Untangling the net: tackling bird bycatch in Baltic gillnet fisheries

Date/Project Code: 14.07.2017/021S16

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| Applicant | BirdLife International |
| Legal Status | UK registered charity |
| Project region | Lithuania/ Central Baltic |
| Project duration | 01.07.2017-31.10.2020 |
| Total project/grant | 328,343.40 Euro / 256.778 Euro |
| Project status | ongoing |

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# Progress report No.1

01.07.2017 – 31.12.2017

Total expenditures reported: 48,812 €/ 70.49% of total project costs

Expenditures reported in reporting period: 48,812 €/ 70.49% of total project costs

Baltcf funding received in total: € 55,069.00 /21.45% of total grant

### Project summary

The overall project goal is to tackle seabird bycatch in Baltic gillnet fisheries. In order to achieve this, the project has three main objectives, which include the development and testing of technical seabird bycatch mitigation measures for gillnet fisheries; the estimation of bycatch in the Curonian Lagoon (Russia and Lithuania); and to raise awareness of the issue with Lithuanian and Baltic decision makers.

From 1st July to 31st December, the project has worked to establish the project within Lithuania. This has included setting up agreements with fishermen, and special fishing permits in both the Baltic Sea and Curonian Lagoon to formalise participation. A total of 12 Baltic fishermen and 5 Curonian Lagoon fishermen are now committed to work with the team.

A major achievement during this reporting period has been the development of a prototype net light and transparent light case, in collaboration with fisheries engineers and sensory ecologists. These lights are currently being trialled on 3 vessels in the Lithuanian Baltic Sea during the first field season of the project (which started in October 2017).

In addition, a new collaboration has been developed between the project team and sensory ecologists assisting the project, which will involve captive bird work to determine potentially aversive stimuli to seaducks under water. Information coming from this work could be extremely useful in informing the successful development of a mitigation measure.

Finally, besides preparatory activities to set up an advocacy and communication strategy, BirdLife, together with other NGOs, recently established a European campaign (www.oceanalert.net) to bring awareness on fisheries impacts across Europe and to establish regional baseline rules across different sea basins (including in the Baltic) to tackle seabird bycatch.

### Progress in project implementation

The overall progress in project implementation is summarised under each of the three objectives, outlining the planned activities, main achievements, and deviations during the reporting period.

**Objective 1. Develop technical seabird bycatch mitigation measures for gillnet fisheries**

Planned activities during reporting period under objective 1.

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| --- | --- | --- |
| Activity no. | Activity description | Activity status during reporting period |
| Activity 1.1.1 | Start-up meeting in London with development team to discuss mitigation measure design and any underpinning sensory work required (June/July 2017) | Complete (August 2017) |
| Activity 1.1.2 | Develop prototype light, tooling (Fishtek, RSPB) (Aug-Sept 2017) | Complete |
| Activity 1.1.3 | Additional meeting to examine prototype and pre-testing (BirdLife, Fishtek, RSPB, Dr. Martin) (Sept 2017) | not needed, email correspondence sufficient for prototype development |
| Activity 1.1.4 | Confirm device for production of ~1000 units, produce and ship to Lithuania (Fishtek, LOD) (Oct/Nov 2017) | Complete |
| Activity 1.2.1 | Obtain special fisheries permissions from Lithuanian government (have done this for the past two years) (LOD) (Jul/Aug 2017) | Complete |
| Activity 1.2.2 | Obtain agreements from individual captains to conduct paired mitigation trials (aim for at least 8 participating vessels; currently working with 10, our intention is to work with many of the same vessels) (LOD) (Aug-Sept 2017) | Complete. 12 Fishermen working with the team, 3 fishermen currently trialling lights (a 4th fishermen began in Jan outside of reporting period) |
| Activity 1.2.3 | Adjust existing data collection protocols and database as required (RSPB, LOD) (Aug-Sept 2017) | Complete |
| Activity 1.2.4 | Order and buy new nets for fisherman, for paired trails (LOD, Aug-Sep 2017) | Complete |
| Activity 1.2.5 | Attach mitigation measures to experimental nets and supply fishermen with otherwise identical control nets (LOD) (Oct 2017)  | Complete |
| Activity 1.2.6 | Data collection (both bycatch and target catch) and entry into database through on-board observers and self-reporting (LOD) (Oct/Nov-Apr in 2017/18; 2018/19 and 2019/20) | Underway |

Summary of activities & achievements under objective 1 during the reporting period

Good progress has been made under Objective 1, with key project milestones met – as shown in the breakdown of activities and actions completed above.

