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Essay

Birds and People: A Symbiotic Relationship in Practice

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Simple Summary: The paper discusses the changing relationships between the human and avian populations on a small Scottish island, Fair Isle, following the establishment of a bird observatory on the island in 1948. The opening of the first observatory saw a significant increase in the number of birdwatchers visiting the island and interacting with the small resident population (50 people) and with the resident and migratory avian populations. Over the period since 1948, several versions of the Observatory have provided economic viability that has stabilised and increased the permanent human population and resulted in a positive relationship between both avian and human populations on the island. Part of the island has been made a Site of Special Scientific Interest, agricultural practices have been modified to accommodate resident and migratory birds, the Observatories have engaged in scientific research, and services for residents and visitors on the island have been greatly improved. The relationship between the human and avian populations can accurately be described as symbiotic because all populations have benefitted from the changes over the past six decades.

Abstract: This Special Issue of *Birds* is focused on a number of ways in which people and birds interact with nature, and the example discussed here incorporates four of the seven relationships noted. These are: how birds and birding connect people with nature, the role of communities in the study and conservation of birds, the involvement of people with professional ornithologists, and citizens' perception and knowledge of birds. The island of Fair Isle provides the location for the examination of these relationships, illustrating the positive interaction between the two human populations of the island and the two avian populations. It is based on fieldwork and literature studies conducted at intervals over a sixty-year period and a review of written and photographic evidence dating back to the beginning of the twentieth century. The purpose of the paper therefore, is to discuss how the relationships between the human and avian populations of the island have changed over time to a more positive and mutually dependent relationship, which is somewhat unique and can be described as symbiotic.

Keywords: symbiotic relationship; fair isle; ornithology; bird observatory; cooperation

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1. Introduction

Relationships between humans and bird populations have traditionally often been competitive and consumptive, with birds being viewed and used as food and revenue sources, in some cases, such as the dodo and passenger pigeon, being consumed and hunted to extinction. In recent decades, major efforts have taken place to preserve biodiversity, including birds and their habitats, and most populations are shielded from at least excessive use, leading to their disappearance. As ornithology and bird watching have increased in participation over the last century, new relationships have emerged [1]). The increased attention being paid to birds has seen the emergence of a range of interests [2,3], such that Oddie [4] identified five sub-species of bird watchers: ornithologist, bird spotter/fancier, birdwatcher, birder, and twitcher. He summarised their primary motivations in participation as the following: for the Ornithologist, a scientific approach; the Fancier—someone who likes birds; the Watcher as someone who observes birds; the Birder, who seeks out, identifies, "collects" bird species; and the Twitcher, who lives to "collect" new species.

Therefore, birdwatchers have multiple motivations and attitudes [5,6], the only one in common to all being an interest in birds. In one form, ornithology, is a scientific pursuit involved with the habitat, ecology, physiology, and behaviour of birds, and while its adherents do not normally put the recording of a new species as their primary motivation, it would be surprising if they did not acknowledge some measure of satisfaction at adding a new species to their list(s), particularly if this was a first record or a "mega-rarity" (recorded less than ten times in the United Kingdom). At the other end of the spectrum are people who simply like birds and watch them when engaged in other activities, where bird watching is not the primary purpose.

While one can reasonably assume that all such parties are supportive of birds and their existence, their behaviours may also constitute threats of varying significance to the well-being of some species, particularly rare migrants [7,8]. The following comments illustrate what can happen when someone discovers a "mega rarity".

"I was absolutely thrilled. I expect that it's every birder's dream to discover a new species for their country, and adding Cape May Warbler to the Irish list was a very special experience for me. I wanted other birders to have a chance to see this beautiful bird as soon as possible. I also spread the word online, asking visitors to respect the fact that the bird was on private property. Despite Achill's remote location, about 30 birders from across Ireland got to see it that afternoon" [9].

This captures both the thrill and excitement for the individual and also the fact that a considerable number of additional viewers were attracted to the site to observe the bird, inevitably involving some disturbance, at least of the bird and possibly the landowner of the property involved. Citing this example is certainly not to criticise the individual's actions nor of those of responsible birdwatchers, and indeed this author admits to similar behaviour on a number of occasions, but to acknowledge that even the most avid supporter of birds can create a situation not of mutual benefit to birds and humans [10].

