assemblages are influenced by the presence of breeding pools in fragmented forest patches, which can increase the likelihood of colonization by invasive species.

Urbanization and habitat fragmentation lead to the development of artificial water bodies such as urban ponds, artificial wetlands, and drainage systems. These man-made habitats can support invasive amphibians by providing suitable breeding and foraging environments. The presence of such habitats in urban and agricultural regions has been linked to changes in amphibian assemblages, with some species thriving in these altered environments (Cushman, 2006).

4.2 Disruption of native communities

Fragmented habitats often result in reduced competition and predation pressure, which can facilitate the establishment of invasive amphibians. The isolation of habitat patches can lead to decreased species richness and altered community dynamics, making it easier for invasive species to establish themselves without facing significant biotic resistance from native species (Teixido et al., 2021).

Habitat fragmentation can disrupt trophic interactions within native communities, further facilitating amphibian invasions. The alteration of food webs and the loss of key species can create ecological opportunities for invasive species to exploit. For example, changes in predator-prey dynamics and the availability of resources in fragmented landscapes can lead to increased vulnerability of native amphibian populations to invasive species (Belasen et al., 2019).

4.3 Enhanced dispersal opportunities

Fragmented landscapes often consist of small habitat patches that can act as stepping stones, enhancing the dispersal opportunities for invasive amphibians. These patches can facilitate movement across the landscape, allowing invasive species to colonize new areas more effectively. The connectivity of these patches is crucial for maintaining population dynamics and enabling the spread of invasive species (Wright et al., 2020).

Human activities associated with habitat fragmentation, such as transportation and land development, can inadvertently assist in the dispersal of invasive amphibians. Roads and other infrastructure can serve as corridors for movement, while human-mediated transport can introduce invasive species to new areas. This human-assisted dispersal is a significant factor in the spread of invasive amphibians in fragmented landscapes (Funk et al., 2005).

5 Interactions Between Habitat Fragmentation and Other Environmental Stressors

5.1 Climate change and amphibian invasions

Climate change significantly impacts the distribution and habitat suitability for amphibians, often leading to shifts in their geographical ranges. For instance, studies have shown that climate change can cause a northward shift and reduction in suitable habitats for species like the giant spiny frog, which is indicative of broader trends affecting amphibians globally (Luo et al., 2021). Additionally, climate change scenarios predict that amphibians in China may lose a significant portion of their original ranges, with suitable habitats moving to higher altitudes and northern regions (Duan et al., 2016). These shifts can create new opportunities for invasive species to establish themselves in previously unsuitable areas, thereby facilitating invasions.

The interaction between habitat fragmentation and climate-driven range shifts can exacerbate the challenges faced by amphibians. Fragmented landscapes can hinder the ability of species to move to new suitable habitats, thus increasing the risk of local extinctions (Opdam and Wascher, 2004). For example, the mountain frog *Quasipaa boulengeri* is projected to experience significant habitat loss and fragmentation due to climate change, which could impede its ability to adapt to new environmental conditions (Yang et al., 2021). This interaction highlights the need for conservation strategies that enhance habitat connectivity to support range shifts in response to climate change.

5.2 Pollution and disease

Pollution in fragmented habitats can create conditions that favor invasive species. Fragmented landscapes often experience increased levels of pollutants, which can alter the ecological balance and provide a competitive