Camera-Media-Status

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Sys.Date()

Status of Canyon Critters Camera Media

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Camera Method Summary

Camera traps deployed at natural (outdoor) and building (indoor) sites in Grand Canyon and Zion National Parks capture animal activity by recording images or videos of detected movement. Camera data is collected seasonally, on average every 3 months. Collected data is organized and formatted for upload to Zooniverse, where citizen science volunteers help to identify animals recorded by the cameras.

Sites are the locations where cameras are deployed alongside a tunnel containing bait and hair and paw print collection materials. Sites are either natural sites located in outdoor locations in the parks, or building sites located in areas of park buildings such as crawlspaces and attics. Each site has a unique alphanumeric ID.

Camera check events are the events when sites are checked. Camera data is collected and fresh SD cards and batteries are installed. Camera checks are named for the date the data is collected, which is the final day of that check event. Camera checks are named with the site ID, "CC" for camera check, and the date of collection. Check event duration is measured in days.

Each camera check event contains some number of trigger events, the instances in which the camera was triggered to record photos or video. Trigger events are intended to capture animal activity, but in some instances movement due to wind, light, or other non-animal sources causes a camera to trigger. As such, animal detections are "successful" trigger events in which the camera was activated by animal movement, while trigger events may be animal detections or false triggers.

Study days are the dates during which cameras generally are collecting data. Camera days are the dates during which an individual camera is collecting data, and consist of a study day combined with a site ID.

Study Design and Maintenance

In the study design, indoor sites are generally set to record XX-second videos and outdoor sites are generally set to record two photos in succession.

From **2020-10-22**, cameras were deployed at **42** sites over **740** days, for a total of **25,553** camera days. **21** (**50%**) cameras are located at natural sites and **21** (**50%**) are located at building sites. The cameras were functional for **4,551** camera days, **17.8%** of the study period. Camera function was interrupted when a camera had a full SD card (**102** camera days [**0.4%**]), a dead battery (**296** camera days [**1%**]), or was dislodged or misplaced (**117** camera days [**0.5%**]).

Camera data is collected seasonally, on average every 3 months. Across all sites, camera data has been collected **339** times. Each check event covers an average of **79.4** camera days, with an average of NUMBER (PERCENT) functional camera days.

```
## Joining, by = "date"
```

```
## Warning: Removed 96 rows containing missing values (`position_stack()`).
```

