



October 21, 2025

Via Federal eRulemaking Portal

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Docket No. FWS–R1–ES–2022–0068

Via Electronic Mail

Department of Land and Natural Resources

Division of Forestry and Wildlife

Attn: Habitat Conservation Planning

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Re: Kaua‘i Island Utility Cooperative Habitat Conservation Plan (dated June 2025) and
Associated Draft Environmental Impact Statement (dated June 2025)

To Whom It May Concern:

Earthjustice submits these comments on behalf of Hui Ho‘omalua i ka ‘Āina, Conservation Council for Hawai‘i, Center for Biological Diversity, and American Bird Conservancy, in response to the U.S. Fish and Wildlife Service’s (“Service’s”) and Hawai‘i Department of Land and Natural Resources, Division of Forestry and Wildlife’s (“DOFAW’s”) requests for public comment on the Kaua‘i Island Utility Cooperative (“KIUC”) Habitat Conservation Plan (“HCP”) and associated Draft Environmental Impact Statement (“DEIS”), both of which are dated June 2025. *See* 90 Fed. Reg. 41,105 (Aug. 22, 2025); Office of Planning and Sustainable Development, The Environmental Notice at 5-6 (Aug. 23, 2025); 8/23/25 KIUC Press Release, available at <https://kiuc.coop/news/kiuc-announces-publication-second-draft-habitat-conservation-plan-and-draft-environmental>.

As discussed below, the draft HCP—which would authorize take of nearly half a million endangered and threatened seabirds over its 50-year term—fails to satisfy the minimum legal

requirements of Hawai'i Revised Statutes ("HRS") chapter 195D and the federal Endangered Species Act ("ESA") and should not be approved in its current form. *See* Draft HCP at ES-27. Far from minimizing and mitigating this staggering level of take "to the maximum extent practicable," as both state and federal law mandate, KIUC instead proposes to conduct no further minimization projects for existing power lines and streetlights over the HCP's entire 50-year term, disregarding effective, practicable minimization strategies to reduce take caused by both powerlines and streetlights. HRS § 195D-4(g)(1); 16 U.S.C. § 1539(a)(2)(B)(ii). The draft HCP also fails to ensure the availability of the Upper Limahuli Preserve (a key mitigation site) and does not incorporate mitigation measures that the Service's and DLNR's own DEIS identifies as both technically and economically feasible. Moreover, the draft HCP fails to satisfy the more stringent standards of Hawai'i state law. KIUC's projections of its activities' cumulative effects do not provide the requisite "reasonable certainty," HRS § 195D-21(c), of "net environmental benefits," *id.* § 195D-4(g)(8) and further fail to establish that the HCP will result in an "overall net gain in the recovery" of Kaua'i's imperiled seabirds. *Id.* § 195D-30; *see also id.* §§ 195D-2 (defining "recovery"), 195D-21(b)(1)(B) (HCP must "increase the likelihood of recovery of the endangered or threatened species that are the focus of the plan"). The HCP must be revised to comply with these legal mandates and provide the legally required protection to the imperiled seabirds that KIUC's operations kill and injure.

As for the DEIS, it fails to satisfy either the National Environmental Policy Act ("NEPA") nor the Hawai'i Environmental Policy Act, both of which require the Service and DLNR to take a "hard look" at the proposed HCP's environmental impacts and examine "alternatives that might be pursued with less environmental harm." *Lands Council v. Powell*, 395 F.3d 1019, 1027 (9th Cir. 2005); *see also Unite Here! Local 5 v. City & Cnty of Honolulu*, 123 Hawai'i 150, 171, 231 P.3d 423, 444 (2010). The DEIS's impact analysis fails to account for KIUC's loss of the Upper Limahuli Preserve as a mitigation site and instead erroneously relies on the significant benefits that mitigation activities at that location were expected to reap to offset some of the massive death and injury to imperiled seabirds that KIUC's activities will inflict. The DEIS's analysis of alternatives is likewise flawed, failing to consider reasonable alternatives to reduce impacts suggested during public scoping, such as requiring the use of streetlight fixtures that minimize short wave-length light and the installation of motion-sensors or timer switches on outdoor lighting to keep lights off when not in use. These flaws must be addressed to pass legal muster.

The Draft HCP Fails to Minimize Take of Endangered and Threatened Seabirds to the "Maximum Extent Practicable."

Under both HRS chapter 195D and the federal ESA, approval of KIUC's HCP depends on whether KIUC will minimize its take of listed seabirds "to the maximum extent practicable." HRS § 195D-4(g)(1); 16 U.S.C. § 1539(a)(2)(B)(ii); 50 C.F.R. §§ 17.22(b)(2)(i)(B), 17.32(b)(2)(i)(B); *see also* HRS § 195D-21(c)(4). Since KIUC cannot operate without both a state incidental take license ("ITL") and federal incidental take permit ("ITP"), the more demanding incidental take standard imposed under Hawai'i law—which mandates that the "cumulative impact of the

[authorized] activity ... provides net environmental benefits,” HRS § 195D-4(g)(8), that the HCP “will increase the likelihood of recovery of the [listed] species that are the focus of the plan,” *id.* § 195D-21(b)(1)(B), and that the HCP “result[s] in an overall net gain in the recovery of Hawaii’s threatened and endangered species,” *id.* § 195D-30—informs the analysis of what alternatives are “practicable.” KIUC moreover cannot secure an ITL under Hawai‘i law unless the HCP identifies “steps that will be taken to minimize and mitigate all negative impacts, including without limitation the impact of any authorized incidental take.” *Id.* § 195D-21(b)(2)(C) (emphasis added). The draft HCP falls far short of these mandates, with KIUC seeking approval for decades-overdue infrastructure modifications that precede the HCP’s effective date, proposing no further powerline reconfigurations and no further modifications to streetlights whatsoever throughout the 50-year HCP term, and instead relegating further practicable minimization measures to adaptive management. Far from minimizing take to the maximum extent practicable as chapter 195D and the ESA require, KIUC proposes to do next to nothing to minimize take for the next 50 years.

1. The HCP Must Include Further Powerline Reconfiguration Strategies to Minimize Take.

Seabird take caused by collisions with powerlines is “one of the most significant threats to Newell’s shearwater (‘a’o) and Hawaiian petrels (‘ua’u) on Kaua‘i.” Draft HCP at 5-7. Powerline collisions break bones, tear off feathers and skin, injure heads, eyes, and wings, and frequently result in grounding and death. *Id.* at 5-7 to -8. KIUC, however, refuses to take any steps to minimize powerline take beyond the measures that KIUC has already completed before the HCP even takes effect. *Id.* at 4-32 (“All planned powerline minimization projects have been completed prior to the start of the HCP permit term”), 4-10 (“No additional powerline reconfiguration projects are planned at this time”). In other words, KIUC seeks to *maintain*, rather than *minimize*, its seabird take.

To comply with the duty to minimize take to the maximum extent practicable, at minimum, KIUC’s HCP must be revised to incorporate the suite of “additional minimization measures on existing powerline spans that have higher collision risk for seabirds ... to further reduce the collision risk for seabirds” and the “additional minimization measures for 360 [miles] of new powerlines” that are detailed in the DEIS’s Alternative C. Draft HCP at 2-22; *see id.* at 2-22 to -24. The Service and DLNR have determined that these additional measures to reduce the toll that KIUC’s power lines inflict on imperiled seabirds are both “technically and economically feasible.” *Id.* at 2-22. There is, therefore, no excuse for the draft HCP’s failure to require them.

In comments submitted on the January 2023 version of KIUC’s HCP, we identified additional opportunities to minimize take from KIUC’s power lines, including undergrounding high-risk power lines, which “would *eliminate* the potential for covered seabird collisions,” or at least

relocating them away from high-collision areas. Draft HCP at 8-5 (emphasis added).¹ KIUC's refusal to include any undergrounding or relocation in its HCP is unacceptable. KIUC should be required to invest in take minimization efforts throughout the entire life of the 50-year HCP, including projects like undergrounding, which would eliminate powerline take altogether. The Service and DLNR must consider all relevant circumstances, such as the 50-year duration of the proposed incidental take authorization, in determining what minimization measures are "practicable," HRS § 195D-4(g)(1); 16 U.S.C. § 1539(a)(2)(B)(ii), and should not allow KIUC to skate by with stop-gap minimization measures that pre-date the HCP. Considering that the HCP would be in effect for half a century, it is not impracticable for KIUC to include, plan for, and fund undergrounding projects to eliminate take over time, particularly in locations with high levels of documented seabird take like the Powerline Trail.

.2. The HCP Must Include Additional Measures to Minimize Take from KIUC's Streetlights and Facility Lights.

The draft HCP acknowledges that attraction to KIUC's streetlights and facility lights causes take of listed seabirds but, as with powerline collisions, KIUC fails to minimize take caused by light attraction "to the maximum extent practicable." As a bare minimum, KIUC's HCP must mandate a reduction in "the number of lumens emitted from lightbulbs by 15 percent by using light dimmers" for both "existing and new streetlights to reduce light attraction for seabirds." DEIS at 2-24. And the HCP must further increase funding by 50 percent to Save Our Shearwaters, which would help minimize the severity of take due to fallout. *See id.* Given that the Service and DLNR have both concluded that these take minimization measures are "technically and economically feasible," there is no justification for failing to insist on their inclusion in the final HCP. *Id.* at 2-22.

In addition, while the draft HCP acknowledges substantial scientific evidence that seabirds are affected differently by different wavelengths of light (with bright white streetlights like KIUC's that contain a high percentage of short-wavelength ("blue") light attracting wildlife to a greater degree than amber streetlights containing longer wavelength light, and therefore causing more take), it fails to act on this "best available scientific ... data" and require reductions in the blue-light content of its streetlights and other lighting fixtures. HRS § 195D-21(b)(1); *see* Draft HCP at 5-9; *id.*, app. 5B at 5B-1; *see also* DEIS, app. C at 13. There is no question that this minimization measure is practicable. For over a decade Hawai'i County has required the use of county streetlights that have less than 2% "blue light content" (defined as "the ratio of the amount of energy emitted by the outdoor light fixture between 400 and 500 nm divided by the amount of energy between 400 and 700 nm"). Hawai'i County Code § 14-51(a)(9); *id.* § 14-55, Table 14-A (specifying that LED fixtures must have "less than 2% blue light content"). In 2022, Maui

¹ Our March 24, 2023 comments on the January 2023 version of the KIUC HCP are attached hereto and incorporated by reference.