The twentieth century, therefore, has seen an increase in the range of attitudes towards birds depending on individual, social, and economic circumstances, with the leisure/tourism aspect of birdwatching assuming increasing economic significance in some locations [11], including the setting of this paper. Thus, birdwatching in its varied forms has become a form of economic development that can be of significant importance in some locations where other forms of economic development are limited or rare, particularly in the role of supporting other more mainstream forms of economic activity, such as agriculture.

The idea that tourism and nature could engage in a symbiotic relationship was first proposed [12] almost a half-century ago. Budowski argued for three types of relationships between the two phenomena: competitive, cooperative, and symbiotic, the latter being where both parties benefit from each other, and the relationship is, in effect, a win-win outcome. A similar argument was made more recently [13] in the specific context of ecotourism and nature resource conservation, which is closer to the case discussed in this paper. There are no specific measures to prove a state of symbiosis exists, and the statement above is the basis for arguing for the existence of such a state in this paper. The information discussed here has been obtained from personal fieldwork by the author over a sixty-year period, involving two surveys of all households on the island (regarding patterns of behaviour, economic activity, and attitudes of residents) and multiple visits to the island, as well as data collection from sources on the Shetland mainland and in Edinburgh.

The purpose of this paper is to discuss the changing relationship over time between people and birds in the specific context of a small island and to demonstrate how that relationship has moved from one of exploitation to one of symbiosis, whereby both populations benefit from the presence of the other. The Bird Observatories have been a key element in that process of change, improving the economy of the island and its population through the increase in tourism and increasing scientific knowledge of the avian population and issues affecting its well-being.

2. Context

In the example discussed here, there are four elements involved: the resident human population, the tourist visiting population, and the avian population. These are also composed of two elements: resident and migratory. The setting for the study is Fair Isle, a small island located between the archipelagos of Orkney and Shetland to the north of the Scottish mainland. Fair Isle is well known for several reasons; it has given its name to one of the marine districts used in the daily weather forecasting programmes of the BBC; it is also known as the origin of a distinctive and popular form of knitwear that also bears its name [14]. It is the most isolated, in terms of distance, of any of the inhabited islands of the British Isles, and, of most relevance here, it is famed in ornithological circles as a migratory "hotspot" in terms of having added more (31) first recorded species to the British List than any other comparatively sized land area [15]. Today, the island is home to around 60 permanent residents and is owned by the National Trust for Scotland and the northern half of the island is a Site of Special Scientific Interest. Since 1948, it has been the location of a bird observatory [16], and over the next five decades, three new and improved versions of the Observatory were constructed. The last observatory was destroyed by fire in 2019, with a replacement under construction, and it is planned to be opened in 2025.

The relationship between the four populations noted above has developed into a somewhat unique form on Fair Isle compared to the normal relationships between humans and birds on other Scottish islands. In the majority of cases, that relationship traditionally has been competitive, or more appropriately, extractive in the sense that the human population used birds, primarily sea birds such as gannets, fulmars, and puffins, as food, for oil, and for their feathers. Noted examples include the heavy reliance of the population of St. Kilda (the last British Isle to be abandoned by its human residents in 1930) on its avian residents and the long-established annual guga hunt on Sula Sgeir in the Outer Hebrides. Fair Isle, probably because of its capability for agriculture and also because of the presence of rich fishing grounds close to the island, did not make heavy use of its resident birds for food or commerce, although there is a reference to a trade in feathers as a source of income some centuries ago [17].

To argue that the relationship between birds and humans on Fair Isle was cooperative would be inaccurate, but the two populations co-existed without apparent undue concern about the other. It was only in the early 20th century that the relationship began to change to one of symbiosis, as will be discussed below. Since that time, this relationship has strengthened to the point that the human population has become dependent to a degree on the well-being of the bird population, particularly the migratory segment of that population, to such a level that active steps have been taken to improve the conditions on the island, favouring the food supply and shelter requirements of both bird populations.

3. Ornithology and Development on Fair Isle

It is necessary to briefly review the origin of ornithology on Fair Isle and the response of the island's human residents in order to explain the movement from minor exploitation of the avian population by humans to a state of symbiosis between the four groups of inhabitants of the island today. Ornithology began on Fair Isle with the visits to the island by a noted British naturalist, Eagle Clarke, who first went to the island in 1905. Clarke recorded a large number (16) of comparative rarities on his early visits and realised that the isolated location of Fair Isle on a major flyway on the western edge of Europe some forty kilometres from the next nearest land masses (Orkney and Shetland to the south and north respectively) made it susceptible to "falls" of both common and rare migrating birds in both Spring and Autumn. Clarke was following a tradition of scientific and literary figures who visited the Shetland Isles in general from the late eighteenth century, recording plant and bird life, documenting the lives of the human residents and publishing their reports (see, for example, [18,19]). His writings attracted the attention of others interested in birds, including the Duchess of Bedford, who visited the island several times on her private yacht and Rear Admiral Stenhouse in the years immediately preceding the Second World War.

