

Evaluation of habitat availability for large carnivores under a changing climate and disturbance regime: an Amur Tiger and Amur Leopard case study

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This project presents a remotely-sensed data-driven modeling initiative aimed at evaluating the long-term habitat availability for a critically endangered large carnivorous species in the Russian Far East – the Amur tiger and the Amur leopard. Russian forests are a stronghold for large carnivore preservation efforts because they provide large interconnected areas of suitable habitat necessary to support a minimum viable population of a given species. The projected increase in the occurrence and spatial extent of natural forest disturbances (primarily fire) in a changing climate and an ongoing expansion of logging activities under the prevailing resource-oriented economic model will lead to destruction, degradation, and fragmentation of available habitat. Additionally, climate induced changes in post-disturbance recovery and species composition are likely to force a shift in the carnivorous species distribution to other areas. While the existence of suitable habitat in the future is expected, a need exists for a spatially explicit analysis of habitat change in a temporally dynamic framework to ensure the connectivity of the current and potential future suitable habitats, which will facilitate the successful migration of the carnivores and their prey species. This project is designed to continue the ongoing NASA-sponsored research projects in the area and build upon their results. It will model habitat distribution using the FAREAST forest succession model. This model will utilize inputs on forest cover and disturbances provided by the decision-tree based fusion of remotely sensed data products from passive optical (MODIS, MISR, MSS, TM, ETM+, ASTER), radar (ENVISAT ASAR, ALOS PALSAR) and lidar (ICESAT) sensors. This project will make a significant contribution to the Northern Eurasia Earth Science Partnership Initiative (NEESPI) program by assessing disturbance-driven forest change in the NEESPI area. Additionally, it will strongly contribute to Amur tiger and leopard conservation efforts.