County adopted revisions to its lighting ordinance requiring the use of low-blue light fixtures for all outdoor lighting, including streetlights. *See* Maui County Ord. 5434, § 2 (Oct. 24, 2022) (enacting Maui County Code § 20.35.060.D).²

During the Maui County Council’s deliberations over its lighting ordinance, the Hawai’i Division of Forestry and Wildlife (“DOFAW”) urged Maui County to use only LED streetlights “designed or filtered to have a correlated color temperature of 2200 Kelvin or less, or a blue light content of less than 2%,” noting that “LED lights with these specifications have been found to have fewer impacts on protected wildlife, including seabirds.”³ To comply with the mandate to minimize take from KIUC’s streetlights and facility lights, the final HCP must require the use of low-blue-light fixtures.

The Draft HCP Fails to Mitigate Take of Endangered and Threatened Seabirds to the “Maximum Extent Practicable.”

Both HRS chapter 195D and the ESA require that KIUC’s HCP mitigate its take of listed seabirds “to the maximum extent practicable.” HRS § 195D-4(g)(1); 16 U.S.C. § 1539(a)(2)(B)(ii); 50 C.F.R. §§ 17.22(b)(2)(i)(B), 17.32(b)(2)(i)(B); *see also* HRS § 195D-21(c)(4). Despite this statutory command, the draft HCP fails to require several additional mitigation measures that the Service and DLNR have concluded are “technically and economically feasible.” DEIS at 2-24. To comply with Chapter 195D and the ESA, any final HCP must “increase ... the total acreage of mitigation effort beyond what is included in the proposed action” and “also increase the intensity and area of management actions proposed in the Draft HCP” as described in the DEIS’s Alternative D. *Id.*; *see id.* at 2-24 to -25 (describing additional mitigation).

Uncertainty About Whether Upper Limahuli Reserve Will Be Available as a Conservation Site Precludes Finding that the Draft HCP Would Confer Net Environmental Benefits and Promote Seabird Recovery

The elephant in the room with respect to mitigation is the draft HCP’s acknowledgment that, due to “[u]nforeseen issues” that arose earlier this year “regarding the Land Agreement with National Tropical Botanical Garden for the Upper Limahuli Preserve conservation sites,” KIUC can no longer count on having access to the Upper Limahuli Preserve to carry out vital mitigation efforts. Draft HCP at 1-15 n.5. As detailed in the draft HCP, the mitigation measures

² Despite acknowledging the harm that outdoor lighting inflicts on native wildlife, including imperiled seabirds, the Maui County Council recently amended the lighting ordinance to exempt streetlights. *See* Maui County Bill No. 109, CD 1, § 5 (2025) (amending Maui County Code § 20.35.070). Maui County continues to require low-blue-light fixtures for other outdoor lights.

³ A copy of DOFAW’s testimony is Attachment B to our March 24, 2023 comments.

planned for the Upper Limahuli Preserve are key to achieving the conservation benefits necessary to offset the massive toll on imperiled seabirds that KIUC's operations will continue to take, even after implementation of all take minimization measures. That is why the draft HCP's adaptive management provisions identify successful implementation of mitigation measures at Upper Limahuli Preserve among the "Key Initial Deadlines" that are "Tied to Permit Compliance." Draft HCP at 6-11.

The draft HCP's claim that, if "the dispute resolution process results in Upper Limahuli Preserve not being used as an HCP conservation site, KIUC will ... find an alternative site or sites, minimization, mitigation, or a combination of these actions to make up for the site being withdrawn from the HCP" is wildly unrealistic. Draft HCP at 1-15 n.5. As anyone familiar with the development of KIUC's HCP knows full well, one of the main reasons it has taken nearly a decade since the expiration of KIUC's short-term HCP to get to this point has been the difficulty of finding adequate mitigation *in addition to use of the Upper Limahuli Preserve* to offset KIUC's staggering levels of take. If the Upper Limahuli Preserve falls out of the picture, there is no way for the math to add up to comply with Hawai'i law, which requires KIUC's HCP to provide "net environmental benefits," HRS § 195D-4(g)(8), and to result in an "overall net gain in the recovery" of Kaua'i's imperiled seabirds. *Id.* § 195D-30. Unless and until KIUC secures firm commitments to use Upper Limahuli Preserve as a mitigation site, there is no way for KIUC's HCP to provide the requisite "reasonable certainty" regarding the likely effect of the plan on endangered and threatened seabirds necessary for approval. *Id.* § 195D-21(c).

The DEIS Violates NEPA and HEPA

The DEIS violates the requirement under both NEPA and HEPA to provide an objective and accurate assessment of the environmental impacts of approving KIUC's HCP and authorizing take of listed species. Nowhere does the DEIS mention that KIUC has lost use of the Upper Limahuli Preserve as a mitigation site. Instead, the DEIS erroneously relies on the significant benefits from using the Upper Limahuli Preserve as a conservation site to offset the sky-high levels of take from KIUC's operations. The DEIS thus fails to provide accurate information about the impacts to imperiled seabirds should the HCP be approved.

The DEIS also violates NEPA's and HEPA's requirements regarding consideration of alternatives, failing to justify the DEIS's refusal to consider reasonable alternatives that the public suggested during scoping. For example, the DEIS notes that, in our scoping comments, we suggested a number of take minimization and mitigation alternatives, including but not limited to requiring KIUC to "[a]djust the color of lighting to minimize short wave-length light," to "install timer switches on outdoor lighting to allow automatic switch-off when lights are not in use, and remove unnecessary lights," and "[f]und a program to eliminate or modify sources of outdoor light that attract shearwaters on properties that are not part of KIUC's operations." DEIS, app. B at B-19. The DEIS failed, however, to examine these alternatives or, even, to explain why these alternatives were eliminated from detailed study. *See* DEIS at 2-1 to -

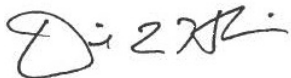
28. The DEIS's conclusory statement that "the Service and DLNR determined whether the suggested alternative should be carried forward as an EIS alternative analyzed in detail or be dismissed from detailed analysis" is not legally sufficient. *Id.*, app. B at B-19; *see* HAR 11-200.1-24(h)(3), (s)(2).

Conclusion

For the reasons set forth in this letter and our prior letter on the 2023 version of the HCP, KIUC's draft HCP fails to minimize and mitigate seabird take to the maximum extent practicable and fails to provide reasonable certainty that KIUC's combined actions will have net environmental benefits and result in an increased likelihood of recovery for covered seabird species. And the DEIS prepared for the HCP fails to take the statutorily mandated hard look at impacts and alternatives. Both documents must be revised to address these deficiencies before it can be approved.

We appreciate the opportunity to provide these comments. Please feel free to contact us if you have any questions or would like to discuss any of the issues raised above. I can be reached by telephone (808-599-2436) or email (dhenkin@earthjustice.org).

Regards,



David L. Henkin
Earthjustice

Attachment



March 24, 2023

Via electronic mail only

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Kaua'i Island Utility Cooperative
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Re: Kauai Island Utility Cooperative Draft Long-Term Habitat Conservation Plan, Kauai, HI

To whom it may concern:

Earthjustice submits these comments on behalf of Hui Ho'omalua i ka 'Āina, Conservation Council for Hawai'i, and Center for Biological Diversity, in response to the Department of Land and Natural Resources' ("DLNR's") request for public input on Kauai Island Utility Cooperative's ("KIUC's") draft long-term habitat conservation plan ("LTHCP"). See Office of Planning and Sustainable Development, *The Environmental Notice* at 3 (Jan. 23, 2023).¹ As discussed below, the draft LTHCP fails to satisfy the minimum legal requirements of Hawai'i Revised Statutes ("HRS") chapter 195D and the federal Endangered Species Act ("ESA") and should not be approved in its current form. Far from minimizing its take "to the maximum extent practicable," as both state and federal law mandate, KIUC instead proposes to conduct no further minimization projects over the LTHCP's entire 50-year term, disregarding effective, practicable minimization strategies to reduce take caused by both powerlines and streetlights. HRS § 195D-4(g)(1); 16 U.S.C. § 1539(a)(2)(B)(ii). The draft LTHCP also fails to satisfy the more stringent standards of Hawai'i state law. KIUC's projections of its activities' cumulative effects do not provide the requisite "reasonable certainty," HRS § 195D-21(c), of "net environmental benefits," *id.* § 195D-4(g)(8) and further fail to establish that the LTHCP will result in an "overall net gain in the recovery" of Kaua'i's imperiled seabirds. *Id.* § 195D-30; see also *id.* §§ 195D-2 (defining "recovery"), 195D-21(b)(1)(B) (HCP must "increase the likelihood of recovery of the endangered or threatened species that are the focus of the plan"). The LTHCP must be revised to comply with these legal mandates and provide the legally required protection to the imperiled seabirds that KIUC's operations kill and injure.

¹ https://files.hawaii.gov/dbedt/erp/The_Environmental_Notice/2023-01-23-TEN.pdf (last visited Mar. 24, 2023).

Background

Kaua'i's population of Newell's shearwater or 'a'o (*Puffinus auricularis newelli*) has been in perilous decline for decades, due in significant part to collisions with powerlines and fallout caused by street lighting. LTHCP at 3A-6 to -10 (pdf 409-13).² Kaua'i is home to an estimated 90% of all 'a'o in the world. *Id.* at 3A-5 (pdf 408). From 1993-2013, the 'a'o population on Kaua'i fell by an average of 13% annually, or a full 94% over those 20 years. *Id.* at 3A-6 to -7 (pdf 409-10). The powerlines, streetlights, and associated structures for which KIUC now seeks 50 years of incidental take coverage are directly responsible for the lion's share of the tens of thousands of 'a'o documented as "taken" on Kaua'i over the last three decades, to our knowledge the largest documented take of any ESA-listed bird species. *See id.* at 4-36 (pdf 129) ("the [Save Our Shearwaters] Program has recovered and released more than 30,500 seabirds since the 1970s"). Documented take, however, is only a small fraction of the take that actually occurs: most downed birds are never recovered, and the massive take levels associated with the Powerline Trail were unknown until only recently, when acoustic monitoring of powerline strikes was initiated. The Kaua'i population of Hawaiian petrel or 'ua'u (*Pterodroma sandwichensis*)—representing about one-third of the global population—has similarly plummeted, decreasing by 78% from 1993-2013, again significantly due to powerline collisions and light-induced fallout. *Id.* at 3A-17 to -18 (pdf 420-21). The endangered Hawai'i distinct population segment of band-rumped storm-petrel or 'akē'akē (*Oceanodroma castro*) faces the same threats posed by KIUC's ongoing activities. *See id.* at 3A-22 (pdf 425).

