



## Kaikoura Business Park | Private Plan Change | Plan Change 4

### Light Industrial Zone | Lighting Impacts | Hutton's Shearwater

#### Background

- The application for a **Private Plan Change** (Plan Change 4) to the **Kaikōura District Plan** relates to the site situated at 69 Inland Road (**Lot 2 DP 501321**) consisting of 21.6 ha.
- **Kaikoura Business Park Ltd** (the Applicant) seeks to rezone the rural site to a proposed Light Industrial Zone, the primary purpose being to accommodate an identified demand for future industrial growth. The proposal will provide for the development of a business park facilitating light industrial activities, while also catering for commercial, retail, and educational activities.
- The proposal addresses site specific constraints and must mitigate potential adverse effects. In particular this proposal focuses on lighting provisions designed to avoid adverse effects on the movement of Kaikōura's **endangered Hutton Shearwater**, a rare seabird with a flight path to and from the sea to the mountain colony in the headwaters of the Kowhai River.
- The introduction of a **Light Industrial Zone** will enable the establishment of activities that require external artificial lighting systems to effectively undertake daily operations. **Kaikōura District Council** and the **Applicant** agreed that the Hutton's shearwater may be impacted by lighting at the site.
- To mitigate these effects, the Applicant engaged **Stephenson & Turner** to undertake a lighting assessment to provide expert recommendations. These were heavily influenced by the '**Responsible Lighting Guidelines for Kaikōura**' (Kyra Xavia, Kaikōura Dark Sky Trust); a guiding document which outlines how artificial lighting at night (ALAN) has adverse effects on ecology, and how by implementing responsible lighting solutions negative impacts can be mitigated on the nocturnal Hutton's Shearwater.
- The recommendations provided have formed part of the performance standards of the proposed Light Industrial Zone, ensuring **protection of the Hutton's shearwater through appropriate light management**.

- The **Hutton's Shearwater Charitable Trust** supports the decision to the proposed plan change, conditional on agreed lighting mitigation. This is based on an assurance that there will be no direct above horizon lighting, and that lighting will be turned off during low cloud or fog conditions during the breeding season from August to April, and in particular during the peak fledging crash landing period of young shearwaters from March to April. On this basis the HSCT sees no significant risk to the species.
- **Dr Larry Field (on behalf of the Kaikōura Dark Sky Trust)** submitted the following: "As the largest proposed development in the district at present (and the nature of the proposed activities) are likely to impact the light pollution of the night sky. As a Dark Sky Trust member, I am empowered to speak on behalf of all members of the Kaikōura Dark Sky group. I would like to submit our strong support of the proposed outdoor lighting approach proposed in the plan change. It is noted that the plan change recommends lighting performance standards via a lighting management plan, prepared by planners Stephenson & Turner. These standards are in alignment with the 'Responsible Lighting Guidelines' produced by the Kaikōura Dark Sky Trust. I have suggested some changes in wording in the 'Lighting Plan of Kaikoura Industrial Park' in order to clarify ambiguity in meaning, and to address the problem of light trespass."
- The **Kaikōura Wildlife Centre Trust** was approached regarding consultation, given extensive knowledge of Hutton's shearwater behaviour in relation to light disorientation and crash landing related injuries/mortality.

## Hutton's Shearwater/Kaikōura Tītī

The Hutton's shearwater/Kaikōura tītī is an endangered seabird endemic to Kaikōura, breeding nowhere else in the world. The species is renowned as being the only alpine breeding seabird in the world, breeding high in the Seaward Kaikōura Ranges at elevations of 1,200 to 1,800 m. The Hutton's shearwater is one of the few remaining pelagic seabirds to solely breed on New Zealand's mainland.

At least ten colonies formerly existed in both the Seaward Kaikōura and Inland Kaikōura Ranges; and there is evidence that the species bred beyond these mountain ranges. After the rediscovery of eight colonies in 1964 by Geoff Harrow, only two remnant colonies (both in decline) remain today on conservation land in the headwaters of the Kowhai River and on private land in Shearwater Stream. The *Te Rae o Atiu* insurance colony was subsequently established via chick translocations within a predator-proof fence on the Kaikōura Peninsula.

