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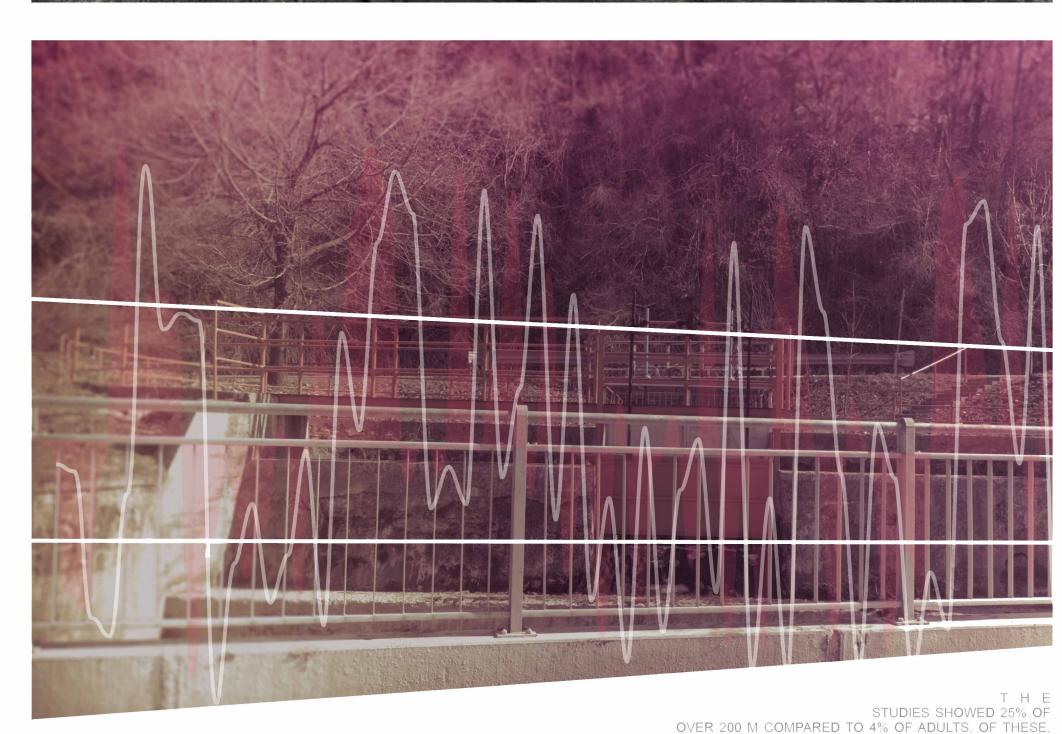




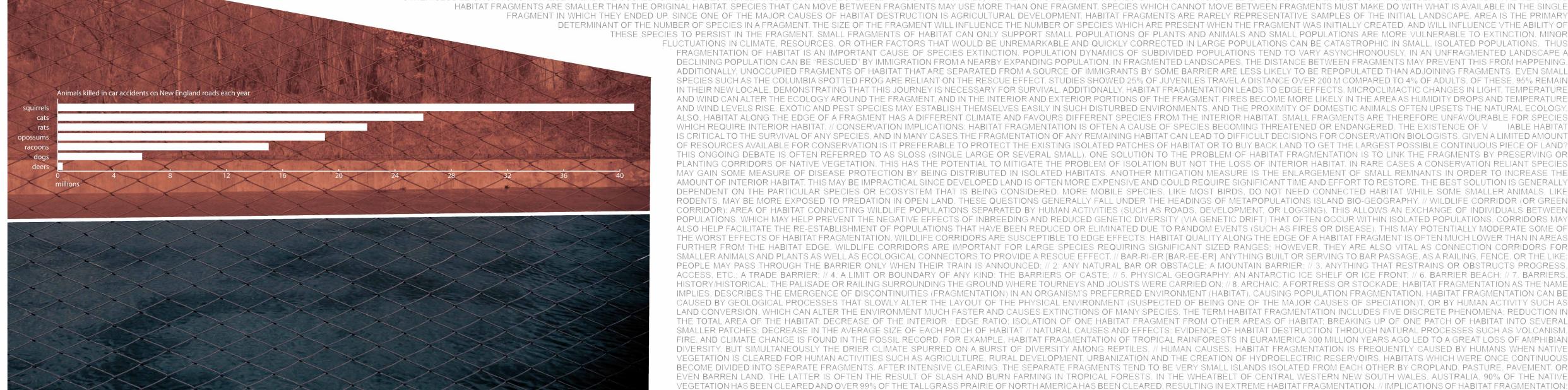
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DETERMINANT OF THE NUMBER OF SPECIES IN A FRAGMENT. THE SIZE OF THE FRAGMENT WILL INFLUENCE THE NUMBER OF SPECIES WHICH ARE PRESENT WHEN THE FRAGMENT WAS INITIALLY CREATED, AND WILL INFLUENCE VTHE ABILITY OF THESE SPECIES TO PERSIST IN THE FRAGMENT. SMALL FRAGMENTS OF HABITAT CAN ONLY SUPPORT SMALL POPULATIONS OF PLANTS AND ANIMALS AND SMALL POPULATIONS ARE MORE VULNERABLE TO EXTINCTION. MINOR FLUCTUATIONS IN CLIMATE, RESOURCES, OR OTHER FACTORS THAT WOULD BE UNREMARKABLE AND QUICKLY CORRECTED IN LARGE POPULATIONS CAN BE CATASTROPHIC IN SMALL, ISOLATED POPULATIONS. THUS FRAGMENTATION OF HABITAT IS AN IMPORTANT CAUSE OF SPECIES EXTINCTION. POPULATION DYNAMICS OF SUBDIVIDED POPULATIONS TEND TO VARY ASYNCHRONOUSLY. IN AN UNFRAGMENTED LANDSCAPE A DECLINING POPULATION CAN BE "RESCUED" BY IMMIGRATION FROM A NEARBY EXPANDING POPULATION. IN FRAGMENTED LANDSCAPES, THE DISTANCE BETWEEN FRAGMENTS MAY PREVENT THIS FROM HAPPENING. ADDITIONALLY, UNOCCUPIED FRAGMENTS OF HABITAT THAT ARE SEPARATED FROM A SOURCE OF IMMIGRANTS BY SOME BARRIER ARE LESS LIKELY TO BE REPOPULATED THAN ADJOINING FRAGMENTS. EVEN SMALL SPECIES SUCH AS THE COLUMBIA SPOTTED FROG ARE RELIANT ON THE RESCUE EFFECT. STUDIES SHOWED 25% OF JUVENILES TRAVEL A DISTANCE OVER 200 M COMPARED TO 4% OF ADULTS. OF THESE, 95% REMAIN IN THEIR NEW LOCALE, DEMONSTRATING THAT THIS JOURNEY IS NECESSARY FOR SURVIVAL. ADDITIONALLY, HABITAT FRAGMENTATION LEADS TO EDGE EFFECTS. MICROCLIMACTIC CHANGES IN LIGHT, TEMPERATURE AND WIND CAN ALTER THE ECOLOGY AROUND THE FRAGMENT, AND IN THE INTERIOR AND EXTERIOR PORTIONS OF THE FRAGMENT, FIRES BECOME MORE LIKELY IN THE AREA AS HUMIDITY DROPS AND TEMPERATURE AND WIND LEVELS RISE. EXOTIC AND PEST SPECIES MAY ESTABLISH THEMSELVES EASILY