*Activity 1.1*

A meeting was held in London between the project team and collaborating bycatch mitigation experts (Fishtek, University of Birmingham) on the 3rd of August to discuss the development of mitigation gear to test during the first field season. During this meeting a complementary but external (to the project) collaboration was discussed with Royal Holloway University (see more under Section 4 below) involving captive bird work in Spring of 2017 to identify aversive stimuli under water.

It was agreed to follow a twin-track approach for the development of mitigation gear involving: testing of mitigation measures in Lithuania (as planned under this project) and to also use information coming from the planned (but externally funded) captive bird work to better inform the ongoing development of mitigation measures in 2018/2019. For the 2017 field season in Lithuania it was agreed to focus on net illumination measures, as a technique that has shown promise in reducing bycatch in other locations and for other taxa.

A prototype flashing net light (v1.0 – see <https://www.youtube.com/watch?v=4QNIl6m8AJY> and pictures/videos in Annex) was developed and produced by Fishtek, with a clear casing designed to haul smoothly through net winches. Given that we will be conducting captive trials in spring 2018, we decided to produce a smaller run of lights than originally anticipated (100 instead of 1,000 units) – this means we have the flexibility, in relation to budget, to amend the design of lights based on the outcomes of our captive trials for future at-sea work. On the 22nd of November (after some delays in production), these 100 lights (90 for trials with 10 spares) were shipped to Lithuania, together with a total of 180 clear cases, so that both cod and smelt gillnets could be rigged with the lights without the need to remove cases.

Based on the trials during the first field season, and the captive bird work, additional mitigation measures might be trialled in 2018/2019.

*Activity 1.2*

Our existing databases and data collection protocols were reviewed and adjusted in September to ensure they were appropriate for these trials. Special fisheries permissions were obtained for one fisherman (this allows for fishing outside of normal effort & location), and 32 new cod nets and 78 smelt nets were purchased. Lights were attached to smelt nets at the end of November 2017 and we commenced data collection with 3 fishermen on the 11th of December (an additional fisherman has started trialling lights in January 2018). The testing of the lights was delayed by one month due to production delays and poor weather. While we have a larger group of 12 fishermen interested in trials, the decision to produce a lower number of prototype lights means that we are not able to fully equip this number of vessels with lights – so, at the time of writing, we have four fishers deploying the lights every 10m on a single 300m set each alongside control sets (see videos in Annex). In spring, these fishers will switch to targeting cod and the lights will be re-attached to the cod nets. The numbers of birds interacting with this fishery (principally Long-tailed Duck and Common Scoter in this inshore fishery) are presently low (owing to warmer conditions in the northern Baltic resulting in delayed migration further south) – but with colder weather we would expect larger numbers. The remaining participating fishermen are providing self-reported fishing effort and bycatch data, to allow the team to assess bycatch under normal fishing conditions.

Deviations from planned project activities under objective 1

The only substantive deviation from the project activities under objective 1 is the reduced number of net lights produced by Fishtek in this first phase (100 units instead of 1,000). As we have developed a deeper collaboration with sensory ecologists (though the addition of proposed captive work, highlighted in more detail below), it has become apparent that it would be beneficial to keep our options open so that we can adapt our mitigation measures based on findings from both captive and at-sea trials. By reducing the number of units produced, we can hold back some budget to tweak and change the lights for testing in at-sea trials in later years of the project. This will enhance project outcomes, as it maximises our chances of finding an effective measure, informed by both the response of birds in a controlled environment *and* results from the fishery itself.

The potential ‘threat’ that this may pose is that we may need to secure additional resources to fund any changes to the prototype light if captive work/at-sea trials highlight that fundamental changes are required. This ‘threat’ – that mitigation measures might not work – is an ever-present risk in testing innovative ideas, and our plan to utilise testing with captive birds actually limits the risks. We are confident that we can secure additional funding if this becomes necessary.

