“Sorry we ain’t got any flowers”
The Biodiversity of *Dr. No*

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The environmental aspects (atmosphere, elements, and natural resources) of the Bond novels and films have already been discussed at some length. For example, Lisa Funnell and Klaus Dodds (2017) document how Bond uses the elements to secure victory over villains who manipulate and engineer the environment for their schemes. A strong example of this comes from the filmic *Moonraker* (Gilbert 1979) when Hugo Drax attempts to use a rare species of orchid to poison and eliminate the entire human race, only to be shot by Bond with a poisonous dart at the film’s climax and ejected into the elemental vacuum of space (Funnell and Dodds 2017, 18). Drax’s scheme relies on the conservation of animal and plant life during the recolonisation of earth, as these would have been untouched by the orchid-derived nerve gas. Drax’s appreciation of the crucial role of nature and ecosystems is quite at odds with those villains who seek to exploit it, such as Dominic Greene in *Quantum of Solace* (Forster 2008). As such, Drax could be considered the first major villain in the filmic Bond series to privilege the conservation of biodiversity over the preservation of humanity.

The word “biodiversity” first appeared in publication in Edward O. Wilson’s book of the same name. At the United Nations Convention on Biodiversity in 1992, the term was defined as “the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosys-

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tems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems" (Titley, Snaddon, and Turner 2017, 2). An "ecosystem", meanwhile, is a community of animals, plants, micro-organisms, non-living things, and their shared environment. Generally, biodiversity relates to the variety of animal and plant life in ecosystems, and is typically measured in terms of the diversity or number of species present (ibid.).

In most regions of the world, a high level of biodiversity is the goal of conservation action, and ecosystems are actively managed to increase the number of species wherever possible (Bonn and Gaston 2005). Writing in the 1950s at his Jamaican winter home, "Goldeneye", Ian Fleming was able to capture the natural biodiversity of the area. Fleming's dives and swims at "Goldeneye" gave him a unique insight into the marine ecology of the Caribbean. The name "James Bond" was even taken from an ornithologist of the same name, who published *Birds of the West Indies* in 1936. Fleming's novel *Dr. No* (1958), is set primarily on a fictional island – Crab Key – in the Caribbean, and is inhabited by the eponymous villain. While in the novel the island functions as a bird preserve and guano quarry, in the film it is presented as a used bauxite mine, reflecting the changes to Jamaica's industrial landscape in the 1950s (Berglund and Johansson 2004). In hiding behind the pretence of guano or bauxite mining, Dr. No is able to plan the toppling of the American missiles at Cape Canaveral.

A hitherto undiscussed aspect of the Bond franchise is the way in which biodiversity is portrayed within the novels and films. Fleming's novel *Dr. No* and the subsequent film adaptation (released in 1962) reflected the state of Jamaica's ecosystems in the 1950s and 1960s, where natural forest cover fell from 319,800 ha (c. 29% of land cover) in 1954 to 260,869 ha (c. 24%) in 1968 (Evelyn and Camirand 2003). Much of this forest loss was due to open-pit bauxite mining (Berglund and Johansson 2004). Dr. No's ruthless pursuit of his nuclear ambitions – like the powerful mining companies who destroyed ecosystems for commercial gain – shows little regard for wildlife on the swamp where vegetation is burned by his dragon tank. This is very much in keeping with the reality of Jamaican ecosystem destruction of the time. In the novel, Dr. No's guano mine and his contempt for the bird reserve illustrate his pitiless regard for the natural world as something to be exploited or destroyed, when necessary. Dr. No's actions justify the need for interventions by Bond and conservation organisations such as the National Audubon Society (NAS) to protect the natural environment.

