The extent of human influence is so pervasive that the earth today is comprised mostly of novel ecosystems (Seastedt et al. 2008). Novel ecosystems have species compositions and relative abundances that have not been previously observed, and usually are the result of anthropogenic changes (Hobbs et al. 2009). Species introductions are major drivers in the creation and maintenance of novel ecosystems both by adding new species and by removing native species (Seastedt et al. 2008). Novel ecosystems may be severely degraded and comprised of non-native species, but many still harbor species that serve important ecological functions, and many are good candidates for restoration. However, effective conservation in these systems requires better knowledge of the species that comprise them – both the remnant native and the introduced species – and their current ecological roles.

Most conservation goals focus on restoring native species to historical abundances, but restoring ecological functions could be more beneficial and feasible for degraded ecosystems (Hobbs et al. 2010). Conservation efforts that have focused on removing invasive species and reintroducing native species have yielded many positive results, however, removing invasive species could have negative consequences if these species play important ecological roles in the novel system (Savaleta et al. 2001). Likewise, reintroducing reduced or extirpated native species can prove unsuccessful or detrimental if persisting threats and current conditions are poorly understood (Hobbs et al. 2011, Godefried et al. 2011).

Although the negative impacts of introduced species are extensive, some introduced species have beneficial roles. Introduced species can be good candidates for restoring severely degraded habitats. For example, planting non-native trees in abandoned pastures in Puerto Rico facilitated the return of native plant communities where the native plants would not have originally colonized (Lugo 1997). Some introduced species may be providing desirable ecological functions such as seed dispersal or food sources for native species (Goodenough 2010). Introduced Japanese white-eyes (*Zosterops japonica*) in Hawaii are seed dispersers for native plants that previously relied on now extinct or rare native birds (Foster and Robinson 2007). Finally, invasive species can act to slow or reverse negative ecological effects from other anthropogenic impacts. For example, cascade effects from overfishing in Cape Cod salt marshes are being reversed by green crabs (Carcinas maenas), which are normally considered a harmful invasive (Bartness and Coverdale *in press*).

Feral ungulates are components of novel ecosystems around the world, and although their negative effects are well-documented (Nogueira-Filho et al 2009, Rooney & Waller 2003, Ickes et al. 2001), there are a few examples where they play beneficial roles (Desbeiz et al. 2011, O’Connor and Kelly 2012). Ungulate eradication is an important restoration tool, especially in island environments where ungulates are considered destructive invasive species (Kessler 2002, Spear and Chown 2009). However, invasive ungulates may also fill missing ecological roles in highly degraded island systems; this complexity makes management of ungulates challenging. Pigs have been documented as dispersers of native plant species on islands where they have been introduced (O’Connor and Kelly 2012) and other ungulates such as cattle and sheep effectively control exotic plant species in island habitats (Klinger et al. 1994). If ungulates have been part of a system for a long time, they may play considerable functional roles, such that their removal results in unintended consequences; these include the release of invasive plant species (Coomes et al. 2001, Cabin et al. 2000) or reduced seed-dispersal (citation- New Zealand paper?). Natural resource managers would be aided by discerning which non-native species serve important functions, and which species are solely destructive before implementing conservation actions in a novel ecosystem.

The islands of Guam and Rota in the Mariana Archipelago, Western Micronesia, as with many islands around the world, have had a long history of species introductions (Fritts and Rodda 1998). Perhaps the most famous invasive species is the brown treesnake (*Boiga irregularis*), which was unintentionally introduced to Guam and is responsible for the extinction of most of Guam’s native birds between 1945 and 1985 (Savidge 1987). The nearby island of Rota has retained more pristine examples of limestone forest habitats than Guam (Falanruw et al. 1989), however, both islands have experienced many species introductions, including ungulates, which have been established for centuries (Wiles et al 1999, Safford 1905, Conry 1989). Common wisdom and the small number of studies on deer and pigs in the Marianas have shown them to have negative effects on the forest. Philippine deer (*Rusa* *mariannae*) density in Guam has been correlated with reduced seedling recruitment in some species of native trees (Wheeler 1979, Schreiner 1997). Feral pigs (*Sus scrofa*) are thought to affect seedling recruitment through physical disturbance of the forest floor and through seed predation (Conry 1989, Ickes et al. 2001). However, these impacts are occurring within unique novel rather than pristine ecosystems, therefore a more thorough examination of the role of each species within the larger ecological context is needed to make appropriate management decisions.

Here, we investigate the ecological role of invasive ungulates in a highly degraded novel ecosystem and in a less degraded system with similar biological history. Because Guam’s forests have effectively lost all ecological services provided by avifauna, we were able to discern the relative magnitude of impacts from introduced ungulates between Guam and Rota. In the Mariana Islands, birds are especially important for seed dispersal of a number of native forest species (Haldre? pers comm.) Here, we examine the impact of feral pigs and deer on seedling survival, seed dispersal, and overall plant community composition. We contrast their role in the bird-free forests of Guam to that in the nearby forests of Rota which still maintain avian populations.