



Black-tailed prairie dog & Black-footed Ferret Recovery in Canada



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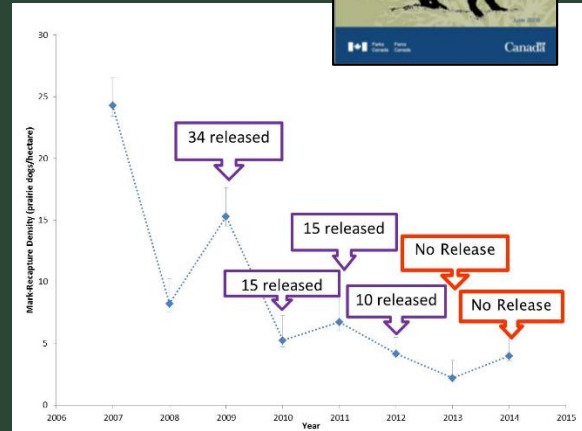
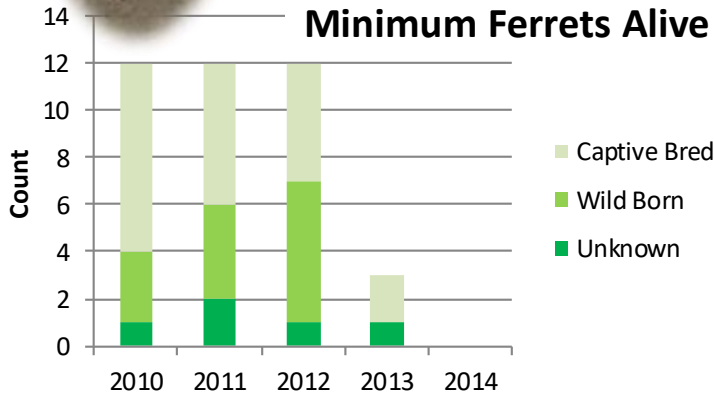
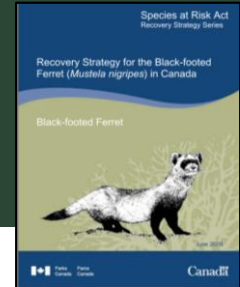
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BFF Recovery (2009-2015)



No BFF detected in GNP since 2013



Recovery feasibility has not changed (yet)

Work on BTPD conservation management will help inform BFF recovery



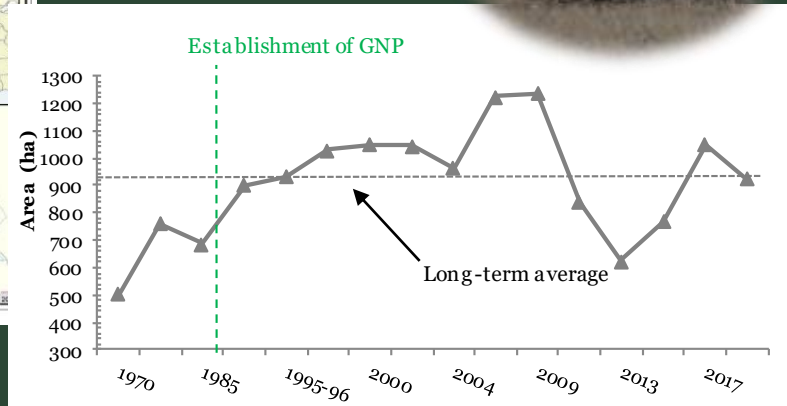
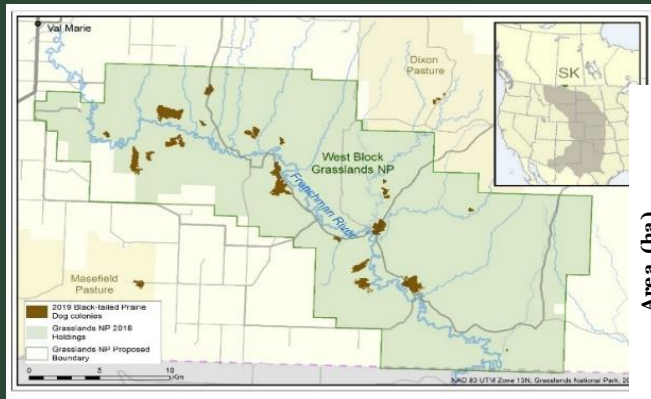
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Black-tailed Prairie Dog Conservation Status