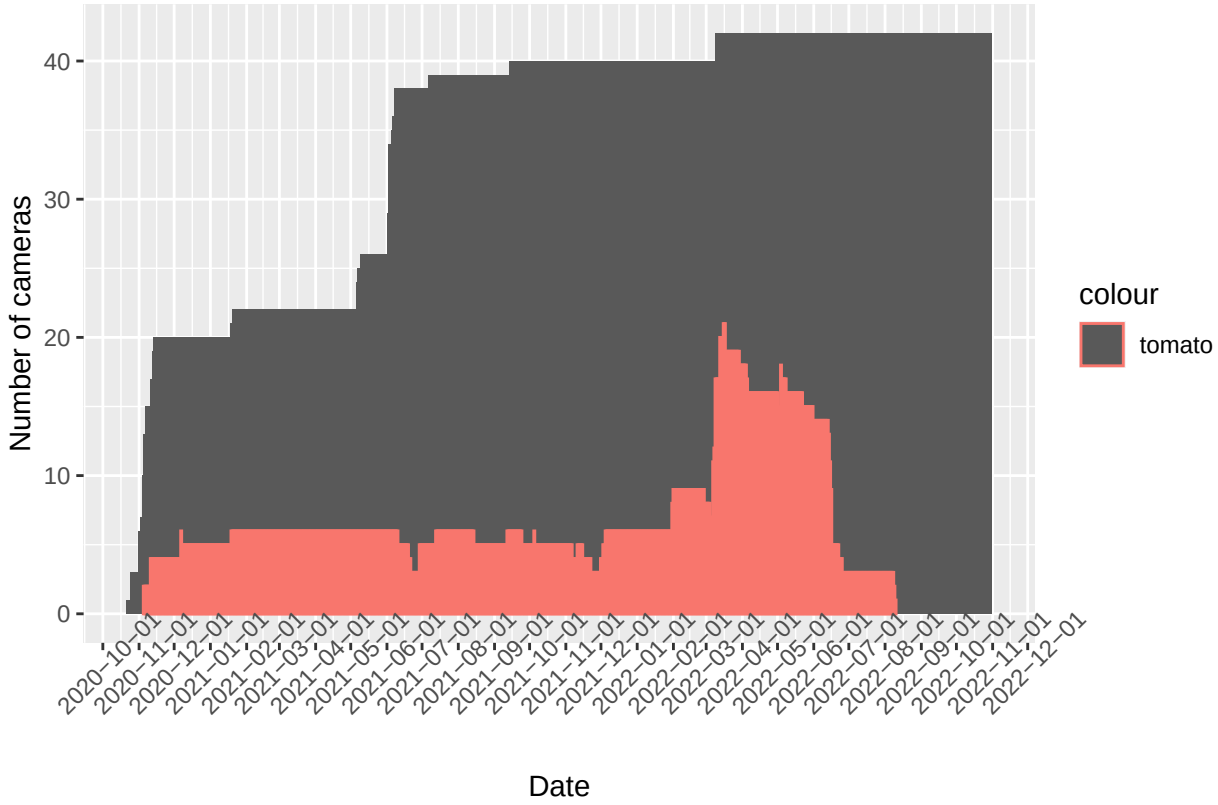
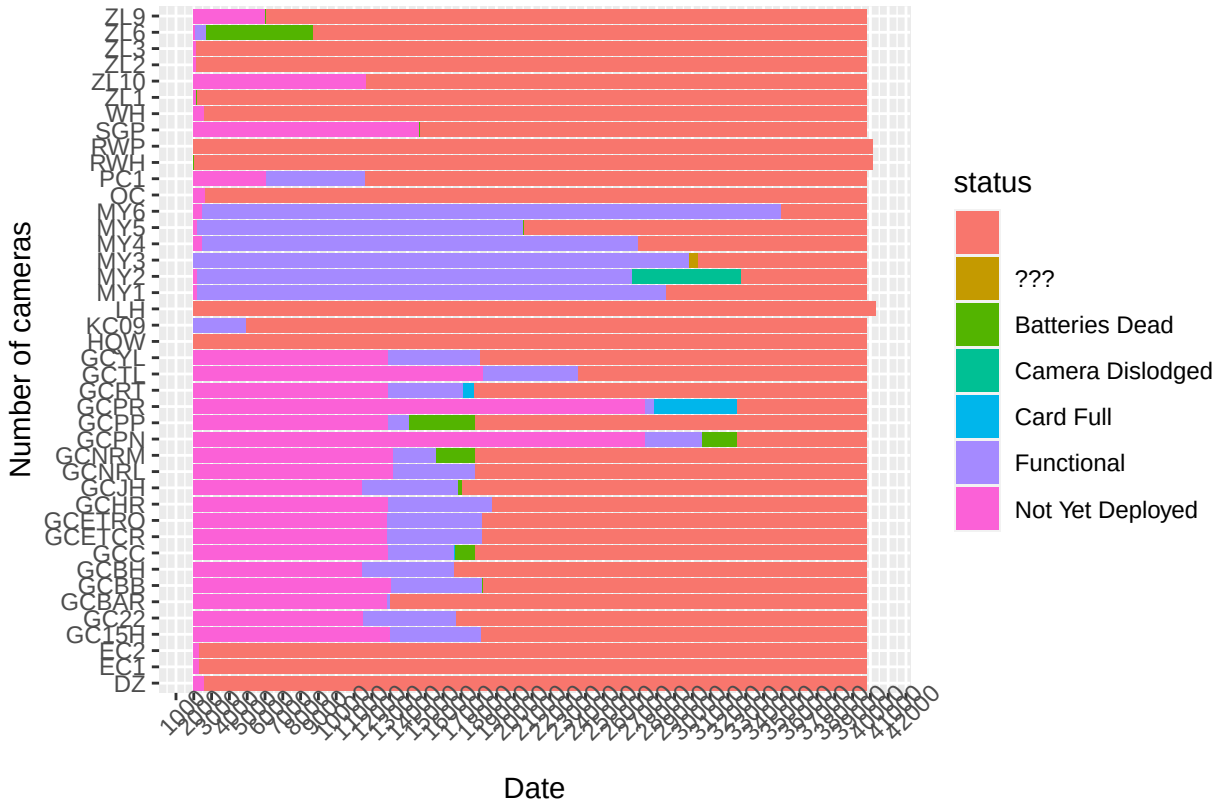


Fig. 1. Number of cameras deployed (black) and functioning (red) on each study day.



