# Supplementary material

## EduForest API endpoint examples and prototype testing evidence

This supplementary material contains expanded request–response examples for the six API endpoints summarised in Table 1 and the six prototype outcome screenshots originally presented in Table 2. The endpoint names, paths, sample values, and screenshots are reproduced from the submitted manuscript.

### Supplementary Table S1. Expanded EduForest API endpoint specifications and sample responses

#### 1. List sensors

| | |
|---|---|
| **HTTP method** | GET |
| **Endpoint** | https://api.edugreen.eduforest.my/royalbelum/sensors |

**Sample response**


```
{
  "sensors": [
    {
      "sensorID": 1,
      "serialNo": "1111",
      "deviceName": "MicroSensor-X01",
      "tenant": "WWF-Malaysia",
      "forestName": "Royal Belum",
      "latitude": -31.953512,
      "longitude": 115.857048,
      "status": "active"
    },
    {
      "sensorID": 2,
      "serialNo": "2222",
      "deviceName": "MicroSensor-X02",
      "tenant": "WWF-Thailand",
      "forestName": "Royal Belum",
      "latitude": 74.9568,
      "longitude": 104.5192,
      "status": "active"
    }
  ]
}
```


#### 2. Retrieve a specific sensor

| | |
|---|---|
| **HTTP method** | GET |
| **Endpoint** | https://api.edugreen.eduforest.my/royalbelum/sensors/{sensorID} |

**Sample response**


```
{
  "data": {
    "sensorID": 1,
    "serialNo": "1111",
    "deviceName": "MicroSensor-X01",
    "tenant": "WWF-Malaysia",
    "forestName": "Royal Belum",
    "latitude": -31.953512,
    "longitude": 115.857048,
    "status": "active"
  }
}
```


#### 3. List incidents

| | |
|---|---|
| **HTTP method** | GET |
| **Endpoint** | https://api.edugreen.eduforest.my/royalbelum/incidents |

**Sample response**

```
{
  "incidents": [
    {
      "incidentID": 1,
      "timeStamp": "2025-02-22 T 11:50 UTC",
      "sensorID": 1,
      "forestName": "Royal Belum",
      "tigerIncident": "true",
      "elephantIncident": "false",
      "plantIncident": "false",
      "humanIncident": "false",
      "latitude": -31.953512,
      "longitude": 115.857048
    },
    {
      "incidentID": 2,
      "timeStamp": "2025-05-15 T 12:00 UTC",
      "sensorID": 2,
      "forestName": "Royal Belum",
      "tigerIncident": "false",
      "elephantIncident": "true",
      "plantIncident": "false",
      "humanIncident": "false",
      "latitude": -36.48373,
      "longitude": 25.65512
    },
    {
      "incidentID": 3,
      "timeStamp": "2025-07-23 T 13:00 UTC",
      "sensorID": 3,
      "forestName": "Royal Belum",
      "tigerIncident": "false",
      "elephantIncident": "false",
      "plantIncident": "false",
      "humanIncident": "true",
      "latitude": 77.54489,
      "longitude": 84.54356
    }
  ]
}
```


### 4. Retrieve a specific incident

| **HTTP method** | GET |
|---|---|
| **Endpoint** | https://api.edugreen.eduforest.my/royalbelum/incidents/{incidentID} |

**Sample response**


```
{
  "data": {
    "incidentID": 1,
    "timeStamp": "2025-02-22 T 11:50 UTC",
    "sensorID": 1,
    "forestName": "Royal Belum",
    "tigerIncident": "true",
    "elephantIncident": "false",
    "plantIncident": "false",
    "humanIncident": "false",
    "latitude": -31.953512,
    "longitude": 115.857048
  }
}
```


### 5. List incidents by WWF branch (tenant)

| **HTTP method** | GET |
|---|---|
| **Endpoint** | https://api.edugreen.eduforest.my/royalbelum/incidents/{tenant} |

**Sample response**


```
{
  "incidents": [
```

```
    {
      "incidentID": 1,
      "timeStamp": "2025-02-22 T 11:50 UTC",
      "sensorID": 1,
      "forestName": "Royal Belum",
      "tigerIncident": "true",
      "elephantIncident": "false",
      "plantIncident": "false",
      "humanIncident": "false",
      "latitude": -31.953512,
      "longitude": 115.857048
    },
    {
      "incidentID": 3,
      "timeStamp": "2025-07-23 T 13:00 UTC",
      "sensorID": 3,
      "forestName": "Royal Belum",
      "tigerIncident": "false",
      "elephantIncident": "false",
      "plantIncident": "false",
      "humanIncident": "true",
      "latitude": 77.54489,
      "longitude": 84.54356
    }
  ]
}
```