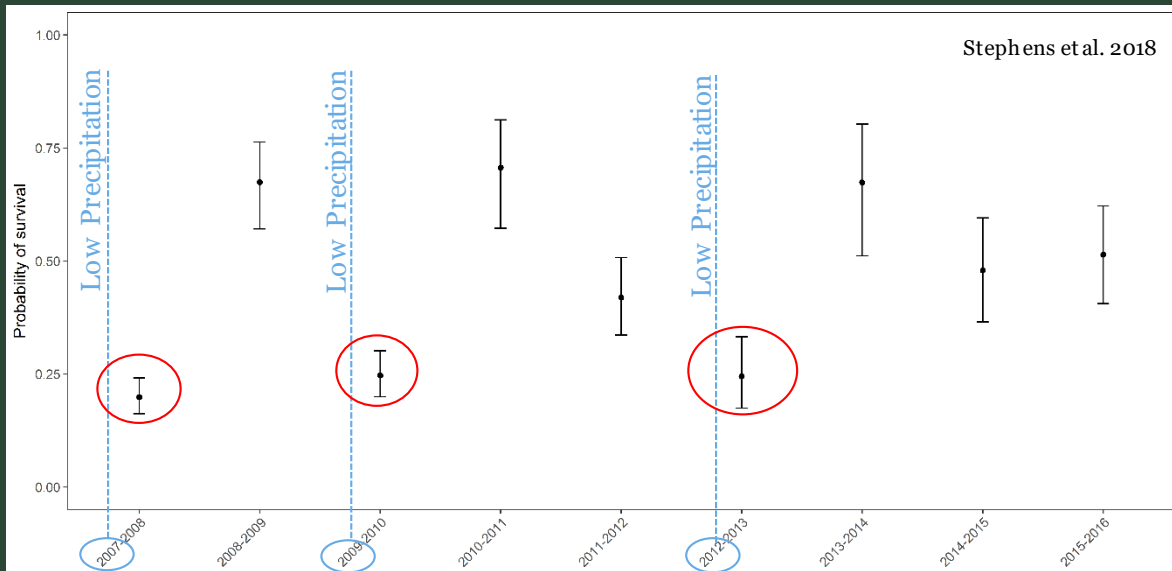
- Species up-listed (Threatened) by SARA in 2018
- 18 of 20 colonies (~95% habitat) are within Grasslands NP
- active colony area = ~ 900 ha; average density ~ 15-25 ind./ha
- No active management outside GNP