**Objective 2 - Estimate gillnet bycatch levels and affected species in the Curonian Lagoon**

Planned activities during reporting period under objective 2

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| --- | --- | --- |
| Activity no.  | Activity description | Status during reporting period |
| Activity 2.1.1 | Obtain agreements from individual captains to conduct bycatch assessment on vessels (aim for at least 4 participating vessels) - (LOD) (Aug 2017) | CompleteTwo meetings held with fishing associations. 5 fishermen agreed to work with project |
| Activity 2.1.2 | Adjust existing bycatch assessment data collection protocols and establish separate Curonian Lagoon database (RSPB, LOD) (Aug-Sept 2017) | Protocols complete under Activity 1.2 |
| Activity 2.1.3 | Bycatch data collection, validation and entry into database through on-board observers and self-reporting (LOD) (Sept/Oct in 2017; Mar-Oct in 2018 and 2019) | Ongoing- no bycatch recorded as yet.  |
| Activity 2.2.1 | Obtain agreements from individual captains in Russia to conduct bycatch assessment on vessels (aim for at least 4 participating vessels) (K University) (Aug 2017) | Not possible as yet due to issues with working with Russian partners, as already communicated  |
| Activity 2.2.2 | Adjust existing bycatch assessment data collection protocols and establish separate Curonian Lagoon database, translate into Russian (RSPB, K University) (Aug-Sept 2017) | Not possible as yet due to issues with working with Russian partners, as already communicated |
| Activity 2.2.3 | Russian Bycatch data collection and entry into database through on-board observers and self-reporting (K University) (Sept/Oct in 2017/18; Mar-Oct in 2018 and 2019) | Not possible ass yet due to issues with working with Russian partners, as already communicated |

Summary of activities & achievements under objective 2 during the reporting period

There has been progress in relation to work on bycatch in the Lithuanian part of the Curonian Lagoon, but major hurdles and delays in getting the work started in Russia.

*Activity 2.1*

The team in Lithuania held two meetings with the fishing associations responsible for the Curonian Lagoon fishermen- Lampetra and Vidmares. This was carried out in order to explain the scope of the project to the fishing associations before individual fishermen were approached about participating in the project. Five fishermen have agreed to carry out the work, and they have been provided with the updated protocols in order to carry out self-reporting data collection. This is the first time data on bycatch has been systematically collected in the Curonian Lagoon. The team has continued to regularly engage with fishermen during the reporting period to make sure that there were no issues with the data forms, and to make sure fishermen were still keen to participate. As of the end of December, no bird bycatch had been recorded, however this fishery operates year-round (except when the lagoon freezes over), and so the field season will be much longer for this fishery.

*Activity 2.2*

This activity has not been carried out, due to the issues in setting up the project in Russia (see section below for further details).

Deviations from planned project activities under objective 2.

The main deviation from the planned activities during this reporting period involved the un-expected issues with setting up work in the Russian part of the Curonian Lagoon.

During the reporting period the team in LOD met with staff in Russia to discuss the planned activities and the sub-contracting arrangement. However, recent changes in Russian foreign policy has complicated their participation in this project significantly, as Russia now considers all foreign NGOs as ‘foreign agents’. Collaboration for Russian locals (as independent experts) with foreign NGOs would open them up to a high degree of scrutiny and they are concerned about potential issues this may raise. Furthermore, the Russian team (Konigsberg University staff) carried out some preliminary work, including discussion with fishers about collaborating on the project. The local fishermen were reluctant to participate in the project and collaborate on bycatch - this has meant that the Konigsberg University staff are now reluctant to participate in the project, concerned that this could damage the relationship that they have with the local fishermen. The two issues combined have meant that during this reporting period working in the Russian part of the Curonian Lagoon has not been feasible, however we are looking at ways to potentially collaborate (See next steps).

This issue was communicated to the baltcf Director Peter Torkler on December, 18th 2017 and discussed with him in a Skype call on January, 12th 2018.

