

Operational Decision-Making Under Urgency: A Qualitative Study of Harm-Reduction Decisions in Animal Protection Organizations

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Abstract

This dissertation examines how harm-reduction organizations make operational rescue decisions under extreme constraints when fully optimal biological outcomes are no longer attainable. Drawing on a qualitative multiple-case design, the study reconstructs 19 wildlife rescue decision episodes across five Brazilian wildlife protection organizations through semi-structured interviews and interpretive organizational reconstruction.

The findings suggest that rescue decision-making under unavoidable harm is best understood as a constrained organizational process rather than as comprehensive optimization. Across cases, organizations progressively narrowed intervention possibilities as operational constraints intensified. Safety concerns, implementation feasibility, coordination pressures, and resource limitations repeatedly shaped which interventions remained actionable, while animal-centered goals were pursued within the remaining feasible space. The Brazilian institutional context further intensified coordination and feasibility challenges, while moral pressure and adaptive readiness influenced how organizations interpreted operational thresholds.

The dissertation contributes to bounded rationality and crisis decision-making literature by showing how organizations preserve defensible action under deteriorating conditions through sequential narrowing rather than unrestricted improvisation or broad simultaneous optimization. It also highlights practical implications for responder safety, operational preparedness, interorganizational coordination, and adaptive learning in high-pressure rescue environments.

Keywords – Operational decision-making; harm reduction; crisis adaptation; bounded rationality; wildlife rescue; qualitative multiple-case study.

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Resumo

Esta dissertação examina como organizações de redução de danos tomam decisões operacionais de resgate sob restrições extremas quando resultados biológicos ideais já não podem ser plenamente alcançados. Com base em um desenho qualitativo de múltiplos casos, o estudo reconstrói 19 episódios de decisão em cinco organizações brasileiras de proteção de fauna por meio de entrevistas semiestruturadas e reconstrução organizacional interpretativa.

Os resultados indicam que a tomada de decisão sob dano inevitável é melhor compreendida como um processo organizacional restrito, e não como uma otimização abrangente. As organizações estreitaram progressivamente as possibilidades de intervenção à medida que as restrições operacionais se intensificavam. Questões de segurança, viabilidade operacional, coordenação e limitações de recursos moldaram quais intervenções permaneciam executáveis, enquanto objetivos centrados no animal eram perseguidos dentro do espaço remanescente. O contexto brasileiro intensificou desafios de coordenação e viabilidade, enquanto pressão moral e prontidão adaptativa influenciaram limites operacionais.

A dissertação contribui para a literatura sobre racionalidade limitada e tomada de decisão em crises ao demonstrar como organizações preservam ações defensáveis sob deterioração operacional por meio de estreitamento sequencial. O estudo também destaca implicações práticas para segurança de equipes, preparação operacional, coordenação interorganizacional e aprendizagem adaptativa.

Palavras-chave – Tomada de decisão operacional; redução de danos; adaptação em crise; racionalidade limitada; resgate de fauna; estudo qualitativo de múltiplos casos.

Título – Tomada de Decisão Operacional sob Urgência: Um Estudo Qualitativo sobre Decisões de Redução de Danos em Organizações de Proteção de Fauna

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List of Symbols, Abbreviations and Acronyms

DE	Decision Episode
FMA	Fundação Mamíferos Aquáticos
ITA	Instituto Arara Azul
IBJ	Instituto Baleia Jubarte
ICS	Incident Command System
NGO	Non-Governmental Organization
R3	Associação R3 Animal

1. Introduction

1.1. Operational Rescue Under Conditions of Unavoidable Harm

Wildlife rescue often begins when the prospect of an ideal outcome has already narrowed. A call about a stranded whale, an injured raptor, or a severely compromised wild animal rarely arrives into a stable decision environment. By the time responders mobilize, biological deterioration, weather, terrain, transport constraints, equipment availability, and responder safety may already delimit what can realistically be attempted. Episodes of large-animal rescue on the Brazilian coast show how quickly operational windows can contract even when expert personnel and urgent intent are present (Kolesnikovas et al., 2012). In such circumstances, the practical question is not simply whether rescue is desirable in principle, but whether a defensible intervention path still remains. This dissertation takes that problem as its point of departure and examines rescue under unavoidable harm as an organizational decision-making problem rather than as a purely clinical or moral one.

This focus matters because rescue organizations must decide while harm is already unfolding and while action itself may intensify risk. Rescue work is therefore doubly constrained: organizations must pursue their mission while preventing additional injury to staff, volunteers, partner agencies, and animals. What may appear externally as a binary choice between intervention and non-intervention is, in practice, a dynamic process of assessing, narrowing, and revising possibilities under pressure. The central challenge is to keep a course of action executable and justifiable before the remaining space for intervention closes.

1.2. The Organizational Problem and Research Gap

For management and organizational research, these settings are analytically revealing because extreme contexts make the structure of organizational choice unusually visible (Hällgren et al., 2018). Classical bounded rationality showed that decision-makers do not optimize across all conceivable alternatives; they operate under limits of information, attention, and computational capacity, and therefore settle for satisfactory rather than ideal solutions (March & Simon, 1958; Simon, 1955, 1957). Organizational search research further demonstrated that organizations act through sequential attention, simplified problem

representations, and adaptive adjustment rather than comprehensive calculation (Cyert & March, 1963). Crisis research adds that time compression, ambiguity, and interdependence intensify these limits by destabilizing interpretation and reducing opportunities for coordinated response (Boin et al., 2005; Maitlis & Sonenshein, 2010).

Yet the problem addressed here is more specific than bounded rationality in general and more severe than conventional searches for a "good enough" option. In rescue environments marked by unavoidable harm, the difficulty is not only that information is incomplete or preferences are hard to rank. It is that possible actions may disappear while the organization is still diagnosing the situation. A theoretically preferable intervention may already be unsafe, inaccessible, under-resourced, or impossible to coordinate by the time it is identified. Under these conditions, operational feasibility is not one evaluative criterion among others; it defines what can remain actionable. Existing literature offers strong foundations for understanding limited rationality, crisis sensemaking, and decision-making under stress, but explains less clearly how organizations narrow possible action when no fully satisfactory outcome is available and harm cannot be fully avoided from the outset (Brehmer, 1992; Maitlis & Sonenshein, 2010; Ocasio, 1997). This organizational process of narrowing is the gap to which the dissertation responds.

This gap is relevant beyond wildlife rescue. Many organizations in crisis settings must act amid deterioration, fragile coordination, and the impossibility of maximizing all relevant goals at once. The management problem is therefore prioritization under constrained action rather than abstract optimization. Rescue environments make this especially visible because urgency, material limitation, distributed authority, and moral pressure converge in the same decision arena. They consequently provide a valuable empirical setting for examining how organizations translate mission commitments into bounded and defensible operational choices.

1.3. Research Question and Analytical Direction

Against this background, the dissertation is positioned as a qualitative organizational decision-making study of rescue decisions under unavoidable harm. It asks:

How do harm-reduction organizations make operational rescue decisions under extreme constraints when optimal biological rescue outcomes are no longer fully attainable?

The purpose of the dissertation is to reconstruct how organizations continue deciding when no fully good option exists. More specifically, it examines how intervention possibilities are identified, narrowed, revised, or abandoned as circumstances evolve; how organizations preserve operational defensibility under urgency; and how recurring patterns across decision episodes can be assembled into a coherent analytical account. The emphasis is processual and organizational. The dissertation does not seek to produce a universal rescue theory, rank veterinary techniques, or explain decisions primarily through moral philosophy, public legitimacy, or broad macro-political forces. Its concern is narrower and management-oriented: how organizations structure rationality when action is necessary, harm is imminent, and conditions resist ideal solutions.

The analytical expectation guiding the study is interpretive rather than statistical. Under extreme constraints, rescue organizations are expected not to evaluate all objectives simultaneously. Instead, they tend to narrow intervention possibilities progressively by treating certain operational conditions as prerequisites for others. In this analytical direction, human safety and operational feasibility function as prior screens within the decision process, after which animal-centered outcomes can be pursued within the remaining action space. This does not imply that organizations cease to care about animal welfare or survival. On the contrary, the dissertation assumes that these organizations remain strongly mission-driven. The critical point is that animal-centered goals become structurally bounded by operational realities. Later chapters reconstruct this recurring tendency as a Sequential Filtering Logic through the comparative analysis of organizational decision episodes. Moral pressure, adaptive readiness, and institutional-operational pressures may shape how thresholds are interpreted, yet they remain secondary modulators within a broader process of progressively narrowed organizational action.

1.4. Empirical Setting and Brazilian Context

The empirical setting consists of wildlife rescue organizations operating in Brazil under urgency, uncertainty, and uneven capacity. The dissertation uses a qualitative multiple-case design and reconstructs 19 decision episodes across five organizations working in marine, riverine, and terrestrial rescue environments. This setting is analytically useful because wildlife rescue concentrates coordination problems that are often dispersed across other crisis domains:

teams must align field assessment, logistics, veterinary judgment, equipment availability, inter-organizational coordination, and external interfaces as circumstances change. Methodologically, such cases function as analytically revealing settings in which organizational limits become especially legible (Eisenhardt, 1989).

The Brazilian context is introduced not as a separate explanatory framework, but as an operational environment in which constraints are highly visible. Brazilian civil-society organizations have developed within a field marked by professionalization, evolving legal frameworks, and persistent asymmetries in institutional support (Alonso & Maciel, 2010; Brazil, 2014; Lucio, 2024). In practice, this can produce fragmented governance arrangements, uneven resource access, and dependence on coordination across state agencies, municipalities, specialized partners, and informal support networks. For wildlife rescue organizations, these conditions complicate the movement from urgency to executable intervention. Brazil therefore matters analytically because it sharpens visibility into how feasibility constraints, coordination burdens, and institutional fragmentation shape operational choice. The context is consequential, but it does not replace the dissertation's main concern with constrained organizational action.

1.5. Contribution and Thesis Structure

The dissertation advances a focused and deliberately bounded contribution. First, it contributes to bounded rationality research by showing that limits on organizational choice in urgent rescue settings are not only cognitive. They are enacted in real time through environmental danger, logistical fragility, coordination dependence, and the possible collapse of implementation windows (March & Simon, 1958; Weick, 1988). Second, it contributes to discussions of constrained organizational adaptation by showing that adaptation under pressure often appears less as unrestricted improvisation than as disciplined recalibration within a damaged field of possibilities (Boin et al., 2005). Third, it contributes to crisis decision-making and satisficing under operational pressure by examining how delay, reduced intervention, or deliberate non-intervention may emerge as organizationally defensible outcomes under severely constrained action. The central analytical claim is therefore not simply that organizations face constraints, but that they progressively structure possible action in response to them. That claim is empirically grounded, modest in scope, and appropriate to a qualitative multiple-case study.

The remainder of the dissertation follows this logic. Chapter 2 develops the focused theoretical framing by reviewing literature on bounded rationality, crisis decision-making, constrained adaptation, and the organizational relevance of feasibility constraints. Chapter 3 explains the methodology, including the qualitative multiple-case design, the reconstruction of decision episodes, and the analytical strategy used to identify recurring patterns across cases. Chapter 4 presents the findings and reconstructs the organizational tendency through which intervention possibilities are progressively narrowed under operational constraint. Chapter 5 returns to the research question, clarifies the dissertation's contribution, discusses managerial implications, and addresses limitations and analytical transferability. Taken together, the chapters move from the practical problem of rescue under unavoidable harm to an empirically grounded explanation of how organizations preserve defensible action when ideal outcomes are no longer fully attainable.

