

Beyond the mission: designing marine pollution restoration through quest-based narrative in story-driven games

Ruiyang Ji

Capital Normal University High School, Beijing, China

ryan_ji2022@163.com

Abstract. Many environmental-themed video games ask players to repair damaged ecosystems. Too often, though, restoration work becomes nothing more than repetitive in-game chores. Players can finish every listed objective without truly understanding what environmental harm means for real people. This paper draws on its own hands-on development experience of the indie story-driven RPG *A Patch of Blue*, to explore how quest-centered storytelling can give environmental missions genuine emotional weight. In this game, the main character A Yuan, a young marine chemist, must travel to five underwater pollution hot-spots and deploy her self-made purification reagent. While this core task follows simple mechanical rules, its meaning unfolds through character bonds, environmental clues scattered across the world, and visible changes to ocean water itself. This study put forward a five-part analytical chain: Task Objective, World Crisis, Character Relationship, Action Process, and Result Feedback. Using this structure, this study argue that environmental quests work best when players grasp not just what they need to do, but why their actions carry importance. This paper also talks about real-world design trade-offs: how to keep narrative depth without taking away player freedom, and how to avoid presenting ecological recovery as an unrealistically easy fix.

Keywords: narrative design, quest design, environmental storytelling, meaningful play, marine pollution

1. Introduction

Human activity has severely harmed marine systems worldwide. Ocean acidification, plastic waste, and continuous chemical wastewater discharge destroy ocean habitats and hurt communities that rely on the sea for survival. These ecological harms happen slowly and spread across huge geographic spaces. For most people, the full human cost of ocean damage stays abstract. Someone can intellectually know pollution is bad, yet struggle to picture how it reshapes individual lives.

Video games offer one way to bridge this gap. Unlike documentaries or textbook readings, games let users walk through a ruined world and take direct action inside it [1]. Still, interactivity alone does not guarantee deeper understanding. Plenty of environmental-focused titles turn conservation into basic busy-work: collect items, travel to map markers, and receive rewards [2]. Under this design pattern, a mission named "Clean the Ocean" can be completed, while the player feels almost no personal connection to that ocean or the people suffering alongside it.

This issue matters especially for story-driven games. Missions in these games should deliver more than check-list progress. Restoration quests can touch on themes of personal loss, intergenerational responsibility, and human-ocean relationships. The hard part lies in weaving those themes into actual gameplay, instead of locking all meaningful ideas inside cut-scenes and dialogue boxes.

This paper uses a self-developed indie RPG *A Patch of Blue*¹ as its central case study. Set hundreds of years into the future, centuries of unregulated industry have turned most seas into what locals call the Crimson Sea. Water turns dark red, native sea life mutates, and marine food webs collapse. Protagonist A Yuan creates a purification reagent and dives down to five underwater pollution sites to release it. Along her journey, she hears her grandmother's recollections of healthy oceans, meets a coastal guardian permanently injured by polluted sea creatures, and finds a sunken research ship holding her late mother's final letter.

The main quest is therefore about far more than delivering a chemical solution. It links A Yuan's laboratory work to family memory and a broken living world. This analysis examines how designers can build those connections through quest goals, environmental storytelling, human relationships, and tangible in-game feedback. This study also discusses realistic limits of this design approach, and what challenges arise when building environmental quests that stay fun to play while keeping thematic honesty.

2. Research background and core concepts

2.1. Quest objectives and narrative meaning

Every game quest defines concrete actions for players to carry out. In *A Patch of Blue*, the central task is straightforward: reach five underwater locations and release purification agents. Players can clearly track their progress as each site gets completed.

Finishing those steps, however, does not automatically give the mission emotional significance. A player could deploy all five doses without learning why the ocean turned poisonous, why A Yuan devotes herself to this risky project, or what tragedy took her mother beneath the waves. Mechanically, the quest still functions. Narratively, much of its power disappears.