Amongst other visitors was George Waterston, who went to the island in 1935 and was enamoured with both the island and its two sets of inhabitants. Clarke had mostly stayed with local residents, in particular George Field, and they pursued visiting birds in order to identify them, often shooting them in order to be able to examine them in detail. Field also shot and kept examples of unusual and unidentified species for Clarke's return. The Duchess of Bedford stayed in a vacant croft house (Pund, Figure 1), viewing it as today's visitor might view a cottage or second home. Reports of the rarities being discovered on Fair Isle attracted the attention of other ornithologists and birdwatchers, but the outbreak of war halted such visits, and the island was garrisoned for the duration of the conflict.

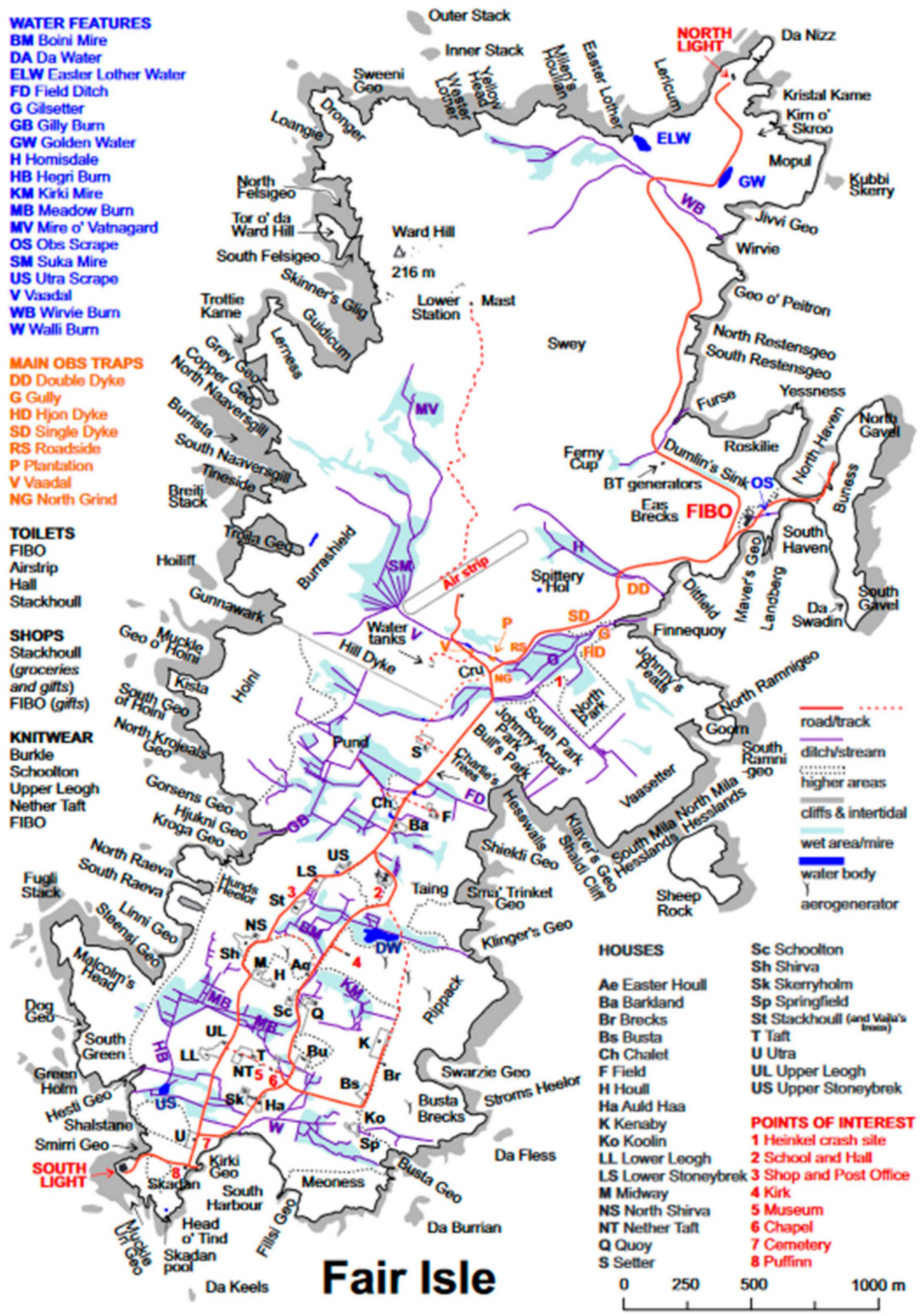

Figure 1. Map of Fair Isle showing settlement and points of interest Source FIBO Archives, Scotland.