IN SUCH DISTURBED ENVIRONMENTS, AND THE PROXIMITY OF DOMESTIC ANIMALS OFTEN UPSETS THE NATURAL ECOLOGY ALSO, HABITAT ALONG THE EDGE OF A FRAGMENT HAS A DIFFERENT CLIMATE AND FAVOURS DIFFERENT SPECIES FROM THE INTERIOR HABITAT. SMALL FRAGMENTS ARE THEREFORE UNFAVOURABLE FOR SPECIES WHICH REQUIRE INTERIOR HABITAT. // CONSERVATION IMPLICATIONS: HABITAT FRAGMENTATION IS OFTEN A CAUSE OF SPECIES BECOMING THREATENED OR ENDANGERED. THE EXISTENCE OF V ABBITAT IS CRITICAL TO THE SURVIVAL OF ANY SPECIES, AND IN MANY CASES THE FRAGMENTATION OF ANY REMAINING HABITAT CAN LEAD TO DIFFICULT DECISIONS FOR CONSERVATION BIOLOGISTS. GIVEN A LIMITED AMOUNT OF RESOURCES AVAILABLE FOR CONSERVATION IS IT PREFERABLE TO PROTECT THE EXISTING ISOLATED PATCHES OF HABITAT OR TO BUY BACK LAND TO GET THE LARGEST POSSIBLE CONTINUOUS PIECE OF LAND? THIS ONGOING DEBATE IS OFTEN REFERRED TO AS SLOSS (SINGLE LARGE OR SEVERAL SMALL). ONE SOLUTION TO THE PROBLEM OF HABITAT FRAGMENTATION IS TO LINK THE FRAGMENTS BY PRESERVING OR PLANTING CORRIDORS OF NATIVE VEGETATION. THIS HAS THE POTENTIAL TO MITIGATE THE PROBLEM OF ISOLATION BUT NOT THE LOSS OF INTERIOR HABITAT. IN RARE CASES A CONSERVATION RELIANT SPECIES MAY GAIN SOME MEASURE OF DISEASE PROTECTION BY BEING DISTRIBUTED IN ISOLATED HABITATS. ANOTHER MITIGATION MEASURE IS THE ENLARGEMENT OF SMALL REMNANTS IN ORDER TO INCREASE THE AMOUNT OF INTERIOR HABITAT. THIS MAY BE IMPRACTICAL SINCE DEVELOPED LAND IS OFTEN MORE EXPENSIVE AND COULD REQUIRE SIGNIFICANT TIME AND EFFORT TO RESTORE. THE BEST SOLUTION IS GENERALLY DEPENDENT ON THE PARTICULAR SPECIES OR ECOSYSTEM THAT IS BEING CONSIDERED. MORE MOBILE SPECIES, LIKE MOST BIRDS, DO NOT NEED CONNECTED HABITAT WHILE SOME SMALLER ANIMALS, LIKE RODENTS, MAY BE MORE EXPOSED TO PREDATION IN OPEN LAND. THESE QUESTIONS GENERALLY FALL UNDER THE HEADINGS OF METAPOPULATIONS ISLAND BIO-GEOGRAPHY. // WILDLIFE CORRIDOR (OR GREEN CORRIDOR): AREA OF