That separation matters. Giving a mission an environmental-themed title does not create meaningful storytelling. Simply labelling something "Restore the Ocean" cannot make players care about that ocean. Narrative weight emerges when objectives connect to the surrounding world, its inhabitants, and clear consequences for player actions [3].

Quest design and narrative design serve different jobs. Quest design governs player tasks and progress measurement. Narrative design supplies context and emotional stakes for those tasks. Strong environmental games need both layers working together.

2.2. Environmental storytelling beyond dialogue

Environmental storytelling holds particular value for ecology-focused games. The landscape itself becomes part of the story [4, 5]. Ruined surroundings can communicate ideas that would otherwise demand long blocks of written exposition.

Inside *A Patch of Blue*, polluted reddish seawater, wrecked vessels, and altered sea creatures all show ecological collapse. The game does not need constant lines of text telling players "the ocean is dangerous".

¹ A Patch of Blue, Mr.Weimeng, 2026, RPG maker

Visual appearance and creature behaviour already deliver that message.

The same logic applies to personal human stories. A sunken research ship hints at a fatal expedition long before players read a single hand-written note. The injured body of the coastal sea-guardian demonstrates pollution's lifelong harm better than pages of statistical description. Good environmental storytelling lets players uncover information while chasing practical, in-game goals.

2.3. Meaningful Play in environmental quests

Meaningful play describes moments where player choices matter for reasons beyond score-points or loot. For environmental games, that means prompting players to reflect on pollution damage, the real costs of restoration, and how human behaviour shapes natural spaces [6].

This does not mean every environmental game needs heavy tragedy or moral complexity. It only asks that ecological themes tie directly to what players actually do. In *A Patch of Blue*, purification work links to family legacy and coastal community survival. Players are not merely cleaning contaminated water. They continue unfinished work left behind by earlier generations.

Combining quest design, environmental storytelling and meaningful play creates a useful analytical toolkit for studying how games communicate environmental ideas.

3. Analytical framework: how environmental quests gain narrative meaning

This paper creates a five-step analytical chain for environmental quest narrative design:

Task Objective → World Crisis → Character Relationship → Action Process → Result Feedback

(1) Task Objective: The concrete operation the player must complete. In *A Patch of Blue*, this is deploying five purification agents at designated underwater sites. This is the mechanical layer of gameplay.

(2) World Crisis: The global context that makes the task necessary. The world of *A Patch of Blue* suffers from three hundred years of industrial pollution, ocean acidification, and the Crimson Sea. Marine life mutates and attacks humans. The ocean, once a partner of humanity, has turned hostile.

(3) Character Relationship: Personal human stakes tied to the large-scale crisis. A Yuan's mother died trying to save the sea. Her grandmother watched the ocean fade year by year. The sea guardian lost part of his body while defending the coast from mutated creatures. The grand ecological disaster becomes personal loss, not just abstract statistics [7].

(4) Action Process: How exploration, combat and discovery happen during the mission. The player does not simply teleport to each site. Players swim through sunken wrecks, fight mutated sea creatures, find old letters, and talk with survivors along the way. Every obstacle and discovery reinforces the reason for the purification work.

(5) Result Feedback: Visible, sensory change after completing the task. When players finish deploying the reagent, the red, murky seawater gradually clears. Sunlight penetrates the water, blue waves return. This visual shift is the most direct proof of the player's action, rather than just a text pop-up that says "mission complete".

This framework explains how a basic technical task can grow narrative weight. The mechanical action of releasing chemical agents is anchored by world crisis and personal grief, and validated by tangible environmental change.

Based on the experience designing *A Patch of Blue*, this study developed a five-part framework to examine how environmental quests connect gameplay with narrative. The framework is intended as a practical design tool rather than a universal model of environmental storytelling. It follows the relationship between what the

player is asked to do, the situation that makes the task necessary, the characters affected by it, the way the player carries it out, and the changes that follow .