Waterston was taken as a prisoner of war and struck up a close friendship in his prisoner of war camp with fellow ornithologists, as described in detail by Neiman in his book, Birds in a Cage [20]. Waterston spent his prison term planning to acquire Fair Isle himself or have a charitable body purchase it in order to establish a bird observatory to study bird migration following the example of Heligoland [Waterston personal communication, 1967]. He also intended to ensure the economic viability of the resident population by stimulating the knitting industry to become independent of a disadvantageous arrangement with London retail outlets, as well as improving the existing living and farming arrangements. Being released early from a prisoner of war camp on health grounds, he returned to Britain in 1943 and eventually acquired the title to Fair Isle in 1948 and began to put his plans into action. His original intention was to have the Observatory based at Pund, the croft used by the Duchess of Bedford, but this had been accidentally burned by the armed forces, and so he managed to purchase the naval huts at the North Haven, and these became the first observatory (Figure 2), opening in August 1948.

Figure 2. First Fair Isle Bird Observatory (1968). Photo by George Waterston, FIBO Archives, Scotland.

From the beginning, Waterston saw the potential for the Observatory to be a positive force for the island economy and the relationship between the resident human population and visitors to the Observatory as being a supplementary source of income for knitters and also as generating employment in the Observatory. His many visits to the island and his plans encouraged the islanders to give up thoughts of abandoning the island, which had been a real possibility in the immediate post-war years when the population had dropped below 40. It became clear that the new ownership meant the end of previous severe restrictions on trade with passing boats and the export of fish, lobsters, and traditional artefacts, mostly knitting, and that those changes, along with the emergence of tourism in the form of visitors to the island coming to see birds provided a market for such products, as well as additional passenger traffic on the island ferry boat. The islanders strongly supported Waterston's efforts, and although not all were brought to fruition during his period of ownership, the processes he set in motion have continued to the present. In commemoration, the island museum bears his name.

He sold the island in 1954 to the National Trust for Scotland (NTS), which remains the current owner. The change in ownership allowed the island owners to apply for and gain funding not available to individual landowners [21], and over the years, has resulted in Fair Isle being the first community to have a wind-driven electric power system in Britain, piped water to all houses, a new airstrip, major improvements to the pier and docking at North Haven, and the rebuilding or renovation of virtually all the residential properties on the island. As well as the ferry, the island now has a regular air service, almost daily in the summer, a fire engine, an improved school building, a medical chalet, and various other improvements benefitting the island population. The success of the schemes planned by Waterston and taken over by NTS has meant that the population has increased to over fifty, with hundreds of applications from many countries whenever the NTS announces a croft is available for rent on the island. The island council, in conjunction with the Trust, select the incoming family, and residents now include Americans, Venezuelans, and French. Much of this success has been dependent on the success of the Observatory, which, in turn, is dependent on the existence of the bird populations of the island, particularly the migrants, as is discussed below.

4. People and Birds on Fair Isle

The success of the Observatory, to a large degree, has been due to the positive relationship it has developed with the resident human population. Visitors are informed of appropriate behaviour, including the designation of any no-go areas (normally nesting areas of ground-nesting birds and private gardens), and it is rare for such advice to be ignored [22]. A survey conducted in 2013 of all households recorded no complaints about visitor behaviour and widespread general approval for the operation of the Observatory and its staff [16]. During the period of operation of the Observatory (generally late April until October), the permanent staff conduct daily surveys of the island for new arrivals, and also engage in the ringing of resident species and conducting counts of populations [23]. Over 250,000 birds have been ringed at the different versions of the Observatory during the years of operation, and the records make an important contribution to ornithological knowledge of both migratory and breeding behaviour of a range of species, including some of critical importance, such as puffin, which is anticipated to experience an 89% decline in numbers by 2050 [24]. The Observatory in its last form (Figure 3) opened in 2018 and also served as a social centre for the island population, having the only licensed bar on the island and being able to function as a venue for weddings and other social gatherings, as well as being a place for informal contact between island residents and visitors at musical evenings and demonstrations of craft production. It is indicative of the positive links between the Observatory's permanent staff and the islanders that several of the former wardens have remained on the island as crofters after finishing employment at the observatory. They also provide a valuable additional set of experienced observers and recorders of bird species and numbers, particularly when the Observatory is closed.