Powerlines and light attraction have been known to cause disastrous seabird take on Kaua'i since at least the 1990s, when an ESA citizen suit against KIUC's predecessor resulted in a 1995 study recommending various strategies to minimize take, including undergrounding, rerouting, and reconfiguring powerlines. After acquiring the utility in 2002, KIUC continued to operate its powerlines, streetlights, and other infrastructure in knowing violation of the ESA, prompting the U.S. Department of Justice in 2010 to indict KIUC on criminal charges for its unpermitted seabird take. A short-term HCP ("STHCP") went into effect in 2011, lasting five years, but take continued at much higher rates than was authorized. In its STHCP, KIUC claimed that all of the "more than 3,000 KIUC streetlights" had been fully shielded, STHCP at 5-5, but KIUC now claims in the draft LTHCP that KIUC's streetlights were retrofitted to minimize light attraction only in 2017, LTHCP at 4-33 (pdf 126). Further, only since 2020 has KIUC made any effort to minimize its powerline take beyond the handful of segments partially addressed under the STHCP. *Id.* at 4-24 to -25 (pdf 117-18), 4-29 (pdf 122). KIUC's foot-dragging

² For ease of reference, we cite to both the LTHCP page number designation and the portable document format ("pdf") page number, based on the draft LTHCP published in *The Environmental Notice* on January 23, 2023.

https://files.hawaii.gov/dbedt/erp/Other_TEN_Publications/2023-01-23-KA-Draft-HCP-Kauai-Island-Utility-Cooperative.pdf (last visited Mar. 24, 2023).

in implementing take minimization measures, together with its decades of past and ongoing seabird take, mean that there are now far fewer seabirds left for KIUC's operations to kill.

KIUC's LTHCP nevertheless seeks permission to take, on average, over 1,200 seabirds each year, including 801 'a'o, of which 375 are expected to die, and 436 'ua'u, including 179 mortalities. LTHCP at 5-21 to -23 (pdf 184-86).³ Over the LTHCP's 50-year term, KIUC requests permission to kill or injure over 61,000 additional imperiled seabirds. *See id.* But in so requesting, KIUC fails to propose any additional minimization measures with respect to either its powerlines or streetlights, other than now long-overdue work it expects to complete before the 50-year LTHCP term even begins. *Id.* at 4-25 to -31 (pdf 118-24), 4-33 to -34 (pdf 126-27). The only achievable outlook KIUC has suggested in the LTHCP is that, after many additional years (for 'a'o, decades) of take, its proposed mitigation strategies may—KIUC hopes—show a slight uptick in seabird numbers as compared to the hypothetical scenario in which KIUC immediately removes its infrastructure and ceases operations. *See, e.g., id.* at 5E-40 (pdf 737) (showing long-term modeled projections for 'a'o). KIUC's approach fails to comply with either state or federal law.

The Draft LTHCP Fails To Minimize Take Of Endangered And Threatened Seabirds To The "Maximum Extent Practicable."

Under both HRS chapter 195D and the federal ESA, approval of KIUC's LTHCP depends on whether KIUC will minimize its take of listed seabirds "to the maximum extent practicable." HRS § 195D-4(g)(1); 16 U.S.C. § 1539(a)(2)(B)(ii); 50 C.F.R. §§ 17.22(b)(2)(i)(B), 17.32(b)(2)(i)(B); *see also* HRS § 195D-21(c)(4). Since KIUC cannot operate without both a state incidental take license ("ITL") and federal incidental take permit ("ITP"), the more demanding incidental take standard imposed under Hawai'i law—which mandates that the "cumulative impact of the [authorized] activity ... provides net environmental benefits," HRS § 195D-4(g)(8), that the LTHCP "will increase the likelihood of recovery of the [listed] species that are the focus of the plan," *id.* § 195D-21(b)(1)(B), and that the LTHCP "result[s] in an overall net gain in the recovery of Hawaii's threatened and endangered species," *id.* § 195D-30—informs the analysis of what alternatives are "practicable." *See also infra* at 8-9. KIUC moreover cannot secure an ITL under Hawai'i law unless the LTHCP identifies "steps that will be taken to minimize and mitigate all negative impacts, including *without limitation* the impact of any authorized incidental take." *Id.* § 195D-21(b)(2)(C) (emphasis added). The draft LTHCP falls far short of these mandates, with KIUC seeking *post-hoc* approval for decades-overdue modifications to its infrastructure that precede the LTHCP's effective date, proposing no further powerline reconfigurations and no further modifications to streetlights whatsoever throughout the 50-year LTHCP term, and instead relegating further practicable minimization measures to adaptive

³ Indirect take of eggs and chicks is assumed to be lethal. This is because, "if one parent dies or is injured, it is likely the chick or egg will be lost." *Id.* at 5-14 (pdf 177).

management. *See* LTHCP at 4-29 (pdf 122), 4-34 (pdf 127). Far from minimizing take to the *maximum* extent practicable as chapter 195D and the ESA require, KIUC proposes to do next to *nothing* to minimize take for the next 50 years.⁴

1. The LTHCP Must Include Further Powerline Reconfiguration Strategies To Minimize Take, Including Undergrounding Of New And Existing Powerlines.

Seabird take caused by collisions with powerlines is “one of the most significant threats to Newell’s shearwater (‘a’o) and Hawaiian petrels (‘ua’u) on Kaua’i.” LTHCP at 5-3 (pdf 166). Powerline collisions break bones, tear off feathers and skin, injure heads, eyes, and wings, and frequently result in grounding and death. *Id.* at 5-4 to -5 (pdf 167-68). KIUC, however, refuses to take any steps to minimize powerline take beyond the measures that KIUC says it will complete before the LTHCP even takes effect. In other words, KIUC seeks to *maintain*, rather than minimize, its seabird take.

Despite seeking approval to continue taking seabirds at devastating rates for another half-century, KIUC proposes *no further powerline take minimization* measures and instead seeks long-term credit for work done before the LTHCP is effective. The draft LTHCP notes a handful of powerline minimization projects completed in 2015-2016 covering just over six miles of powerlines, *id.* at 4-24 to -25 (pdf 117-18), describes the stop-gap powerline minimization measures that were initiated only in 2020, *id.* at 4-25 to -26 (pdf 118-19), and lists just three powerline reconfiguration projects which KIUC began implementing in 2020, covering only 8.1 of the 171 miles of transmission lines KIUC operates. *Id.* at 4-29 (pdf 122). KIUC refuses to implement any further powerline minimization, stating unequivocally that “[n]o additional powerline reconfiguration projects are planned as part of this HCP.” *Id.*

To satisfy the federal and state mandates, KIUC must do more to ensure that seabird take is minimized “to the maximum extent practicable.” Although KIUC claims that its current minimization strategy will reduce seabird take by an average of 65% (ranging as low as 42%), LTHCP at 4-25 (pdf 118), this is not the maximum practicable take reduction strategy available and does not justify KIUC’s request to continue taking over 1,200 seabirds per year. Undergrounding powerlines, which has been recommended for reducing seabird take on Kaua’i since at least 1995, “would *eliminate* the potential for covered seabird collisions.” *Id.* at

⁴ Mitigation measures like colony protection are intended to “offset” incidental take and mitigate “any impacts expected to remain *after* avoidance and minimization measures are implemented.” U.S. Fish & Wildlife Service, *Habitat Conservation Planning and Incidental Take Permit Processing Handbook* (Dec. 21, 2016) at 9-19 (pdf 168), <https://www.fws.gov/sites/default/files/documents/habitat-conservation-planning-handbook-entire.pdf> (last visited Mar. 24, 2023) (emphasis added). Mitigation measures are no substitute for avoiding take in the first place.

8-2 (pdf 333) (emphasis added). Other benefits of undergrounding powerlines include increased resilience against extreme weather and improved sightlines, both of which would benefit Kaua'i residents. While there has been historical pushback by KIUC to undergrounding current and future powerlines, KIUC has been aware of the need to bury powerlines since it acquired Kaua'i Electric decades ago and should have long ago prepared, funded, and began implementing an undergrounding program.

Undergrounding its existing powerlines, moreover, is not the only practicable measure KIUC can implement to minimize its seabird take. Other available strategies include lowering and otherwise reconfiguring distribution and transmission lines—which KIUC itself demonstrated is practicable but implemented only for 8.2 miles of its powerlines, LTHCP at 4-29 (pdf 122)—and relocating powerlines away from high-collision areas, a possibility that KIUC refuses even to consider. *Id.* at 8-1 (pdf 332). KIUC claims that implementing such measures can avoid 80% of seabird take, significantly greater take minimization than the 65% reduction that KIUC says its proposed minimization strategy will achieve, yet KIUC refuses to implement any of these additional modifications to its existing powerlines. *Id.* at 4-25, 4-32 to -33 (pdf 118, 125-26). Particularly given the 50-year term of the requested take authorization, KIUC has failed to carry its burden to establish that it is impracticable to underground *any* powerlines, or otherwise reconfigure or relocate them, including spans known to be most lethal to imperiled seabirds.

KIUC plans only for *new* powerline construction, but refuses again to consider even the possibility of undergrounding any of the new lines, instead seeking authorization to build new, 45-foot tall powerlines during the next half-century, adding to the toll on listed seabirds. *Id.* at 4-32 to -33 (pdf 125-26). KIUC's estimates of "reduction in powerline collisions for new powerlines" due to omission of static wires and installation of diverters defy logic. *Id.* at 4-33 (pdf 126). Prior to the installation of new powerlines, there would be no collisions to reduce. Thus, any new powerlines would inflict new harm on imperiled seabirds, not minimize take. KIUC should not assume that it would be allowed to operate new powerlines in violation of chapter 195D and the ESA.