The modern conservation movement was born in the 1950s, and Fleming's novel includes an NAS bird reserve on Crab Key. Conservation is in direct conflict with Dr. No's secretive activities, and ultimately leads to his defeat by

Bond after he has two ornithologists murdered. By the 1950s, the NAS was involved in a high-profile campaign against the pesticide DDT, which culminated in the publication of long-standing NAS member Rachel Carson's book *Silent Spring* in 1962 (the year the filmic *Dr. No* was released). Fleming, as a keen birdwatcher, would have been aware of the activities of the NAS at a time when the concept of anthropogenic harm to ecosystems was beginning to enter the public's consciousness. In the novel, M's diatribe about the NAS – "People start preserving something – churches, old houses, decaying pictures, birds – and there's always a hullabaloo of some sort. The trouble is these sort of people get really worked up about their damned birds" (Fleming 1958, 24) – presents a rather reactionary view of the need for the conservation of heritage or biodiversity. This rant may have been Fleming's self-deprecating humour in mocking his own interests in natural history, but it also reflects a resistance to the new-found awareness of wildlife protection and the laws necessary to enforce the protection of rare species.

Rare species are often the basis for the selection of conservation nature reserves and for legal protection (Dudley 2008). Fleming's use of the NAS bird reserve – the Roseate Spoonbills (*Platalea ajaja*) play a key plot device in the novel that brings Bond to Crab Key – highlights the importance of rare species in the selection of important biodiverse areas. The global conservation movement has only recently moved towards the protection, management, and restoration of whole ecosystems to conserve biodiversity, in addition to focusing primarily on single species (Dudley 2008). Had it been written in the twenty-first century, perhaps Fleming's novel would have been more concerned with the conservation of entire ecosystems such as mangrove swamps and rainforests.

The growing threat of anthropogenic climate change was also unheard of in the 1950s, but today the biodiverse ecosystems of Jamaica are expected to be affected by increased hurricane intensity (there were five in the period 2001 to 2012), warming ocean temperatures, and rising sea levels (Government of Jamaica 2015). The removal of coastal habitats such as forest, mangroves, seagrass meadows, and swamps has rendered Jamaica's coast increasingly vulnerable to hurricane damage (ibid.). The destruction of coastal forests in the 1950s and 1960s by mining corporations would have decreased the important buffer zone that protects inland areas from flooding. The loss of forests would also have reduced carbon sequestration, contributing to the warming of the atmosphere. Indeed, global surface temperatures have risen dramatically since the 1940s and

1950s, coinciding with the major landscape change documented in Fleming's novel.

In this short review, I will document the biodiversity in the novel and filmic versions of *Dr. No* using a simple taxon counting metric to assess how influential aspects of Jamaica's wildlife is in their respective plots. The attitudes of major characters to biodiversity and how wildlife is utilised by them will also be discussed in relation to the changing landscape of Jamaica in the 1950s and early 1960s.

Biodiversity is often measured in the ecological sciences using species richness; that is, the number of species in a geographical area or ecosystem (Spellerberg and Fedor 2003). Species richness, for example, can be calculated for an ecosystem such as swamp, an entire country, or simply a 1x1 metre area known as a "quadrat" used for monitoring plant populations. The assumption is that an area with a higher species richness is more biodiverse than one with a lower number of species. This should be cautiously interpreted, as sometimes an area with low species richness is not always of low conservation importance (e.g. acid bogs are not species-rich but are important due to their rarity as a habitat). Where identification to species level is difficult, higher classification levels (e.g. class or order) can be used in richness calculations (Alroy 2020).

To determine the approximate taxon richness of the novel, I searched an online version of *Dr. No* for all references to wildlife orders (e.g. *Orthoptera*: grasshoppers and crickets; or *Coleoptera*: beetles, including fireflies), including those occurring in the plot or mentioned by main characters. Order is midway through the classification structure of the different natural kingdoms (kingdom > phylum > class > order > family > genus > species) and is deemed a suitable level of identification for animals and plants found in the novel and film where detailed nomenclature (e.g. to family, genus, or species) is necessarily absent. This follows procedures in biological recording schemes where animals and plants are classified at class, order, or family levels, where it is difficult to determine an organism to genus or species (Ojija, Gebrehiwot, and Kilimba 2017; Gooliaff and Hodges 2019). There is also a high chance of misidentification to species level from video imagery or photographs where similar species occur or high quality images are not available (Mckibben and Frey 2021). Therefore, a safer method is to classify animals or plants to a higher taxonomic level (such as order) to provide a broad assessment of the taxon diversity present.