2. Literature Review

2.1. Decision-Making Under Extreme Constraints

Crisis situations impose severe informational and cognitive limits on organizations (Kowalski-Trakofler et al., 2003). In such contexts, decision-makers rarely possess the time, information, or analytical stability required to compute fully optimal strategies, a condition Herbert Simon conceptualized as bounded rationality (Simon, 1955, 1957). Rather than emerging from comprehensive calculation, decision-making is constrained simultaneously by the structure of the environment and by the actor's ability to process information (Augier, 2013). Under rapidly evolving operational conditions, ambiguity, incomplete data, and unstable situational awareness narrow the possibility for comprehensive evaluation and increase dependence on simplified decision procedures (Gigerenzer & Gaissmaier, 2011).

These pressures become particularly visible in crisis environments characterized by uncertainty, urgency, and deteriorating coordination conditions. Emergency situations frequently disrupt normal organizational routines and reduce the reliability of established procedures. Research on crisis governance shows that organizations operating under high turbulence often face situations in which "standard" expertise becomes insufficient because the environment changes faster than formal structures can adapt (Boin et al., 2005; Norris et al., 2020). Under such conditions, bureaucratic procedures that ordinarily support coordination may instead slow operational responsiveness or create additional friction between organizational actors. Decision-making therefore becomes less a process of optimization and more a process of continuously managing instability.

The crisis management literature further suggests that uncertainty is rarely experienced as purely informational. Rather, ambiguity interacts with emotional stress, fragmented communication, and shifting operational priorities. Sensemaking studies emphasize that organizations under pressure must rapidly construct shared interpretations while simultaneously acting within incomplete and often contradictory informational environments (Maitlis & Sonenshein, 2010; Weick, 1988). This process is inherently fragile. Communication breakdowns, conflicting interpretations, and compressed time horizons can destabilize coordination precisely when organizations are most dependent on it. In extreme contexts, operational actors frequently oscillate between rapid improvisation and rigid adherence to

routines, reflecting the tension between adaptability and control (Boin et al., 2005; Weick, 1988).

Empirical research also demonstrates that organizations operating under acute pressure often exhibit forms of organizational blindness or threat rigidity, maintaining outdated assumptions even as conditions fundamentally change (Staw et al., 1981). Such dynamics do not necessarily reflect irrationality. Rather, they illustrate how constrained cognition, institutional routines, and operational overload shape organizational attention under stress. In highly volatile settings, organizations may prioritize immediate operational continuity over broader analytical reassessment simply because the cognitive and logistical costs of reevaluation become too high (March & Simon, 1958; Staw et al., 1981).

Within this context, satisficing becomes not merely a secondary decision strategy but a practical necessity. Organizations facing unstable operational conditions typically search for solutions that are sufficiently viable under prevailing constraints rather than theoretically optimal across all dimensions. Decision-makers rely on heuristics, simplified prioritization rules, and compressed evaluation processes because exhaustive analysis becomes operationally unattainable (Gigerenzer, 2008; Gigerenzer & Gaissmaier, 2011). Crisis decision-making therefore reflects constrained adaptation under unstable conditions rather than linear rational optimization. The literature consequently situates urgent organizational action within a broader paradigm of constrained choice in which uncertainty, limited cognition, and environmental instability jointly shape how operational priorities emerge.

2.2. Operational Prioritization Under Feasibility Constraints

Once minimum safety conditions are established, organizations must confront a second layer of constraints concerning what can realistically be executed under operational pressure. Crisis environments dramatically compress the range of feasible actions. Time scarcity, resource depletion, logistical disruption, and coordination difficulties reduce complex operational possibilities into narrower sets of actionable alternatives. Decision-making therefore increasingly shifts from identifying ideal interventions toward determining which interventions remain operationally viable (Flin, 1996; Wilson & Law, 2016).

The triage literature provides an important conceptual foundation for understanding this dynamic. Triage is commonly defined as the process of establishing priorities under conditions of severe scarcity, where available resources are insufficient to address all needs simultaneously (Wilson & Law, 2016; Yancey & O'Rourke, 2023). Such situations inevitably generate difficult trade-offs because responding effectively to some demands may require deprioritizing or abandoning others. In both medical and conservation contexts, prioritization therefore becomes inseparable from the management of unavoidable sacrifice. Unlike bounded rationality research, triage literature places stronger emphasis on unavoidable sacrifice under conditions of scarcity rather than primarily on cognitive or informational limitations.

Operational feasibility constraints intensify this narrowing process. Crisis research demonstrates that time pressure significantly shortens decision horizons and redirects attention toward interventions that can be implemented immediately and with available capacities (Flin, 1996; Kowalski-Trakofler et al., 2003). Under deteriorating conditions, organizations often cannot sustain prolonged analytical search processes. Instead, operational actors focus on maintaining workable interventions under unstable circumstances. This creates a sequential pattern of narrowing possibilities rather than a simultaneous evaluation of all alternatives (March & Simon, 1958; Simon, 1957).

Within this structure, safety functions as a non-negotiable boundary condition. Actions that expose personnel, volunteers, or operational continuity to unacceptable risk are typically excluded before other considerations are evaluated. However, once this first boundary is satisfied, organizations encounter a second layer of tension centered on feasibility. Logistical realities such as transport access, equipment limitations, environmental conditions, institutional approvals, personnel fatigue, or financial constraints further reduce the set of actionable options. The remaining alternatives are therefore not necessarily the most desirable ones, but rather those that remain operationally sustainable within compressed organizational capacities (Simon, 1955; Wilson & Law, 2016).

Importantly, feasibility constraints often create internal organizational tensions rather than purely technical limitations. Operational teams may confront competing pressures between rapid intervention and procedural compliance, between immediate rescue objectives and long-term organizational sustainability, or between field improvisation and centralized coordination. In unstable contexts, organizations must frequently preserve their own operational continuity

while simultaneously responding to escalating external demands. This creates recurring dilemmas in which protecting personnel, maintaining legitimacy, preserving resources, and pursuing intervention objectives become partially competing priorities rather than fully compatible goals (Hahn et al., 2015).

The literature on heuristics and bounded rationality suggests that under such multidimensional pressure, decision-makers often adopt simplified sequential evaluation strategies. Rather than balancing all criteria simultaneously, organizations frequently prioritize one dimension fully before proceeding to the next. This resembles lexicographic decision-making structures in which certain constraints function as threshold conditions that cannot be traded away (March & Simon, 1958; Simon, 1957). Safety therefore tends to operate as a hard boundary, while feasibility functions as a narrowing operational filter through which only executable options remain visible.

Only after these prior constraints are addressed do organizations begin to consider outcome maximization within the remaining action space. Even then, optimization remains partial and constrained. In practice, organizations do not maximize across all possible outcomes but instead seek acceptable interventions within already restricted operational conditions. The literature on conservation triage captures this logic particularly clearly: under severe scarcity, decision-making increasingly reflects the management of constrained harm rather than the achievement of ideal outcomes (Wilson & Law, 2016). Operational rationality consequently emerges through sequential narrowing under pressure rather than through comprehensive strategic optimization.

2.3. Organizational Adaptation and Modulating Conditions

While the preceding sections outline the core filtering structure shaping operational decisions, organizations do not navigate these constraints in socially or institutionally neutral ways. Crisis decision-making is further influenced by a range of modulating conditions that shape how organizations interpret pressure, prioritize interventions, and tolerate operational risk.

One important modulator concerns moral pressure. In situations involving visible suffering, human-caused harm, or high emotional salience, operational decisions frequently

acquire an ethical intensity that extends beyond technical assessment alone. Research on moral decision-making suggests that actors generally attempt to avoid causing harm whenever possible. However, when all available options involve some degree of sacrifice, decision-making gradually shifts toward comparative harm reduction rather than absolute harm avoidance (Berman & Kupor, 2020). Under these conditions, organizations may become more willing to accept operational burdens or elevated risks if doing so appears necessary to prevent greater suffering elsewhere.

This dynamic can sharpen organizational tension considerably. Responders may experience conflict between immediate rescue imperatives and the need to preserve personnel well-being, institutional continuity, or procedural safeguards. Particularly in high-visibility crises, moral urgency can intensify pressure for rapid intervention even when operational feasibility remains uncertain. In practice, organizations often operate within unstable balances between compassion-driven escalation and operational restraint. Such tensions rarely eliminate the filtering logic itself, but they can influence how aggressively organizations approach the limits of safety or feasibility (Berman & Kupor, 2020; Hahn et al., 2015).

Organizational learning and adaptive readiness also shape how constraints are interpreted and managed. Crisis management literature emphasizes that organizations with prior experience, flexible routines, decentralized coordination structures, or stronger feedback systems are often better able to adapt under rapidly changing conditions (Antonacopoulou & Sheaffer, 2014; March, 1991). Adaptive capacity does not eliminate scarcity or uncertainty, but it can widen the range of interventions considered feasible under urgency. Organizations that routinely operate in unstable environments may develop greater tolerance for ambiguity, stronger improvisational capabilities, and faster coordination mechanisms (Antonacopoulou & Sheaffer, 2014).

At the same time, adaptation itself may generate new organizational vulnerabilities. Improvisation can improve responsiveness but may weaken procedural consistency or increase coordination strain. Similarly, decentralized operational autonomy can accelerate field-level reactions while complicating broader organizational oversight. The relationship between flexibility and control therefore remains inherently tension-filled. Organizations operating under crisis conditions must continuously negotiate between responsiveness and stability,

particularly when institutional environments are fragmented or operational conditions deteriorate rapidly (Antonacopoulou & Sheaffer, 2014; Boin et al., 2005).

Institutional pressures further shape operational behavior. Funding structures, legal mandates, public expectations, media visibility, and interorganizational dependencies all influence how Non-Governmental Organizations (NGOs) define acceptable risk and operational responsibility. In highly regulated environments, formal procedures may constrain rapid action, while loosely structured organizations may gain agility at the cost of coordination stability or accountability. External scrutiny can also intensify organizational caution because failed interventions may threaten both legitimacy and long-term survival.

Importantly, these modulating conditions do not necessarily replace the central filtering tendencies discussed throughout the literature. Rather, existing research suggests that they may influence how organizations interpret operational pressure, approach feasibility thresholds, and prioritize intervention under urgency. Moral pressure may intensify the perceived urgency associated with intervention decisions, adaptive readiness may expand the range of actions considered operationally feasible, and institutional fragmentation may increase coordination difficulties or implementation strain. Across these variations, however, the literature continues to indicate that organizational decision making under crisis conditions remains shaped by sequential constraints linked to safety, feasibility, and limited implementation capacity. The modulators therefore add interpretive depth and organizational variation without fully displacing the broader tendency toward progressively narrowed operational action.

2.4. Brazilian NGO Operational Context

The Brazilian institutional and operational environment intensifies many of the pressures identified in the broader crisis management literature. NGOs operating in Brazil frequently confront fragmented governance structures, uneven state capacity, unstable funding conditions, and weak interorganizational coordination mechanisms (Lucio, 2024; OECD, 2023). These dynamics do not create an entirely different decision logic, but they significantly sharpen the constraints through which operational decisions must be made.

Public trust in institutions remains comparatively fragile, and coordination across agencies and levels of government is often inconsistent (Andrini & Escudero Loaiza, 2021;

OECD, 2023). Governance fragmentation can generate overlapping responsibilities, delayed responses, and uncertainty regarding operational authority during crisis situations. Under these conditions, NGOs are frequently required to assume responsibilities that exceed their formal capacities, particularly in remote or environmentally vulnerable regions where state presence is limited or operationally inconsistent.