KIUC should be required to invest in take minimization efforts through the entire life of the 50-year LTHCP, including projects like undergrounding, which would eliminate powerline take altogether. DLNR must consider all relevant circumstances, such as the 50-year duration of the proposed ITP/ITL, in determining what minimization measures are "practicable," HRS § 195D-4(g)(1); 16 U.S.C. § 1539(a)(2)(B)(ii), and should not allow KIUC to skate by with stop-gap minimization measures that pre-date the LTHCP. KIUC claims that undergrounding any powerlines is "infeasible and cost prohibitive," despite noting an operating budget surplus of \$12 million for *one year alone*. LTHCP at 8-2 to -3 (pdf 333-34). Considering that the LTHCP would be in effect for half a century, it is not impracticable for KIUC to include, plan for, and fund undergrounding projects to eliminate take over time, particularly in locations with high levels of documented seabird take like the Powerline Trail.

Instead, KIUC relegates further powerline minimization to adaptive management, acknowledging that it could, if it wanted to, “identify additional minimization” to reduce powerline take. *Id.* at 6-9 to-12 (pdf 232-35). But adaptive management is no substitute for the obligation to minimize take; if additional minimization would be practicable at some point over the next 50 years, it is practicable for KIUC to plan for such measures *now*. Such minimization measures must be included and implemented as part of the LTHCP to comply with the legal mandate to minimize take to the “maximum extent practicable.”

2. The LTHCP Should Include Replacing KIUC’s Streetlight Bulbs To Minimize Take.

Artificial lighting such as streetlights attract seabirds and cause them to become disoriented and fatigued, circling around lights and sometimes colliding with structures, ultimately becoming grounded, a phenomenon known as fallout. LTHCP at 5-7 (pdf 170). Take caused by fallout predominantly affects fledging seabirds attempting their first flights to sea, or birds at sea who are attracted back to land by lights onshore. *Id.* Bright lights confuse, disorient, or blind seabirds, causing them to land where they would not otherwise land, unable to take off again due to injury, exhaustion, or confusion, and subjecting them to predation, starvation, dehydration, and being crushed by automobiles. *Id.* Seabirds experiencing fallout are assumed to die. *Id.* at 5-15 (pdf 178).

As with powerline collisions, KIUC fails to minimize take caused by streetlight attraction “to the maximum extent practicable.” The draft LTHCP notes that KIUC finished installing shielding on its existing streetlights in 2017, but proposes no additional take minimization strategies other than to mimic the 2017 retrofitting when installing new streetlights. *Id.* at 4-33 to -34 (pdf 126-27). KIUC’s retrofits, however, were not entirely beneficial to imperiled seabirds. While installing full-cutoff shielded fixtures was a positive move, converting from high-pressure sodium bulbs (which are amber-colored and have a relatively low blue-light content) to LED bulbs (which are white and have a higher blue-light content) was not. *Id.*

KIUC acknowledges—but does not act on—substantial scientific evidence that seabirds are affected differently by different wavelengths of light, *id.* at 5-7 (pdf 170), with bright white streetlights like KIUC’s that contain a high percentage of short-wavelength (“blue”) light attracting wildlife to a greater degree than amber streetlights containing longer wavelength light, and therefore causing more take. *See id.* (listing studies); *see also, e.g.,* Att. A: Airam Rodriguez, et al., *Reducing light-induced mortality of seabirds: High pressure sodium lights decrease the fatal attraction of shearwaters*, *Journal for Nature Conservation* (2017). KIUC says it will consider—but again only as an adaptive management measure—“[c]hanging the wavelength of the LED *if research shows* a different LED wavelength is more bird-friendly.” LTHCP at 6-41 (pdf 264) (emphasis added). Current research already *does* show this. KIUC cannot legally defer these proven minimization techniques to a nebulous future adaptive management scenario.

Further minimizing the take caused by KIUC's high-blue-light-content streetlights is undeniably practicable. As with powerline minimization, KIUC acknowledges the potential for undertaking "additional minimization" of streetlight take, LTHCP at 6-13 (pdf 236), but provides no justification for deferring implementation of further practicable minimization measures to some later time.

One practicable take minimization measure KIUC can—and therefore must—promptly implement is to reduce the blue-light content of its streetlights and other lighting fixtures. Both Maui County and Hawai'i County have enacted ordinances requiring the retrofit of county streetlights with fixtures that have less than 2% "blue light content" (defined as "the ratio of the amount of energy emitted by the outdoor light fixture between 400 and 500 nm divided by the amount of energy between 400 and 700 nm"). Hawai'i County Code § 14-51(a)(9); *see* Maui County Ord. 5434, § 2 (Oct. 24, 2022) (enacting Maui County Code § 20.35.060.D) (same); *see also* Hawai'i County Code § 14-55, Table 14-A (specifying that LED fixtures must have "less than 2% blue light content"). DOFAW itself urged Maui County to use only LED streetlights "designed or filtered to have a correlated color temperature of 2200 Kelvin or less, or a *blue light content of less than 2%*" and noted that "LED lights with these specifications have been found to have *fewer impacts on protected wildlife, including seabirds and turtles*" (emphases added). A copy of DOFAW's letter is attached as Att. B.

Another practicable way KIUC can minimize light attraction and seabird fallout is by dimming its streetlights during the fledging season, when most fallout occurs. KIUC already dims its facility lights at Port Allen Generating Station at the beginning of fledging season, and has seen "significant reductions in fallout" as a result. LTHCP at 4-34 (pdf 127). KIUC must apply this demonstrably effective minimization strategy to its streetlights. Streetlight dimming is practicable, as demonstrated by Maui County's agreement in 2021 to reduce light attraction by dimming over a thousand of its LED streetlights to 80% of full brightness, which reduces fallout but is bright enough to maintain public safety. *See* Att. C, Settlement and Release Agreement at pdf 4 (¶ 2). While KIUC may claim that whether to dim streetlights or reduce blue-light content is a decision for Kaua'i County to make, KIUC has already implemented or committed to other streetlight modifications. LTHCP at 4-34 (pdf 127). Even if county approval were required, KIUC has failed to demonstrate that it is not practicable to get it.

To minimize take of listed seabirds, KIUC must replace its high-blue-light-content streetlight fixtures with fixtures emitting no more than 2% "blue light content" and dim its streetlights. Particularly considering the 50-year term of the LTHCP and the astronomical level of take authorization KIUC seeks, minimizing take from streetlights by dimming its fixtures and minimizing their blue-light content is practicable and, therefore, must be implemented as part of KIUC's LTHCP.

KIUC Fails To Meet Specific State Law Standards Requiring “Reasonable Certainty” That The LTHCP Will Result In “Net Environmental Benefits” And An “Overall Net Gain In The Recovery” Of Kaua’i’s Imperiled Seabirds.

Under HRS chapter 195D, KIUC must show that the cumulative impacts of its activities will “provide[] net environmental benefits,” HRS § 195D-4(g)(8), and must provide “sufficient information for the board to ascertain with reasonable certainty the likely effect” of the LTHCP. *Id.* § 195D-21(c). An HCP also must “increase the likelihood of recovery” of the species covered under the plan, *id.* § 195D-21(b)(1)(B), and must be “designed to result in an overall net gain in the recovery of Hawai’i’s endangered and threatened species.” *Id.* § 195D-30. The statute defines “recovery” as an increase in species population such that the legal protections of chapter 195D and the federal ESA “are no longer needed.” *Id.* § 195D-2.

Instead of providing any certainty about environmental benefits or species recovery, however, KIUC relies on an admittedly *uncertain* model, *see, e.g.*, LTHCP at 5E-14 to -15 (pdf 711-12) (“there remains a high level of uncertainty for many of the biological assumptions that are input parameters for the . . . model”); *id.* at 5E-41 (pdf 738) (“many model uncertainties have not been quantified”), to speculate that, after continuing to drive seabird populations down for many more years to come, the balance of KIUC’s planned activities *may* finally result in a slight uptick in seabird numbers, for ‘a’o perhaps only in the late 2060s. *See id.* at 5E-40 (pdf 737). KIUC’s guesswork fails to establish the requisite reasonable certainty that the LTHCP will result in net environmental benefits or increase the likelihood of species recovery. The model KIUC uses to forecast that seabird populations *may* eventually turn the corner includes no confidence bands or intervals to show the range of possible outcomes (*e.g.*, due to stochasticity), including the possibility that there would be *no* long-term benefit to seabird populations under KIUC’s LTHCP.

As one specific example of the uncertainty and bad data built into KIUC’s long-term projections, the LTHCP assumes that, for powerline strikes, only “20% of injuries and mortalities are breeding adults,” resulting in indirect lethal take of “one egg or chick . . . for every breeding adult injured or killed.” *Id.*, Table 5-2 at 5-21 (pdf 184). This assumption was discussed in depth—and universally panned—at the March 1, 2023, meeting of the Endangered Species Recovery Committee (“ESRC”).⁵ KIUC’s own seabird expert, André Raine, stated that “none of us actually agree” with the assumption that only 20% of the seabirds that powerline strikes injure or kill are breeding adults, which came from a scientific paper with a seriously

⁵ The ESRC’s March 1, 2023, meeting can be reviewed online at <https://www.youtube.com/watch?v=DG9Sswz0EHI> (last visited Mar. 24, 2023). The relevant discussion begins at timestamp 2:35:12.

flawed methodology analyzing a very limited dataset.⁶ KIUC's seabird experts endorsed using the better assumption that *half* of powerline collisions that cause injury or mortality also indirectly result in egg and chick mortality.⁷ The ESRC member representing the U.S. Fish & Wildlife Service, Michelle Bogardus, agreed that "I don't think anybody is comfortable with 80-20, least of all me."⁸ In other words, the experts agree that the LTHCP's 20% assumption for indirect powerline take of eggs and chicks is wrong, and that the rate of indirect lethal take should instead be much higher. To pass legal muster, KIUC must ensure that the take estimates in the LTHCP—as well as its modeled population trends—are based on "reliable data," not assumptions that everyone knows lack any scientific basis. HRS § 195D-21(b)(1).

DLNR's consideration of "net environmental benefits" and "overall net gain in . . . recovery" must moreover consider the effects of KIUC's seabird take and KIUC's proposed take minimization and mitigation as compared with no take at all. In other words, KIUC must provide "reasonable certainty" that its mitigation measures would save more listed seabirds than its permitted activities would kill. HRS § 195D-21(c). Instead of carrying its burden to show "net environmental benefits" and a "likelihood of recovery" with "reasonable certainty," KIUC places the burden to survive on the seabirds themselves, with little more than a hope that reproduction rates, a handful of managed breeding sites, and the chance of rescue will combine to save these birds from the brink of extinction. KIUC has failed to carry its burden to establish that its proposed LTHCP satisfies Hawai'i law.