For the filmic *Dr. No*, I used the same approach, noting the number of references to wildlife orders either mentioned verbally or seen on screen. The differing format of the film obviously led to problems in identifying every single

wildlife order seen, the denseness of the forest making it hard to ascertain to which order a tree belonged or the nondescript calls of crickets. However, it was possible to identify some trees from different orders in each scene, mainly species of mangrove and palm (Powell et al. 2015). The total number of taxon references were then totalled and used to compare novel and film to determine how biodiverse each one is. It should be noted that the total number of wildlife order references counted for novel and film is only an approximation and that some occurrences may have been missed in both formats. References to wildlife in food and drink (e.g. lime in Bond's gin and tonic) or character names (e.g. Sisters Lily and Rose) were excluded from the analysis as they were not direct references to wildlife.

To summarise, the following criteria were used to count wildlife orders in novel and film:

1. Only plants and animals included in count
2. Plants and animals identified to their classified order
3. If a plant or animal related to food, drink or a character name it was excluded
4. Plant or animal must be mentioned in plot or by characters in novel
5. Plants and animals seen or heard in film included

Both the novel and film of *Dr. No* are set in the tropical climate of the Caribbean. Tropical regions are typically highly biodiverse because evolutionary rates and ecological processes are faster at higher temperatures (Brown 2014). This leads to a high number of ecosystems in both novel and film, with a strong presence for mangrove (Dr. No's swamp), marine (Crab Key beach), and rainforest, all of which Bond inhabits. A seagrass meadow of Turtle Grass (*Thalassia testudinum*) appears in the novel as Bond and Quarrel arrive at Crab Key but is absent from the film. Similarly, Dr. No's lair in the mountain is only used in the novel. The bird reserve with the Roseate Spoonbills is also absent from the film, despite being integral to the plot of the novel. Urban habitats also feature in both the novel and film and typically have a range of commonly observed Jamaican insects such as singing crickets and abundant birdlife – although it is impossible to determine which species were used to create the sound in the film. However, the film diverges from the novel with some of the invertebrates that Dr. No uses to try to kill Bond. Notably, the centipedes of the novel are replaced by a tarantula in the film, and Honeychile Rider of the novel is threatened by crabs in Dr. No's lair

that do not feature in the film: instead, Ryder is tied up in a chamber filling with water. Plants are most prominent in both formats.

Table 1. The biodiversity profile of novel and film

	Novel	Film
Climate	Tropical	Tropical
No. ecosystems	14	13
Total wildlife orders	57	15
Total wildlife order references*	407	71
Key ecosystems	Littoral, mangrove, marine, mountain rainforest, seagrass, swamp, urban	Littoral, mangrove, marine, rainforest, swamp, urban
Key wildlife orders	Bird, centipede, crab, cricket, fish, reed, sea snail	Bird, crab, cricket, fish, reed, sea snail, tarantula

*estimate of the total wildlife orders referenced

In total, there are 407 references to wildlife orders in the novel (57 orders) which compares with 71 (15 orders) for the film. This reveals a higher biodiversity for the novel compared to the film – not surprising given the higher number of wildlife orders mentioned and overall references. Fleming's eye for detail is based on his intimate knowledge of Jamaica and its ecosystems. In the novel, species from the different orders are non-threatening (Quarrel refers to "blink-a-blinks", which are fireflies) or threatening (black crabs, centipedes, squid, and tarantulas). Sea snails (mainly present in the form of Ryder's conch shells) are typical tropical crustaceans and would have been well known to Fleming through his swimming and diving pursuits. There is relatively even coverage of wildlife in the novel, with 206 references to vertebrate animals (50.6%), 129 to invertebrate animals (31.7%) and 72 to plants (17.7%). Predictably, avian animals feature strongly in the novel (127 references, 31.2% of total) due to the NAS bird reserve on Crab Key from which Dr. No's dragon tank attempts to keep visitors away, as do fish (54 references). Sea snails (conch shells; 33 references) and a variety of threatening invertebrate species (centipede, crab, and spider) have prominence at various stages of the plot (e.g. Dr. No's centipede or Ryder's conch shells). Plants feature a little less prominently in the novel, although mangrove (38 references) is conspicuous due to Dr. No's swamp on Crab Key that it inhabits. Bond's use of bam-

boo in the novel to breathe underwater is an innovative method of escaping Dr. No's guards in the Crab Key swamp.