Figure 3. The Fourth Fair Isle Bird Observatory (2018), showing bushes planted to attract migrants. Photo by Ian Andrews, FIBO Archives, Scotland.

The Observatory thus fulfils several roles on the island: its scientific role in research and recording resident and migratory birds, as a social venue for everyone on the island, as a source of part-time employment for islanders, as the provider of most of the accommodation for visitors (48 of approximately 58 beds), and a consistent source of custom for the village store. The increasing number of visitors (overnight visitors to the Observatory increased from 2610 in 2006 to 3165 in 2017) also means additional passengers on the island-maintained ferry boat to Shetland and the air service, improving the viability of both modes of access to the island (FIBO 2017). In different circumstances, the growth in numbers of both tourists and permanent residents might well have caused the rise of negative relations between the two populations, but the way in which the two groups have interacted has avoided this and also ensured the continued conservation of the island as a safe refuge for breeding and migrant birds.

All of these developments are the result of the island's bird populations and the positive relationships between them and the island's human populations. These relationships and their changing dynamics are illustrated in Figures 4 and 5. Figure 4 illustrates the four populations on Fair Isle, human and avian, in the period before the establishment of the first observatory in 1948. At that time, the permanent resident population was decreasing almost to the point of non-viability (in terms of economic survival and sufficient members capable of manning the ferry boat based on the island), and the visiting human population was very small, mostly individuals on occasional annual visits. Their relationship was one of minor exploitation and dependence by the visitors on the residents for assistance and sometimes supplies. The avian populations were in a balanced relationship; the migratory birds rarely, if ever, in sufficient numbers to pose a threat to food supplies and very few predators amongst migrants. The resident human population had little impact on the resident birds, and both human populations killed very few migrant birds, with the migrant birds being the attraction for visitors to the island.