The LTHCP Lacks Adequate Provisions For Monitoring.

Even if the LTHCP otherwise satisfied HRS chapter 195D's and the ESA's substantive standards to authorize KIUC's incidental take (and it does not), the LTHCP would still fall far short of providing adequate "provisions for monitoring" to enable state and federal agencies to "evaluat[e] [KIUC's] progress in achieving [the LTHCP's] goals qualitatively and quantitatively." HRS §§ 195D-21(b)(2)(H); *see also* 50 C.F.R. §§ 17.22(b)(1)(iii)(B), (3); *id.* § 17.32(b)(1)(iii)(C)(2), (3). KIUC sketches out a three-pronged monitoring program for LTHCP compliance, take, and biological effectiveness, but does not establish any standards for selection of monitoring staff or provide for any audits or independent third-party verification of monitoring data. *See* LTHCP at 6-2 to 6-3 (pdf 225-26). To ensure adequate protection for Hawai'i's critically imperiled species, the LTHCP must detail the standards for monitors to ensure that only individuals with the necessary qualifications and experience will conduct this vital task. The LTHCP should further require adequate training for monitors from the U.S. Fish & Wildlife Service or other third-party entities with expertise in the covered seabirds (*e.g.*, the

⁶ ESRC March 1, 2023, meeting at timestamp 2:36:33.

⁷ *Id.*, beginning at timestamp 2:37:54.

⁸ *Id.* at timestamp 2:48:55.

Kaua‘i Endangered Seabird Recovery Project). Finally, the LTHCP should require KIUC to secure independent, third-party verification of monitoring data and also to provide regulators and the public with real-time monitoring updates (*e.g.*, on a publicly-available website) to ensure that any seabird take—particularly take in excess of the LTHCP’s estimates—is accurately, promptly, and transparently documented.⁹ Without robust standards for monitoring accuracy and a commitment to independent verification of monitoring data, KIUC’s LTHCP risks becoming little more than a paper exercise.

Conclusion

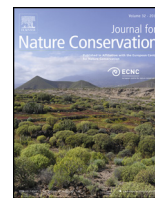
KIUC’s draft LTHCP fails to minimize seabird take to the maximum extent practicable and fails to provide reasonable certainty that KIUC’s combined actions will have net environmental benefits and result in an increased likelihood of recovery for covered seabird species. The LTHCP must be revised to address these deficiencies before it can be approved. We appreciate the opportunity to provide these comments. Please feel free to contact us if you have any questions or would like to discuss any of the issues raised above. I can be reached by telephone (808-599-2436) or email (mcleveland@earthjustice.org).

Sincerely,



Mahesh Cleveland
Senior Associate Attorney
Earthjustice
Attachments A, B, & C

⁹ Reporting “the amount of take of each covered species” only once a year, as KIUC proposes (LTHCP at 7-50; pdf 329), would impermissibly delay implementing vital adaptive management measures in the event that KIUC exceeds its authorized take.



Short communication

Reducing light-induced mortality of seabirds: High pressure sodium lights decrease the fatal attraction of shearwaters

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ARTICLE INFO

Article history:

Received 23 January 2017

Received in revised form 6 July 2017

Accepted 10 July 2017

Keywords:

Artificial light

Fledging

Illumination

Light pollution

Mortality

Seabird

ABSTRACT

The use of artificial light at night and its ecological consequences are increasing around the world. Light pollution can lead to massive mortality episodes for nocturnally active petrels, one of the most threatened avian groups. Some fledglings can be attracted or disoriented by artificial light on their first flights. Studies testing the effect of artificial light characteristics on attractiveness to seabirds have not provided conclusive results and there is some urgency as some endangered petrel species experience high light-induced mortality. We designed a field experiment to test the effect of three common outdoor lighting systems with different light spectra (high pressure sodium, metal halide and light emitting diode) on the number and the body condition of grounded fledglings of the short-tailed shearwater *Ardenna tenuirostris*. A total of 235 birds was grounded during 99 experimental hours (33 h for each treatment). 47% of birds was grounded when metal halide lights were on, while light emitting diode and high pressure sodium lights showed lower percentages of attraction (29% and 24%). Metal halide multiplied the mortality risk by a factor of 1.6 and 1.9 respectively in comparison with light emitting diode and high pressure sodium lights. No differences in body condition were detected among the birds grounded by the different lighting systems. We recommend the adoption of high pressure sodium lights (or with similar spectra) into petrel-friendly lighting designs together with other light mitigation measures such as light attenuation, lateral shielding to reduce spill and appropriate orientation.

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1. Introduction

The increasing use of artificial light at night is causing a loss of the natural nightscapes worldwide (Falchi et al., 2016). Light pollution is an emerging threat to biodiversity conservation by disrupting circadian rhythms, affecting natural behaviours, reproduction, animal movement or endocrine systems, and finally, influencing the ecosystem functioning by cascading effects (Gaston, Duffy, Gaston, Bennie, & Davies, 2014; Hölker, Wolter, Perkin, & Tockner, 2010; Longcore & Rich, 2004). Although marine environments are mostly free of artificial light, most coastal areas are affected by light pollution at night (Davies, Duffy, Bennie, & Gaston, 2014). Artificial lights along the coast can cause direct and incidental mass mortality events in endangered marine taxa, e.g. turtles or seabirds (Rich & Longcore, 2006; Rodríguez, Holmes et al., 2017). Despite the multiple effects on human health and biodiversity, artificial light is steadily proliferating in the night environment led

by improvements in luminous efficiency (Kyba, Hänel, & Hölker, 2014). Thus, the determination of the impact of the different artificial lighting systems on biodiversity should be a priority for developing appropriate lighting policies to enable better coastal planning and conservation practices.

Fledglings of nocturnal petrel species (including shearwaters and storm-petrels) are attracted to artificial lights during their first flights from nest-burrows to the ocean, often colliding with human structures or the ground. If they survive the collision, they are grounded in artificially lit areas and susceptible to being killed by incidental threats (vehicle collision, predation, starvation or dehydration) (Ainley, Podolsky, Deforest, & Spencer, 2001; Le Corre, Ollivier, Ribes, & Jouventin, 2002; Rodríguez, Rodríguez, Curbelo et al., 2012; Rodríguez et al., 2014). To mitigate light-induced mortality of petrels, rescue programs have been implemented in several locations around the world (Rodríguez, Holmes et al., 2017). However, pre-emptive measures, that reduce the attractiveness of artificial lighting to seabirds, would be much more effective at the population level. To our knowledge, there is no published information on whether seabird attraction to artificial lights is related to the type of lights or individual traits of the seabirds. Here, we test the effect of three commonly used lighting systems with different

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light spectra (metal halide – MH, high pressure sodium – HPS – and light emitting diode – LED) on the attraction of short-tailed shearwater (*Ardenna tenuirostris*) fledglings, a species severely affected by light pollution (Rodríguez et al., 2014). We also test if body condition of grounded fledglings differs among lighting systems. Why petrels are attracted to lights is not entirely understood, but it may be related to food as petrels could confuse lights with natural bioluminescent prey or associate light with food during the nestling period at their nest-burrows (see Rodríguez, Holmes et al., 2017). Although short-tailed shearwater fledglings attracted by artificial lights do not seem handicapped, as their body condition is similar to those of adults (Rodríguez, Moffett et al., 2017), degree of attraction to lighting systems could be mediated by body condition. Body condition at fledging is a proxy to greater likelihood of survival and recruitment in long-lived seabirds (Becker & Bradley, 2007; Maness & Anderson, 2013). Thus, attraction of birds in good condition, i.e. those with higher survival and recruitment probabilities, to a particular lighting system would worsen the impact of such light for petrel populations. Apart from lighting systems, other factors appear to play a role in the number of seabirds attracted to lights. First, birds tend to fledge early in the night (Reed, Sincoc, & Hailman, 1985; Rodríguez, Rodríguez, & Negro, 2015), and therefore, it was expected that the number of grounded birds would increase during the first nocturnal hours. Second, fledging is a synchronous process leading to high number of birds fledging around a peak date (27–28 April for the short-tailed shearwater; Rodríguez et al., 2014). Third, fledging date is favoured by strong winds which give a lift to flight-inexperienced fledglings (Rodríguez et al., 2014; Skira, 1991). Fourth, the number of grounded birds is reduced during full moon nights (Le Corre et al., 2002; Rodríguez & Rodríguez, 2009; Telfer, Sincoc, Byrd, & Reed, 1987). Fifth, the number of attracted birds in a year is related to the number of fledglings produced by the population in that particular year, i.e. the higher breeding success the higher the numbers of grounded birds (Day, Cooper, & Telfer, 2003; Rodríguez, Rodríguez, & Lucas, 2012).

2. Material and methods

Our study was conducted on Phillip Island, south-eastern Australia, where natural night skies unpolluted by artificial lights are available adjacent to short-tailed shearwater breeding colonies (Fig. 1a). Phillip Island is relatively low with a maximum altitude about 112 m above sea level. It holds around 543,000 breeding pairs of short-tailed shearwaters (Harris, Brown, & Deerson, 1980), which is more than 1% of its global breeding population (BirdLife International, 2017), mainly distributed along the south coast (Fig. 1a). The short-tailed shearwater nests in dense colonies generally in sandy soils. Adults start migration before their chicks fledge and consequently fledglings depart the colony in the absence of their parents. Fledglings try to reach the ocean on their first flights.

Our experiment was conducted in the overflow car park at Phillip Island Nature Parks on the Summerland Peninsula (–38.505942°S, 145.149486°E), which is a 13,000 m² grassed area surrounded by some unlit buildings and short-tailed shearwater colonies (Fig. 1b). At the experiment site, masts held the three types of lamps (MH, HPS and LED) at the same height and orientation at each mast. Five masts of 3–5 m high supported the lamps used during the experiment (Fig. 1b, c). The three light types employed in our study are commonly used in outdoor facilities (e.g. car parks, sport stadiums and industrial areas) and they emit different spectra (Fig. 2a; Table 1). MH and HPS bulbs emit light in 360° in every direction, and for this reason they were housed in similar luminaries. In contrast, LED emits light in one direction.