From an estimated population once numbering millions of birds, introduced mammals, changes in land use and climate change have decreased the Hutton's shearwater population significantly. A range of human related threats are driving population declines, impacting the last two remaining natural breeding colonies.

Land-based threats include predation by introduced mammalian predators (feral cats, stoats and feral pigs), unstable habitat at breeding colonies (particularly landslides post-earthquake), and disorientation by artificial lighting (resulting in crash landings).

Sea-based threats include fisheries bycatch, overfishing (prey depletion), plastic pollution (plastic ingestion), and global warming (marine heatwaves). Increasing sea surface temperatures (decreasing ocean productivity and suppressing prey availability) are resulting in increased foraging effort and decreased foraging success, leading to poor body condition and starvation. Reduced prey availability is now considered a major threat to seabird survival, including Hutton's shearwaters, impacting survival by reducing reproductive success and increasing mortality rates. Individuals which are weakened by poor body condition will ultimately lack physical strength and be poor fliers, and are therefore expected to be more prone to light disorientation and crash landing.

Kaikōura lies in the flight path of these rare seabirds, which travel between their mountain breeding colonies in the Seaward Kaikōura Ranges and the sea every August to April. Artificial lights interfere with shearwater navigation, causing disorientation and crash landing (termed 'fallout').

Crash landing is more frequent during poor weather, when overcast skies and rain interfere with stellar navigational cues. Without these cues, nocturnal shearwaters are significantly impacted by disorientation from township lights. During inclement weather the sky glow of Kaikōura affects shearwaters more severely, which is further compounded

by wet roads causing confusion by resembling the sea surface, and reflecting lighting back into the night sky.

The primary reason for this is light pollution from street lighting, as well as the cumulative effects of commercial and residential lighting. Crash landing primarily occurs on roads due to street lights, at commercial sites with flood lights, dairy farms, and in residential backyards. Localities such as SH1 (Beach Road and Churchill St), the Esplanade and Torquay Street are typically sites with high numbers of downed shearwaters in the township.

Shearwater crash landing in Kaikōura has been well-documented by the Hutton's Shearwater Charitable Trust, Kaikōura Wildlife Centre Trust (Kaikōura Wildlife Hospital Project) and Kaikōura Dark Sky Trust.

Hutton's shearwater adults crash land throughout the breeding season, from August to March (with clusters of up to 35 shearwaters reported crash landing at a time (e.g. dairy farms, Puhī Peaks valley, etc) and individuals in the township.

Young Hutton's shearwaters fledge during March and April, upon departing breeding colony burrows for their maiden voyage to sea. During the peak fledgling period there is the potential for hundreds of shearwaters to ground due to light disorientation in a single night. For example, 200 shearwaters crash landed in one night within the wider Sudima Hotel vicinity on the Esplanade in March 2023.

Crash landing data is based on recorded numbers of rescued and deceased shearwaters, however unaccounted for individuals (crash landings out of sight, removal by predators, or shearwaters taking flight) could drive this number in excess of 1,000 individuals in some breeding seasons. The shearwaters that are reported represent a fraction of the total annual fallout, with rescue for release significantly increasing survival probability.

As Hutton's shearwaters are pelagic seabirds which spend 90% of their lives at sea, they are significantly less immobile on land. Once grounded due to light disorientation, crash landed Hutton's shearwaters are often unable to become airborne as they are impaired, and typically rely on thermal updrafts from the crest of a wave or hillside to take flight. Grounded shearwaters (particularly if injured) are therefore generally unable to return to sea, nor able to evade predators or oncoming prior to attempted dawn take off. Without rescue, Hutton's shearwaters subsequently succumb to vehicle strike, crash landing injuries, cat and dog predation, dehydration and starvation. Crash landed Hutton's shearwaters require immediate rescue for release at sea, while those that suffer from injuries require treatment or euthanasia.

Township lighting is responsible for considerable shearwater losses, and is a conservation issue that can be addressed with positive steps to address lighting pollution impacts. As a district, we have a moral responsibility to minimise shearwater threats where proven

solutions exist. Implementing best practice lighting guidelines to mitigate ecological impacts is critical.

As the Kaikōura township continues to grow, increased development will lead to an expanding light footprint regarding sky glow. It is imperative that artificial lighting impacts are limited to mitigate to Hutton's shearwater injury and mortality.