The filmic version has far fewer references to wildlife, beyond the landscape shots we see in Jamaica and on Dr. No's Crab Key island. Omission of certain elements of the novel plot reduces the reliance on wildlife to convey the narrative (e.g. Dr. No's centipedes and crabs are missing from his filmic Crab Key lair). However, birds are still the most commonly mentioned vertebrate (11 references) and singing crickets the most notable invertebrate (16 references). Mangrove and palm trees are widely referenced too, with 25 scenes having the latter in them while the former species is noted in Dr. No's swamp. Ryder's sea shells are shown in several significant scenes on Crab Key, including where she spots sea tulip shells in Dr. No's aquarium. On Crab Key beach, filmed at Laughing Waters and Dunn's River Falls on the north Jamaican coast, individual plant species are noteworthy on screen. When Dr. No's guards appear in the gunboat, Bond, Quarrel and Ryder hide under a Sea Grape (*Coccoloba uvifera*) bush, while the red flowers of Ginger Lily (*Alpinia purpurata*) are notable as they climb the waterfall. The travertine limestone and tufa terraces are evident in the film, while Bond and Ryder wash in one of the pools typical of this kind of coastal river. The use of Dunn's River Falls as a filming location is in keeping with the geological plotline; it provides the viewer with a glimpse of the underlying geology of Jamaica on which the lush forest vegetation proliferates. The biodiversity of the novel, and to a lesser extent the film, then indicates a natural element integral to Bond's mission, in which the biodiversity of the tropical Jamaican setting is hard to ignore. It is also harnessed by Bond (bamboo or reeds to breathe underwater), Ryder (collecting shells brings her to Crab Key), and Quarrel, who is a keen fisherman.

Nature is carefully used in both novel and film to outline the consequences of failure in Bond's mission to defeat Dr. No. The bleakness of the mangrove swamp merely illustrates the desolation that the megalomaniacal Dr. No is willing to create in his drive to conquer nature for personal gain. In the film, his dragon tank burns the vegetation of the swamp to deter visitors from investigating his operations on Crab Key. This is symptomatic of Dr. No's desire to accrue capital without allegiance to any political power ("east, west, just points of the compass, each as stupid as the other"). In the novel, his guano-harvesting operation is undoubtedly a capitalist enterprise at odds with the high biodiversity of its surroundings. In the film, Dr. No's bauxite mine poses a threat to the biodiverse setting of Crab Key as it invariably involves deforestation. Bond's attitude to bio-

diversity is also negative, reflecting the general hostility to nature of the male characters in the novel and film. In the novel, Bond describes Dr. No as a "giant venomous worm" (111) and is constantly threatened by nature. To Bond, nature is seen as a threat; sharks, spiders, centipedes, and crabs are potential hazards to be overcome to succeed in the mission. In the filmic version, nature is no less threatening to Bond, who must overcome the desolation of the mangrove swamp to avoid the guards with dogs, only to be captured by Dr. No's dragon tank and brought into the villain's palatial lair for questioning. In Quarrel, a stereotypically pastoral character, superstition creates an irrational fear of nature, and Quarrel is portrayed as simple-minded in comparison to Bond's cynical, city-dwelling attitude. Undoubtedly, both novel and film portray Bond, a white colonial figure overcoming the biodiverse environment in a way that the Cayman Islander, Quarrel, cannot. For Quarrel, elemental factors from the biodiverse Crab Key create fear, such as the fire from Dr. No's dragon tank. Bond simply dismisses the dragon as a legend by noticing the tank tracks in the film. Fire is portrayed as damaging to the vegetation of the marsh and swamp in both the novel and the film through the reduction of the marshland landscape to a few burned bushes. Charcoal burning of mangrove is currently associated with environmental decline in Jamaica (Chidumayo and Gumbo 2013), but the effect of burning on the ecology of ecosystems was not really well studied by ecologists before the 1950s (Steers et al. 1940).

