

Ecosystem Simulation

The simulation will take place in an island(a forest would be more accurate but an island would be better in terms of view and the feel of the game.) which contains grass, flowers and trees, a lake, occasional water puddles during rains and 5 different animal species, rabbit, snake, hawk, vulture and bee. The game will day night cycles of 12 hours(game time). Player will have the following camera options, animal POVs, soft attached cameras on animals and free camera and they can also change the game speed, zoom in and out, fast forward, notifications(optional) and statistics. Player can use these tools to capture beautiful moments or watch the life cycle of animals and plants.

Animals

Animals will have 4 main attributes, hunger, speed, thirst and age and animals will only survive for a limited time without food and water also they will die at a certain age. Another common behaviour will be reproduction. All animal species will have their unique reproduction. Day and night vision will also be specific for each animal species. Vision is how far an animal can see/detect other animals. All the animals have 1% chance of getting sicked, this chance goes up to 50% around a decaying body of an animal that hasn't been cleaned for at least 2 weeks.

Rabbits - Primary consumer, provides food for the upper parts of the food chain. Rabbits eat grass and can only live 12 hours without food and 24 hours without water. Rabbits lifespan is 9 years. They will start breeding at the age of 1 and their gestation period will be random number between 25 and 35 days resulting in birthing and they have 2-5 offsprings. (this number is usually higher in real life but their survival is not very high) They have survival instinct where if they see a snake or a hawk, they will start running away as rabbits are the prey of snakes and hawks. Their vision is limited during night.

Snakes - Secondary consumer. Keep rabbit numbers in check to prevent consumption of all plant life. Snakes can live without food or water for 6-7 months. They usually remain stationary for most of the day which allows them to stay hidden from both their preys, rabbits and their predators, hawks. Snakes have better night vision than other animals.

Hawks - Tertiary consumer - Top of the food chain, keeping number of primary and secondary consumers in check. Hawks can last 48 hours without food or water. Hawks hunt during daytime and male and female hawks will fly together in a circular motion. Upon reaching a certain height, the male will dive toward the female and then they will rise back again. The two birds will repeat this until finally the male latches onto the female and they begin to free-fall down to earth. In one year, a female hawk will lay about five eggs.

Bees - Pollinator of the plant life. Bees gather nectar and pollen and pollinate plants in doing so. Nectar is stored within their stomachs and is passed from one worker to next until the water within diminishes. At this point the nectar becomes honey and then workers store them in the cells of the honeycomb. This process takes a day. Hives are randomly placed in game at the start and they are fully observable. Each hive will have initially 10,000 to 30,000 bees each. Bees communicate via Waggle Dance which workers used to indicate the location of a food source. (This may not be 100% accurate in game as in real life in terms of how they actually dance but it's a nice touch that player may enjoy)

Vultures - Consume dead animal remains to prevent covering the area with dead animals and disease occurrences. Vultures don't attack on healthy animals but may attack on wounded or sick. Vultures start their reproduction cycle at the start of a new year breed with 1 or 2 eggs each hatching in 50 to 60 days.

Game UI

Zoom in-out: Players can adjust the zoom by either manually typing a percentage based number or pressing '+' '-' buttons.

Game speed: Game speed can be changed by pressing '+' '-' buttons

Fast Forward: Game can be skipped to a certain date and time. (may take time to process)

Camera Options: Player can switch between POV, soft attached and free camera. If player wants to switch from free camera to POV or soft attached cameras will be on last observed animal. Double clicking on an animal will switch to that animal's POV.

Date/Time: Player can see current time and date.

Alarm: Player can set an alarm to specific date/time as a reminder of important moments like Vulture egg hatching. It can have more uses as the simulation grows bigger (more species and such).

Stats Pane: Player can see the successful hunt counts in general or specific to an animal, death count of a specie or in general, population of species, growth rate chart of populations.

Notifications: Optionally player can choose to receive notifications on important events, hunts, breeding, egg hatching etc.

Save/Load: Game can be saved and loaded at any point of the game. Additionally it will have periodic auto saves.