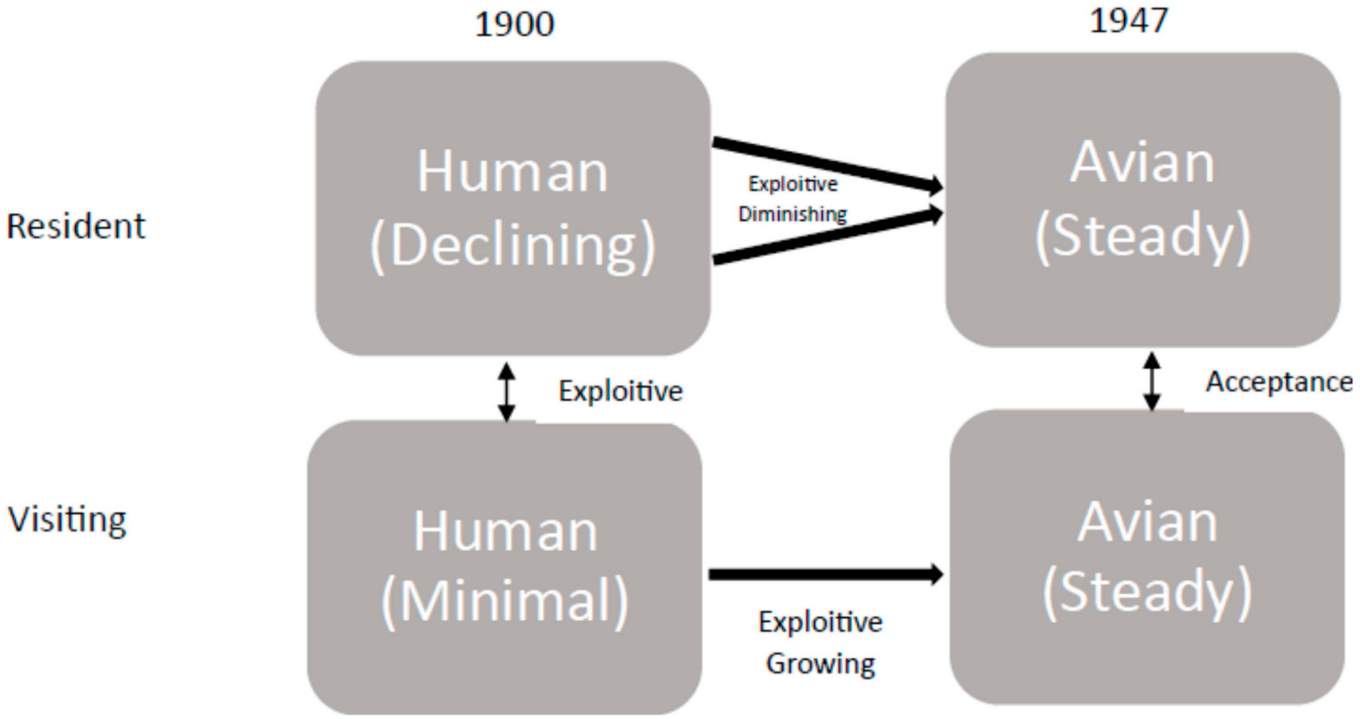

Figure 4. Populations and Relationships on Fair Isle Pre-1948. Source: Author.

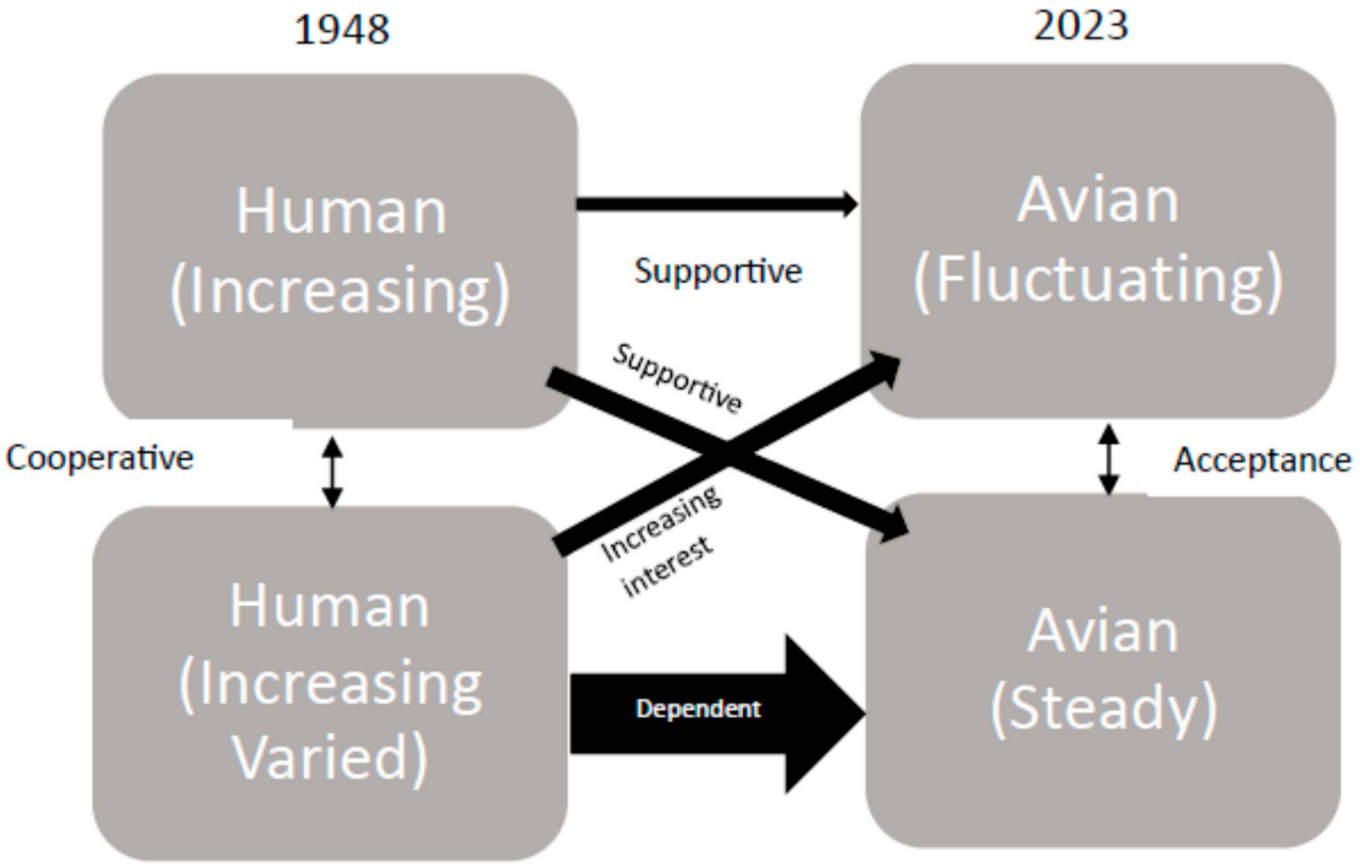

Figure 5. Populations and Relationships on Fair Isle Post 1948. Source Author.