The regulatory environment surrounding Brazilian civil society organizations further contributes to operational complexity. Legislative reforms have introduced new partnership structures and accountability mechanisms intended to formalize NGO-state collaboration (Brazil, 2014). However, the coexistence of older institutional arrangements, uneven implementation practices, and varying administrative expectations has also produced legal ambiguity and procedural friction (Aquino Alves & Massaco Koga, 2006; Liu, 2023). During emergency situations, these institutional layers may slow coordination processes or complicate rapid resource mobilization.

Resource scarcity remains a persistent operational reality. Environmental disasters, wildlife emergencies, and humanitarian crises often occur within contexts characterized by limited infrastructure, logistical fragmentation, and unstable funding streams. NGOs therefore operate under conditions in which intervention demands routinely exceed available capacities. Organizations may face simultaneous pressure to preserve personnel safety, maintain organizational continuity, satisfy donor expectations, coordinate with public authorities, and respond to escalating operational emergencies (OECD, 2023; Rouhi et al., 2019).

Such conditions intensify trade-off dynamics considerably. A small organization confronted with a large-scale environmental emergency may be forced to prioritize between interventions affecting different species, regions, or stakeholder groups while also protecting exhausted staff and maintaining minimal operational sustainability. Under these circumstances, decision-making increasingly reflects the management of constrained organizational survival alongside broader humanitarian or environmental objectives. The tension between mission commitment and operational endurance becomes particularly visible in prolonged or resource-intensive crises.

Coordination challenges also remain central. Although collaborative frameworks formally encourage cooperation between public institutions and NGOs, operational integration

often remains uneven in practice. Bureaucratic delays, communication gaps, overlapping jurisdictions, and competition for limited resources may weaken collective response capacity precisely when rapid coordination becomes most necessary (Rouhi et al., 2019). NGOs therefore frequently operate within unstable interorganizational environments where collaboration and fragmentation coexist simultaneously.

The Brazilian context consequently acts as an amplifier of the sequential filtering dynamic identified throughout the literature. Scarcity, institutional fragmentation, logistical instability, and governance gaps increase the severity of both safety and feasibility constraints while heightening moral and operational pressures. Organizations must therefore navigate not only immediate rescue decisions but also broader questions concerning institutional survival, legitimacy, and operational continuity. The result is an environment in which constrained prioritization becomes not an exceptional occurrence but a recurring organizational condition.

2.5. Towards a Sequential Filtering Logic

Taken together, the literature suggests that organizational decision making under conditions of unavoidable harm increasingly reflects a constrained process of progressive narrowing rather than comprehensive optimization. As operational pressures intensify, organizations reduce the range of acceptable interventions through interacting safety, feasibility, and outcome considerations (March & Simon, 1958; Wilson & Law, 2016).

The first narrowing tendency typically emerges around safety. Interventions that threaten responder survival, organizational continuity, or minimum operational stability are generally excluded early because they undermine the organization's ability to continue functioning. Safety therefore operates less as one consideration among many than as a foundational condition shaping subsequent operational choices (Flin et al., 2008; Weick & Sutcliffe, 2007).

Among the remaining options, feasibility pressures further compress the operational landscape. Resource scarcity, environmental instability, logistical barriers, and coordination difficulties reduce the set of interventions that remain practically executable under deteriorating conditions. Feasibility therefore functions as a second order operational filter through which only sustainable interventions persist (Flin, 1996; March & Simon, 1958).

Only within this already narrowed action space do organizations begin prioritizing among potential outcomes. Decisions increasingly reflect constrained forms of harm reduction in which actors attempt to maximize achievable benefits while accepting that some losses, sacrifices, or unmet needs may be unavoidable.

Importantly, the literature also suggests that this process is neither entirely linear nor free from tension. Moral pressure, adaptive readiness, institutional fragility, and changing operational conditions may alter how organizations interpret thresholds or tolerate uncertainty. These factors, however, generally modify the intensity or interpretation of the filters rather than displacing the broader structure itself.

The sequential filtering logic offers a coherent synthesis across bounded rationality, crisis management, triage, and organizational adaptation literatures. Bounded rationality explains why organizations cannot comprehensively optimize under uncertainty and time pressure (March & Simon, 1958; Simon, 1955). Crisis and sensemaking research illuminate how unstable environments disrupt coordination and compress decision horizons (Boin et al., 2005; Weick, 1988). Triage and scarcity literatures clarify why prioritization becomes unavoidable once resources collapse relative to demand (Wilson & Law, 2016). Organizational learning and institutional context help explain variation in how organizations navigate these pressures across cases and operational settings (Antonacopoulou & Sheaffer, 2014; March, 1991).

Within the Brazilian NGO context, these pressures become particularly pronounced due to fragmented institutional environments, operational instability, and persistent resource constraints. NGOs therefore provide a particularly relevant setting for examining how organizations structure decisions when no option fully avoids harm and when operational continuity itself may become uncertain.

Overall, the literature converges toward an understanding of crisis decision making as a constrained organizational process shaped by uncertainty, scarcity, instability, and limited implementation capacity. Rather than reflecting comprehensive optimization, decision making under urgent conditions increasingly involves the progressive narrowing of operational possibilities as organizations attempt to preserve feasible and defensible forms of action under

pressure. The resulting organizational logic reflects a form of constrained satisficing shaped by both environmental conditions and institutional context (March & Simon, 1958; Simon, 1955).

3. Methodology

3.1. Research Design and Methodological Positioning

The study adopts a qualitative multiple-case study design to examine how harm-reduction organizations make operational rescue decisions when fully optimal biological outcomes are no longer attainable. Its methodological aim is explanatory in an interpretive sense: rather than estimating the effect of isolated variables, it reconstructs how organizational actors narrow action possibilities under urgency, uncertainty, and operational constraint. This is consistent with case-based process research, which is appropriate when complex organizational action must be understood in context and temporal sequence rather than as detached measurable attributes (Crowe et al., 2011; Eisenhardt, 1989; Langley, 1999; Yin, 2018).

The study is therefore positioned as a qualitative multiple-case study and an interpretive organizational reconstruction. Its concern is not prediction, formal optimization, or statistical hypothesis testing, but the reconstruction of recurring organizational tendencies under incomplete information, deteriorating conditions, and the impossibility of satisfying all goals simultaneously (March & Simon, 1958; Simon, 1955, 1957; Weick, 1988). Consistent with the dissertation's final architecture, the guiding hypothesis was treated as an interpretive theoretical expectation. The methodology assesses whether this logic can be plausibly reconstructed from recurring cross-case patterns, not whether it operates as a deterministic law.

This positioning also clarifies the status of the reconstructed logic. The study does not claim that rescue organizations consciously apply a formal decision model, nor does it seek causal certainty in a decision-science sense. The Sequential Filtering Logic is understood as an analytical synthesis of recurring empirical tendencies rather than a formal decision model consciously applied by practitioners, consistent with interpretive traditions in bounded rationality research (March & Simon, 1958; Ocasio, 1997; Simon, 1957).

3.2. Empirical Setting, Case Selection, and Unit of Analysis

Brazil was methodologically relevant because it provided a context in which operational constraints and coordination difficulties became particularly visible in practice. These

contextual conditions are treated as intensifiers of constraint, not as a separate macro-theoretical agenda (Aquino Alves & Massaco Koga, 2006; Brazil, 2014; Lucio, 2024).

Case selection followed a purposive logic. The organizations were chosen because they offered variation in rescue context while sharing a wildlife protection mission and repeated exposure to urgent intervention decisions. The corpus included Fundação Mamíferos Aquáticos, Instituto Baleia Jubarte, Associação R3 Animal, Onçafari, and Instituto Arara Azul (see Table 1). This enabled comparison across marine, riverine, Pantanal, Cerrado, and avian settings while preserving a common problem: how to decide when action windows are narrow, conditions unstable, and some harm already unavoidable. Domestic-animal rescue organizations were excluded to keep the focus on wildlife rescue, where conservation, field access, species-specific handling requirements, and legal mandates differ materially.

Table 1: Profile of Participating Organizations

Organization	Region	Main Species Focus	Operational Scope
Associação R3 Animal	Southern Brazil (Florianópolis, SC)	Marine mammals (pinnipeds) and coastal wildlife	Marine wildlife rescue, rehabilitation, and coordination of field response operations
Instituto Baleia Jubarte (IBJ)	Northeast and Southeast Coast (BA, ES)	Humpback whales and other cetaceans	Cetacean monitoring, rescue coordination, and whale disentanglement support
Fundação Mamíferos Aquáticos (FMA)	Northeast Brazil (PB, SE, PE)	Manatees, aquatic mammals, and seabirds	Aquatic wildlife rescue, rehabilitation, and environmental monitoring
Onçafari	Pantanal, Cerrado, Amazon, and Atlantic Forest	Jaguars and other wild felines	Wildlife conservation, field monitoring, rescue support, and wildfire response
Instituto Arara Azul (ITA)	Pantanal, Cerrado, and Amazon (Pará)	Hyacinth macaws and other birds	Avian conservation, nest monitoring, and field-based wildlife management

The unit of analysis was the decision episode rather than the organization as an abstract whole. A decision episode was defined as a temporally bounded rescue situation beginning with the recognition of an animal in distress and ending when a final operational course of action was implemented, withheld, or converted into euthanasia. This bracketing made it possible to analyze decision-making as an unfolding sequence rather than as a generalized organizational attitude (Langley, 1999). It also aligned with the dissertation's process-oriented research question by focusing on how feasible action spaces narrowed over time.

The empirical corpus consisted of 11 interviews yielding 19 reconstructed decision episodes across the five organizations (see Table 2). A full overview of reconstructed decision episodes is provided in Table IV in the Appendix. Episodes were retained when they displayed three qualities: an urgent biological or welfare problem; evident constraint or trade-off among available courses of action; and sufficient detail to reconstruct chronology. Several interviews generated more than one episode, and some episodes were described by more than one respondent. This overlap allowed timelines and key turning points to be cross-checked rather than derived from a single recollection.

Table 2: Overview of Participants and Reconstructed Decision Episodes

Participant ID	Organization	Role	Language	Episodes Discussed (ID)
P1	FMA	Field Lead / Vet	Portuguese	DE1, DE2
P2	FMA	Environmental Technician	Portuguese	DE1
P3	FMA	Base Coordinator	Portuguese	DE1, DE3
P4	ITA	Field Biologist	English	DE17, DE18
P5	ITA	Field Biologist	English	DE17, DE19
P6	IBJ	Senior Veterinarian	Portuguese	DE8, DE9, DE10
P7	IBJ	Senior Veterinarian	English	DE11, DE12
P8	Onçafari	Field Biologist	English	DE13, DE14, DE15
P9	Onçafari	Field Biologist	English	DE15, DE16
P10	R3 Animal	Senior Coordinator / Veterinarian	English	DE4, DE5, DE6, DE7
P11	R3 Animal	Senior Coordinator	Portuguese	DE6, DE7

3.3. Data Collection and Episode Reconstruction

Primary data were generated through semi-structured interviews with experienced practitioners, typically veterinarians, coordinators, or rescue leaders directly involved in high-stakes cases. This format combined comparability across organizations with flexibility to capture the situational specificity of each episode (Braun & Clarke, 2013). Interviews averaged 35 minutes and were conducted online over a concentrated three-week period in April 2026. This concentrated timeline reduced the likelihood that broader environmental or political developments would substantially alter the institutional conditions under which participants reflected on recent rescue episodes. To ensure proper expression and articulative depth, sessions were held in the participant's preferred language, either Portuguese or English, and focused on concrete operational situations rather than abstract opinions. The protocol moved from open

episode elicitation to chronological reconstruction and then to targeted probes on constraints, priorities, authority, information flow, and outcomes. The interview protocol and guiding questions are included in Table 7 in the Appendix.