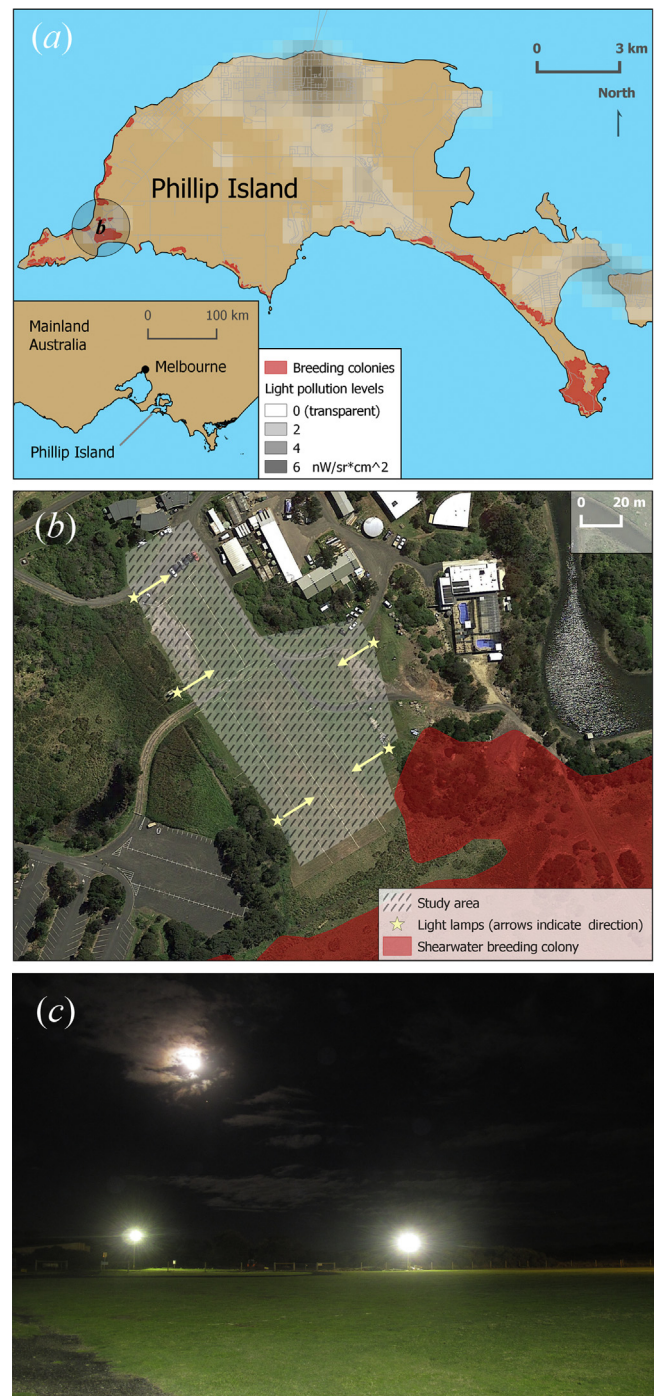


Fig. 1. (a) Phillip Island map showing distribution of breeding colonies, study site (grey circle) and light pollution levels taken from a nocturnal satellite imagery; NOAA National Geophysical Data Center; available at http://ngdc.noaa.gov/eog/viirs/download_monthly.html. (b) Map of the study area showing the light posts and the lit area. (c) Nocturnal picture showing two light-posts and the moon.

To assess the potential attraction of shearwater fledglings to the three lighting types, we designed an experiment in which every treatment (light type) was replicated every night. We lit the area at night during the fledging period and counted the number of grounded birds on the lit field. The experiment was repeated over three fledging seasons (2014: 22 April–4 May; 2015: 19 April–5 May; 2016: 26–29 April). To account for the high variability in number of groundings from night to night, we turned on each lighting type for one hour in a random order each night. The same type

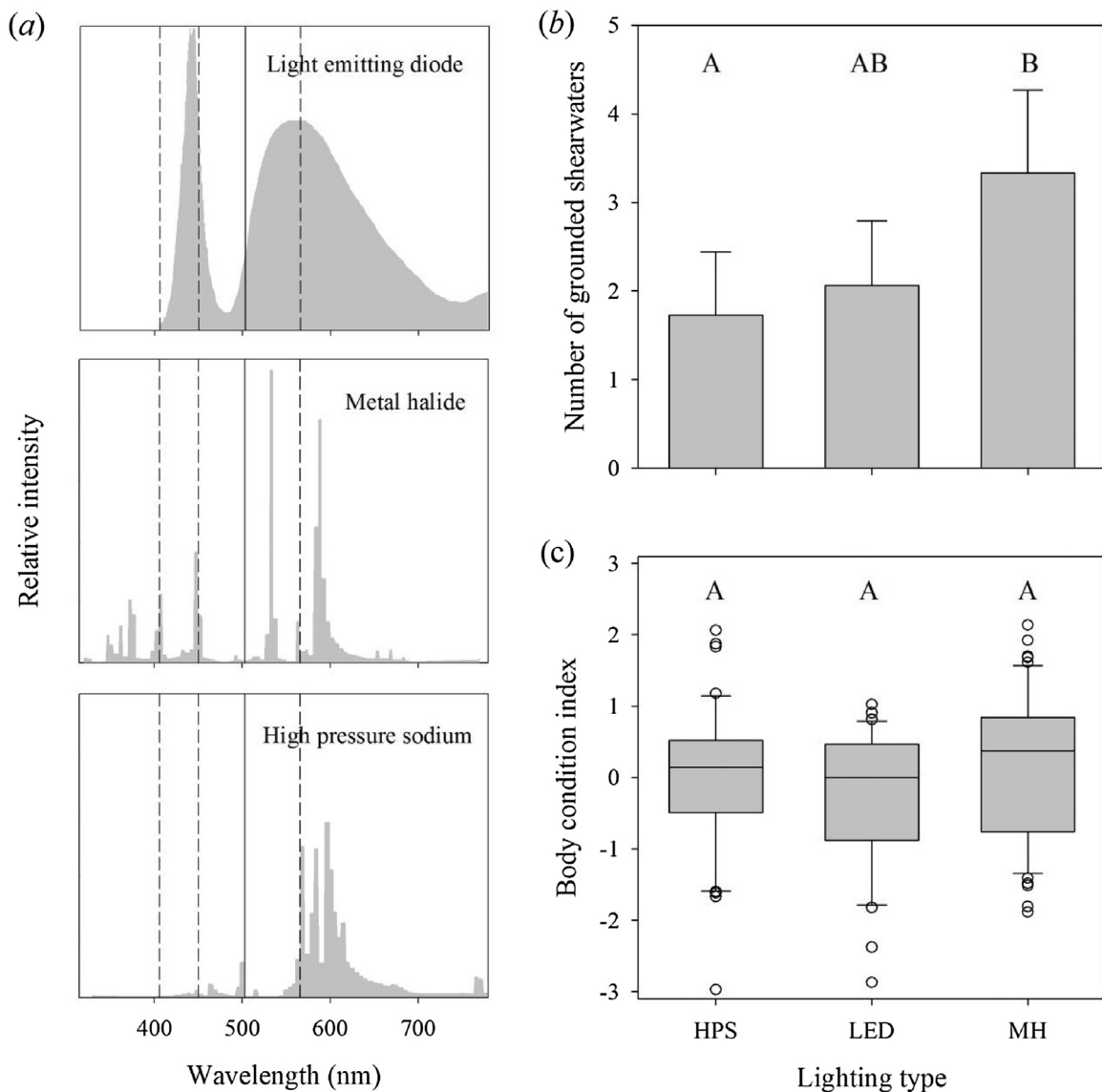


Fig. 2. Spectral composition (a) of the lighting types used (data provided by manufacturer). Vertical dashed and solid lines indicate the wavelength of maximum absorbance of visual pigment of cones and rods for *Ardena pacifica* (Hart, 2004). Mean number per hour (b) and body condition (c) of short-tailed shearwater fledglings grounded by lighting types. In (b) bars show mean \pm s.e. Different capital letters indicate significant differences between levels.

Table 1
Characteristics of light systems used in the experiment.

Light	Comercial reference	Lamp Wattage (W)	Color Temperature (K)	Luminous Flux (Lm)
High pressure sodium (HPS)	SON-T 400W/220 E40 1SL	400	2000 (warm)	48000
Metal halide (MH)	MASTER HPI-T Plus 400W/645 E40 1SL	400	4500 (cool)	32000
Light emitting diode (LED)	VBLFL-855-4-40	200	4536 (cool)	18111

of light (MH, HPS and LED) was on in the five masts during each experimental hour. We also had a period of 15-min in darkness between treatments to avoid potential attractive effects of the previous treatment on the birds. First light-treatment was turned on 45–60 min after sunset. We ran the experiments in the first hours of darkness (three experimental hours in total plus two 15-min gaps) as they coincide with the peak of fledging time (Reed et al., 1985; Rodríguez et al., 2015). By randomly sequencing the three treatments, we controlled for any changes in hourly fledgling rate through the night.

Grounded birds were collected and kept in boxes. Each individual was marked with a permanent marker pen on the toe webbing

for identification and released in the closest colony at the end of each experimental night. Recaptured birds (five birds) were not included in the analyses. In 2015, body mass (g) and four biometric variables (wing, tarsus, bill length and bill depth) were measured from grounded birds in the treatments of the experiment. The biometric variables were taken using an electronic balance (nearest 5 g), a ruler (nearest 1 mm) and an electronic calliper (nearest 0.01 mm). To obtain a size indicator of the grounded birds, we ran a principal component analysis (PCA) on centered and scaled morphometric variables (wing, tarsus and bill length, and bill depth) and the first principal component was used as a body size index (BSI). The first principal component retained 54% of variation. The

four morphometric variables showed positive factor loadings (factor loadings: 0.47, 0.51, 0.49 and 0.52 for wing, tarsus, and bill length, and bill depth) and highly significant correlations to the first principal component (Fig. S1). Then, we run a linear model of body mass on BSI (the first principal component). This regression showed a $R^2 = 0.33$ and it was statistically significant ($F_{1,133} = 65.2$, $P < 0.001$). Diagnostic plots indicated that model assumptions were not violated (see Fig. S2). Finally, we extracted the standardized residuals of this model and used them as a body condition index (BCI), where positive and negative values indicate that birds are heavier and lighter than the average in the population, respectively (Green, 2001; Rodríguez, Rodríguez, Curbelo et al., 2012; Rodríguez, Moffett et al., 2017).