After 1948, with the establishment of the first Observatory, the relationships began to change (Figure 5), with the increasing resident human population becoming somewhat

dependent on the increasing numbers of visitors for economic support, improved transportation links and facilities and employment at the Observatory, while the visitors relied on resident willingness to allow access to their properties for bird observation and netting, and information about new species arriving on the island. The visiting population became highly dependent on the arrival of migratory birds, with a small but increasing proportion of visitors also interested in both the resident birds and the human residents and their way of life. The human residents adapted their behaviour and actions slightly in order to support both resident and migratory birds through the planting of certain crops, protecting nesting habitats and planting bushes and trees in selected areas as cover for migrants (and also to attract migrants to fixed Heligoland traps and mist netting settings). Relations between the two avian populations remained constant and non-competitive for the most part, with the resident populations varying in terms of breeding success and population stability. In the most recent years, the likely effects of climate change have been experienced with greater fluctuations in storms and resulting migrant numbers and species.

The overall effect of the establishment and replacement of the observatories has been an increasing integration of the relationships between the four populations with greater dependency of the human populations on the presence of the avian populations, which attracts visitors to the Observatory and its subsequent benefits to all concerned. Each new observatory has meant an increase in bed capacity and considerable improvements in the quality of accommodation and services, thus attracting other types of visitors than the committed birdwatchers of the early years of observatories. While the visitors, most of whom stay at the Observatory, can be viewed as having been exploitive of residents (Figure 4), they have also become more cooperative with residents (Figure 5), by proffering assistance in island-wide activities such as the annual corralling of sheep from the common grazing area of the north of the island. Cruise ship visitors interact with residents at the Village Hall, providing them with refreshments during a visit and exploring bird locations in season (Figure 6).

Figure 6. Cruise ship visitors observing puffins. Source: FIBO Archives, Scotland.

The absence of an Observatory since 2019 has meant a reduction in part-time employment on the island, a loss of passenger traffic on the marine and air carriers, a major loss of income to the privately owned island store, and a reduction in services such as social, dining and bar facilities formerly available to residents and other visitors (e.g., on private yachts or on work projects). Sales of knitwear and other craft products have not been severely impacted as most sales are conducted online, and cruise ship passengers, apart from during the COVID-19 pandemic lockdowns, have remained constant, allowing those visitors to see and purchase island products during their visits.

While most of the birdwatchers at the Observatory visit the island for the migratory species, particularly the "regular" rarities on Fair Isle that are hard to find elsewhere in the United Kingdom, a small but increasing number of visitors, mostly during the "dead" months for migration of July and August, come partly for the resident birds, particularly the puffins and other sea birds, as well as to visit Fair Isle itself which has gained novelty value in recent years. The appeal of the island has grown, as has that of Shetland as a whole, through the popularity of the books and television programme (*Shetland*) based on the books of Ann Cleaves, who was a cook at the Observatory. The "hero" of the books is supposedly a Fair Islander, and one book, *White Lightning* [25], was based and filmed at the Observatory on Fair Isle.

The crofting (part-time tenant agriculture) on Fair Isle is based around sheep production for meat and wool, with the northern half of the island being common grazing, the southern half having some enclosed gardens and fields for mostly root crops, improved pasture, and oats. The oats are no longer grown for human food production (but for material for handicraft production [26]), provide some feed for birds, and the limited mechanisation means little disturbance of nesting species. Thus, the crofting way of life and acceptance of the importance of habitat and biodiversity is critical to the success of the resident avian population. With little fishing by Fair Islanders taking place in recent years, there has been little competition by locals with birds for fish. Although off-shore, mostly foreign vessels have unfortunate severe impacts on sand eels, with effects on puffins especially.

5. Conclusions: Future Developments and Implications

The current relationships between human and avian populations on Fair Isle have remained fairly consistent for over half a century or even longer. Birds have not been consumed on Fair Isle for over two centuries, and the islanders accept the environmentally friendly management of the island, which is overseen by NTS. The Observatories, their staff and visitors have been managed in ways that accommodate and support both the human and avian populations of the island; the four years during which there has been no Observatory operating on the island (2020–2023) because of the destruction of the Observatory by fire in 2019 has seen the number of staying visitors shrink to almost none, and the COVID19 pandemic and associated restrictions meant that cruise ship visits and numbers of arrival on the island also dropped markedly 2020–2022, with a consequent loss in first-hand customers for knitting and other local products, and significant impacts on the community store and transport to the island (Shaw, personal communication 2023).