**Objective 3. Raise awareness of the issue to decision makers in Lithuania and across the Baltic to gain support for better national/regional fisheries management**

Planned activities during reporting period under objective 3

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| Activity no.  | Activity description | Status during reporting period |
| Activity 3.1.1  | Development of an advocacy and communication plan for influencing Lithuanian and regional fisheries management, identifying opportunities to engage in discussion and influence key policy outcomes and identify most effective communication methods for policy audiences and other stakeholders (October 2017; BL +LOD) | UnderwayThe larger EU advocacy and communication plan has been completed |
| Activity 3.1.2 | Production of a national shadow seabird bycatch plan that is promoted for national adoption (BL +LOD) | Not started |
| Activity 3.1.3 | Production of recommendations for MPA management plans, mitigation solutions, and bycatch data collection (BL+ LOD) | Recommendation to European Parliament to implement and test seabird mitigation measures in the Baltic sub region |
| Activity 3.1.4 | Engagement with National Parliament (Seimas) including Environment Protection and Rural Affairs committees, Department of Fisheries of the Ministry of Agriculture and Ministry of Environment and with fishing sector (LOD + BLI Support) | Workshop is planned in end of winter/begging of spring with Lithuanian Department of Fisheries and Ministry of Environment  |
| Activity 3.1.5 | Support Lithuanian government in championing seabird bycatch management in the region | Related with workshop from 3.1.4 Activity |
| Activity 3.1.6 | Attendance of team at policy relevant workshops (ICES, HELCOM, Baltic Sea Advisory Council) to raise the profile of the issue and the current experimental technical solutions (all team) | Creation of a BirdLife Baltic Sub-group with LOD participation. LOD also representing BL on the new AEWA seaduck working group.  |
| Activity 3.2.1 | Interview of Lithuanian fishermen as part of a series of web stories to illustrate the relationships between fishermen and seabirds (LOD with BLI support) and translation and promotion across the Baltic region (BLI with Baltic partners) | Not Started |
| Activity 3.2.2 | Capacity building to LOD by BLI on communication planning to local decision makers- e.g. building a social media outlet | Attendance of LOD at BirdLife European Marine Task Force meeting which included capacity development activities on communication planning |
| Activity 3.2.3 | Online promotion of materials developed throughout the project (Seabird Task Force website, web stories, newsletters) | Creation of www.oceanalert.net |
| Activity 3.2.4 | Attendance of project team (LOD, RSPB, BLI) at relevant technical meetings and conferences to present results of project. | Attendance of LOD & BLI at BirdLife European Marine Task Force meeting to present the project to BL Partners and Seabird Task Force participants |

Summary of activities & achievements under objective 3 during the reporting period

Activities were focused at a European level to link to ongoing discussions on tackling seabird bycatch and to enable future delivery of the project at a regional and national level. In particular, BirdLife and Partners have focussed on the European Commission technical measures regulation, which is highly relevant for the implementation of mitigation measures developed in the course of this project. As a result of these efforts (particularly through the OceanAlert campaign – funded by external funds), recommendations made to the European Parliament on the introduction of baseline measures in the Baltic to tackle seabird bycatch were adopted in plenary as part of the European Parliament’s position in January 2018. These measures were at first rejected by the European Parliament Fisheries Committee in November 2017.

Specifically, the European Parliament took a position that all Baltic Member States must apply the following management measures to minimise incidental catches of seabirds in the region:

* Scientific research programme to be established to identify the overlap of sensitive species with fisheries and determine technical solutions for fishing gears.
* Spatial measures should be applied where scientific research has identified areas where sensitive seabirds are known to be incidentally caught until these can be replaced with other technical measures.
* Member States are to monitor and assess the effectiveness of the mitigation measures that have been established, including in relation to fish catch and fishing effort.

Our strategy for Lithuania will focus on having the national government champion the application and implementation of these management measures in the region.

Furthermore, discussions within HELCOM have started regarding protocols to collect data on seabird bycatch in the region. BirdLife has been present in these meetings through BirdLife’s German partner (NABU). This has been led by the Polish and German governments, but it is currently blocked by Denmark. In 2018, we would want to ensure that Lithuania is vocally supportive of standardised protocols and data collection – and implements them.

Deviations from planned project activities under objective 3.

There has been deviation from the planned delivery of the Lithuanian advocacy and communication strategy, as it was necessary to focus initial efforts on securing the best possible outcome for seabirds at the EU level. The larger EU advocacy and communication plan has been completed, discussions have now commenced with Baltic partners, including a specific Lithuanian strategy. This shall be finalised by early 2018, and it is the reason that national-level action above are yet to be completed. However, this should not derail the delivery of these activities within the completion of the project.