Drivers of BTPD population dynamics

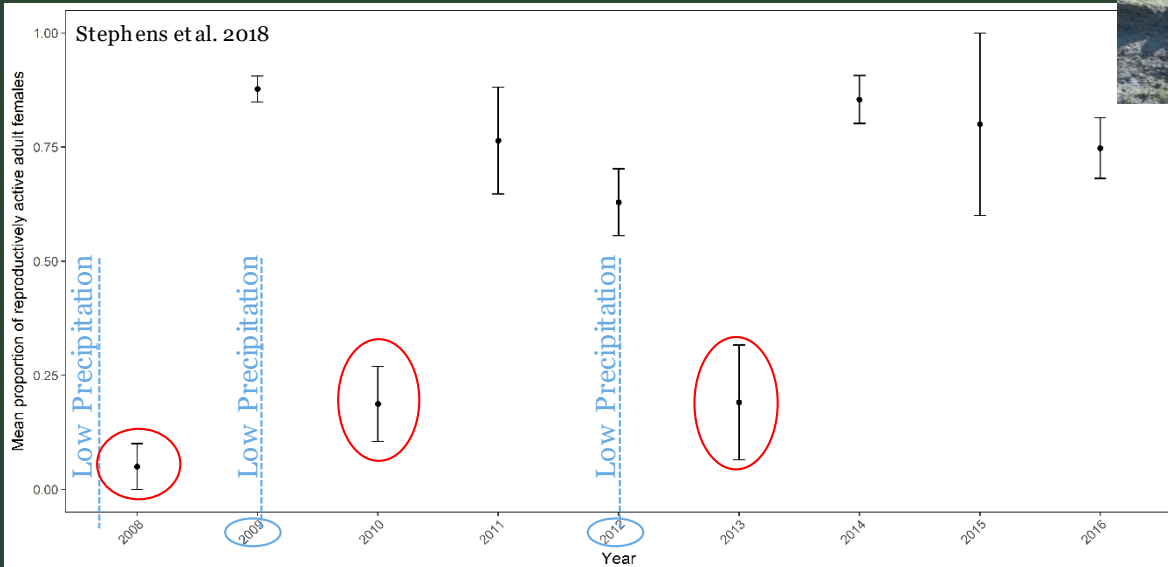
- **Survival** likely limited by:
 - Low precipitation → limited resource availability
 - Winter severity?





Drivers of BTPD population dynamics

- **Reproduction** likely limited by:
- Low precipitation → limited resource availability
- Winter severity?





Sylvatic Plague

- Recent evidence suggests sylvatic plague is enzootic in Grasslands NP (Liccioli et al 2020)
- Relatively narrow window of flea and plague activity - no confirmed outbreak
- Warming change can shift vector distribution/activity and disease dynamics
- Recent plague outbreaks in UL Bend suggest things may change quickly



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ECOSPHERE

DISEASE ECOLOGY

Enzootic maintenance of sylvatic plague in Canada's threatened black-tailed prairie dog ecosystem

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In a nutshell

- Canada is amongst the smallest, most isolated and fragmented BTPD population
- Current area of occupancy is in line with 20+ year average
- Densities are in line with 20+ year average, and lower than elsewhere in BTPD range
- Drought is a key limiting factor to population dynamics
- Current threats (drought & plague) are projected to increase with climate change
- **No support from ranchers to conservation management of the species**





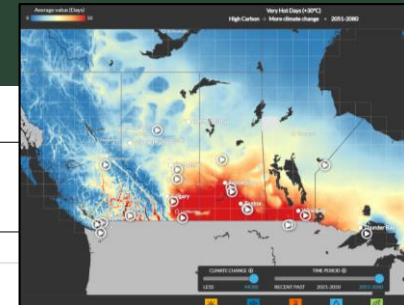
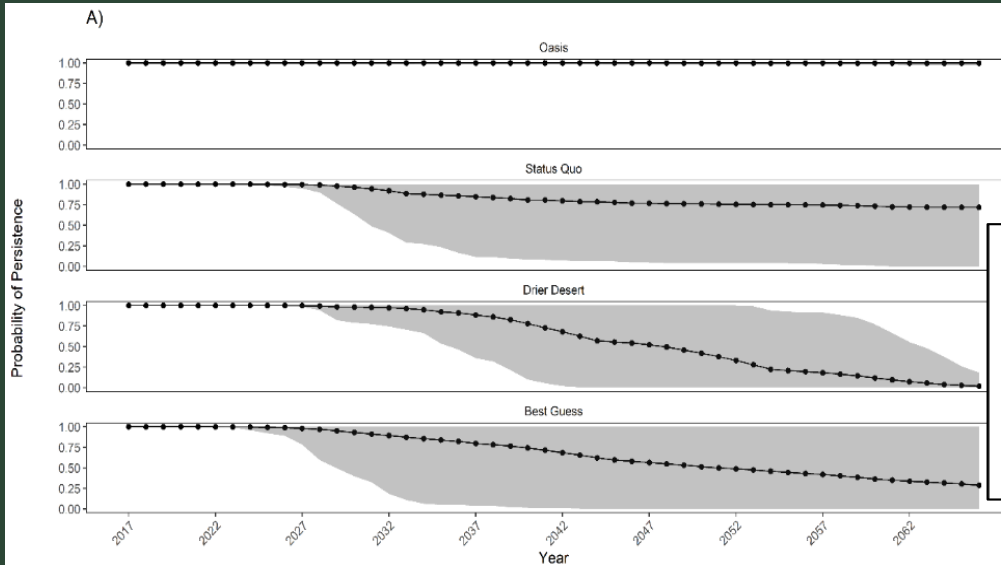
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Climate and Probability of Persistence