With the anticipated opening of the new (fifth) Observatory in 2024, visitor numbers will almost certainly recover to pre-2019 levels, both in terms of birdwatchers of various types who normally stay for a week or two, and casual tourists who stay one or two nights, or even fly in and out on the same day. The 'casual tourist' type of visitor is a welcome boost to the island and particularly the Observatory economies during the non-migratory months of mid-summer, but as few of these visitors are interested in birds, except perhaps for wanting to see puffins, their relationship with the island and all of its inhabitants is somewhat less defined and potentially problematic [26]. Such visitors tend to see Fair Isle and its inhabitants as curiosities, harking back to tourists of a century or more ago, when such locations were visited to witness the inhabitants and their supposedly unique and fascinating lifestyles [27]. This is similar to the way that modern tourists visit places like Easter Island to view a different pattern of life for a short time before returning to the

contemporary world. The lack of any real relationship with human or avian populations at the current level of such visitors does not appear to present any problem, but a larger number of such visitors, either by plane or by cruise ship, may weaken the positive attitude of islanders towards such day or short-term visitors, resulting in them being viewed as a nuisance and a source of disturbance. To envisage Fair Isle experiencing overtourism [28] is very unlikely, but with such a small island and a small resident population, visitor numbers would not have to increase by too much to change the delicately balanced current relationships. Limits on visitor numbers, particularly to puffin colonies and to avoid skua nesting areas at key times, are not unlikely but would represent a significant change in management and probably attitudes between resident and visiting populations, and the Observatory and its work would be caught in the middle of such change, charged with some responsibility both for creating the changed situation (by providing tourist accommodation) and for managing it.

The Northern Isles (Orkney and Shetland Islands) of the United Kingdom may not appear to be ideal locations for cruise ship visiting, but Orkney has emerged as the "cruise ship capital" of Britain, and Fair Isle is a regular location for small (100–200 passenger) cruise ships, with visitors exploring the island for several hours during their visits and experiencing home baking and craft item sales at the Community Hall. Small numbers of other visitors stay on the island in local houses while taking knitting instruction courses (for example, 'The Fair Isle Textile Workshop' [29]) or for art or photographic visits. None of those activities is in competition or represents any threat to the avian populations of the island, but as these groups of tourists are mostly concentrated in the southern settled half of the island, they are in frequent, sometimes complete contact with residents, which may become annoying or intrusive if the levels increase significantly as has happened in many tourist destinations over time [30]. One of the significant advantages of the Observatory is that it is located in the north of the island, out of sight from resident houses, thus leaving the permanent population free from sight or sound of visiting birders from late afternoon till morning and not experiencing the "goldfish bowl" lifestyle of some busy tourist destinations' populations.

Maintaining the current successful levels of tourism and thus ensuring the continuance of the symbiotic relationship between the four populations of Fair Isle is crucial to the quality of life of the permanent human residents and the quality of environment and diversity for the avian populations for both breeding and migratory. At present, the local community is involved and supportive of the conservation of birds and their habitat on the island, and is also involved and cooperates well with professional ornithologists visiting and working at the Observatory [31].

The local residents report new bird arrivals during migration and note and mark nesting areas of permanent species, and their perception and knowledge of birds are well above the level of most populations. Above all, they are aware and supportive of how birds and birding connect with their own lifestyle and the island's natural environment. Such a set of circumstances and attitudes is something uncommon and certainly, a situation that should be encouraged and maintained as a truly symbiotic set of relationships. To quote Budowski [12,31]:

> "There are many reasons and examples which prove that a change of attitude, leading to a symbiotic relationship between tourism and conservation in the wide sense, can offer a very large variety of advantages and benefits—physical, cultural, ethical, and economic—to a country. A tourist industry can expect a brilliant future based on natural environmental assets, provided due consideration is given to the ecological principles that must guide resource use. The alliance of those responsible for tourism with ecologists and conservationists is a natural one, that should contribute greatly to development—the right kind of development involving the right kind of change—leading to a better quality of life for all concerned".

In the case of Fair Isle, his comments have proved correct for the last half-century.

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Data Availability Statement: The 1963 study and copies of related journal articles are in Fair Isle Bird Observatory Archives and Shetland Island Council Archives.

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