Episode reconstruction proceeded immediately after each interview. For every case, a narrative summary identified the trigger, evolving cues, perceived constraints, decision premises, implementation steps, and outcome. When two or more participants described the same event, their accounts were compared and synthesized. An overview of the reconstruction structure and a sample reconstructed episode are included in Table 5 and 6 in the Appendix. Where available, interview accounts were supplemented by limited documentary and contextual materials to clarify chronology, contextual conditions, or formal operational constraints. These materials served a supportive and triangulatory function rather than constituting an independent analytical dataset, helping reduce reliance on retrospective narration alone (Yin, 2018).

The reconstruction logic was chronological and situational. Participants were encouraged first to describe what happened, then what changed, and only then why certain actions became possible, impossible, or undesirable. This allowed the analysis to follow how cues were interpreted under pressure, a feature central to crisis and sensemaking research (Maitlis & Sonenshein, 2010; Weick, 1988). It also produced enough granularity to observe shifts in attention, thresholds of acceptable risk, and moments when intervention paths narrowed or collapsed.

Because the corpus included Portuguese and English material, translation was treated as a methodological issue. Portuguese interviews were translated into English for unified analysis, but key operational terms were checked so interpretation remained anchored in participants' practical vocabulary. Several reconstructed episode summaries were returned to participants for factual review. These member checks were limited to chronology and descriptive accuracy, not theoretical interpretation, preserving factual integrity without turning participants into co-authors of the analytical framework.

3.4. Analytical Categories and Controlled Hybrid Reconstruction

The analytical design can be described as a controlled hybrid architecture. It was hybrid because it combined theory-informed orientation with inductive reconstruction from interview material. It was controlled because the analytical structure remained subordinate to the episodes rather than hardening into a quasi-model. Initial attention was guided by the research question and by literature on bounded rationality, process analysis, crisis decision-making, and organizational sensemaking (Boin et al., 2005; Langley, 1999; March & Simon, 1958; Simon, 1957). However, the explanatory sequence was not imposed a priori. Categories were refined only when they improved the reconstruction of what actors did under constraint.

As outlined in Table 3, the codebook organized the material into five broad category families: constraints, decision variables, decision criteria, outcomes, and modulating conditions. These categories separated analytically distinct layers without turning the study into a fixed-variable model.

Table 3: Simplified Analytical Coding Structure

Category	Description	Representative Indicators
Constraints	Structural and situational conditions that progressively narrowed the operational action space during rescue decision-making under urgency.	Environmental instability, biological urgency, resource scarcity, logistical complexity, safety risks, legal restrictions, institutional limitations.
Decision Variables	Organizational capacities and adaptive mechanisms that shaped implementation possibilities and influenced operational flexibility.	Coordination networks, protocol use, information flow, operational flexibility, adaptive capacity, escalation structures.
Decision Criteria	Operational priorities used by organizations to evaluate and prioritize feasible intervention options under constrained conditions.	Human safety, feasibility, survival probability, welfare considerations, conservation priorities, scientific value.
Outcomes	Final operational decisions reached after sequential filtering and constrained organizational evaluation.	Rescue intervention, non-intervention, euthanasia.
Modulating Conditions	Secondary contextual and organizational conditions that intensified, accelerated, or reshaped the dominant decision process.	Human-caused harm, moral pressure, adaptive learning, institutional fragility, coordination challenges.

Coding was iterative and interpretive rather than mechanically exhaustive. Passages were coded when they clarified how an option was opened, narrowed, modified, or excluded. The analysis did not assume that every mention of a topic carried equal weight or treat code

frequency as proof of importance. Instead, coded passages were reread within the episode chronology to assess practical salience. This mattered when several considerations were present but only one or two were consequential at the moment of decision. The codebook therefore served analytical discipline, while interpretation remained anchored in narrative context and process coherence (Braun & Clarke, 2013).

This approach also avoided overcoding. The five category families were orientation tools, not equally precise empirical objects. Where boundaries overlapped, interpretation privileged plain organizational meaning over taxonomic neatness. Public pressure, anthropogenic harm, protocolization, and organizational learning were retained only when they altered how safety or feasibility were interpreted; they were not allowed to compete with the central explanatory architecture (March, 1991). This maintained parsimony and supported a readable, empirically grounded reconstruction rather than a maximalist coding display.

3.5. Cross-Case Synthesis and Emergence of the Sequential Filtering Logic

Once the episode reconstructions had been completed, cross-case synthesis proceeded through repeated narrative comparison. The key analytical question was not simply which categories appeared within episodes, but how operational possibilities narrowed over time under conditions of urgency and constraint. The analysis therefore focused on reconstructing sequence, threshold, and practical decision progression rather than listing isolated influences.

Through iterative comparison across cases, recurring organizational tendencies became increasingly visible and were progressively consolidated into an interpretive analytical reconstruction. The resulting Sequential Filtering Logic is therefore treated as a cross-case synthesis grounded in recurring empirical patterns rather than as a formalized decision model or universally applicable script.

Secondary dynamics were incorporated only insofar as they altered how the broader filtering process unfolded within specific episodes. Their analytical role remained supportive and contextual rather than constituting independent explanatory architectures.

3.6. Credibility, Reflexivity, Ethics, and Limitations

Rigor was pursued through transparency, evidentiary traceability, and disciplined interpretation rather than pseudo-quantitative procedures. Credibility was strengthened by purposive selection of experienced respondents, chronological reconstruction of concrete episodes, comparison of overlapping accounts, documentary anchors where available, and factual member checking of episode summaries. The analysis also retained an explicit trail from interview material to reconstructed episode narratives and cross-case synthesis in order to keep interpretive decisions transparent and contestable (Langley, 1999; Yin, 2018).

Reflexivity was important because coding and synthesis were conducted by a single researcher interpreting retrospective accounts. The analytical categories were treated as aids to disciplined reading, not neutral containers. Throughout the analysis, attention was given to the risk of retrospective rationalization, institutional self-presentation, and the researcher's tendency to impose tidy structure on messy events. Keeping categories broad, privileging chronology over detached code frequency, and treating the sequential model as a recurring tendency rather than a law formed part of this reflexive discipline.

Ethically, participation was voluntary and confidential. Interviewees contributed in their professional capacity and were informed of the purpose of the research, the use of the material, and their right to decline participation or clarify factual details in reconstructed summaries. The study involved no intervention in rescue operations and no collection of sensitive personal data beyond what was necessary for professional identification. These procedures are consistent with Brazilian guidance for research involving human participants, particularly Resolution No. 510/2016 (Conselho Nacional de Saúde, 2016).

Several limitations remain. First, the evidence is retrospective, and memory, hindsight, interview dynamics, or organizational narrative discipline may have shaped how episodes were reported. Second, the corpus is rich but unevenly distributed across organizations and outcomes, meaning some contexts are reconstructed more densely than others. Third, the reconstructed decision logic is interpretive and context-bound: it supports analytical transferability to other urgent, constrained settings, but not universal claims. Finally, the Brazilian setting intensifies some constraints in ways that may not map directly onto other national environments. The

methodology therefore supports a credible reconstruction of recurring organizational tendencies under constraint, not a predictive theory of rescue decision-making.

4. Findings and Discussion

4.1. Operational Rescue Under Conditions of Constraint

Field teams consistently describe the operational environment as highly unstable and unpredictable, which imposes immediate ceilings on what actions are even possible. Unforeseen weather, tides, or terrain conditions often force teams to delay or cancel planned interventions. For example, one rescuer recalled arriving at a whale stranding only to find the “condition of the sea [was] very strong, with waves, with currents,” making any approach unsafe (P1). In another riverine rescue, seasonal flooding had destabilized access conditions and intensified water currents, preventing rescue boats from safely reaching the animal (P2).

Material and logistical constraints further restrict the realm of feasible interventions. Rescue organizations frequently operate with chronic shortages of equipment, vehicles, and funding. Handling large animals dramatically amplifies these shortages: for example, one coordinator noted that a large mammal rescue, in this case a manatee, might require “at least 20 people” and specialized gear just for capture and transport (P1). Teams even lacked basic transportation: in one case the responders had to use a passing tourist vessel because their own boat was unavailable (P11). Basic supplies can also run out during an operation. In one case, after days of searching for a dispersed manatee, the team’s boat ran out of fuel and veterinary supplies, forcing them to abandon planned treatments (P1). Such resource exhaustion meant that any intervention requiring sustained support was eliminated from consideration.

Coordination complexity and institutional pressures add a third layer of constraints on rescue action, consistent with broader crisis-coordination literature emphasizing fragmentation and interorganizational dependence under emergency conditions (Boin et al., 2005; Rouhi et al., 2019). Respondents emphasized that Brazilian wildlife rescues typically involve a patchwork of NGOs, municipal authorities, state agencies, and even federal forces, each with its own protocols. Early in crises, most teams operated without formal joint structures, forcing improvised networks. One incident commander described how the team had to “establish a chain of command...and decide jointly” with other organizations before any field intervention could proceed (P11). In another case, a veterinarian recalled that they even had to “ask for permissions...[from] the government...[and] judges” before proceeding with a novel

intervention (P8). In short, these bureaucratic and inter-organizational delays ruled out some interventions on procedural grounds as quickly as physical constraints did.

As these combined pressures accumulate, the range of intervention options collapses rapidly. Early in each incident, teams often brainstormed broad sets of possible responses, from setting up containment perimeters to administering medication, relocation, or continuous monitoring, but almost all were quickly deemed impractical given the context. In practice, respondents reported that after accounting for environmental dangers, equipment limits, and procedural hurdles, “most of these options get eliminated,” leaving only a few marginal alternatives (P4). Often the surviving plan was simply the least-worst one. One coordinator admitted they would sometimes opt to “maintain the decision...[because] there’s nothing else to do” (P3). In some cases, teams explicitly recognized “doing nothing” to avoid causing additional harm as the only defensible choice.

In sum, the empirical evidence shows that unpredictable environments, scarce resources, and tangled coordination pressures collectively shrink the operational action space long before formal decision rules are applied. By the time field teams begin to execute plans, their action space has already narrowed to a few last-resort possibilities. This context of instability, scarcity, and constraint lays the groundwork for the sequential decision logic that will be reconstructed in the following section.

4.2. The Progressive Narrowing of Feasible Action Spaces

4.2.1. Safety as the First Screen of Intervention

Across cases, teams consistently report that the very first consideration is responder safety. Under volatile conditions, risky environments or unstable animal behavior immediately remove any proposed intervention from the decision set. In the interviews one rescuer put it bluntly: “the first thing is human safety... if it’s not safe for humans, we don’t do anything” (P7). In practice, this means that if conditions are too hazardous, whether due to severe weather, nightfall, dangerous terrain, or aggressive animals, the option to intervene is effectively ruled out from the outset. For example, when strong currents threatened to sweep away rescuers, interviewees described how the operation was stood down or delayed entirely (P1). One practitioner recalled a case at nightfall: the team “always prioritize[d] the safety of the team”

by halting any approach until daylight (P6). Another described storms rising: as waves grew, “he start[ed] to roll...we didn’t start the euthanasia at that time,” deferring all action until conditions improved (P7).

