ECOBOTS INSTRUCTIONS

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WHAT IS THIS?

This mod applies the principles of ecology and complex systems to create a functional, self sustaining, adaptive ecosystem out of self replicating blocks.

It simulates the behavior of a real ecosystem.

These blocks fill out every habitable biome in Minetest, doing a complete replacement of the static default vegetation. This will then grow, adapt, and change like a real forest.

It also includes examples of network and swarm intelligence, and evolution.

HOW TO USE:

SPAWNER:

The spawner will create semi-mature ecosystems across the map. You don't need to do anything.

However it is less than perfect, and because it is trying to establish living populations rather than static decorations it occasionally starts out looking a bit odd and doesn’t guarantee every species will get established. But it will evolve!

Either way getting a new ecosystem going can benefit from some help...

BECOME A VIRTUAL WILDLIFE CONSERVATIONIST:

Save the animals!

Seriously, they suffer most in the early stages. Without food they die. They risk extinction. Try planting the pioneer grass as a quick growing food supply.

Good.

So, you saved the animals.

Now you might need to slaughter the animals. Damn animals. Pest control time. Ecobots' food web is very simple, and therefore could be unstable - you may need to be a part of it, forest ranger.

The spawner isn't equally good at getting all species established in a mature state. You might want to help them out if they are looking a little scarce. Try planting things, spreading animals around, etc. Make a botanical garden.... Save the endangered Swamp herb! ... Protect the coral reefs!

But... but... but...!

I know... I know...!

You want to go in and clear the forests for construction... build a city... drop nuclear bombs across the entire planet. Fine... just, be aware that this will have an impact on the ecosystem. Things could go extinct, become unstable, use their swarm intelligence to hunt you down and punish you for your crimes....

GROW YOUR OWN FOREST FROM SCRATCH:

These three blocks are the minimum needed to create an ecosystem:

- a plant bot (there are many to choose from): grows in the presence of light.

- a herbivore bot: eats plant bots.

-The Decomposer Bot: eats dead matter.

As long as you have these in three in place it will vaguely act like a real ecosystem. The cycle of energy will be complete. (The oceans are a simplified version of this - they only have one tier because... well, most life in the oceans is microscopic, so we're going to ignore it!)

In practice, here's how to get a forest going:

1. Choose some plants that are suitable for the site. If it dies, it wasn't suitable! The pioneers are a good choice for most places... they are pioneers after all. Check out the species list below.

2. Start by placing plenty of plants around. Then place more. And more. No... I meant more than that. More!

3. Let them grow. Forests take a long time to get established, even on the fast settings. Hit leaves to make them fall and encourage soil formation and new growth. Destruction breeds creation, so go wild. Well, wildish. Don't kill them all.

3. When you have a good plant food supply then introduce the herbivores.

4. Once you're getting lots of dead matter introduce decomposers.

5. When the herbivores and decomposers have reached a good number you can introduce their predators.

6. When it's getting shady try some understory plants. In fact... just try plants. What will grow will grow. Let natural selection sort it out. The more biodiversity the better.

6. Leave it be, or become a part of the forest. You will act as another component of the system: an omnivorous super-predator and ecosystem engineer - just like you are in reality.

SETTINGS:

Species growth rates can be set under the settings menu.

Early on you may want plants to grow faster, later you may want to slow things right down. This may also help with balance if something starts growing out of control.

The default settings are mostly fairly slow. This is to conserve computing power, and to keep Ecobots subtle and un-intrusive. Very fast rates can leave you constantly weeding and getting buried in decaying vegetation.

Be aware, changing these rates will have an impact on how the ecosystem functions. Setting only one group of species super-fast will give them an advantage in the struggle for survival. The default settings are intended to be balanced, and to reflect the realities of different habitats and life history strategies.

HOW DOES THIS ALL WORKS?

See the pdf "The Theory Behind Ecobots"

SPECIES LIST:

ANIMALS

- herbivore: eats plants. Uses synchronized fire-fly style flashing based on network principles to congregate around the best food supplies.

- decomposer: eats dead bots.

- detritivore: eats decomposers. Can dig through dead bots and hibernate when there's no food.

- apex predator: eats all other animals. Builds webs to lure prey to their doom.

- eusocial: a eusocial swarm intelligent bot, which mimics ants. Eats pioneer grass, builds large nests, and is restricted to living in Savannahs (otherwise it would use its intelligence to take over the world).

- swarmer: a dangerous flying bot which eats plants. Forms swarms.

PIONEER PLANTS

- pioneer grass: a fast growing light-loving grass. Tolerant of dry conditions.

- pioneer shrub: a fast growing light-loving shrub. Tolerant of dry conditions.

- pioneer tree: a fast growing light-loving tree Tolerant of dry conditions. Grows short spreading trees.

SWAMP FOREST

- swamp forest herb: a slow growing shade-loving herb. Tolerant of wet conditions.

- swamp forest shrub: a slow growing shade-loving shrub. Tolerant of wet conditions.

- swamp forest tree: a slow growing shade-loving tree. Tolerant of wet conditions. Grows very tall narrow trees.

GENERALIST PLANTS

- generalist tree: A balanced tree. Aims for a middle-ground compromise strategy. Grows tall spreading trees.

- generalist flower: A balanced ground growing plant. Aims for a middle-ground compromise strategy.

SNOW PLANTS

- snow flower: a slow growing snow tolerant flower.

- snow shrub: a slow growing snow and cold desert tolerant shrub.

- snow tree: a slow growing snow tolerant tree. Grows woody narrow trees.

HILL PLANTS

- hill tree: a cliff and climbing adapted tree. Grows a tree that welds itself onto cliff faces and other trees.

SAND PLANTS

- sand grass: a slow growing sand tolerant grass. Builds and erodes sand dunes.

- sand cactus: a slow growing desert cactus.

- sand palm: a slow growing sand tolerant palm.

SEA CREATURES

- coral: grows coral reefs.

- beach shellfish: grows shellfish beds in sand. Shellfish can be harvested by hitting them. When placed back the shellfish will rebury themselves.

- estuary shellfish: grows shellfish beds in dirt. Shellfish can be harvested by hitting them. When placed back the shellfish will rebury themselves.

CAVES

- cave slime: a slime that lives in dark wet caves.

EVOLUTION

-evolving vine: a climbing vine which can evolve. A single value which controls it’s life history strategy is subject to natural selection. Either it can evolve to grow fast and die young, or grow slow and live long.

CAUTIONS:

Ecobots is by nature complex, unpredictable, and dynamic. You can’t put things down and expect them to stay there. Some species will take over. Some species will go extinct. Others will migrate. They have a life of their own.

The plants bury things in vegetation and soil. So if you don't want your buildings to go the way of lost Mayan temples swallowed by the jungle, then you'll have to do pruning, or make some kind of barrier.

Like real living organisms an established Ecobot ecosystem is difficult to eliminate. If you don't want one, don't plant one.

Over long time periods Ecobot forests get *very* big. This can impact performance. Try slowing down the growth rates in the settings if this becomes an issue.