- Keep rates of plague outbreak low, see what are the impacts of climate



Climate Atlas Report
Region: WOOD MOUNTAIN

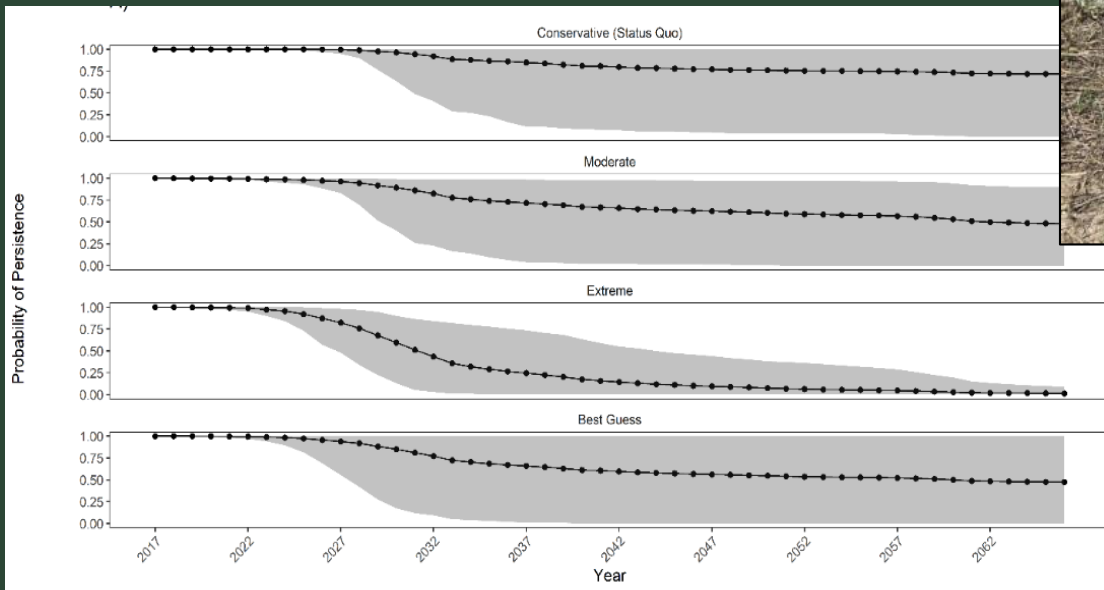
RCP 8.5: High Carbon climate future
Climate projections continue to increase at current rates

Variable	Period	1976-2016			2021-2050			2051-2080		
		Low	Mean	High	Low	Mean	High			
Precipitation (mm)	Annual	368	366	368	314	264	252	252	252	
Precipitation (mm)	Spring	81	81	80	100	100	34	151	146	
Precipitation (mm)	Summer	112	73	140	105	36	130	230	230	
Precipitation (mm)	Fall	81	20	81	107	27	62	101	101	
Precipitation (mm)	Winter	95	26	10	84	28	35	35	35	
Mean Temperature (°C)	Annual	2.7	3.7	5.0	9	5.2	7.6	16.8	16.8	
Mean Temperature (°C)	Spring	2.8	1.2	5.5	8.8	2.4	6.5	16.2	16.2	
Mean Temperature (°C)	Summer	17.2	17.3	18.9	22	16.0	21.9	24.9	24.9	
Mean Temperature (°C)	Fall	4.9	3.7	6.5	9	5.9	8.7	11.7	11.7	
Mean Temperature (°C)	Winter	-11.1	-10.3	-8.4	-3.4	-11.1	-6.2	-1	-1	
Tropical Nights	Annual	0	0	1	3	0	3	12	12	
Very Hot Days (≥30°C)	Annual	0	0	0	0	27	52	84	84	
Very Hot Days (≥30°C)	Spring	0	0	0	0	11	0	1	0	
Days of at least 1 Frost	Annual	May 10	May 3	May 10	May 10	April 26	May 2	May 10	May 10	
Days of at least 1 Frost	Spring	May 15	May 10	May 10	May 10	May 11	May 11	May 11	May 11	
Frost-Free Season (Days)	Annual	151	151	150	150	150	150	150	150	