This safety-first stance emerges as an adaptive, organizational pattern rather than a formal rule. It appears as a *de facto* filter: in the chaos of crisis, plans that might save animals are abandoned if they pose unacceptable risk to staff or volunteers. Notably, this filter is invoked by many participants independently, suggesting an ingrained culture of caution. Even when the animal’s plight is urgent, teams will often withdraw rather than endanger lives. In one case, firefighters on site overruled rescuers’ eagerness to capture an injured marine mammal: the firefighters “made the decision to remove them from there because people were at risk” (P9). The repeated emphasis on human safety shows how this screen effectively prunes the action set. Only once every intervention candidate is deemed safe from the human perspective does the organization move on to the next stage of assessment.

4.2.2. Assessing Operational Feasibility and Logistics

Once immediately dangerous options are set aside, teams turn to the practical question: which of the remaining ideas can actually be carried out given the constraints of time, equipment, and manpower? In other words, they filter for operational feasibility. This involves checking whether necessary resources, personnel, or environmental conditions are in place. Several interviewees noted that an otherwise ideal solution was dropped simply because it was impractical in the moment. For instance, one coordinator described the difficulty of relocating a drifting manatee each night under unstable river conditions: “we’d face the challenge of finding the animal every day...” (P1). Over time, maintaining the rescue effort became operationally unsustainable. In another case, rescuers were unable to approach a distressed chick positioned close to the water because the surrounding terrain left no safe access route. As one team lead explained, “the chick falling in the water made intervention unfeasible” (P5).

These feasibility checks often expose hidden trade-offs. Participants spoke of juggling shifting personnel schedules (“we always evaluate who is on vacation... who is a bit busier...”) and clashing commitments (“we needed to look for all the options... meet the demand there and also meet our others”), reflecting how stretched resources prune choices (P3). Environmental factors, such as tides, darkness, or infrastructure, also frequently block actions.

One responder mentioned that towing a stranded whale required a nearby vessel; when none was available, that “ideal solution” was dropped (P6). In another scenario, a proposed procedure had to be abandoned because the available anesthesia supply remained insufficient despite attempts to obtain additional medication through external veterinary contacts (P10). Each time, interventions that might have benefited the animal under ideal conditions were removed from consideration when operational requirements could not be met.

Importantly, these feasibility eliminations are not formal computations but emerge organically from team discussions. Rescuers describe iterating through possibilities until only those deemed “doable” remain. If none turn out to be practical, the team may cycle back or conclude no rescue is possible. In some cases, interviewees described temporarily suspending intervention efforts until uncoordinated public involvement had subsided and operational control could be re-established. As P7 noted, teams sometimes found themselves “waiting for the public’s attempt to fail” before coordinated intervention efforts could resume. Operational possibilities therefore narrowed progressively until only interventions that remained practically executable under unstable and resource-constrained conditions could be sustained.

4.2.3. Prioritizing Animal Outcomes Within Remaining Options

After unsafe and impractical ideas have been set aside, attention turns fully to the animal. Within the now-constrained set of possible actions, rescuers focus on maximizing the biological outcome for the animal. This often involves difficult judgments about which remaining intervention offers the most defensible outcome for the animal under constrained operational conditions. Consistently, participants stressed that once safety and feasibility are secured, “the animal has priority... think about the animal first” (P3). In practice, this means selecting among the remaining interventions those considered most favorable for the animal’s overall condition and prospects under the existing operational constraints.

Interview data show a clear pattern: teams compare how each viable plan affects the animal’s health. For example, in one instance where a manatee pup was stranded on a remote beach, after confirming it was safe to approach and a boat was secured, rescuers debated whether to release it immediately or bring it to the rescue center for treatment. One responder explained that the deciding factor was whether the pup could “appear healthy and then [be] release[d]” in the wild; when that seemed unlikely, they opted for rehabilitation instead (P1).

Another recounted a jaguar with severe paw burns from the wildfires: “the animal has priority... we intervened because she wasn’t feeding, she wasn’t drinking,” an action taken once logistics were sorted (P8). In these narratives, choices are guided by survival and welfare criteria, not by operational convenience.

However, this optimization always occurs under constraint. Teams frequently noted that the optimal clinical solution (such as cutting-edge treatment or a multi-stage operation) was only pursued when it fit within the narrowed action space. One quote illustrates this: rescuers recognized an ideal plan to bring a large animal to a rehab center, but when no truck could be found, that plan became moot (P2). At that point they looked for next-best options, perhaps releasing the animal near a protected nursery area, that still align with conservation goals. In effect, organizations fine-tune their response to maximize biological outcomes given what remains on the table. They do not apply an a priori mathematical model; rather, they organically shift focus to animal-centric criteria only after earlier screens have ensured an approach is safe and feasible.

This approach also means that longer-term or population-level considerations occasionally influence choices, but only within the tight constraints. A few interviewees mentioned population viability, e.g. “every animal in this population matters so much” (P1), but typically this broader concern only became central when immediate threats were controlled. In short, by this stage the decision process feels pragmatic: the best of the feasible plans is selected for the animal, even if it falls short of the ideal rescue scenario first imagined.

4.2.4. Settling for Adequate Solutions under Crisis Constraint

Finally, when no intervention can fully restore the ideal state, organizations shift toward solutions that contain harm under the remaining operational constraints rather than fully resolving the situation. At this stage, decision-making often centers on limiting suffering, preserving minimum control, or preventing escalation once safer or more effective interventions are no longer viable. In some cases, this resulted in euthanasia when continued intervention was considered unlikely to secure survival without prolonged suffering. As one respondent explained, “if [the animal] is in pain or suffering and it’s not feasible to survive, we decide to euthanize” (P10).

In other situations, organizations accepted operationally reduced outcomes because environmental, social, or logistical conditions prevented more complete responses. One interview described how teams prioritized rapid whole-carass removal over full necropsy procedures after crowd interference, limited institutional support, and public health concerns made controlled on-site management increasingly difficult (P6). Similarly, some interviewees described choosing monitored non-intervention when capture itself was likely to generate greater risk or distress than continued observation (P8).

These decisions did not emerge from formal optimization procedures (Simon, 1957). Rather, teams repeatedly described moving toward the “least harmful” or “most feasible” remaining option once safer and more workable alternatives had been exhausted. Importantly, these outcomes also remained revisable. Several interviewees emphasized that decisions could be reopened if weather conditions changed, new equipment became available, or animal behavior shifted. Even so, the broader tendency remained consistent: once operational limits became too restrictive, organizations increasingly settled on constrained forms of harm management rather than ideal recovery outcomes.

4.3. Modulating Conditions of the Sequential Filtering Logic

The cross-case material indicates that the dominant filtering sequence did not unfold in a fully uniform manner. Three recurring conditions shaped how intensely organizations pushed against operational limits, how much room for action they were able to preserve, and how quickly feasible options narrowed. None of these conditions displaced the central logic reconstructed above. Instead, they modulated it by tightening internal tensions, expanding preparedness, or amplifying coordination burdens. Their analytical value therefore lies in explaining variation in the enactment of the filtering logic, not in replacing it.

4.3.1. Moral Pressure and Human-Caused Harm

Intervention pressure became visibly stronger when harm was attributable to human action. Under those conditions, organizations did not confront only a clinical event; they also faced a situation interpreted as carrying a compensatory obligation. The Itapira rescue, for example, unfolded under conditions of severe infrastructural damage and substantial resource strain following the Pantanal wildfires. Within this context, P8 and P9 described the decision to

transport the injured jaguar for treatment as driven “mostly because it was human-caused” and therefore “our responsibility.” A comparable tendency appeared in the boat-strike manatee cases, where the anthropogenic origin of the injuries sustained organizational commitment even when staffing, travel, and reporting burdens made prolonged support difficult (P1–P3). In the Corumbá cub case, intervention was likewise intensified by the fact that the mother’s death followed a failed human rescue attempt (P8; P9).

What changed in these episodes was not the order of evaluation, but the amount of effort expended before a case was filtered out. Human-caused harm appeared to increase willingness to continue searching for an implementable option, mobilize outside support, and absorb heavier operational burdens than would likely have been accepted in episodes treated as part of natural mortality or ecological exposure. In that sense, moral pressure did not create a separate decision path; it worked within the existing filtering process by making organizations more reluctant to abandon a case at an early stage. This pattern is consistent with research suggesting that, when harm cannot be fully avoided, actors often move from absolute harm avoidance to comparative harm reduction and may accept greater burdens to prevent a morally worse outcome (Berman & Kupor, 2020).

At the same time, the evidence does not indicate that moral urgency suspended operational discipline. Even in morally charged episodes, teams continued to monitor conditions, negotiate scope, and reduce exposure where necessary. In the Itapira case, intervention followed several days of observation rather than immediate extraction (P8; P9). In the Paraíba support decision for Astro, the organization did not grant the full 30-day request, but negotiated a shorter 20-day deployment that it could sustain alongside other commitments (P3). Moral pressure therefore intensified tension within the filtering process, especially around feasibility and acceptable risk, without displacing the sequence itself.

4.3.2. Adaptive Readiness and Organizational Learning

A second recurring condition concerned the extent to which prior experience had been translated into routines, equipment, and coordination habits. Accumulated readiness did not eliminate uncertainty, but it frequently altered the practical width of the feasible action space. Organizations with stronger prior exposure seemed better able to move quickly without

reopening every decision from first principles, which is in line with literature on crisis learning and adaptive search (Antonacopoulou & Sheaffer, 2014; March, 1991).

This was particularly visible in the contrast between earlier and later rescue capacity. In the manatee cases, P1 described how the protocols had become “well-defined” after refining over more than 50 cases, with roles more clearly distributed and decisions increasingly supported by prior routines. In the newborn pup episodes, the release-versus-rehabilitation threshold had been stabilized into a rapid field assessment, while a further lesson, manually supporting the pup’s breathing in the pool, had been incorporated after earlier experience showed that standard assumptions about recovery were insufficient (P1). Comparable dynamics appeared elsewhere. P10 described the 2010 Right Whale stranding as a period in which the team had to “learn from scratch,” whereas later whale operations increasingly drew on the organizational structures developed through the Beach Monitoring Project and the introduction of Incident Command System coordination practices. Importantly, however, increased protocolization did not eliminate the need for situational adaptation in unstable field conditions where standardized procedures alone often remained insufficient. After a difficult calf euthanasia, P7 noted that “the first thing I buy is the needle” and also did exactly that within the next year, showing how a concrete operational deficit was converted into future readiness.

These patterns matter because they subtly reshaped filtering capacity. Experience reduced the time needed to establish who could decide, what equipment would be required, and which interventions were unrealistic from the outset. In practical terms, learning shortened some feasibility checks and made others less fragile. It also supported limited flexibility inside the constraints already described. P3’s use of vacation calendars and workload monitoring to create temporary staffing slack, and P9’s reliance on satellite fire tracking and pre-existing rescue networks, show that readiness was not only procedural but anticipatory. Yet the empirical pattern remained disciplined. Adaptive readiness expanded the set of options that could survive the filtering process, but it did not abolish the filters. When conditions remained unsafe, clinically hopeless, or materially impossible, experienced organizations still narrowed action rather than forcing intervention.

