**ODD Protocol**

Description: 1 (first) [see “Controle\_modelo.xlsx”]

Details:

**OVERVIEW**

1. **Purpose**

Primate seed dispersal

Seed shadows

1. **Entities, State Variables, and Scales**

Entities: A) Agents (BLT, fruiting trees), B) Environment (grid), C)

State Variables: BLT (intern state/behavioral strategy); fruiting trees (location, aggregation, fruit set); grid (size and coordinates); global environment.

Scales: Temporal (resolution: thick; extent: 30 days); Spatial (extant: =fragment sizes,

1. **Process Overview and Scheduling**

BLTs: Travelling, Eating, Defecating

Fruiting trees: phenology

Envinronment:

Observer processes (Model output): Location of BLTs at every time step, location of defecated seeds

Schedule:

[See Railsback & Grimm for *tasks*] [See Vincenot et al 2015]

**DESIGN CONCEPTS**

1. **Design Concepts**

- Basic principles

- Emergence

Patterns of movement, ranging and foraging; Patterns of seed dispersal (Pegman et al 2017)

- Adaptation

- Objetives

- Learning

- Prediction

- Sensing

- Interaction

- Stochasticity

- Collectives

- Observation

**DETAILS**

1. **Initialization**

[setup]

[Make it independent of initial conditions]

Grid size: (range)

1. **Input data**

Tree locations and phenology

Resource distribution (aggregation) and availability

BLTs sleeping sites

1. **Submodels**

BLTs internal state submodel

Phenology/fruit ripening submodel?