PHOTORIA:
Exploring the value of Fireflies through immersive Narrative
Fireflies: International recognition
Selangor Declaration, 2010

- Fireflies are a part of our biodiversity heritage and are iconic insects that have been the subject of much investigation in the sciences, an inspiration in the arts and a part of local cultures, folklores and traditions because of their ability to produce light.

- Fireflies have been a source of ecotourism revenue for many communities in different parts of the world and have the potential to bring similar benefits to other local communities. Fireflies and their natural habitats also enhance quality of life and contribute to economies through the promotion of aesthetically pleasing landscapes that have greater appeal.

- Fireflies are bio-indicators of the health of the environment and are declining across the world as a result of degradation and loss of suitable habitat, pollution of river and water systems, increased use of pesticides in agro-ecosystems, non-regulated commercial harvesting and increased ecological light pollution in areas of human habitation.
Fireflies: International recognition, limited distribution

Map of Observations

https://www.inaturalist.org/projects/fireflyers-international
Fireflies: International recognition, limited distribution

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Firefly Watches: Mass Audubon, Boston Museum of Science, Tufts University

Firefly Watch Citizen Science Project

Firefly Watch combines an annual summer evening ritual with scientific research. Join a network of citizen scientists around the country by observing your own backyard, and help scientists map fireflies.

Why Watch Fireflies?
Are firefly populations growing or shrinking, and what could lead to changes in their populations? Mass Audubon has teamed up with researchers from Tufts University to track the fate of these amazing insects.

https://www.massaudubon.org/get-involved/citizen-science/firefly-watch/
Firefly Watches: Mass Audubon, Boston Museum of Science, Tufts University

"Visualization of firefly reports in 2019" created by Matthew Smith and Mapbox volunteers Lo Benichou and Sam Fader.
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## Immersive Fireflies

### Yellow green flash - *Photinus sp.*

<table>
<thead>
<tr>
<th>Species</th>
<th>1 sec.</th>
<th>2 sec.</th>
<th>3 sec.</th>
<th>4 sec.</th>
<th>5 sec.</th>
<th>6 sec.</th>
<th>7 sec.</th>
<th>8 sec.</th>
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<tbody>
<tr>
<td><strong>consimilis</strong>&lt;br&gt;(fast pulse)</td>
<td>male</td>
<td>female</td>
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<td>(repeated 10.6 seconds at 66°)</td>
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<td>(female flash 3 sec. after last flash of male)</td>
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<td>(70°)</td>
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<tr>
<td><strong>consimilis</strong>&lt;br&gt;(slow pulse)</td>
<td>male</td>
<td>female</td>
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<td>(repeated at 14.7 seconds at 67°)</td>
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<td><strong>carolinus</strong>&lt;br&gt;</td>
<td>male</td>
<td>female</td>
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<td>(repeated at 10 seconds at 70°)</td>
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<td>(female flash 3 sec. after last flash of male)</td>
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<td><strong>carolinus</strong>&lt;br&gt;</td>
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<td>(repeated at 13.8 seconds at 64°)</td>
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<td>(female flash 6.4 sec. after last flash of male and may be repeated 2-3 times)</td>
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<td>(67°)</td>
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<td><strong>obscurellus</strong>&lt;br&gt;</td>
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<td>(65°)</td>
<td>(67°)</td>
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<td><strong>ardens</strong>&lt;br&gt;</td>
<td>male</td>
<td>female</td>
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<td>(repeated 10 to 20 seconds at 67°)</td>
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</tbody>
</table>

Lee Roscoe – Mass Wildlife
Immersive Fireflies

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Immersive Fireflies

Lloyd, J. (1966), Studies on the Flash Communication System in Photinus Fireflies

TiLIA (Time-Lapse Image Analysis): a software package for the image analysis of firefly flash patterns, Olympus Corporation
Immersive Fireflies
Immersive Fireflies
Research

Sexual Selection in Fireflies

Fireflies are justifiably famous for their spectacular bioluminescent courtship displays. In North American Photinus fireflies, species differ both in male flash signals and females’ flash responses (see chart). Firefly females most often mate with several different males during their short adult lives, so sequential episodes of sexual selection happen before, during and after mating. Our firefly research, which is funded by the National Science Foundation, is helping to elucidate several key features of this evolutionary process.

What makes a firefly attractive?

Using photic playback experiments, we’ve shown that females of Photinus fireflies differentially respond to male courtship signals produced by males of their own species. Females show directional preferences for longer pulse duration in single pulse species such as Photinus ignitus, while females in double-pulse P. greeni prefer faster pulse rates. We also documented that male mate choice occurs later in the mating season, as firefly males will preferentially mate with those females that carry more eggs. View graph>

How costly is bioluminescent flashing?

We used a combination of open-flow respirometry and field experiments to measure two potentially important costs associated with producing bioluminescent signals: elevated energy costs and elevated predation risk.

We discovered that from an energetic perspective firefly flashing (without flight) is surprisingly inexpensive; metabolic rate measured during flashing was comparable to that during walking. However, field experiments revealed a striking cost of bioluminescent signals from specialist predators: simulated courtship signals attracted many more predators (Photuris female fireflies) compared to non-flashing controls.
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Firefly Femmes Fatales

Aggressive Mimicry in Photuris: Firefly Femmes Fatales

Abstract. Firefly females of the genus Photuris, long known to be canrivorous, attract and devour males of the genus Photinus by mimicking the flash-responses Photinus females. Although suspected, this behavior had not been observed previously.

While observing firefly behavior, several naturalists have noted that females of the genus Photuris are canrivorous. Many, including myself, have discovered this by trying to keep groups of fireflies alive overnight in the same container. In the morning one usually finds one Photuris female and bits and pieces of all the rest.

Place Illusion and Plausibility

- The illusion of location has been referred to as telepresence or presence—the ‘sense of being there’, which we refer to as Place Illusion. “It is the strong illusion of being in a place in spite of the sure knowledge that you are not there. Since it is a qualia there is no way to directly measure it.”

- Plausibility is about the illusion that what is apparently happening is really happening (even though you know for sure that it is not). It is maintained through correlations between actions and reactions, and correlations between events.

Mel Slater (2009), “Place illusion and plausibility can lead to realistic behaviour in immersive virtual environments”, Phil. Trans. R. Soc. B (2009) 364, 3549–3557
VR for Impact

Using Virtual Reality to Drive Positive Impact in Support of the Sustainable Development Goals
Games For Change (G4C)

Tree

DEVELOPED BY New Reality Company

SUMMARY
Tree transforms you into a majestic rainforest tree.

RELEASE DATE 01.19.2017

TAGS
Environmental VR

SYNOPSIS
In Tree, users experience the cycle of life through the lens of the natural world. Users enter the tree’s body and perspective, beginning the installation as a virtual seed and growing to
Thank You

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https://b.bhaptic.net