4.3.3. The Brazilian Institutional-Operational Context

The third condition was contextual rather than event-specific. Across cases, the Brazilian institutional-operational environment repeatedly intensified the feasibility stage by making coordination, authority, and implementation support uncertain. The consequence was not a different decision logic, but a more demanding operating environment in which already narrow action spaces became even harder to stabilize. This reading is consistent with the broader literature on Brazilian civil-society action under fragmented governance, uneven state capacity, and formalized but friction-filled public-NGO collaboration (Aquino Alves & Massaco Koga, 2006; Brazil, 2014; Lucio, 2024; OECD, 2023).

Several episodes illustrate this concretely. In Belmonte, the absence of city hall support and police made crowd control impossible, leaving the team unable to complete the technically preferred response (P6). In Salvador, IBJ provided technical guidance but depended on municipal authorities and heavy equipment it did not control, so the final course of action reflected institutional dependence as much as veterinary judgment (P6). In Itajaí, public pressure escalated while environmental authorities effectively withdrew, forcing the team to wait until the crowd dispersed before resuming professional action (P7). Another marine operation, R3, had to mobilize Military Police and Civil Guard for perimeter control, and the availability of Petrobras-funded beach-monitoring equipment materially affected what could be attempted in practice (P11; Petrobras, 2018).

This repeatedly placed NGOs in substitution roles (Lucio, 2024; OECD, 2023). They were expected to stabilize emergencies, coordinate actors, and provide technical judgment, yet they often lacked direct control over police isolation, municipal machinery, permits, or transport assets. The same contextual pressure also appeared in less visible but organizationally significant ways. P3's account of supporting the Astro response shows that emergency deployments were assessed alongside contractual indicators, reporting requirements, staffing cycles, and ongoing project obligations. In other words, cases were filtered not only against biological urgency, but also against a layered environment of reporting duties, partnership arrangements, and uneven institutional responsiveness. This helps explain why improvisation was so recurrent across the material. Cross-state staff sharing, volunteer mobilization, technical notes to city halls, ad hoc use of tourist vessels, and rapid network activation were often

necessary not because organizations preferred informality, but because ordinary institutional channels did not reliably provide timely operational support (P3; P6; P11).

Taken together, these modulating conditions enrich the cross-case interpretation without revising its central mechanism. Moral pressure increased the willingness to keep difficult cases in play, adaptive readiness made some intervention paths more stable and executable, and the Brazilian context made feasibility more brittle and coordination more demanding. Across these variations, however, the dominant explanatory pattern remained intact: intervention advanced only insofar as organizations could still convert urgency into a safe, workable, and organizationally defensible course of action.

4.4. Cross-Case Synthesis and Decision Logic Reconstruction

Across the 19 reconstructed decision episodes, the strongest cross-case convergence lies not in any single rescue technique, species-specific protocol, or institutional arrangement, but in a recurrent organizational movement from broad possibility to narrowed action. When crises first emerged, more than one response could often be imagined. Yet as the situation unfolded, those possibilities were steadily reduced by exposure risk, implementation burdens, coordination dependence, and dwindling temporal windows. The central analytical pattern is therefore one of progressive narrowing: under constrained operational environments, organizations adapted by reducing the field of admissible action until only one operationally defensible pathway, or no defensible pathway at all, remained. This reconstruction shifts the analytical focus away from isolated factors and toward the organizational process through which actionable coherence is preserved under deteriorating conditions.

What makes this pattern analytically significant is that it shows adaptation under pressure as an ordered rather than undifferentiated process. In environments marked by uncertainty, unstable operational conditions, fragmented authority, and resource scarcity, organizations cannot realistically optimize across all goals at once. Attention is instead structured through successive thresholds. The first threshold concerns safety. This did not appear merely as a formal doctrine or a moral truism, but as an organizational boundary condition that protected responders, volunteers, and the minimum continuity of the collective. In bounded-rationality terms, the interaction between environmental complexity and limited

organizational processing capacity narrows what can even enter serious consideration (March & Simon, 1958; Simon, 1955, 1957).

This safety filtering should not be interpreted as a rigid checklist applied identically across all cases. Thresholds varied with species, terrain, weather, staffing patterns, and accumulated experience. In some episodes, the same organization could tolerate higher exposure under one set of field conditions and suspend intervention under another. Even so, the cross-case tendency was consistent: once exposure moved beyond what the organization regarded as acceptable, intervention was delayed, scaled down, or abandoned. This is analytically important because it repositions deliberate non-intervention. Across the reconstructed cases, standing down did not necessarily indicate indecision, indifference, or mission failure. Rather, it emerged as one possible outcome of organizational responsibility under constraint. Put differently, when harm could not be reduced without imposing unacceptable danger on those expected to act, refusal to proceed became part of the rescue logic itself rather than a breakdown of that logic.

Once a minimally acceptable safety margin had been established, a second filter became decisive: feasibility. If the first stage established whether intervention could be attempted without intolerable exposure, the second established whether it could actually be mounted and sustained. This proved to be the dominant operational engine of narrowing across the material. The relevant question was no longer whether a certain course of action would be desirable in principle, but whether it remained executable within the real conditions of access, equipment, personnel, transport, weather, institutional support, timing, and coordination. Many biologically attractive interventions failed at precisely this point, not because actors valued them less, but because the implementation chain required to carry them out could not be stabilized in time. Feasibility therefore frequently functioned as the main translation point between moral intention and operational action. It compressed expansive rescue aspirations into a smaller set of workable options and, in doing so, repeatedly directed organizations toward less ideal but more defensible forms of intervention. This is also where constrained coordination became especially visible: what remained possible frequently depended on whether partners, municipalities, police, transport providers, or technical networks could be aligned quickly enough to keep the action space from collapsing.

Only within the action space that survived those prior filters did animal-centered priorities become decisive. This third stage is best understood as constrained biological optimization. The cases do not indicate that organizations ceased to care about survival, welfare, behavioral integrity, or longer-term conservation value. On the contrary, such commitments remained strong throughout the material and were often articulated with considerable urgency. What changed was the level at which biological aims could operate. Rather than structuring the entire decision from the outset, they were pursued within a space already narrowed by prior operational realities. This distinction is central to the dissertation's contribution. It shows that mission commitment did not disappear under pressure; instead, it was reorganized. Biological optimization was therefore neither absent nor primary. It was conditional, localized, and situationally bounded. In that sense, the reconstruction supports a view of crisis action in which outcome-oriented reasoning remains present, but only after the organization has established that action is still survivable and executable (Cyert & March, 1963; Simon, 1957).

The final consequence of this sequence is a recurring pattern of satisficing under constraint. Organizations converged on progressively narrowed intervention pathways not because they lacked ambition or moral commitment, but because continued search for an ideal solution often generated no practical gain and could instead intensify failure by exhausting staff, missing environmental windows, or aggravating coordination breakdowns. Closure occurred when one option remained sufficiently safe, workable, and beneficial to justify action, even if it fell short of any idealized rescue scenario. Where no such option persisted, the process yielded deliberate non-intervention or, in some episodes, euthanasia as forms of constrained harm reduction. Satisficing in this reconstruction should therefore be read in its organizational sense: not as settling casually for less, but as terminating search once a defensible threshold has been met under adverse conditions (Simon, 1957). This is what explains why highly committed organizations repeatedly arrived at solutions that were partial, temporary, or tragic, yet still rational within the action space available to them.

This sequential filtering logic should, however, be read as an empirically emergent organizational tendency rather than as a rigid algorithm. The episodes did not unfold through clean linear steps. Information changed during action, weather windows opened and closed, equipment failed, crowds intervened, and actors returned to earlier assessments as the situation evolved. The reconstruction is therefore interpretive and processual, not deterministic. Yet this

situational messiness does not invalidate the sequence. On the contrary, it clarifies why the sequence matters. Even when decisions were revisited, organizations repeatedly returned to the same underlying ordering of operational priorities. The model thus condenses a recurring order of organizational attention and justification, while leaving room for iteration, reversal, and case-specific variation.

The secondary conditions discussed in Section 4.3 help explain variation in how the filtering process unfolded across cases without displacing its broader structure. Consistent with literature on comparative harm reduction, human-caused harm often intensified organizational persistence within difficult interventions (Berman & Kupor, 2020). Organizational learning and accumulated readiness expanded the range of actions considered operationally feasible, reflecting broader arguments on adaptive search and crisis learning under uncertainty (Antonacopoulou & Sheaffer, 2014; March, 1991). At the same time, fragmented institutional environments and unstable interorganizational coordination repeatedly intensified feasibility pressures, which aligns with existing literature on Brazilian civil-society action under uneven governance conditions (Brazil, 2014; OECD, 2023). These conditions therefore modified how the filtering process was enacted in practice while leaving the broader pattern of sequential narrowing intact.

The findings suggest that constrained adaptation is best understood not as broad optimization under stress, nor as pure improvisation, but as the ordered reduction of possibilities through successive filters that stabilize organizational action under deteriorating conditions. This also clarifies the conceptual status of the final Decision Logic Model in Figure I. It should be read as a visually simple representation of a recurrent organizational filtering tendency, not as a universal or highly technical decision rule. Its value lies in making explicit the dominant logic through which organizations progressively narrow intervention possibilities into one defensible course of action, or into the recognition that no such course remains.

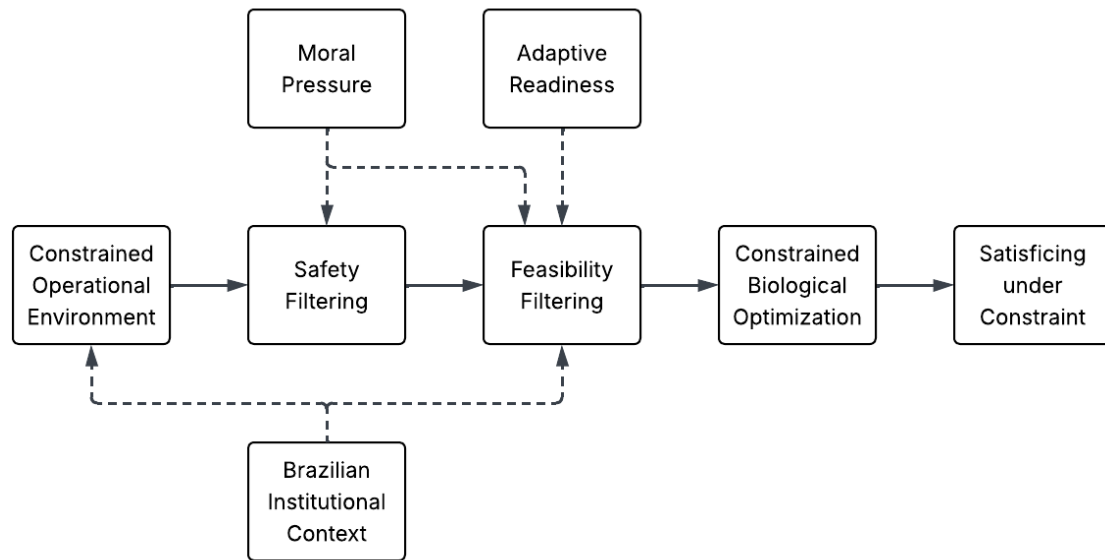


Figure 1: Sequential Filtering Logic in Operational Decision-Making under Urgency

5. Conclusion and Implications

5.1. Answering the Research Question

The research question can now be answered directly. The findings indicate that rescue decision-making under unavoidable harm is best understood as a constrained organizational process rather than as comprehensive biological optimization. Across cases, organizations continuously adjusted intervention ambitions to deteriorating operational realities, unstable coordination conditions, and limited implementation capacity, with operational safety and feasibility repeatedly shaping which interventions remained actionable. Rescue outcomes therefore reflected not only biological urgency, but also the organization's ability to preserve actionable and defensible intervention under pressure.