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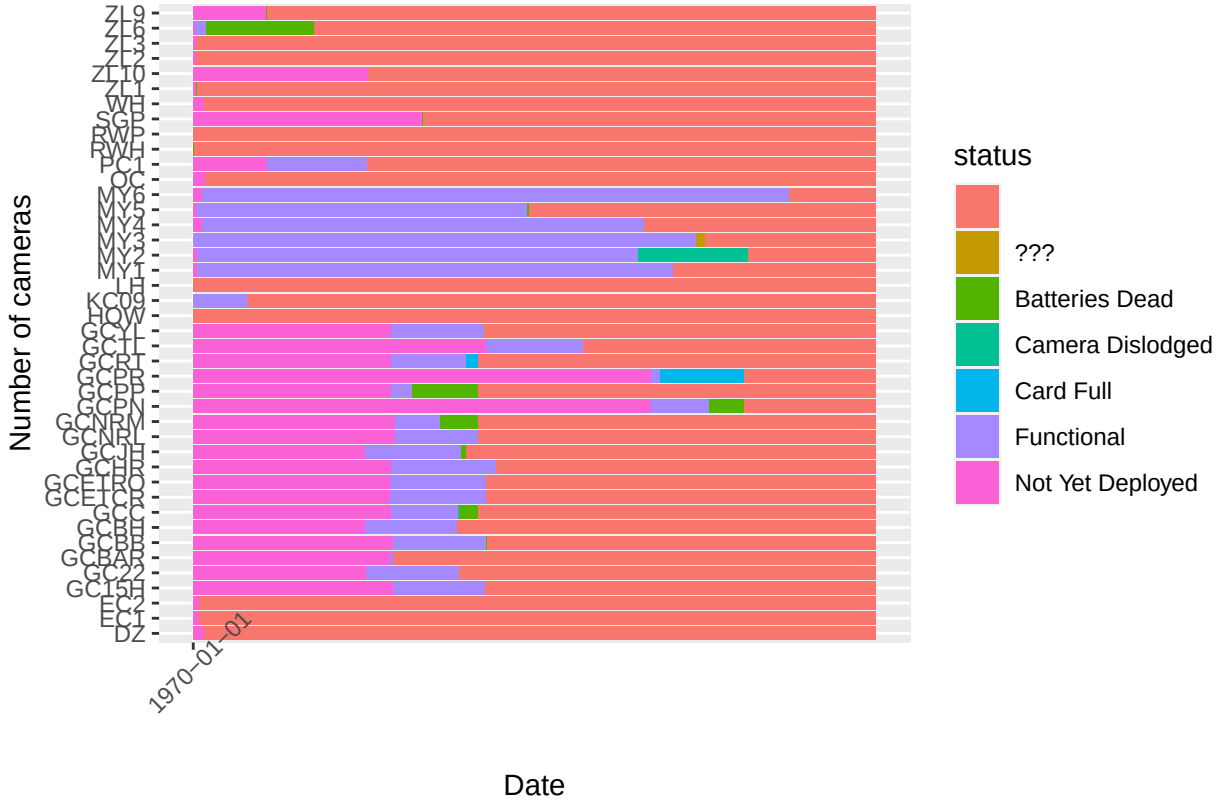