To control for the confounding variables noted in the introduction, i.e. fledging time/order and wind strength, moon light and inter-annual breeding success, we added five predictors: 1) Order of light treatment (three-level factor: first, second and third). 2) Quadratic term of fledging date (continuous variable ranging from 19 April to 5 May). 3) Wind speed (km/h) taken from an automated meteorological station located at Rhyll, Phillip Island, and distant 15 km from the study area (Bureau of Meteorology reference: 086373). The station provides wind data every 30 min and we calculated the average for the two readings of each experimental hour (treatment). 4) Moon light or luminance (continuous variable) measured as the percentage of luminance at full moon at zenith at distance equal mean equatorial parallax (Austin, Phillips, & Webb, 1976). We calculated moon luminance for each 10-min periods by using the moonlight Fortran software (Austin et al., 1976) and we assigned the maximum moon luminance to each experimental hour. 5) Year as a three-level factor to account for annual variation in breeding success.

We used generalised linear mixed models (GLMMs) with log link and Poisson error distributions to assess whether the number of grounded birds differs between light treatments (three-level factor). To control for the dependence in the number of grounded birds per light treatment in a single night, night was included as a random factor. To control for confounding variables, i.e. variables affecting the number of attracted birds (see above), we conducted GLMMs adding these predictors plus light treatment factor. To avoid over parameterization, only two predictors were included in each model (light treatment plus predictor). To assess whether body condition of grounded birds differs between lighting types, a linear model was conducted including body condition index as response variable and light treatment as a factor. Models were compared to null models, i.e. including only the intercept, using the 'anova' function (stats package) and assumptions were checked using diagnostic plots (Supplementary material). Statistical analyses were conducted in R version 3.3.2 (R Core Team, 2016). The function 'prcomp' (stats package) was employed to conduct the principal component analysis (PCA). Linear models and generalised linear mixed models were conducted using the functions 'lm' (stats package) and 'glmer' (lme4 package) (Bates, Mächler, Bolker, & Walker, 2015). Model assumptions of generalised linear mixed models were checked through a simulation-based approach using the 'DHARMA' package (Hartig, 2016).

3. Results

A total of 235 short-tailed shearwater fledglings were grounded during the 33 experimental nights (99 h; 33 h for each treatment) in the three annual fledging periods. Pooling all nights, the highest number of grounded fledglings was reached when MH lights were on ($\chi^2_2 = 19.974$; $P < 0.001$; 110, 68 and 57 birds for MH, LED and HPS lights, respectively). Eight out of the 235 birds were killed or subsequently euthanized after fatal collision with the ground or

light-posts (4, 3 and 1 birds for MH, LED and HPS lights). The GLMM including just the light treatment was significant with regard to the null model, i.e. including only the intercept term ($\chi^2_2 = 19.209$; $P < 0.001$; Fig. 2b). Light treatment was also significant in all the GLMMs including additional variables (all P-values < 0.003 ; Supplementary material). In 2015, 135 grounded shearwaters were captured and measured. Body condition was similar between the shearwaters grounded by the different lighting types (Fig. 2c), as the model was not better than the null model ($F_{2,132} = 1.908$; $P = 0.153$).

4. Discussion

The number of grounded birds differed among light types, with MH being the light type attracting the highest number of the short-tailed shearwater fledglings. LEDs were second highest light type in causing grounded birds, although no statistical differences were apparent in comparison with HPS. Body condition of birds grounded by each lighting type was similar, indicating that attraction power of each lighting type did not depend on body condition, and more interestingly that no lighting system selectively attracted birds with higher survival and recruitment probabilities, i.e. birds in good body condition.

Differences in the number of grounded birds per light type may be explained by the visual systems of shearwaters. The retina of the congeneric wedge-tailed shearwater (*Ardenna pacifica*) have five visual pigments with maximum absorbance at 406–566 nm (Hart, 2004). Assuming a similar visual system, short-tailed shearwater fledglings could be more sensitive to MH and LED lighting, which produce a very cool light (blue) and a wider emission spectrum, than HPS which produces warmer light (red/orange) and low emissions under 550 nm (Table 1; Fig. 2a). Thus, shearwaters are likely to perceive lights differently. Given they display an attraction response, heightened perception may lead to heightened attraction. Our results on the higher number of grounded birds by MH and LED than HPS lights, agree with the possibility that MH and LED lights are appreciably brighter for shearwaters than HPS lights, thus increasing the attraction response.

Our results agree with other studies on other taxa in which HPS lights affect behaviour less than MH or LED lights, e.g. bats (Stone, Wakefield, Harris, & Jones, 2015) or invertebrates (Pawson & Bader, 2014), but contrast with those found for songbirds at off-shore platforms. Nocturnal migrating songbirds are more attracted by light with visible long-wavelength radiation (red and white) than by light with less or no visible long-wavelength radiation (blue and green) (Poot et al., 2008). Thus, adopting taxa-specific recommendations for the effect of artificial lights is crucial.

Designing experiments to study the potential attraction of different light types to seabirds is a challenging task, due to the intrinsic seabird natural traits, the low number of colonies and the vast extensions of cities and their associated light pollution (Reed, 1987, 1986; Reed et al., 1985). Reed et al. conducted two field experiments changing light characteristics (polarization and spectra), but failed to reduce light attraction in Newell's shearwaters *Puffinus newellii* (Reed, 1987, 1986). Despite these inconclusive results, light signatures (wavelength and intensity) have been changed around nesting colonies around the world to mitigate light-induced mortality. However, these actions have been conducted without any scientific evidence and their effectiveness has not been appropriately assessed (Rodríguez, Holmes et al., 2017). Our experimental study sheds some light on the potential effect of commercially available lighting systems, providing first-hand information for the lighting management around seabird breeding grounds. If artificial lights cannot be completely avoided, we strongly recommend that HPS lights, or filtered LED and MH lights with purpose-designed filters for lower emission spectra, should be the only external lights

used in proximity to shearwater colonies. The type of light must be adopted together with other light reduction actions (KSHCP, 2017). Light should be as dim as possible to be fit the purpose, and should be correctly oriented towards the target area or object to avoid skyward light spill. Shielding and cut-off designs for luminaries can also help to avoid unnecessary light spread and reduce shearwater attraction (Reed et al., 1985). Finally, turning off the lights when not required or using motion sensors to turn on/off the lights would contribute to reducing light pollution (for a complete list of light mitigation actions see KSHCP, 2017). More research is needed to further understand the role of emission spectra on the potential attraction of seabirds and the impact of seabird-friendly lighting on sympatric organisms.

Competing interests

The authors declare no competing interests.

Funding

This study was supported by a Marie Curie International Outgoing Fellowship within the 7th European Community Framework Programme (330655 FP7-PEOPLE-2012-IOF) and a Juan de la Cierva contract from the Spanish Ministry of Economy, Industry and Competitiveness (IJCI-2015-23913).

Ethics

Procedures were approved by the Animal Ethics Committee, Phillip Island Nature Parks (Project 1.2014), and the Department of Environment and Primary Industries, Victorian State Government (Permit 10007170).

Acknowledgments

We are grateful to the volunteers during fieldwork, especially to Rut Martínez and Manuel Cáceres, and the Phillip Island Nature Parks personnel. Comments of Mike Weston and an anonymous reviewer improved the manuscript.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.jnc.2017.07.001>.

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DAVID Y. IGE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
FIRST DEPUTY

M. KALEO MANUEL
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
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CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
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HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

February 24, 2022

Rowena M. Dagdag-Andaya, Director
County of Maui Department of Public Works
Engineering Division
200 South High Street
Room No. 410
Wailuku, Maui, HI 96793

Dear Ms. Dagdag-Andaya,

Subject: Request for consultation for proposed streetlight replacement at various locations; DPW Project No. 22-44

The Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) has received the subject request for consultation. As General Electric has ceased the production of high-pressure sodium (HPS) light fixtures, the Department of Public Works (DPW) proposes to replace those lights when they are broken or burnt-out with new light-emitting diode (LED) fixtures. DPW seeks concurrence that the replacement of the HPS lights with LED lights is exempt from the preparation of an environmental assessment (EA), pursuant to Chapter 343, Hawai'i Revised Statutes (HRS). Pursuant to §11-200.1-15, Hawai'i Administrative Rules, exemptions from the preparation of an EA are provided for certain categories of projects that will individually and cumulatively probably have minimal or no significant effects.

DOFAW appreciates the intent to replace broken streetlights in compliance with lighting standards identified in §201-8.5, HRS. However, we have documented incidences of protected seabirds being downed at LED streetlights reported to have been rated at 4,000 Kelvin or less. The Division of Aquatic Resources is additionally concerned with the impacts of lighting on the nesting success of both ESA endangered hawksbill and threatened green sea turtles on Maui. We therefore recommend that those replacement LED lights being installed under an exemption from preparation of EA be designed or filtered so as to have a correlated color temperature of 2200 Kelvin or less, or a blue light content of less than 2%. Blue light content refers the ratio of the amount of energy emitted by the outdoor light fixture between 400 and 500 nm, divided by the amount of energy between 400 and 700 nm. LED lights with these specifications have been found to have fewer impacts on protected wildlife, including seabirds and turtles, and are consistent, for example, with lighting ordinances on the island of Hawai'i.

ATTACHMENT B

If you have any questions, please contact Paul Radley, Protected Species Habitat Conservation Planning Coordinator at (808) 295-1123 or paul.m.radley@hawaii.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "DGS", is positioned above the typed name.