HABITAT CONNECTING WILDLIFE POPULATIONS SEPARATED BY HUMAN ACTIVITIES (SUCH AS ROADS, DEVELOPMENT, OR LOGGING), THIS ALLOWS AN EXCHANGE OF INDIVIDUALS BETWEEN POPULATIONS, WHICH MAY HELP PREVENT THE NEGATIVE EFFECTS OF INBREEDING AND REDUCED GENETIC DIVERSITY (VIA GENETIC DRIFT) THAT OFTEN OCCUR WITHIN ISOLATED POPULATIONS. CORRIDORS MAY ALSO HELP FACILITATE THE RE-ESTABLISHMENT OF POPULATIONS THAT HAVE BEEN REDUCED OR ELIMINATED DUE TO RANDOM EVENTS (SUCH AS FIRES OR DISEASE). THIS MAY POTENTIALLY MODERATE SOME OF THE WORST EFFECTS OF HABITAT FRAGMENTATION. WILDLIFE CORRIDORS ARE SUSCEPTIBLE TO EDGE EFFECTS; HABITAT QUALITY ALONG THE EDGE OF A HABITAT FRAGMENT IS OFTEN MUCH LOWER THAN IN AREAS FURTHER FROM THE HABITAT EDGE. WILDLIFE CORRIDORS ARE IMPORTANT FOR LARGE SPECIES REQUIRING SIGNIFICANT SIZED RANGES; HOWEVER, THEY ARE ALSO VITAL AS CONNECTION CORRIDORS FOR SMALLER ANIMALS AND PLANTS AS WELL AS ECOLOGICAL CONNECTORS TO PROVIDE A RESCUE EFFECT. // BAR-RI-ER [BAR-EE-ER] ANYTHING BUILT OR SERVING TO BAR PASSAGE, AS A RAILING, FENCE, OR THE LIKE: PEOPLE MAY PASS THROUGH THE BARRIER ONLY WHEN THEIR TRAIN IS ANNOUNCED; // 2. ANY NATURAL BAR OR OBSTACLE: A MOUNTAIN BARRIER; // 3. ANYTHING THAT RESTRAINS OR OBSTRUCTS PROGRESS ACCESS, ETC.: A TRADE BARRIER; // 4. A LIMIT OR BOUNDARY OF ANY KIND: THE BARRIERS OF CASTE; // 5. PHYSICAL GEOGRAPHY: AN ANTARCTIC ICE SHELF OR ICE FRONT; // 6. BARRIER BEACH; // 7. BARRIERS HISTORY/HISTORICAL: THE PALISADE OR RAILING SURROUNDING THE GROUND WHERE TOURNEYS AND JOUSTS WERE CARRIED ON; // 8. ARCHAIC: A FORTRESS OR STOCKADE; HABITAT FRAGMENTATION AS THE NAME IMPLIES, DESCRIBES THE EMERGENCE OF DISCONTINUITIES (FRAGMENTATION) IN AN ORGANISM'S PREFERRED ENVIRONMENT (HABITAT), CAUSING POPULATION FRAGMENTATION, HABITAT FRAGMENTATION CAN BE CAUSED BY GEOLOGICAL PROCESSES THAT SLOWLY ALTER THE LAYOUT OF THE PHYSICAL ENVIRONMENT (SUSPECTED OF BEING ONE OF THE MAJOR CAUSES