4. Case study: *A Patch of Blue*

4.1. The main quest and its setting

Players control A Yuan, a young marine chemist raised by her grandmother. Her mother, also an ocean researcher, perished long ago inside polluted waters. A Yuan invents a purification reagent and sets out alongside her companion Lan to treat five major underwater pollution hot-spots. Deploying that reagent forms the backbone of the main quest.

Important story moments unfold through gameplay progression, instead of one long opening info-dump. One pivotal scene takes place right after defeating the giant mutated soft-shell turtle boss. After this difficult fight, players gain access to a previously blocked sunken ship.

As lead developer, A Yuan's mother's final letter was chosen to place inside this wreck for two key reasons. First, players are wanted to witness real sacrifice from earlier generations of ocean researchers. The letter connects A Yuan's present-day work to past failed expeditions; her mission is not some isolated scientific breakthrough. Second, this document reveals intimate family heartbreak. Players learn not only about a lost research trip, but read a last private message left by her mother. That absence has shaped A Yuan's whole life.

Timing proved critical for this design choice. Players enter the wreck immediately after high-stress combat, when exploration becomes possible. They stumble across the letter naturally while moving through wreckage. No forced cut-scene interrupts quest flow. Emotional layers of the main mission surface through player-driven discovery.

4.2. the Sea guardian and intergenerational memory

The optional side quest *A Patch of Blue* introduces an ageing sea-guardian who has defended the shore for decades. Toxin from mutated octopuses left lasting physical damage. Part of his leg loses feeling; his body grows extra features including a sixth toe. Even in cold winter weather, he constantly overheats.

These physical marks make pollution's harm visible on one human being. More importantly, the guardian holds conflicting feelings toward the ocean. He remembers the healthy blue seas of his childhood, yet spends every day fighting mutated creatures crawling toward land. He loves what the ocean once was, while resenting its current destructive form.

His viewpoint broadens the narrative beyond A Yuan's family circle. The ecological disaster is not just a scientific problem or private family tragedy [8]. It reshapes ordinary people's daily existence. Listening to his story also pushes players to see mutated sea creatures as more than generic combat obstacles.

Grandmother's quiet domestic conversations serve another storytelling purpose. Her nostalgic descriptions of ancient blue oceans contrast sharply against dark, oppressive underwater environments. A Yuan pursues restoration not purely out of scientific curiosity. She chases a world her family once knew and lost.

4.3. The mutated turtle as a narrative encounter

The giant soft-shell turtle functions as a boss battle, yet its role extends past simple combat gameplay. This same category of mutated sea creature killed A Yuan's mother years before.

That historical link gives the fight deeper narrative meaning. The turtle embodies damage brought by human-caused ocean collapse. It acts as an antagonist in gameplay terms, yet it is itself a victim of the

Crimson Sea. Players are not fighting some inherently evil monster. They confront one painful outcome of long-term pollution.

The battle also draws a line between past and present. Players face exactly the same threat that defeated A Yuan's mother decades earlier. This single fight becomes one chapter within a long record of failed ocean-restoration attempts.

4.4. Result feedback and the patch of blue

The final environmental feedback in *A Patch of Blue* was designed around a simple visual idea: the seawater should turn blue after the player completes the purification mission. The game designer chose this change because it is immediately understandable and easy for players to recognize. Rather than relying on a message such as "mission complete", the game shows the player that their actions have changed the environment [9].

The final sequence is presented through three illustrated frames. The first frame shows the area around the island where A Yuan is standing. After the five purification agents have been deployed, the nearby seawater has turned blue. The second frame pulls the camera slightly farther away, revealing that the surrounding ocean is still red. In the final frame, the camera moves farther out again. The player can see that most of the distant ocean remains crimson, while only a small area near the island has been restored.

This three-frame progression was a deliberate artistic and narrative decision. The first frame gives the player a direct sense of achievement: the place they have worked to restore is visibly different. The second and third frames then expand the player's perspective, showing the limits of that achievement. The restored water is only a small part of the larger ocean, and the wider ecological crisis has not disappeared.