Honey Ryder, as the female protagonist in the film, has a more positive view of biodiversity, reflected in her interest in diving and collecting shells. Her attitude to biodiversity is akin to an environmental protector aligned with the marine setting she exploits. Ryder has an almost child-like wonder at the world, in contrast with Bond's melancholic and world-weary view. This may be due to the relative lack of capitalist influence in her life compared with that of Dr. No and Bond, who each exploit the environment to accomplish their own goals. Bond's attitude softens when he meets her and Honey subsequently educates Bond on Jamaica's biodiversity before they traverse the mangrove swamp in both novel and film. This contrasts with Ryder's naivety concerning the intentions of male characters. Despite Ryder's influence, Bond retains a city-dweller's cynicism to myth in the film ("it's running on a diesel engine, so you can forget about dragons"), and a misogynistic attitude at dinner with Dr. No ("there's no point involving the girl at this stage"). Dr. No's arrogance leads him to believe he has control over nature; his dragon tank and its associated legend is used to disturb birds, murder ornithologists trying to conserve them, and burn vegetation. Dr. No openly admits that Crab Key is a disposable asset that he will destroy, pre-

sumably eradicating biodiversity at the same time. The antagonist's contempt for biodiversity extends to the use of species not native to Jamaican to assassinate Bond, most notably the tarantula in the film. These out-of-place species represent the villain's lack of regard for the natural world, and reflects the early conservation movement's ignorance of the impact of invasive alien species on natural ecosystems, where they can outcompete native species (Mooney and Cleland 2001).

However, Dr. No's attitude to biodiversity is contradictory. Having captured Bond and Ryder in the film, Dr. No shows off his aquarium two hundred feet below sea level, focusing on its high expense ("one million dollars, Mr. Bond"), while Bond provokes ("minnows pretending they're whales, just like you on this island, Dr. No"). Later, over dinner the impressive aquarium forms the backdrop to Dr. No's exposition to Bond; Dr. No's folly is his belief that nature can be treated as a commodity and controlled for human exploitation. Ultimately, Dr. No's hubris contributes to his downfall when, in the novel, he is killed by being buried alive in guano – environmental justice, to some extent, over capital interest. In the film, Dr. No is boiled alive in the reactor pool, an elemental demise revealing that his adaptive metal hands and belief in nuclear power are misplaced. The film presents a precautionary view of nuclear power and the dangers associated with its exploitation. The destruction of Hiroshima and Nagasaki by nuclear weapons in 1945 illustrated the human and environmental cost of atomic energy. The film portrays nuclear power as a resource to be harnessed by megalomaniacs such as *Dr. No*. The radioactive rocks of Crab Key collected by Strangways suggests that Dr. No's operations were already having an impact on the environment of the island long before Bond investigates. After Bond and Ryder are captured in the swamp, Geiger counter readings reveal their radioactivity from exposure in the contaminated wetland. They consequently pass through decontamination before being allowed entry into Dr. No's lair. It appears that Dr. No's operations led to radioactive leaks into the local environmental to the detriment of its biodiversity. The destruction of the Crab Key nuclear reactor at the film's climax possesses an immense risk to biodiversity with the likely release of more radiation into surrounding forest, marine, and swamp ecosystems. While Bond could be viewed as an environmental protector due to his defeat of Dr. No in the film, the wilful destruction of the reactor proves this comes with a negative environmental cost.

The incorporation of ecological and geological aspects provides a strong sense of place for the film's action. The film would set the standard for many of those that followed, such as the biodiverse landscapes in *Thunderball* (Bahamas; marine) and *You Only Live Twice* (Japanese; forest and marine) of the Connery era. The loss of biodiverse ecosystems as depicted in *Dr. No* has implications for climate change now, due to increased deforestation, coastal erosion, and reduced carbon sequestration. Fleming was therefore quite innovative in incorporating the environmental issues of the time in his presentation of the proto-modern conservation movement.

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