Background

Bella does:

* Might be out of date

We do:

* quantify dispersal and connectivity between fruit bat subpopulations in different ecoregions
* 4 pteropus (2M 2F per site)
* Budget: ~60k for GPS

My questions:

* Recommended tags
* Recommended troubleshooting
* Advice

Notes from meeting

* What you want to do and how confident you are in your decision
* Defending your decision for use of tech
* No right or wrong
* Ethics: how much do you want to stress the animals?
* This is what I think will work, didn’t have time to test, so here we go
* Need to defend the tech
* Doesn’t really matter what you end up choosing
* Battery, budget, bat size, data
* Figure out who uses a system that works and go with that
* e-obs tags
  + tag manufactory helpful in navigating
  + quite finicky, require certain situations to work well
  + don’t give you as much data as others
* battery life vs data
* how many data points per day?
* High fidelity – need more data points per day
  + Can choose with every model
* 90s when a bat starts moving above speed (want to know, looking at landscape, where do they fly)
  + Extrapolate where they’re moving in trees (i.e. eating)
  + Data is a mess to work with because it’s irregular
  + Extracting info is difficult
  + Highly specific
* Regular scheduled points: can still extract behavior, have more power over how the battery is used
* Do I care about behavior or location?
* Acceleration – can still tell different behaviors
* Software
  + MoveBank
  + Machine learning
* 4 GPS points
* Collars can fall off because won’t catch bats again
  + Attach with collars
  + Close with soluble thread
  + Vs
* They fall off – signal vanished
* Couple months
* Up data collection because of the few numbers
* Tagging more bats vs getting more data
* Tagged 14/17
* ¼ bats never show up again
* Are not sure about bats coming back or visiting bat—catch a few more in that area
* Do we know site fidelity, that determines how many tags you put out

Training

* Keeping Pteropus in makeshift cage for 2-3 nights to try tags
* If it doesn’t work, lose a lot of money
* Get in touch with a zoo – Tzimbazza
* Ability to test in real life

Tags

* E-obs
  + Manufacturer very interactive
  + Active during day
  + How active are Pteropus during day?
  + GSM / satellite option
    - Cost??
    - Phone coverage (GSM)
  + Base station
  + Works well with MoveBank
* Satellite tags need bigger batteries
* 15g for other peteropus
* High data collection schedule
* Without solar panels, 2 weeks of really good data
* Satellite would work well, phone probably not
* Money and size

Acceleration, temperature, speed, magnetic levels,

Can’t go wrong – you will get some sort of data

Summary

Bella is wonderful. She seems eager to be available to help and would be a great collaborator. That is a point toward using the type of tags that she uses (e-obs), although she says that they are generally known as finicky.

Any tag will get you data. There are infinite small decisions to make about the type/time of data you take, but the end point is that you will get data. The best you can try to do is to tailor the data collection to try and answer the questions that you are trying to answer. Modifications to data include:

* Frequency of data collection in time
* Regularity vs irregularity of data collection (i.e. only when bat is moving)
* Length of time to collect data (at odds with reality of collars falling/getting lost)

There are tag options

* Solar vs battery
* Size (length of battery life)
* Data download (GSM/satellite/PTT (platform terminal transmitter)

There are ethical options. Namely:

* How heavy of a tag ( up to 5% is okay). Less is less strain on the bat, but less battery life = less data
* Permanent vs non-permanent collar

Thoughts

* If we are venturing to far away/expensive places to do this work, we want the data to be as high quality as possible to make it worth it. i.e. either tag more bats per location or take more data points for a shorter amount of time
* Maybe for this first pass we do ‘short and hard’, i.e. get a ton of data over a short period of time. This can give us general information that can help us develop more specific questions.
* Eidolon could easily get a general movement paper. Could use non-solar (cheaper) ones for that, where we go back to the base station to collect the data.
* This summer should be a piloting time.
* We should ask if we can practice putting collars on the bats at the zoo.
* First go to Analambotaka—familiar, able to get tags if they fall off, maybe able to keep a few bats for 2-3 days to make sure it works.
* I am sure that Angelo/Santino would be great at putting on tags.
* Maybe we start with a few cheaper tags this time around then get more pricey ones for the harder to get to locations?

To Do

* Identify papers that use GPS data in metapopulation models