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Data Storage and Status

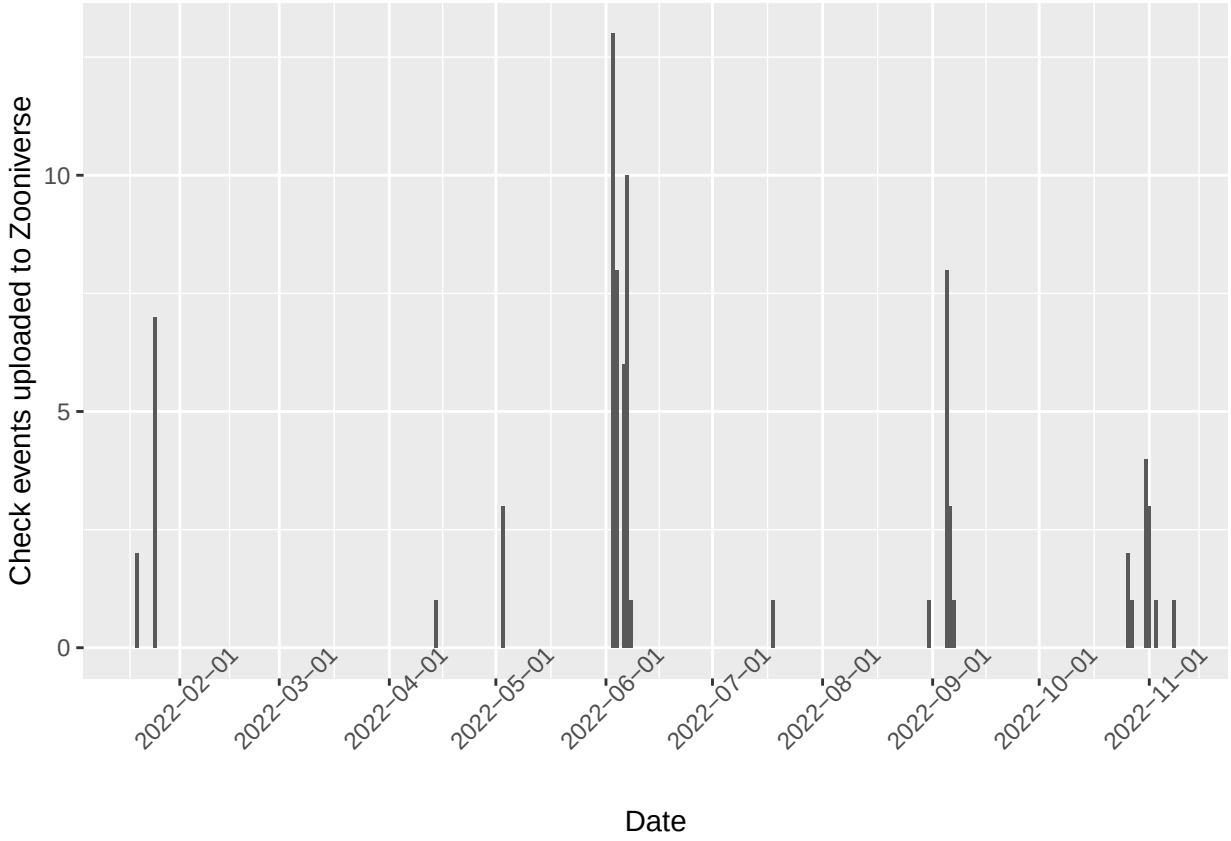
Camera data is stored by check event. Of the **339** check events, **243** (**71.7%**) are stored in two physical locations. **92** (**27.1%**) are uploaded to the Canyon Critters Zooniverse project.

Camera data is not always aligned to the correct time. Cameras may have their internal times offset from the correct time at the site. During a camera check, the discrepancy between the camera's internal time and the current time is recorded. Time adjustments have been confirmed for X, but need to be addressed for **21370** trigger events. Of the incorrect times, X% have been corrected to UTC.

Camera checks occur in two time zones (UTC -6 and UTC -7). Arizona uses UTC -7 year-round, while Utah uses UTC -7 during standard time and UTC -6 during Daylight Savings Time. After being standardized to UTC, trigger events are corrected to the appropriate time zone for the location and date where they were recorded. X% of times have been corrected to the appropriate time zone.

```
## Warning: 248 failed to parse.
```

```
## Warning: Removed 262 rows containing non-finite values (`stat_count()`).
```



Preliminary Analysis

Across all sites, cameras captured **263,186** trigger events, of which **68,866** (**26%**) were animal detections. Cameras deployed at natural sites recorded two photographs per trigger event. In total, natural sites captured **251,920** trigger events, covering DURATION. Cameras deployed at building sites recorded videos in 20, 30, or 60-second durations. In total, building sites captured **10,437** trigger events, covering DURATION.