The empirical reconstruction further suggests that crisis adaptation did not emerge through unrestricted improvisation or broad simultaneous optimization. Instead, organizations progressively reduced the range of admissible actions as operational constraints intensified, often abandoning interventions that could no longer be sustained safely or feasibly. In this sense, non-intervention, delayed intervention, or constrained harm-management strategies emerged not as organizational failure, but as legitimate outcomes of bounded crisis decision-making.

The theoretical expectation is therefore best treated as refined rather than simply confirmed. The empirical material strongly supports the expectation that operational constraints shape how and when animal-centered goals can be pursued. At the same time, the findings complicate overly linear interpretations of this process. Organizations revisited decisions as circumstances changed, tolerated different levels of uncertainty across cases, and continuously renegotiated what remained operationally defensible. Under unavoidable harm, rationality therefore appeared less as comprehensive optimization than as a bounded and situational process of maintaining viable organizational action under pressure (March & Simon, 1958; Simon, 1955, 1957).

5.2. Theoretical Contribution

The dissertation makes a focused contribution to bounded rationality by showing that the limits shaping organizational choice in urgent rescue settings are not merely cognitive. They

are also produced by danger, time compression, unstable environments, coordination dependence, and implementation fragility. In this empirical setting, bounded rationality does not appear simply as incomplete information or limited calculation. It appears as the progressive contraction of the feasible action space itself. Organizations are not only unable to compute an optimum; they are frequently prevented from sustaining the conditions under which optimal search would even remain meaningful. This extends classical discussions of administrative choice by specifying how bounds are enacted in real time through shifting operational ceilings rather than treated as static background conditions (Cyert & March, 1963; Simon, 1955, 1957).

A second contribution concerns constrained organizational adaptation. The cases suggest that adaptation under crisis is not well captured as broad flexibility or creative improvisation alone. It is better understood as disciplined recalibration within a shrinking field of possibilities. Organizations adapted by redefining what could still be responsibly attempted, by modifying intervention scope, and by converting prior experience into routines, partnerships, and readiness infrastructures that modestly widened future options. This places the dissertation in conversation with work on organizational learning and adaptive search, while preserving a restrained claim: learning did not remove constraint, but it sometimes shifted the threshold at which feasibility broke down (Antonacopoulou & Sheaffer, 2014; March, 1991). The contribution lies in showing that adaptation in such settings is often conservative in form. It stabilizes action under pressure rather than liberating organizations from pressure.

A third contribution speaks to crisis decision-making. Much of the crisis literature is concerned with how organizations act under urgency, ambiguity, and threat (Boin et al., 2005; Flin et al., 2008; Weick, 1988). The present dissertation adds a more specific insight: when harm is unavoidable, decision quality may depend as much on the disciplined rejection of unsafe or unworkable action as on rapid intervention itself. In that respect, the reconstruction repositions deliberate non-intervention. It should not automatically be interpreted as indecision, passivity, or mission failure. In constrained operational environments, refusing to proceed may constitute a technically and organizationally rational outcome once the minimum conditions for defensible action have disappeared. This contribution is theoretically modest but analytically important, because it clarifies how crisis organizations preserve responsibility when action and additional harm become too closely coupled.

Finally, the dissertation contributes to discussions of satisficing under operational pressure. The findings indicate that satisficing in this context is neither casual compromise nor simple acceptance of mediocrity. It is a structured organizational endpoint reached after prior filters have eliminated what cannot safely or feasibly be done. The “acceptable” option is therefore not the first option encountered, but the first option that remains survivable, executable, and sufficiently aligned with the mission to justify action. The result is a grounded reformulation of satisficing for high-pressure rescue work: organizations do not search for the best abstract outcome, but for the most defensible intervention within a damaged and narrowing opportunity structure (March & Simon, 1958; Simon, 1957). That is the dissertation’s central theoretical payoff.

5.3. Practical Implications

The practical implications follow directly from this reconstruction. For wildlife rescue organizations, the first implication is that responder safety should be formalized as a decision boundary rather than left as an implicit ethical intuition. Clear safety thresholds, stand-down authority, and explicit criteria for suspending or delaying intervention would reduce ambiguity in high-pressure moments and protect teams from escalation beyond acceptable exposure, while also making difficult non-intervention decisions more transparent and defensible. Such procedures matter not because they replace judgment, but because they preserve the organizational capacity to keep judging under stress (Flin et al., 2008).

A second implication concerns crisis coordination and operational preparedness. If feasibility is the dominant operational bottleneck, then preparedness should focus less on abstract scenario optimism and more on the infrastructure that keeps options executable. Resource mapping, modular equipment planning, transport access, pre-authorized decision chains, mutual-aid arrangements, and scenario-based operational exercises may help organizations identify feasibility bottlenecks before real crises emerge. The practical aim is to widen the feasible action space before the next incident occurs. In this sense, preparedness is not merely about stockpiling assets, but about ensuring that safe ideas can still become implementable actions when time, weather, or bureaucratic delay narrow the intervention window.

A third implication relates to responder sustainability. Under unavoidable harm, difficult decisions do not only consume physical resources; they also consume organizational attention and moral endurance (Flin et al., 2008). Rescue organizations would therefore benefit from staffing models that protect reserve capacity, rotation practices that reduce cumulative overload, and decision routines that distribute responsibility for irreversible choices rather than concentrating them in one actor. Post-incident debriefing should be treated not as an optional reflective exercise, but as part of operational maintenance. Debriefs can identify where thresholds failed, where assumptions proved unrealistic, and where future teams require better support. This is particularly important when outcomes are tragic, because unresolved moral strain can quietly degrade future decision quality.

A fourth implication concerns interorganizational coordination. The findings suggest that many feasibility problems were not purely technical; they were relational and procedural. For that reason, coordination should be designed as infrastructure rather than improvised only at the point of crisis. Shared terminology, role clarity, updated contact trees, escalation protocols, and pre-negotiated interfaces with municipalities, environmental agencies, police, or transport providers would likely reduce the friction that currently consumes precious decision time. Within the Brazilian setting, where fragmented authority and uneven institutional support can tighten feasibility constraints, such measures are especially consequential (Brazil, 2014; OECD, 2023).

A final implication concerns adaptive readiness. Organizations should systematically convert difficult episodes into revised thresholds, training scenarios, and protocols. The practical lesson is not that every crisis can be domesticated by routine, but that recurring failure points can often be translated into future readiness. In this respect, the value of after-action learning lies less in assigning blame than in expanding the set of options that may survive future screening. Adaptive readiness is therefore not separate from the decision logic reconstructed here; it is the means through which organizations slowly improve the conditions under which that logic will operate (March, 1991).

5.4. Analytical Transferability

The dissertation does not claim universal generalizability. Its contribution is interpretive and grounded in a specific empirical setting. Even so, the reconstructed logic appears

analytically relevant beyond wildlife rescue wherever organizations operate under compressed time, incomplete information, coordination dependence, and conditions in which some degree of harm cannot be fully avoided. In such settings, the core question often shifts from “What is the best outcome in principle?” to “What can still be responsibly attempted now?”

This makes the reconstruction plausibly transferable, in analytic rather than predictive terms, to other crisis environments characterized by compressed time, coordination dependence, infrastructural instability, and unavoidable trade-offs under pressure. Humanitarian response, disaster coordination, and emergency triage settings similarly confront situations in which desired outcomes may be constrained by responder safety, implementation capacity, resource scarcity, or unstable operational conditions. Across such settings, the narrowing of intervention possibilities may become at least as consequential as the ranking of ideal outcomes.

The appropriate level of transfer, however, is that of a sensitizing analytical lens rather than a portable operational formula (Yin, 2018). The Decision Logic Model should therefore be treated as a disciplined interpretive representation of a recurring filtering tendency, not as a universal algorithm. Threshold content, legal duties, professional norms, and moral priorities will differ substantially across domains, especially where human patients or civilian populations are involved. What may travel is not the substantive content of each filter, but the broader insight that organizations under unavoidable harm often narrow action possibilities progressively under operational pressure.

5.5. Limitations and Future Research

Several limitations define the boundaries of this dissertation’s claims. First, the argument is qualitative and interpretive. The reconstructed model is derived from retrospective episode reconstruction rather than direct observation of decisions as they unfolded in real time. As a result, the analysis necessarily depends on narrated accounts of what was seen, prioritized, and judged after the fact. This creates the familiar risks of selective recall, post hoc rationalization, and narrative smoothing, particularly in crisis contexts where ambiguity may later be remembered as greater coherence than was actually experienced (Weick, 1988; Yin, 2018).

Second, the empirical base remains limited in scope. Although the cross-case design strengthens analytical comparison, the study draws on a bounded sample of organizations and episodes within one national context. The Brazilian setting is analytically valuable precisely because it intensifies operational difficulty through fragmented governance, uneven public capacity, and resource constraints. Yet this also means that the reconstructed logic may partly reflect the severity of those contextual conditions. The dissertation therefore supports analytic transferability, not statistical representativeness. It offers a plausible reconstruction of a recurrent tendency in these cases, not a prevalence claim about all rescue organizations.

Third, the study does not include longitudinal observation. It identifies adaptive readiness and learning as important modifiers of feasible action, but it cannot directly trace how such learning becomes stabilized over longer periods, how thresholds shift across repeated events, or how organizations institutionalize lessons after catalytic failures. Similarly, the analysis does not provide quantitative validation. It cannot estimate how often particular filters dominate, whether certain combinations predict specific outcomes, or how strongly the reconstructed sequence holds across a wider population of organizations and crisis types.

These limitations are not merely constraints; they also define a productive research agenda. Comparative country studies would help determine how strongly the filtering logic is shaped by institutional context and whether similar patterns emerge under different regulatory, infrastructural, and cultural conditions. Longitudinal research could examine how organizations translate difficult episodes into durable readiness, including whether learning broadens future feasibility or simply hardens future caution. Real-time crisis observation, shadowing, or time-stamped process data would be especially valuable in capturing decision dynamics before retrospective coherence sets in. Future research might also examine whether emerging digital decision-support systems, including artificial intelligence-assisted coordination or information-filtering tools, can help organizations manage attentional overload and situational complexity during rapidly evolving crises. Finally, cross-sector comparison with humanitarian operations, disaster coordination, and emergency triage could test whether the same basic narrowing logic appears when the object of care, legal mandate, and moral stakes differ.

Taken together, these limitations counsel interpretive restraint. At the same time, they do not diminish the dissertation's central contribution. The analytical value of the study lies in clarifying that when harm cannot be fully prevented and action unfolds under operational

pressure, effective organizational decision-making is not best understood as failed optimization. It is better understood as a disciplined process of narrowing intervention possibilities until one defensible course of action remains, or until responsible action requires acknowledging that none does. That conclusion provides the dissertation with its final analytical closure.

