conservation target as a sacred value.

*Decision regret.* Decision regret challenges the durability of conservation decisions. Decisions are typically not permanent and societal regret can impact subsequent decisions (Zeelenberg and Pieters 2007). The natural tendency for people to regret unfortunate outcomes will predictably erode support for implementation of actions that cost people. Conservation must recognize that the inevitable outcome of successful conservation implementations that are costly to society is growing empathy for those whose interests were displaced. Attitudes toward dangerous wildlife, for example, are mixed and constantly shifting (Lischka et al 2019, Lute et al 2014).

Shifting sentiments, driven by regret for the harm caused by predators, may make protection measures less durable than needed to successfully conserve the target. Thus, implementation must be viewed as the start of a campaign to retain that action, not the conclusion of a negotiation. Avoiding regret-driven reversals suggests conservation organizations should prioritize reinforcing the benefits achieved through conservation action. Prioritizing media coverage (e.g., Niemiec et al 2020) and careful use of language to manage a discourse (Serenari and Lute 2020) may be critical to continued success.

### ***Conclusion***

In a contested decision, it is to be expected that all advocates will likely behave in a manner that minimizes their chance of perceived loss, fighting particularly hard for values they view as sacred. Difficult trade-offs become tragic when the opposing parties each claim that they are fighting to protect sacred values. In these cases, values, ethics, emotions, and psychological barriers to action can all play important roles in thwarting implementation.

The science and practice of conservation should anticipate the tendency toward escalating conflict decisions toward being taboo or even tragic. Conservationists should expect that decisions that impinge upon someone's livelihood will quickly switch from an economic conversation of cost to one of values, freedom, self-determination and human rights – values that most hold sacred. Similarly, many conservationists might argue that

protecting biodiversity is, itself, a sacred value. Some fraction of these arguments likely resonate with significant sectors of society. When conservation action trades off the loss of diminishing biological diversity against livelihoods, most often the economically underprivileged, to engage in their livelihoods, conservation must be prepared for tragic trolley problem-like choices.

Implementation is made more difficult by avoidance issues. Governments might not want to accept the responsibility; agency staff may choose to avoid decision; sectors of society that could weigh in on their values and help legitimize a decision may avoid voicing uncomfortable opinions. Everyone involved is likely to regret the unfortunate components of the outcomes.

The ethics of conservation trolley problem thinking and the behavioral psychology of tragic and taboo choices highlight the challenge of implementing difficult decisions that require humans to sacrifice deeply held personal values for the benefit of biodiversity. Recognizing that taboo decisions and tragic conservation trolleys are entry points toward biodiversity-centered research on behavioral psychology and applied ethics is the first step. Understanding these relationships is the necessary precursor to helping agencies become more effective at implementation.

### **Acknowledgments**

I thank KS Robinson, P. Singer, S. Strauss, P. Tetlock, and A. Varzi for valuable conversations along the way. I thank C. Batavia, M. Burgman, A. Karasov-Olson, M. Williamson and three anonymous reviewers for feedback on this manuscript.



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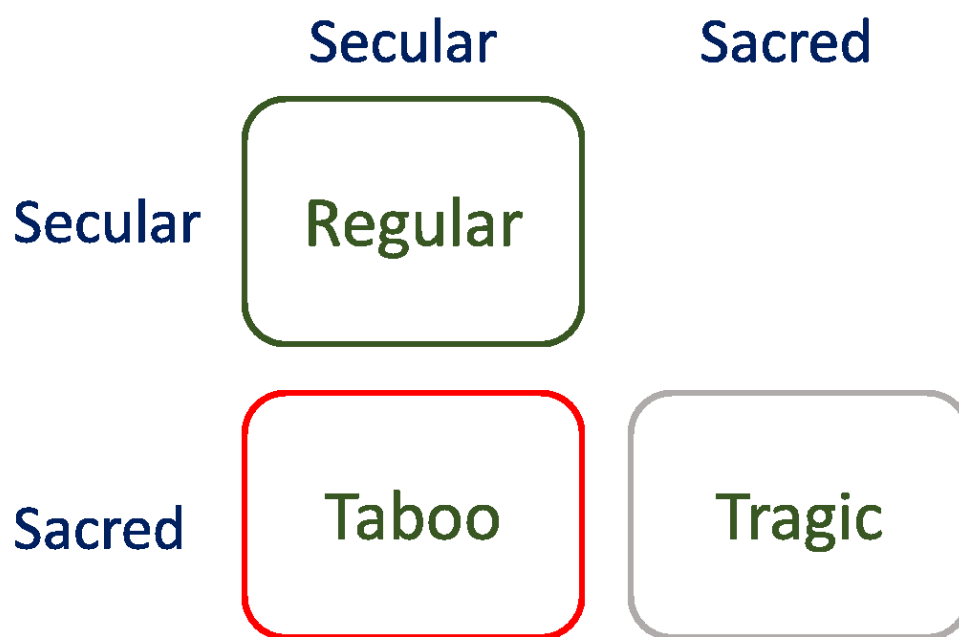
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#### Tables and Figures.



**Figure 1.** The potential suite of difficult trade-off choices. Secular values are those for which compensatory approaches may be broadly acceptable while sacred values are those where someone views them as incommensurable (e.g., freedom, identity). Taboo choices pit secular values versus sacred ones in a situation where monetary solutions may politically prevail but result in moral residue. Tragic choices pit sacred values against one another and force a potentially unavoidable, but regrettable, choice. Redrawn based on Daw et al (2015).

**Table 1.** Five critical challenges that emerge from linking conservation decisions to the behavioral psychology of taboo and tragic decisions, examples and steps that might be taken to improve conservation outcomes in light of these observations. The strategies are also easily re-framed as research questions.

Challenge	Example	Strategies
<i>Adopting Discursive Strategies</i> – Faced with negotiating for the loss of sacred values, calculations of ‘fair’ value may have limited impact	The sagebrush rebellion pits the sacred value of rancher’s identities against government interactions on behalf of species few people would even recognize.  Green-grabbing of indigenous lands by conservation organizations is increasingly viewed as sacrificing a sacred value for a secular one (conservation).	Evaluate which values claimed by the impacted as sacred are viewed as sacred by decision-makers and society.  Evaluate pluralities of values among the regulated and regulators.  Evaluate which conservation values are held by society as sacred values warranting equal consideration.
<i>Responsibility Avoidance</i> – Faced with difficult choices, people tend to avoid the responsibility for decisions.	Most countries with endangered species laws have failed to list most of their endangered species	Create an environment for shared decision and implementation responsibility  Create transparent, well-documented decision processes.
<i>Action Avoidance</i> - Faced with difficult choices, people tend to favor inaction or status quo choices or deferred action.	Malcom and Li (2015) assessment of endangered species jeopardy consultations	Emphasize that inaction is a decision that leads to a default outcome.  Establish default decisions to favor conservation.
<i>Uncomfortable Opinion Avoidance</i> - Faced with difficult choices, people prefer to not confront their values directly and may remain neutral.	Public comment on controversial US government decisions garners numerous institutional, but few individual, responses to the environmental review.	Do not assume, or expect, that volunteered responses to proposed actions are representative of public opinion.  Proactively seek general public sentiment through surveys.
<i>Decision Regret</i> – Having made a difficult choice, people regret unfortunate outcomes of actions more than outcomes of inaction.	Fluctuating public opinions on human-wildlife conflicts where large predators attack and kill livestock.	Post-implementation marketing of achieved benefits can sustain enthusiasm and stave off regret.  Monitoring of implementation impact may include measuring decision regret.