The final sequence also connects to the emotional purpose of the mother's letter. The letter shows the sacrifices made by an earlier generation of researchers, while the ending shows what A Yuan has managed to accomplish in the present. The blue water represents the possibility of continuing that work, but the surrounding red ocean reminds the player that the problem is far from solved.

The final line, "Do not wait until the sea turns red to save it", reinforces this contrast. The player has created a patch of blue, but the larger ocean remains damaged. Restoration is possible, yet the scale of the remaining pollution makes clear why prevention matters.

5. Discussion: balancing gameplay and narrative

Design choices around the sunken-ship letter and multi-frame ending illustrate how narrative meaning grows from when and where players uncover information. Finding the letter after turtle combat retells A Yuan's whole project. Her work is no longer only releasing lab-produced chemicals. It carries forward lost efforts of prior researchers, including her own mother. That emotional layer emerges without long pre-mission monologues.

The ending sequence works differently. It introduces no new character dialogue. Instead, it alters players' spatial understanding of the game world. Initial local success gives satisfaction; wider zoom-out reveals unfinished damage. This balance matters. The game rewards player labour without selling the unrealistic fantasy that one short mission can reverse centuries-long harm.

These two design cases highlight tensions between narrative density and playable experience. The mother's letter sits inside optional wreck exploration. Players rushing straight through main objectives still witness the restored ocean ending. Those who choose to explore unlock fuller family back-story. Spreading story content across mandatory and optional paths accommodates different play-styles [10]. Not every narrative beat must force itself onto every user.

6. Conclusion

Building environmental-themed quests does not automatically create meaningful commentary about nature. Even missions labeled "ocean protection" can reduce to mindless check-list tasks. The case study of *A Patch of Blue* shows how quest-based storytelling gains power when mechanical objectives connect to real-world crisis, human-character stakes, player action, and visible in-world environmental change.

The five-part analytical chain (Task Objective, World Crisis, Character Relationship, Action Process, Result Feedback) offers a practical tool for analysing this design relationship. A simple reagent-deployment quest expands into commentary on ecological loss and cross-generational responsibility. Side perspectives such as the sea-guardian and grandmother's memories add layered human viewpoints onto one shared catastrophe.

The ending deserves special attention. It refuses to present total, perfect recovery. That small patch of blue counts as genuine progress, yet sits inside a still-broken global ocean. Hope and limitation co-exist: individual effort can improve local conditions, yet cannot fully undo centuries-worth of destruction.

Future environmental-focused games could extend this design framework. Designers might explore trade-offs between marine conservation and local economic needs, community disagreements over restoration strategy, or slow, gradual ecological healing instead of instant visual fixes. Such ideas help move past simplistic "clean-the-polluted-world" fantasy and confront hard real-world decisions around ocean protection.

When environmental storytelling integrates directly into what players actually do, restoration stops being just a quest checkbox. It lets users feel ecological loss first-hand, and understand why prevention matters long before seas turn crimson.

Beyond game design itself, this study also reminds us of the limits of fictional solutions. *A Patch of Blue* gives players the power to purify a small patch of sea with one set of reagents, but real-world marine repair has no quick-fix tool. There is no single hero, no perfect chemical formula, and no short quest that can erase hundreds of years of human-caused damage. Real-world ocean protection relies on continuous, collective effort passed across generations, just as reflected in the bond between A Yuan and her mother. Interactive games cannot solve actual pollution, yet they can change how players think [11]. By letting us live through loss, hope and incomplete victory, environmental-narrative games turn abstract environmental data into personal feelings. They invite young audiences to reflect: superpowers are not required to care for the ocean. Awareness, memory, and long-term commitment are already the most valuable resources. In the end, the true goal of such games is not to finish a restoration quest, but to inspire people to value the real blue sea before it fades away.

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