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Appendices

Table 4: Case Catalog of 19 Decision Episodes

ID	Context (NGO/Taxon/ Biome)	Episode Description	Core Dilemma / Trade-off	Decision	Operational Details & Evidentiary Anchors
DE1	FMA / Manatee / Coastal	Adult male ("Astro") found with life-threatening bleeding wounds from a boat strike.	Behavioral Integrity (Wild) vs. Clinical Control (Rehab).	Rescue Intervention	History: 34th lifetime collision. Logistics: 20-person capture team. Meds: Field-ready medical kits used.
DE2	FMA / Manatee / Marine	Stranded newborn manatee pups found in high-traffic/unsafe coastal zones.	Immediate Release (Naturalism) vs. Long-term Rehab (Certainty).	Rescue Intervention	Biological: Newborns lack innate surfacing rhythms; requiring 24-hour manual support in pools to prevent pneumonia.
DE3	FMA / Bird / Marine	"Bird Boom" mass stranding surge in Aracaju requiring sudden staff mobilization.	Base Stability (Local) vs. Network Support (Regional).	Rescue Intervention	Managerial: Coordinator used Staff Vacation Calendars to manually create "Operational Slack" (DV5).
DE4	R3 / Right Whale / Marine	50-60 ton whale stranded in 2010; the organization's first major large-scale crisis.	Public Expectation (Refloat) vs. Welfare/Safety (Euthanasia).	Euthanasia Intervention	Catalyst: Absence of Incident Command System (ICS) led to a chaotic, non-protocolized 8-day cycle.
DE5	R3 / Humpback / Marine	Recent stranding where the falling tide closed the physical window for a refloat.	Immediate Euthanasia (Protocol) vs. Waiting for Tide (Hope).	Euthanasia Intervention	Deadline: Euthanasia finalized once tidal windows closed and clinical decline became irreversible.
DE6	R3 / Sperm Whale / Marine	Adult whale stranded during a severe storm warning with 3-meter waves.	Mission Fulfillment (Rescue) vs. Team Safety (No-Action).	No Intervention	Meteorology: 3m waves and steep sand inclination rendered access lethal; ICS used to assign Bronze/Silver/Gold roles.

ID	Context (NGO/Taxon/ Biome)	Episode Description	Core Dilemma / Trade-off	Decision	Operational Details & Evidentiary Anchors
DE7	R3 / Humpback / Marine	Stranding during COVID-19 with perfect environmental ease but poor clinical signs.	Clinical Probability (Skinny) vs. Operational Opportunity (Ease).	Rescue Intervention	Logic: Prioritized "workable window" of available vessels/calm sea over the animal's poor clinical prognosis.
DE8	IBJ / Humpback / River	Whale beached at a remote river mouth with an uncooperative/aggressive crowd.	Scientific Science (Necropsy) vs. Site Abandonment (Social Safety).	No Intervention	Conflict: Crowds cutting meat for bait; team unable to maintain exclusion zone due to lack of local police presence.
DE9	IBJ / Humpback / Urban	Stranding on a Salvador urban reef with extreme animal mass and mass public.	Technical Optimization vs. Urban Sanitation (Deadline).	Rescue Intervention	Constraints: Rescuers operated within a strict 5-hour window dictated by tidal cycles to ensure safety.
DE10	IBJ / Humpback / Urban	Stranding on a busy tourist beach requiring complex whole-carcass disposal.	Scientific Slow-Down vs. Rapid Removal (Sanitation).	Rescue Intervention	Network Mobilization: Utilization of the Petrobras partnership (cranes, backhoes) to manage mass in sensitive urban zones.
DE11	IBJ / Whale Calf / Marine	Dependent calf stranded alive in "The Bosque" dry area; survival impossible.	Natural Starvation (No-action) vs. Protocolized Euthanasia (Science).	Euthanasia Intervention	Equipment: Use of a 1.5m heart needle for intracardiac injection to ensure diagnostic data gain before autolysis.

ID	Context (NGO/Taxon/ Biome)	Episode Description	Core Dilemma / Trade-off	Decision	Operational Details & Evidentiary Anchors
DE12	IBJ / Whale / Urban	Stranding event with physical threats and shouting from an aggressive crowd.	Expert Control (Protocol) vs. Withdrawal (Conflict Avoidance).	No Intervention	Safety Filter: Technical lead withdrew team when public aggression compromised the safety of the human infrastructure.
DE13	Onçafari / Jaguar / Pantanal	Orphans found in 2014 after a botched mother-rescue resulted in an overdose.	Permanent Captivity (Standard) vs. Experimental Rewilding.	Rescue Intervention	Moral Catalyst: Human-caused harm justified high-risk rewilding with live-prey training in massive enclosures.
DE14	Onçafari / Jaguar / Pantanal	8-month-old cub found losing weight after maternal abandonment.	Center Rehab (Safety) vs. Postponed Action (Naturalism).	No Intervention	Capacity: Cub left in wild because local enclosures were full; prioritized species naturalism over individual safety.
DE15	Onçafari / Jaguar / Pantanal	Jaguar ("Itapira") found with severe paw burns following the 2024 massive wildfires.	Natural Selection vs. Intervention (Anthropogenic Harm).	Rescue Intervention	NASA Anchor: Satellite data confirmed habitat area was 90% burned; transferred to distant specialized hospital.
DE16	Onçafari / Puma / Pantanal	High-velocity rescue of a puma in a biome with high territorial pressure.	Standard Protocol vs. Adaptive Capacity (DV7).	Rescue Intervention	Adaptive Tool: Used "drop-off collars" to mitigate the risk of the organization's own intervention imposing wild setbacks.
DE17	ITA / Macaw / Cerrado	Nest chick attacked by aggressive bees during a tourist tour with children.	Biological Urgency (Chick) vs. Safety of Public/Team.	Rescue Intervention	Safety: Rescue delayed for mobilization of bee gear; 30+ stings near eyes. "Danger for the kids" quote.

ID	Context (NGO/Taxon/ Biome)	Episode Description	Core Dilemma / Trade-off	Decision	Operational Details & Evidentiary Anchors
DE18	ITA / Macaw / Cerrado	Fledgling macaws at risk of drowning near a river with dangerous currents.	Active Save vs. Risk-Avoidance (Nature).	No Intervention	Safety Filter: River access deemed too dangerous for field staff; Gate 1 (Human Safety) closed the intervention window.
DE19	ITA / Macaw / Cerrado	Nest chick survived predation but found with invasive parasitic larvae ("lizards").	Removal for Rehab (Control) vs. Nest-based Treatment (Integrity).	Rescue Intervention	Behavioral: Chose in-situ antibiotic injections to prevent parental abandonment and human-conditioning "setbacks".

Table 5: Episode Reconstruction Template (Blank)

Analytical Section	Operational Context & Interpretation
1. Episode ID & Context	NGO; participant ID; episode title; species; location or environment
2. Triggering Situation	Initial alert, observed condition, urgency cues, reason the episode became relevant
3. Situational Conditions	Environmental, logistical, institutional, temporal, and resource conditions shaping the episode
4. Organizational Assessment	How the team interpreted the situation, monitored changes, consulted internally, and reassessed options
5. Key Decision Considerations	Main criteria shaping the decision, including safety, feasibility, animal condition, responsibility, and uncertainty
6. Operational Adaptation & Coordination	Coordination steps, external support, network mobilization, procedural adjustments, or improvised arrangements
7. Final Decision & Outcome	Implemented intervention, delayed intervention, monitoring, euthanasia, non-intervention, or other operational resolution
8. Retrospective Reflection & Learning	Lessons identified, changes in preparedness, revised routines, or future implications

Table 6: Sample Episode Reconstruction (DE15)

Analytical Section	Operational Context & Interpretation
1. Episode ID & Context	NGO: Onçafari
	Participant IDs: 8, 9
	Episode: Burned jaguar “Itapira” during Pantanal fires
	Context: Large-scale wildfire affecting approximately 85% of the Caiman region in the Pantanal
2. Triggering Situation	Field teams repeatedly observed a young female jaguar remaining immobile inside a drainage pipe for several days following the wildfire. Initial monitoring suggested severe paw burns, lack of movement, absence of feeding behavior, and deteriorating condition.
3. Situational Conditions	Extreme environmental destruction following wildfire
	Limited local veterinary infrastructure for severe burn treatment
	Time pressure due to worsening injuries
	Restricted intervention options during active fire conditions
	Dependence on external rescue and treatment partnerships
	Ongoing uncertainty regarding whether the animal could recover naturally
4. Organizational Assessment	Teams initially prioritized observation rather than immediate intervention because jaguars can often recover independently from injuries. Continuous monitoring, photographic assessment, veterinary consultation, and internal discussion gradually shifted the assessment toward intervention as the animal’s condition deteriorated and survival without assistance became increasingly unlikely.
5. Key Decision Considerations	Severity and progression of burn injuries
	Probability of survival without intervention
	Availability of personnel and transport capacity
	Lack of specialized treatment infrastructure on-site
	Stress imposed on the animal through capture and treatment
	Human-caused origin of the fire increasing perceived responsibility to intervene
	Feasibility of long-term monitoring after release
6. Operational Adaptation & Coordination	Onçafari coordinated with veterinarians, environmental authorities, and external rehabilitation partners to transfer the jaguar to a specialized treatment facility. Existing institutional relationships enabled rapid authorization and logistical coordination. The episode also accelerated longer-term preparedness measures, including fire monitoring routines, firefighter training, and later development of a wildlife hospital within the region.
7. Final Decision & Outcome	The organization decided to tranquilize and rescue the jaguar for intensive treatment. After approximately two months of recovery, the animal was released back into the wild with a temporary tracking collar to monitor post-release survival and mobility. Later, the collar was remotely removed after concerns emerged that continued growth could make it too restrictive.
8. Retrospective Reflection & Learning	Participants described the episode as a major learning experience regarding wildfire preparedness, burn treatment logistics, interorganizational coordination, and early detection systems. Teams emphasized that later preparedness improvements, including satellite-based fire monitoring, firefighting training, and expanded treatment infrastructure, emerged directly from challenges encountered during this episode.

Table 7: Semi-Structured Interview Protocol

Interview Stage	Core Objective	Indicative Guiding Questions
1. Episode Identification & Context	Establish the basic operational setting and relevance of the episode	“Can you describe a rescue episode that was especially difficult, uncertain, or operationally constrained?”; “What species, location, and environmental context were involved?”
2. Initial Situation & Trigger	Reconstruct how the situation first emerged and why it required attention	“How did the organization first become aware of the situation?”; “What were the initial signs, risks, or urgency cues?”; “What made this episode operationally significant?”
3. Situational Conditions & Constraints	Identify the operational, environmental, institutional, and logistical conditions shaping the episode	“What environmental or logistical conditions influenced the rescue?”; “Were there resource, coordination, staffing, or infrastructure limitations?”; “Did external institutions or actors influence the situation?”
4. Organizational Assessment & Sensemaking	Understand how the organization interpreted the situation and reassessed options over time	“How did the team initially interpret the situation?”; “Did assessments change as the episode evolved?”; “What information or uncertainties shaped the discussion?”
5. Intervention Considerations & Decision Process	Explore how options were evaluated, narrowed, or excluded	“What intervention possibilities were considered?”; “Why were certain options rejected or maintained?”; “Did previous experience, protocols, or partnerships influence what was considered feasible?”; “Who was involved in the decision, and how was decision authority organized?”
6. Final Decision & Operational Outcome	Reconstruct the implemented course of action and its immediate consequences	“What final decision was made?”; “How was the intervention implemented, delayed, modified, or abandoned?”; “What operational or biological outcome followed?”
7. Secondary Influences & Contextual Dynamics	Explore broader factors influencing persistence, feasibility, or organizational behavior	“Did public pressure, human involvement, or perceived responsibility influence the decision?”; “Did coordination problems or institutional conditions affect what remained possible?”
8. Retrospective Reflection & Learning	Identify organizational learning, adaptive changes, or later reassessment	“Looking back, would the organization approach the situation differently today?”; “Did the episode lead to procedural changes, new preparedness measures, or revised thresholds?”; “What lessons were learned from the experience?”