Plague and Probability of Persistence

- “Best guess” climate scenario, see what different rates of plague outbreaks do



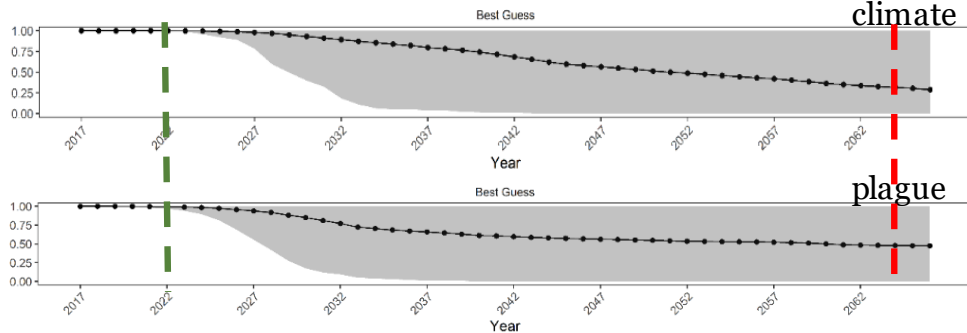


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- Little concern for the extirpation of the species in the immediate future (i.e. ~ 10 years).
- Relatively high chance of species extirpation in the next 50 years without any additional mitigation measures.





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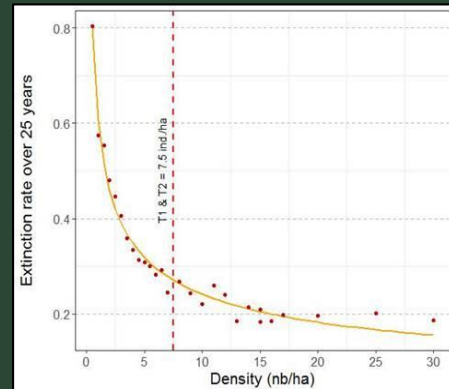
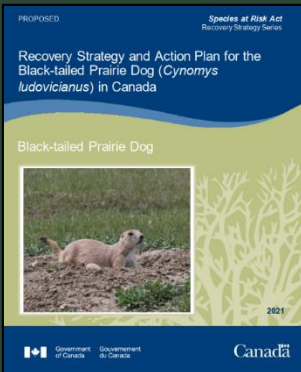
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Population & Distribution Objectives

To ensure, **by 2040**, at least **80% probability of persistence** of the Canadian Black-tailed Prairie Dog population **over 50 years** (i.e., 2040-2090) within its known range in Canada, and maintain:

- i. a minimum area of occupancy of 1,400 ha
- ii. a minimum average population density of 7.5 individuals/ha





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To meet the PDO, one or more of the following broad recovery actions will be implemented:

- Minimize the risk of a plague outbreak by implementing different strategies for plague management
- Restore and/or establish **up to 600 ha (total 2,000 ha)** of BTPD colonies in Grasslands National Park
- Conduct population management (e.g., captive breeding, conservation translocation, supplemental feeding), should these measures be necessary and effective for species survival and recovery.