DAVID G. SMITH
Administrator

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KYLIE W. WAGER CRUZ #10165
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**Electronically Filed
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Attorneys for Plaintiffs

IN THE CIRCUIT COURT OF THE SECOND CIRCUIT
STATE OF HAWAI'I

HAWAI'I WILDLIFE FUND, a non-profit corporation, and CONSERVATION COUNCIL FOR HAWAI'I, a non-profit corporation,)	CIVIL NO. 19-1-0053(1) (BJK)
)	(Environmental Court)
)	
)	
Plaintiffs,)	STIPULATION FOR DISMISSAL WITH
)	PREJUDICE OF ALL CLAIMS AND
)	PARTIES; EXHIBIT A
v.)	
)	
DEPARTMENT OF PUBLIC WORKS, COUNTY OF MAUI; ROWENA M. DAGDAG-ANDAYA, in her official capacity as Director of the DEPARTMENT OF PUBLIC WORKS, COUNTY OF MAUI;)	JUDGE: Blaine. J. Kobayashi
MICHAEL P. VICTORINO, in his official capacity as MAYOR OF THE COUNTY OF MAUI; COUNTY OF MAUI; and MAUI ELECTRIC COMPANY, LIMITED,)	TRIAL DATE: None
)	
Defendants.)	
)	

STIPULATION FOR DISMISSAL WITH
PREJUDICE OF ALL CLAIMS AND PARTIES

WHEREAS, on February 12, 2019, plaintiffs Hawai‘i Wildlife Fund and Conservation Council for Hawai‘i, (collectively, “Plaintiffs”) filed the above-captioned lawsuit against defendants Department of Public Works, County of Maui; Rowena M. Dagdag-Andaya, in her official capacity as Director of the Department of Public Works, County of Maui; Michael P. Victorino, in his official capacity as Mayor of the County of Maui; and County of Maui (collectively, “the County Defendants”) and Maui Electric Company, Limited (“Maui Electric”);

WHEREAS, on March 4, 2019, Plaintiffs filed a notice of partial dismissal without prejudice of all claims against Maui Electric;

WHEREAS, on April 26, 2021, Plaintiffs and the County Defendants executed a Settlement and Release Agreement, attached hereto as Exhibit A; and

WHEREAS, on October 20, 2021, the Honorable Blaine J. Kobayashi entered an order granting Plaintiffs’ motion for award of attorneys’ fees and costs (Dkt. 343);

NOW, THEREFORE, pursuant to Hawai‘i Rules of Civil Procedure 41(a)(1)(B) and 41.1(b)(2), IT IS HEREBY STIPULATED by and between Plaintiffs and the County Defendants, by and through their respective counsel and without any admission of law or fact, that:

1. All of Plaintiffs’ claims against the County Defendants in the above-captioned matter are dismissed with prejudice; and
2. All other claims and parties are dismissed.

//

//

//

//

Executed this 6th day of December, 2021.

/s/ Kylie W. Wager Cruz
DAVID L. HENKIN
KYLIE W. WAGER CRUZ
EARTHJUSTICE

Attorneys for Plaintiffs
Hawai'i Wildlife Fund and
Conservation Council for Hawai'i

/s/ Brian A. Bilberry
MOANA M. LUTEY
Corporation Counsel
BRIAN A. BILBERRY
Deputy Corporation Counsel
County of Maui

Attorneys for the County Defendants
Department of Public Works, Rowena M.
Dagdag-Andaya, Michael P. Victorino,
and County of Maui

Hawai'i Wildlife Fund et al. v. Department of Public Works, County of Maui et al., Civ. No. 19-1-0053(1) (Environmental Court), STIPULATION FOR DISMISSAL WITH PREJUDICE OF ALL CLAIMS AND PARTIES

SETTLEMENT and RELEASE AGREEMENT

Plaintiffs Hawai'i Wildlife Fund and Conservation Council for Hawai'i (collectively, "Plaintiffs") filed Civil No. 19-1-0053(1) ("lawsuit") against the Department of Public Works, County of Maui; David Goode, in his official capacity as Director of the Department of Public Works, County of Maui; Michael P. Victorino, in his official capacity as Mayor of the County of Maui; County of Maui (collectively, "County").

Plaintiffs and the County settle the lawsuit as follows:

1. The Department of Public Works will complete the environmental review process initiated on August 20, 2019 pursuant to Hawaii Environmental Policy Act (HEPA), for the replacement of high-pressure sodium street light fixtures on the island of Maui with light-emitting diode (LED) fixtures ("Streetlights Project").
2. The one thousand twenty-one (1,021) installed LED streetlight fixtures that have been installed in east Maui and central Maui shall be set at a level of eighty percent (80%) of their output in lumens, pending completion of the environmental review, as follows:
 - a. The Department of Public Works has contracted with Maui Electric for the installation of factory preset devices to set the levels of the fifty-six (56) LED streetlight fixtures whose locations are listed in **Appendix A**.
 - b. The Department of Public Works shall contract with Hawaiian Electric Company, Maui County to install smart nodes to set the levels of the nine hundred sixty-five (965) LED streetlight fixtures whose locations are listed in **Appendix B**. The Department of Public Works shall make good faith efforts to ensure that the smart

nodes are installed and operational, such that the nine hundred sixty-five (965) LED fixtures are set at a level of eighty percent (80%) of their output in lumens within six (6) months of the execution of the contract.

3. The output levels set forth in Paragraph 2 shall remain in effect until the Department of Public Works issues its final HEPA document (a final environmental impact statement or a final environmental assessment for which a notice of a finding of no significant impact is issued) for the Streetlights Project. The Parties agree that any challenge to Defendants' final environmental assessment or final environmental impact statement would constitute a separate lawsuit.
4. The parties shall issue a mutually agreeable joint press release concerning the resolution of Plaintiffs' lawsuit. The parties shall not make public statements concerning the resolution of the lawsuit, including any statements regarding the agreed-upon output levels described in Paragraph 2, that are inconsistent with the joint press release. The agreed-upon joint press release is attached hereto as **Appendix C**.
5. Until the dismissal of their lawsuit, Plaintiffs and their counsel will not have any *ex parte* communications with any County officials or councilmembers, other than Corporation Counsel, regarding the allegations, disputes, claims, and settlement of the disputed matters raised in their lawsuit. If Defendants discover any such communications, they may seek appropriate relief from the circuit court.
6. As part of its environmental review process pursuant to HEPA for the Streetlights Project, the Department of Public Works shall fully evaluate the following alternatives:

- a. Implementation of the Streetlights Project using LED streetlight fixtures that are manufactured (as opposed to modified after the fact) to have a blue-light content of less than 2%, calculated using the County of Hawai'i formula, *i.e.*, "the ratio of the amount of energy emitted by the outdoor light fixture between 400 and 500 [nanometers (nm)] divided by the amount of energy between 400 and 700 nm," Haw. Cnty. Code § 14-51(a)(9)); and
 - b. Long-term adjustment to the output in lumens of the LED streetlight fixtures installed pursuant to the Streetlights Project to minimize the alleged attraction of imperiled seabirds and sea turtles.
7. Defendants have extended the early consultation comment period for Plaintiffs to submit information to inform the draft environmental assessment for the Streetlights Project, including, but not limited to, information related to the alternatives described in Paragraph 6, until October 31, 2020.

USE OF AGREEMENT

8. This Agreement was negotiated and executed by the parties in good faith to avoid expensive and protracted litigation. This Agreement and any drafts hereof shall not constitute an admission with respect to any allegation made by any party.
9. This Agreement and any drafts hereof shall not constitute waiver of any party's claims or defenses in any separate action, to the extent not already alleged or raised in this lawsuit.

DISMISSAL OF THIS ACTION

10. Upon the Department of Public Works' execution of a contract with Maui Electric for installation of the smart nodes as described in Paragraph 2.b above, and following resolution of Plaintiffs' claim for an award of attorneys' fees, Plaintiffs' lawsuit shall be dismissed with prejudice. Plaintiffs' claim for attorneys' fees and costs shall be mediated. If mediation fails to resolve the dispute over attorneys' fees and costs, the claim shall be disposed of by motion. Plaintiffs will have sixty (60) days following the final execution of this Settlement and Release Agreement to file Plaintiffs' motion for attorneys' fees and costs.

11. Upon the Court's dismissal of this case with prejudice, the County, its officials, agents, and all of its employees, shall be released from all claims that were raised in this lawsuit, Civil No. 19-1-0053(1). Plaintiffs do not waive any claim that the environmental assessment initiated on August 20, 2019 is not in compliance with HRS Chapter 343. Defendants do not waive any defense of res judicata and/or collateral estoppel, not exclusively, in any potential future litigation.

AUTHORIZATION TO SIGN

12. This Agreement shall apply to and be binding upon the parties, their delegates, and assigns. The undersigned representatives certify that they are authorized by the party or parties they represent to enter into this Agreement and to execute and legally bind that party or parties to the terms and conditions of this Agreement. Execution of this agreement as identified below will release all entities and individuals named as parties in Civil No. 19-1-0053(1).

Executed this 26th day of April, 2021.

HAWAI'I WILDLIFE FUND

By _____

Its _____

CONSERVATION COUNCIL FOR HAWAI'I

By _____


Its _____

COUNTY OF MAUI

By Michael P. Viti

Its Mayor

DEPARTMENT OF PUBLIC WORKS

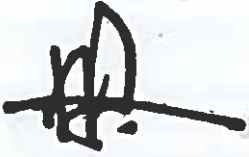
By 
ROWENAM DAGDAG-ANDAYA

Its Director of Public Works

APPROVED AS TO FORM:

DAVID L. HENKIN
KYLIE W. WAGER CRUZ
EARTHJUSTICE

Attorneys for Plaintiffs



BRIAN A. BILBERRY
Deputy Corporation Counsel
County of Maui

Attorney for Defendants

Executed this 15th day of April, 2021.

HAWAII WILDLIFE FUND

By 

Its Executive Director

CONSERVATION COUNCIL FOR HAWAII

By _____

Its _____

COUNTY OF MAUI

By _____

Its _____

DEPARTMENT OF PUBLIC WORKS

By _____

Its _____

APPROVED AS TO FORM:

DAVID L. HENKIN
KYLIE W. WAGER CRUZ
EARTHJUSTICE

Attorneys for Plaintiffs

Executed this 13 day of April, 2021.

HAWAI'I WILDLIFE FUND

By _____

Its _____

CONSERVATION COUNCIL FOR HAWAI'I

By Moana B...

Its Executive Director

COUNTY OF MAUI

By _____

Its _____

DEPARTMENT OF PUBLIC WORKS

By _____

Its _____

APPROVED AS TO FORM:

DAVID L. HENKIN
KYLIE W. WAGER CRUZ
EARTHJUSTICE

Attorneys for Plaintiffs

Executed this 16 day of April, 2021.

HAWAI'I WILDLIFE FUND

By _____

Its _____

CONSERVATION COUNCIL FOR HAWAI'I

By _____

Its _____

COUNTY OF MAUI

By _____


Its _____

DEPARTMENT OF PUBLIC WORKS

By _____

Its _____

APPROVED AS TO FORM:



DAVID L. HENKIN
KYLIE W. WAGER CRUZ
EARTHJUSTICE

Attorneys for Plaintiffs