### Achievements during the reporting period

During this reporting period, the major achievements have been:

* Development & production of a gillnet-specific prototype net light
* Testing of prototype light on several vessels in Lithuania during the 2017 winter season- with fishermen willing to collaborate on the project.
* Agreement from 5 Curonian Lagoon (Lithuanian) fishermen to participate in bycatch data collection.
* Collection of bycatch data (independent of mitigation trials) by 12 different Baltic gillnet fishermen. New collaboration with three Baltic fishermen who are providing data on seabird bycatch.
* Close collaboration with sensory ecologists through the technical development team meeting which has resulted in a ‘sister’ project to support this objectives of this project through captive bird work.
* European Parliament adopting a position to implement Baseline Baltic management measures to tackle seabird bycatch

### Partnership and cooperation

Throughout this reporting period the team have continued to develop collaborations within the project team and with external collaborators.

Bycatch mitigation experts/fishing technologists

As regards mitigation measure development and testing, we established clear lines of communication through our technical development team meeting in August. Since then, the team have been in direct liaison with one another in the development of the prototype net lights, and the successful production and deployment of flashing lights in the Lithuanian fishery is evidence of this. This has involved collaboration between LOD, Fishtek, sensory ecologists and BirdLife to design and produce the lights, and excellent liaison between LOD and collaborating fishermen to ensure the lights were deployed on nets.

Sensory ecologists- captive bird work

The major collaboration developed outside the project is the captive bird work proposal outlined above. In essence, this proposal is to use funding from the Royal Society for the Protection of Birds to conduct trials of aversive stimuli with captive birds, most likely at a US-based facility (discussions with the facility are at an advanced stage). This is being led by Dr. Steve Portugal[[1]](#footnote-2) from Royal Holloway University in London, in collaboration with Prof. Graham Martin and a PhD student[[2]](#footnote-3) who will conduct the trials. More specifically, the purpose of this research is to:

* categorise and determine general foraging, swimming and diving behaviour of diving ducks (long-tailed ducks, white-winged scoters, surf scoters and common eiders - using cameras, observations, and potentially biologgers) to assist with development of technologies that may interrupt foraging behaviour near gillnets.
* work through constant feedback with Fishtek to trial new technology (lights, auditory cues) in a laboratory setting to test its effectiveness at interrupting normal foraging behaviour

Collaborations with other researchers around Baltic & Europe

Baltic:

Before this project commenced, BirdLife had already built some connections with bycatch researchers conducting mitigation research in the Baltic. This involved an initial meeting in early 2017 to discuss ongoing projects at DTU Aqua’s headquarters in Copenhagen, attended by DTU Aqua staff (Lotte Kindt-Larsen, Finn Larsen, Gildas Glemarec) staff from SL in Sweden (Sara Koningson, Peter Ljungberg) and staff and PhD students from the Thunen Instiute in Germany working on the STELLA project (Daniel Stepputtis, Uwe Krumme, Sarah Kraak, Isabella Kratzer, Fanny Barz, Jerome Chladek). The purpose of this grouping, which re-convened in December 2017, is to discuss mitigation techniques, results, proposed research and to develop a synergistic and supportive group to advance bycatch mitigation techniques in the most efficient way possible. In December we were updated on the progress SLU are making in developing fish traps (alternative gear to gillnets), the plans the STELLA students have to test sound-based and visual stimuli, and plans in Denmark to test some adapted net lights (along the lines of our design) in January.

Mediterranean:

BirdLife has recently been successful in securing funding (through the MAVA foundation) for bycatch mitigation work in the Mediterranean, focused on reducing multi-taxa (eg. of seabirds, cetaceans, sharks, turtles). Gillnets are one of the fishing gears of focus. Staff from this project team will be involved in the scientific committee of this Mediterranean project, providing advice on data collection and mitigation. This will involve active collaborations with the Regional Fisheries Management Organisation (the GFCM) and with other regional bodies (the ACCOBAMS agreement, the UN regional seas convention- RAC/SPA) and national and regional NGOs. Information on the mitigation measures developed under this project will inform the approach of mitigation measures developed for the Mediterranean.

Fishing industry in Lithuania

The project team has continued to develop a strong collaboration with the Lithuanian fishing industry, including fishermen operating in both the Baltic Sea and the Curonian Lagoon, fishing associations and with net makers. There are twelve fishermen working with the team, and within the reporting period three fishermen were actively trialling the prototype lights. The remaining fishermen have been self-reporting their fishing effort and bycatch data. During the reporting period, the team visited two Lithuanian fishing associations which represent fishermen operating in the Curonian Lagoon. Following these visits, five Curonian Lagoon fishermen have agreed to collect bycatch data using the self-reporting protocols with data collection underway.

