Biome Design Document

Green highlight is stuff I expect to be MVP

Yellow highlight is technically not MVP but adds a lot of depth to the game without too much programming

Blue highlight is stuff that are a would more advanced/technical but could be really cool optional features

Also using a cascading priority system withing the bullet points; Biome is absolutely part of MVP, the Biome slowly shifting and eroding is not necessary to implement Biome. Biome is not MVP, and Biomes having different associated mutation chances is MVP for the biome feature but is not MVP for the entire game.

2 Tier system:

* Biome
  + Grass, Sand, Stone, Water, Tundra
  + Cannot be changed by player
  + Each Biome will be associated with different mutations chances
  + Each Biome will have naturally generating POIs
  + Biome “strength” will define how biome edges will interact. E.G a Mountain biome will have a hard border while a forest biome might taper off.
* POIs
  + POIs are explicit in game objects
  + POIs will have “hitboxes” that obstruct the placement of other POIs
  + Some POIs will be destructible
  + Some POIs will be movement obstructions
  + Buildings created by the player will be part of the feature set
  + Proximity to certain POIs, like poison or radiation will influence evolution

Biome

* Biome should influence rat movement depending on what the rats have evolved to traverse on. Water movement should be the most difficult/evolution dependent e.g maybe impossible without swimming trait, or with an oxygen system or something. Hopefully water generation will create interesting “strategic positions” for strongholds.
* Biome should also influence food and starvation as well, this should be through the biome system if we implement that but the simple version is that Grass will have the most food and sand/stone will have the less, and water will have none
* Biome will be generated by joining Voronoi tiles together, I think it would be best for most of the map to be land traversable and connected, with maybe a few small islands dotted around. Land Biome should be most common Grass then Sand then Stone
* Biomes also have a related “danger” level which influences mortality beyond food and climate, This could be amount of hazardous POIs generated or just a flat increase in mortality rates. E.g the forest has a lot of predators so just traversing/existing in forests are more dangerous
* Main attributes for Biome Class are:
  + How it influences mutation
  + POIs it generates
  + Difficulty level
* 5 main core biomes:
  + Grass
    - Low difficulty
    - Medium human population
    - Player can spawn
  + Stone
    - medium difficulty
    - More human population
    - Player can spawn
  + Desert
    - High difficulty
    - Safe (fewer humans)
    - Improves your rats by spending time there
    - No player spawns
  + Tundra
    - High difficulty
    - Safe (Fewer humans)
    - No player spawns
    - Improves your rats by spending time there
* “DLC” Biomes
  + Some of these are more developed than others, all of them should be unique extreme biomes that mainly exist to give access to more interesting mutations. I recommend adding at most 2 of these if any otherwise we may be overcomplicating a 10 minute game.
  + Radioactive
    - Forms near a radioactive POIs
    - Mutated/corrupted POIs
    - Medium Food levels
    - Radioactive Climate
    - High mutation
    - Forms on all land Biome
  + Rainforest
    - Similar to forest
    - Hot Climate
    - High Danger
    - High food levels
    - Forms on Grass Biome
  + Saltwater
    - Forms on outland water
    - Mainly to create more mutation variety
  + Freshwater
    - Forms on inland water
    - Mainly to create more mutation variety
  + Volcano
  + Magic
  + Alien

Tiles

* Each biome has random tiles
* Requires a hitbox for space and to be on correct Biome
* Visual clutter: trees, plants, etc.
* Travel obstructions like mountains

Implementation

* Biome – generate Voronoi cells for initial map and then assign each Voronoi cell to a biome type
* Clustering of similar tiles, e.g. forest tiles together
* Visual clutter: random, increase near POI to look interesting
* POIs evenly distributed at random
* Per biome POI distribution