Mitigation measures are based on avoidance and minimisation of fallout. The Kaikōura Dark Sky Trust is working to achieve International Dark Sky status, which will protect the night sky by addressing light pollution. Policy changes to improve lighting regulations will benefit the species significantly and is crucial in minimising losses.

To reduce light-induced mortality, the most immediate action has been a volunteer rescue programme to aid grounded shearwaters (FLY SAFE night patrols), treatment and rehabilitation of injured shearwaters, alongside outreach and advocacy.

Wildlife rehabilitator Sabrina Luecht has voluntarily treated injured Hutton's shearwaters for the past seven years. A shift in direction is underway with the establishment of the Kaikōura Wildlife Centre Trust, which is managing the Kaikōura Wildlife Hospital vision (Project WellBird) to implement a purpose-built facility as a long-term solution for at-risk wildlife.

As Hutton's shearwaters are one of the primary wildlife patients in care (unfunded conservation work), there is a direct understanding to which artificial light sources correlate to light pollution hotspots (i.e. where key mitigation measures are required), the trauma resulting from crash landings and the treatment required.

Over the years significant numbers of Hutton's shearwaters have been treated for injuries related to crash landing collision impact (e.g. head trauma, eye injuries, beak fractures, wing fractures), vehicle strike (e.g. wing fracture, leg fracture) and subsequent predation events (open bite wounds), as well as individuals in poor body condition (severely underweight due to decreased food sources). Each year many receive treatment, enabling successful recovery and release; while a percentage require euthanasia to end suffering.

For an endangered species, aiding individual birds and safeguarding future breeding potential in the population is vital. Halting further decline relies on a community-wide effort.

## Seabird Lighting Impacts

- Kaikōura is a biodiversity hotspot and marine mecca, renowned globally as a seabird capital. The district has one of the greatest varieties of seabirds on earth, and is a site of international importance. A diverse range of pelagic and inshore seabirds rely on the Kaikōura marine environment.
- With transboundary lifestyles in both marine and terrestrial environments, seabirds are subject to an array of cumulative threats and are classed as the most threatened group of vertebrates globally. 90% of seabirds are threatened with extinction due to a multitude of threats, of which light pollution is a key issue that can be addressed with known solutions.
- The harmful impacts of artificial lighting on ecological health are well known. Preserving Kaikōura's night sky with regulatory measures will benefit species throughout the ecosystem, and particularly the endangered Hutton's shearwater.
- The negative impacts of light pollution on seabird navigation are recognised, and there is growing research into the types and colours of lights which are attractive to seabirds.
- Seabirds often fall victim to lighting pollution, with artificial lighting interfering with navigational cues, altering behaviour, causing disorientation, crash landings, collisions and resulting in significant fatalities. This anthropogenic threat has been documented globally, and is a conservation management issue near seabird breeding colonies (seabird injury and mortality induced by artificial lights).
- Most shearwaters, petrels and albatrosses (*Procellariiformes*) are active at night. This allows these species to avoid predation, which is particularly important during the breeding season when they must evade diurnal avian predators, when returning to and leaving from their nesting sites.
- Many nocturnally-active seabirds are sensitive to light pollution and become easily disorientated by intense sources of artificial light (visual and sensory overload). In certain circumstances enormous numbers can be drawn to artificial lighting (e.g. the larger the development the more significant the overall light footprint).
- Kaikōura attracts many seabirds in relation to the nutrient-rich inshore sub-marine Kaikōura Canyon, and lies along a major migration route. Hutton's shearwaters, Sooty shearwaters, Buller's shearwaters, Fluttering shearwaters and storm petrels have crash landed in Kaikōura in relation to light disorientation.
- Vulnerability to artificial lighting varies between species and age classes, as well as seasonal, lunar and weather conditions. In general, young birds are more likely to

become disorientated by man-made light sources. Most collisions occur in poor weather, when the moon is new, or during periods of peak migration.