### 6. List incidents by species

| | |
|---|---|
| **HTTP method** | GET |
| **Endpoint** | https://api.edugreen.eduforest.my/royalbelum/incidents/{species} |

**Sample response**

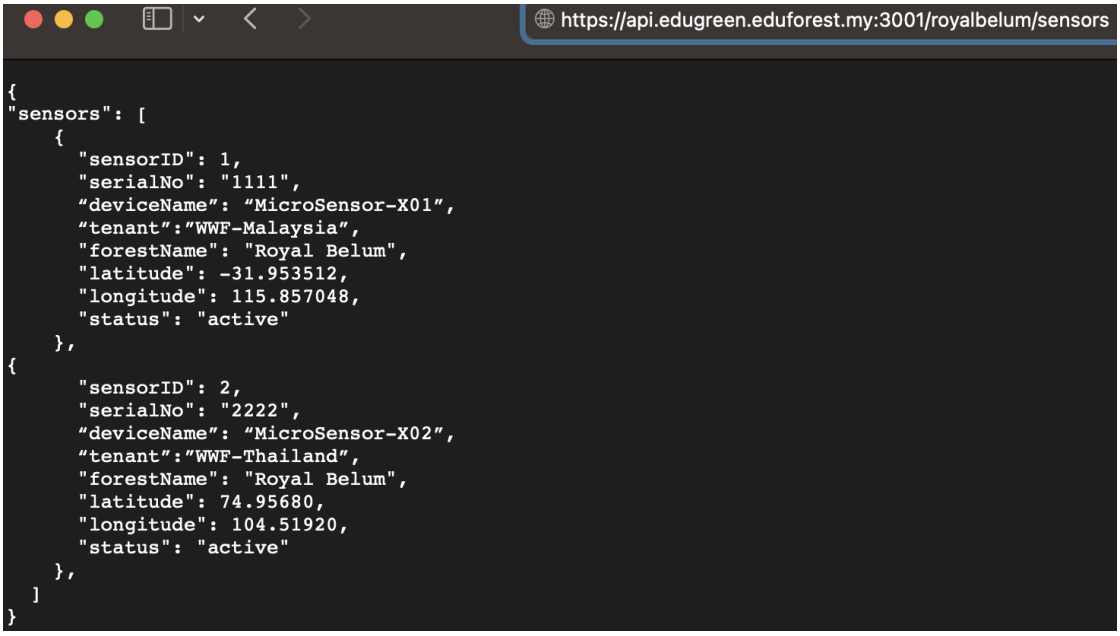

```
{
  "incidents": [
    {
      "incidentID": 1,
      "timeStamp": "2025-02-22 T 11:50 UTC",
      "sensorID": 1,
      "forestName": "Royal Belum",
      "tigerIncident": "true",
      "elephantIncident": "false",
      "plantIncident": "false",
      "humanIncident": "false",
      "latitude": -31.953512,
      "longitude": 115.857048
    },
    {
      "incidentID": 4,
      "timeStamp": "2025-03-10 T 10:00 UTC",
      "sensorID": 2,
      "forestName": "Royal Belum",
      "tigerIncident": "true",
      "elephantIncident": "false",
      "plantIncident": "false",
      "humanIncident": "false",
      "latitude": -35.02757,
      "longitude": -75.00449
    },
    {
      "incidentID": 5,
      "timeStamp": "2025-05-12 T 13:00 UTC",
      "sensorID": 3,
      "forestName": "Royal Belum",
      "tigerIncident": "true",
      "elephantIncident": "false",
      "plantIncident": "false",
      "humanIncident": "false",
      "latitude": 21.31341,
```

```
      "longitude": 179.23724
    }
  ]
}
```

### Supplementary Figure S1. Prototype functional testing evidence

The following six screenshots reproduce the prototype outcomes provided in the manuscript's Table 2. Each screenshot is associated with the corresponding endpoint operation.