Seabird Task Force team & BL Partnership

The project team (LOD, RSPB, BLI) are part of BirdiIfe’s Seabird Task Force initiative- a group of BirdLife International staff who are experts in bycatch and who work with fishermen on understanding and mitigating bycatch. Through this project the team have been able to continue to play an active role within the BirdLife partnership in relation to furthering the understanding of gillnet bycatch and mitigation. The team from LOD attended the European Marine Task Force meeting (the collective group of European BirdLife partners who work on seabird and marine issues), where information on the project was shared and the prototype design was discussed. Other Partners who are actively involved in gillnet bycatch work include the BirdLife Partner in Germany (NABU) and in Portugal (SPEA), and so information on the development of the prototype and the experimental trials has been of particular use. A Baltic regional sub-group was formed during this meeting, involving BirdLife partners from the Baltic Sea region, and LOD is actively participating in this group, which will be key in developing the capacity of other partners to investigate gillnet bycatch and test mitigation.

### Communication

During this reporting period, BirdLife established (together with other NGOs: Seas at Risk, ClientEarth, WWF) a broad-based #OceanAlert campaign ([www.oceanalert.net](http://www.oceanalert.net/)) that will now also include a focus on the needs in the Baltic. This campaign will ensure that the strategic engagement in Lithuania and communications (such as the ‘fishermen stories’) reach a wider audience and enables the required influence on Lithuanian decision makers. It will also establish the broader context of the issue, linking local to European.

### Next steps

*Activity 1.2*

During the next reporting period (1/1/2018-30/6/2018) the team will have completed the first full field season of mitigation trials. The field season usually extends until April after which migrating seaducks return north to breeding grounds. Preliminary information (expected to be qualitative) may be available on the apparent efficacy of the trialled prototype, and any issues with the design will be discussed and workshopped with Fishtek (designer).

*Complementary project with sensory ecologists*

The complementary project, involving captive bird work, will have commenced, and potentially there might be some preliminary results on aversive stimuli which could feed in to further developments of mitigation gear.

*Activity 2.1*

The work in the Lithuanian part of the Curonian Lagoon will have progressed, and data will have been collected throughout winter 2017 and spring of 2018 on both fishing effort and any bycatch. The fishery operates year-round (although not when the lagoon is ice-covered). This will provide the first information on bycatch in this fishery. If enough data is available, the Activity 2.3 (analysis of bycatch data) may commence.

*Activity 2.2*

BirdLife and LOD will aim to resolve the issues with the experts in Russia who had planned to collaborate on this project. The Russian Curonian Lagoon National Park and the Konnisberg University will be contacted to see if a direct and official relationship can be forged to work around the issues of individuals being listed as foreign agents. Potentially the team in Lithuania will visit Kaliningrad to have a further meeting with Russian experts to discuss the project and the challenges of getting fishermen to collaborate.

*Activity 3.1*

LOD, together with support from BirdLife, will finalise their advocacy and communication strategy linking to the overarching European BirdLife advocacy strategy. LOD will start interviews of fishermen to develop content for the OceanAlert campaign. LOD will engage with different Lithuanian decision makers to enable Lithuanian to be a champion in tackling seabird bycatch. LOD, together with BirdLife, will develop further recommendations to decision makers. Workshop or meeting with is planned in end of winter/begging of spring with Lithuanian Department of Fisheries, State Service for Protected Areas and Ministry of Environment to discuss bycatch problematic.

## ANNEX

1. Financial progress report
* Financial-reporting-template\_1st report\_2017.xlc
* Financial-reporting-template\_1st report\_2017.pdf – with signature
* Financial evidence.zip
1. Products and Deliverables
* Prototype lights trialled in Lithuania (see attached photos and videos as evidence)
1. [https://pure.royalholloway.ac.uk/portal/en/persons/steve-portugal(1440de30-110a-4f0c-8981-419d652dfe90).html](https://pure.royalholloway.ac.uk/portal/en/persons/steve-portugal%281440de30-110a-4f0c-8981-419d652dfe90%29.html) [↑](#footnote-ref-2)
2. <https://www.researchgate.net/profile/Jennifer_Cantlay> [↑](#footnote-ref-3)