

Invasive Species and Climate Change FOSTERING ECOSYSTEM RESILIENCE



Climate change can accelerate the introduction and spread of invasive species.

Combined effects of invasive species and climate change reduce ecosystem resilience and negatively impact biodiversity.¹

CLIMATE CHANGE

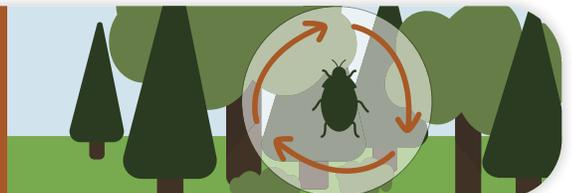
More frequent extreme weather events (e.g. floods and droughts) stress native species and create opportunities for invasive species movement.



Melting sea ice opens new shipping routes and pathways for invasive species spread.



A changing climate can affect species life cycles and their ability to spread into new areas.



Increased carbon dioxide (CO₂) in the atmosphere leads to higher CO₂ uptake in plants, which can increase herbicide resistance.



Changes to climate (including temperature, humidity, and rainfall) can create favourable conditions for increased spread of invasives.

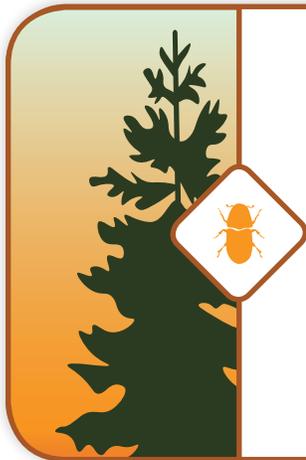
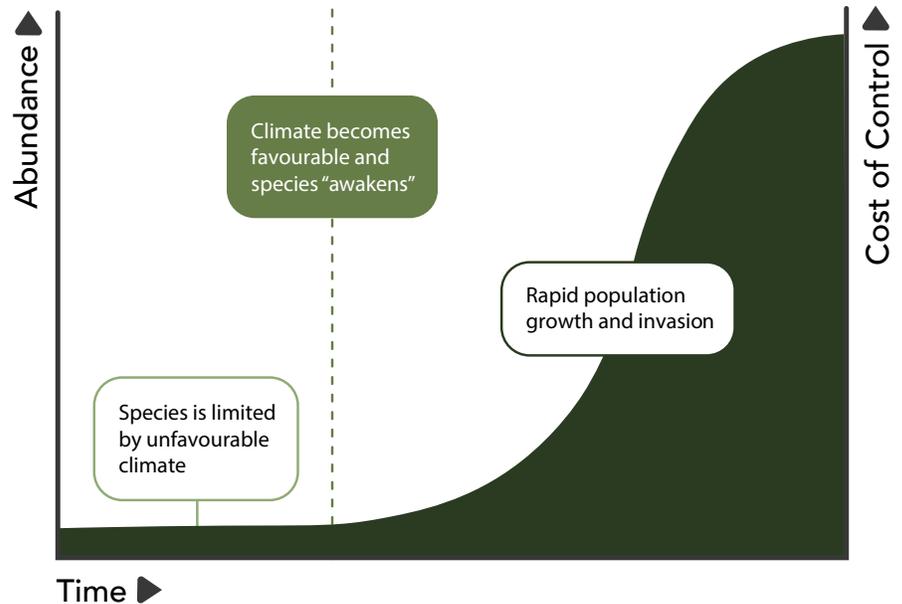


As our climate continues to change, incorporating biosecurity, early detection, and rapid response in climate change policy will help prevent the introduction and spread of invasive species.¹

Ecosystems that are already impacted by invasive species should be prioritized for management to improve the resilience of our natural environment.

WHAT'S AT RISK: Rise of the Sleeper Species^{2,3}

Sleeper species are non-native species already present in an ecosystem that have potential to be invasive, but are limited by factors such as climate or other species. Sirex woodwasp, for example, was introduced to Canada in 2005 and has since been limited to parts of Ontario and Quebec. Climate change could create favourable conditions for the spread of this species, leading to negative impacts on Canada's important pine plantations. Identifying sleeper species and preventing their spread will protect vulnerable ecosystems and maximize resources.



Mountain pine beetle (MPB; *Dendroctonus ponderosae*) is native to Western Canada, but has rapidly spread beyond its historical range in recent years. Warming winters have enabled spread into areas where the cold previously killed up to 98% of populations. MPB is now acting 'invasive' and threatens pine trees across Canada.

Healthy forests are 'carbon sinks' that capture and store large amounts of atmospheric carbon and help offset the impacts of climate change. A MPB outbreak could turn Canada's forests from a carbon sink to a 'carbon source', as killed trees release stored carbon back into the atmosphere – further accelerating climate change.

Prioritizing invasive species in climate change policy benefits native tree populations, protects biodiversity, and can help slow the effects of climate change.

¹ Invasive alien species and climate change. (n.d.) Retrieved from <https://www.iucn.org/resources/issues-briefs/invasive-alien-species-and-climate-change>.

² Bradley, B. A., Beaury, E. M., Fusco, E. J., Griffin, B. J., Laginhas, B. B., McLaughlin, B. C., ... & Munro, L. (2018). Regional Invasive Species & Climate Change Management

Challenge: Double Trouble. Understanding risks from invasive species + climate change. *Environmental Conservation Educational Materials*. 5.

³ Graphic adapted from Bradley, B. A., Beaury, E., Fusco, E. J., Laginhas, B., Morelli, T. L., & Pasquarella, V. (2018). Regional Invasive Species & Climate Change Management Challenge: Preparing for sleeper species. *Environmental Conservation Educational Materials*. 2.



Invasive
Species
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The **INVASIVE SPECIES CENTRE** is a non-profit organization that connects stakeholders, knowledge and technology to prevent and reduce the spread of invasive species that harm Canada's environment, economy, and society.

For more information and to sign up for invasive species news, visit www.invasivespeciescentre.ca.    