**Supplementary Figure S1a. Prototype outcome 1: list sensors.**




**Supplementary Figure S1b. Prototype outcome 2: retrieve a specific sensor.**




**Supplementary Figure S1c. Prototype outcome 3: list incidents.**

https://api.edugreen.eduforest.my:3001/royalbelum/incidents

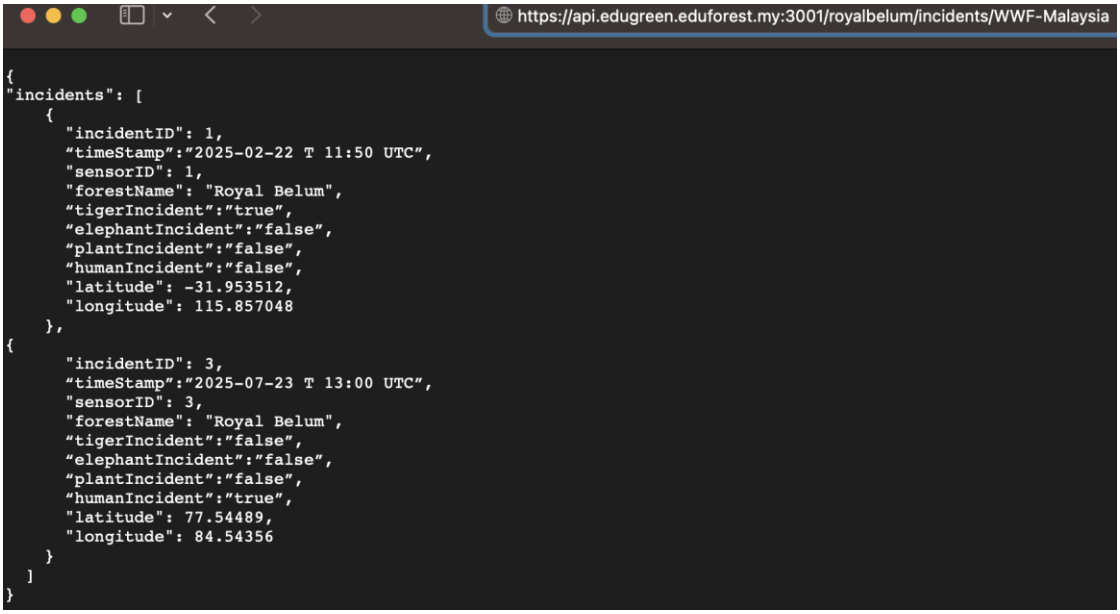

```
{
"incidents": [
    {
      "incidentID": 1,
      “timeStamp”:”2025-02-22 T 11:50 UTC”,
      "sensorID": 1,
      "forestName": "Royal Belum",
      “tigerIncident”:”true”,
      “elephantIncident”:”false”,
      “plantIncident”:”false”,
      “humanIncident”:”false”,
      "latitude": -31.953512,
      "longitude": 115.857048
    },
{
      "incidentID": 2,
      “timeStamp”:”2025-05-15 T 12:00 UTC”,
      "sensorID": 2,
      "forestName": "Royal Belum",
      “tigerIncident”:”false”,
      “elephantIncident”:”true”,
      “plantIncident”:”false”,
      “humanIncident”:”false”,
      "latitude": -36.48373,
      "longitude": 25.65512
    },
{
      "incidentID": 3,
      “timeStamp”:”2025-07-23 T 13:00 UTC”,
      "sensorID": 3,
      "forestName": "Royal Belum",
      “tigerIncident”:”false”,
      “elephantIncident”:”false”,
      “plantIncident”:”false”,
      “humanIncident”:”true”,
      "latitude": 77.54489,
      "longitude": 84.54356
    }
  ]
}
```


**Supplementary Figure S1d. Prototype outcome 4: retrieve a specific incident.**

https://api.edugreen.eduforest.my:3001/royalbelum/incidents/1


```
{
"data":
    {
      "incidentID": 1,
      “timeStamp”:”2025-02-22 T 11:50 UTC”,
      "sensorID": 1,
      "forestName": "Royal Belum",
      “tigerIncident”:”true”,
      “elephantIncident”:”false”,
      “plantIncident”:”false”,
      “humanIncident”:”false”,
      "latitude": -31.953512,
      "longitude": 115.857048
    },
{
```


**Supplementary Figure S1e. Prototype outcome 5: list incidents for the WWF-Malaysia tenant.**




**Supplementary Figure S1f. Prototype outcome 6: list incidents for the tigerIncident species.**