Intended approach

- Proposed PDO is meant to deal with uncertainty, while providing “good” Probability of Persistence (e.g., >80%) over 50 years, to be achieved through different management options
- The combination and relative contribution of different management options (e.g., plague mitigation, habitat management/restoration, supplemental feeding) will be assessed through the PVA framework and upon evaluation of their feasibility
- Established target (1,400 – 2,000 ha) will help **re-assess long-term feasibility of BFF recovery**





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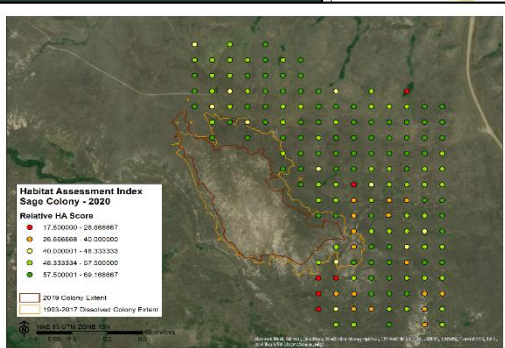
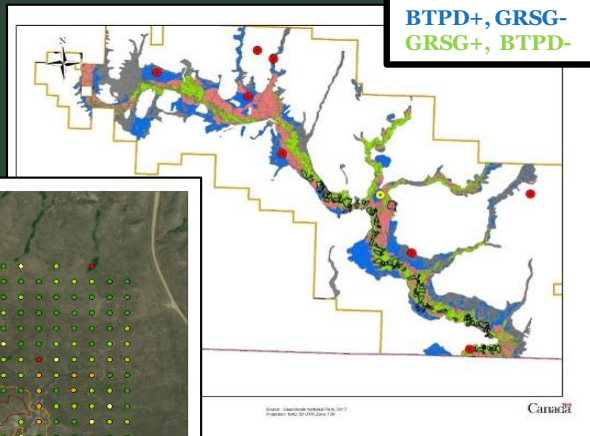
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BTPD Habitat Suitability & Colony expansion

- Previous work identified areas suitable for BTPD habitat enhancement/creation based on abiotic factors
- Development of BTPD Habitat Suitability Index to include biotic factors
- Help select translocation and colony creation sites
- Consider multi-SAR objectives
- **Increase population resilience**

Thorpe & Stephens 2018





BTPD Recovery & Population management

- Developing a conflict mitigation plan **outside GNP/Critical Habitat** with ranchers and Province of SK
- Build on 2020 conflict mitigation translocations
 - 26 individuals translocated August 2020
 - 16 (61.5%) on site October 1st 2020
 - 7 (26.9%) on site/alive March 1st 2021
- Stepping stone toward BFF recovery?
- **Despite these efforts, stakeholders opposition continues**





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Questions for you

Can we still provide support to BFF recovery?

- *Lower BTPD densities but relatively “low” plague activity (for now)*
- *Experimental site for applied management questions?*
- *Value of a (very) small BFF population (e.g., < 30) ?*

Can the BFF recovery framework in US provide “support” to BTPD/BFF recovery in Canada?





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Supplemental Information





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BTPD Conflict Management

- Available knowledge and expertise
 - GNP Mitigation translocations
 - 26 individuals translocated August 2020
 - 16 (61.5%) on site October 1st 2020, 7 (26.9%) on site/alive March 1st 2021
 - Can help achieve PDO
 - U.S. partners (USFWS, USDA, WWF)
 - Physical/visual barriers
 - Vegetation Management
- Need for coordinated approach (PCA, SK and ECCC)
 - Specific case within the larger SOD/CH protection framework



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Examples of BTPD Conflict Management to help achieve PDOs

1. Relocate colonizing BTPD to selected sites in GNP
2. “Zoning” for BTPD conflict management on CH outside GNP; e.g:
 - A. Critical Habitat (e.g., habitat protection, natural expansion of BTPD can occur)
 - B. Containment: individuals could be trapped and relocated (e.g., to GNP)
 - C. No tolerance: lethal removal
3. Test barriers (including vegetation management) in sites of reoccurring colonization
4. Permit lethal removal if not effective/timely/feasible