OF SPECIATION)T, OR BY HUMAN ACTIVITY SUCH AS LAND CONVERSION, WHICH CAN ALTER THE ENVIRONMENT MUCH FASTER AND CAUSES EXTINCTIONS OF MANY SPECIES. THE TERM HABITAT FRAGMENTATION INCLUDES FIVE DISCRETE PHENOMENA: REDUCTION IN THE TOTAL AREA OF THE HABITAT: DECREASE OF THE INTERIOR: EDGE RATIO: ISOLATION OF ONE HABITAT FRAGMENT FROM OTHER AREAS OF HABITAT: BREAKING UP OF ONE PATCH OF HABITAT INTO SEVERAL SMALLER PATCHES; DECREASE IN THE AVERAGE SIZE OF EACH PATCH OF HABITAT // NATURAL CAUSES AND EFFECTS: EVIDENCE OF HABITAT DESTRUCTION THROUGH NATURAL PROCESSES SUCH AS VOLCANISM FIRE, AND CLIMATE CHANGE IS FOUND IN THE FOSSIL RECORD. FOR EXAMPLE, HABITAT FRAGMENTATION OF TROPICAL RAINFORESTS IN EURAMERICA 300 MILLION YEARS AGO LED TO A GREAT LOSS OF AMPHIBIAN DIVERSITY, BUT SIMULTANEOUSLY THE DRIER CLIMATE SPURRED ON A BURST OF DIVERSITY AMONG REPTILES. // HUMAN CAUSES: HABITAT FRAGMENTATION IS FREQUENTLY CAUSED BY HUMANS WHEN NATIVE VEGETATION IS CLEARED FOR HUMAN ACTIVITIES SUCH AS AGRICULTURE, RURAL DEVELOPMENT, URBANIZATION AND THE CREATION OF HYDROELECTRIC RESERVOIRS. HABITATS WHICH WERE ONCE CONTINUOUS BECOME DIVIDED INTO SEPARATE FRAGMENTS. AFTER INTENSIVE CLEARING, THE SEPARATE FRAGMENTS TEND TO BE VERY SMALL ISLANDS ISOLATED FROM EACH OTHER BY CROPLAND, PASTURE, PAVEMENT, OR EVEN BARREN LAND. THE LATTER IS OFTEN THE RESULT OF SLASH AND BURN FARMING IN TROPICAL FORESTS. IN THE WHEATBELT OF CENTRAL WESTERN NEW SOUTH WALES, AUSTRALIA, 90% OF THE NATIVE VEGETATION HAS BEEN CLEARED AND OVER 99% OF THE TALLGRASS PRAIRIE OF NORTH AMERICA HAS BEEN CLEARED, RESULTING IN EXTREME HABITAT FRAGMENTATION. // IMPLICATIONS OF HABITAT FRAGMENTATION:

ONE OF THE MAJOR WAYS THAT HABITAT FRAGMENTATION AFFECTS BIODIVERSITY IS BY REDUCTION IN THE AMOUNT OF AVAILABLE HABITAT (SUCH AS RAINFORESTS, BOREAL FORESTS, OCEANS, MARSHLANDS, ETC.)

NECESSARY FOR SURVIVAL, ADDITIONALLY, HABITAT FRAGMENTATION LEADS TO EDGE