- Light pollution is a particular problem for fledgling shearwaters (mass fallout events), which are disoriented by urban lighting along their flight path as they make their first flight to sea from the mountain colonies. Artificial lighting is an avoidable threat which takes a deadly toll on our unique seabird.
- Beyond shearwaters becoming grounded, many can become 'entranced' by artificial light sources and circle these for hours due to disorientation. The energetic costs of such disorientations may also have serious consequences for fledgling survival. This has been noted with various light sources. For example, c. 200 Hutton's shearwaters circling NPD before dawn due to the brightness of lighting (which has subsequently been seasonally dimmed).
- An increase in urban development will lead to greater amounts artificial lighting at night (ALAN) impacting shearwater fallout.
- Effective mitigation measures will reduce the impact of artificial light on seabirds. It is important that measures to reduce light pollution, such as removing unnecessary illumination, reducing light intensity and eliminating unnecessary skyward and seaward light projection, are more widely implemented.

## Light Pollution - Mitigation Measures

- Light pollution impacts are a significant concern, regarding the size of the development and the site being situated along the flight path of Hutton's shearwaters breeding in the headwaters of the Kowhai River (Kowhai colony).
- Seabird friendly lighting must be incorporated into the development and utilised across the site. Scientists recommend a warm yellow colour temperature of **2,000K-2,200K (vs the cited 2,200-2,700K)** for seabird appropriate lighting. (This is compared to standardised 4,000K neutral white lighting which is not acceptable for threatened species and sensitive ecological areas, with adjacent breeding colonies and high conservation values).
- The recommendation is to implement best practice standards (refer to 'Responsible Lighting Guidelines for Kaikōura') to install responsible lighting that complies with seabird friendly requirements.
- Any excess or unnecessary lighting (internal and external) should be avoided at all times. For example, internal lighting that is not in use after dusk must be turned off; or blinds/curtains pulled to minimise outward light spill and stop interior lighting radiating out of windows. Flood lights must employ automatic motion sensors and timers, to minimise unnecessary illumination from dusk to dawn when not required.
- Beyond addressing brightness intensity and colour temperature of lighting, it is imperative that there is no upward or lateral light spill. All lights must be downward facing and shielded or hooded (i.e. capped street lights, flood lights and bollards), to mitigate light pollution.
- Self-illuminated signs and billboards (with an internal light source) will be prohibited.
- Use of LED lighting that is dimmable to adjust the brightness scale (e.g. dimmed from 9pm-6am at off-peak times). These are important provisions for street, commercial and residential lighting within the development.
- Lighting must be dimmed from dusk to dawn during the breeding season (August to April), to mitigate lighting impacts along the flight path of Hutton's shearwaters.
- Lighting must be turned off during dense low cloud or fog conditions during the breeding season from August to April, and in particular during the peak fledging crash landing period of young shearwaters from March to April.
- Inclusion of a welfare protocol to facilitate the rescue, reporting and handover of grounded shearwaters. This will require ongoing checks for downed shearwaters during the breeding season - particularly during poor weather and the peak crash landing period from March to April.



## Hutton's Shearwater - Rescue Guidelines

- Please look out for grounded shearwaters during the breeding season from August-April and rescue immediately. Please drive carefully, particularly at night and in poor weather.
- If you find Hutton's shearwater *adults* during the breeding season (August-February), please rescue immediately for release or handover. Healthy lively shearwaters can be released into the sea from wharves or boat ramps, by placing shearwaters on the water to let them swim, dive or fly off.
- If unable to self-release rescued shearwaters, please handover to Encounter Kaikoura (during business hours), for release at sea via Albatross Encounter tours.
- If you find young Hutton's shearwater *fledglings* (March-April), please rescue and drop off at the HUTTON'S HUB next to the Department of Conservation on 115 Ludstone Rd, which is checked by volunteers daily.
- Please take unwell, weak or injured Hutton's shearwaters to VetCare Kaikoura during business hours. Patients with a chance of recovery may be transferred for rehabilitation, while severely injured shearwaters will be euthanised.
- For further assistance, please call the Renwick DOC Office on 03 572 9100 or the DOC Hotline on 0800 362 468, to report a shearwater and request handover to a DOC ranger at the Kaikōura Base.
- Hutton's Shearwater Charitable Trust: <https://www.huttonsshearwater.org.nz/>
- Kaikōura Wildlife Centre Trust: <https://www.kaikourawildlifecentre.org/huttonsshearwater>

Sincerely,



**Kaikōura Wildlife Centre Trust**  
Rescue | Rehabilitate | Release

