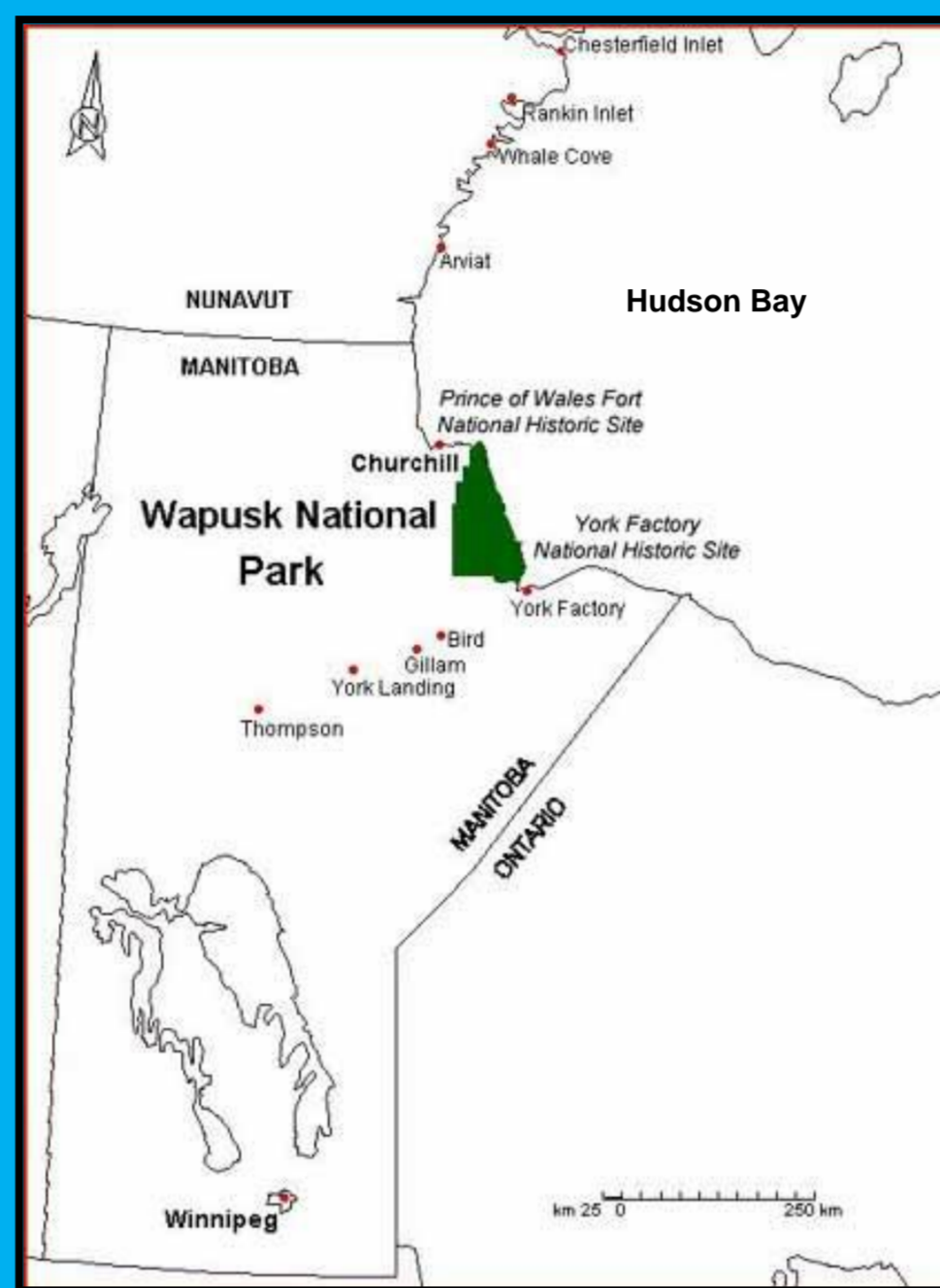




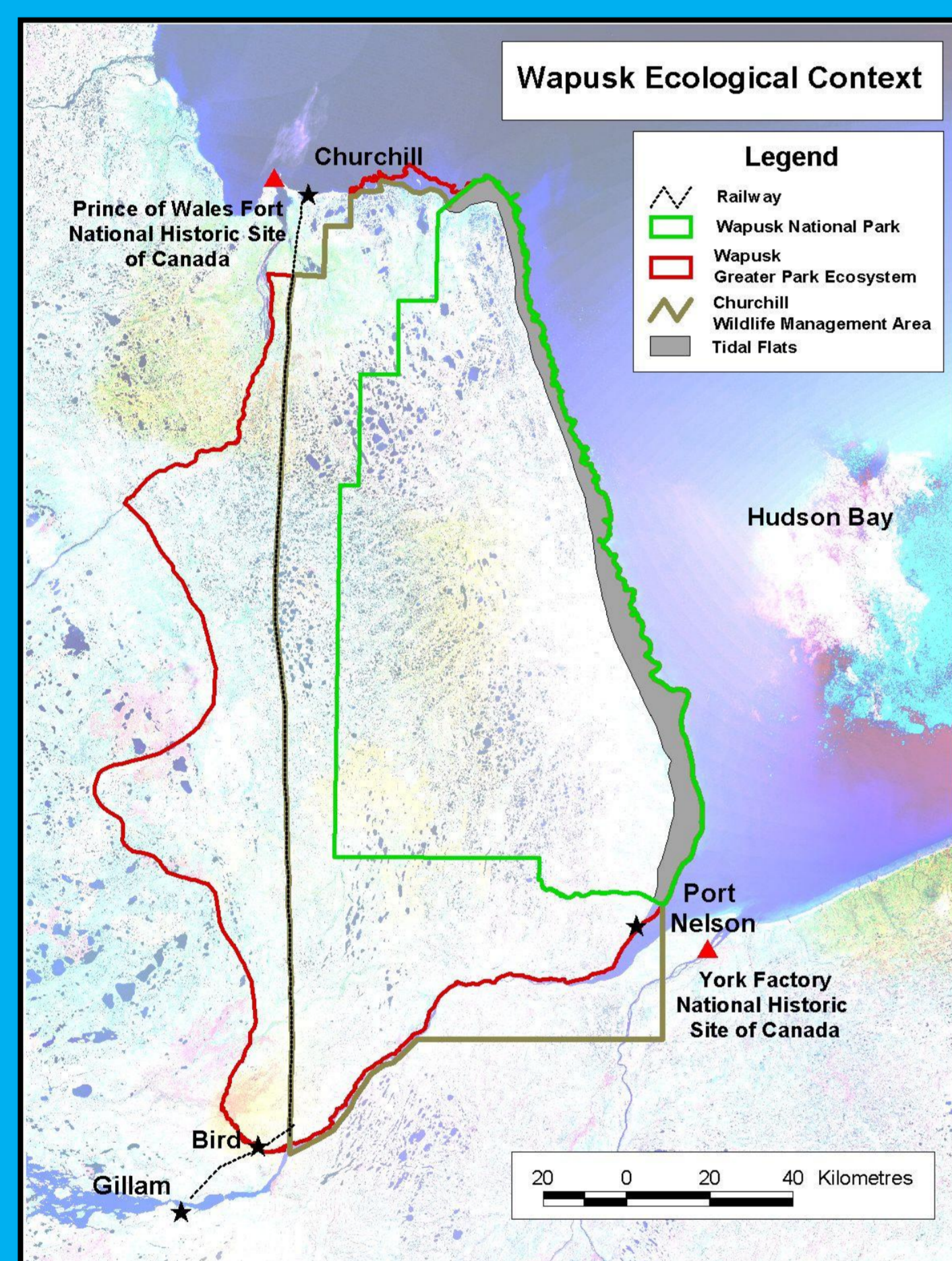
# Mapping Recent Fire History in Wapusk National Park and Greater Park Ecosystem with Landsat Imagery

## Wapusk National Park

Wapusk National Park (WNP) is located south and east of Churchill, along the shore of Hudson Bay in Manitoba. The park was established in 1996 and encompasses a large area of the Hudson Bay Lowlands. Continuous permafrost, topped by North America's most extensive mantle of peat characterizes the park. Despite this environment, the park includes a section of spruce lichen forest where fire is frequent and plays a significant role in vegetation and ecosystem dynamics. The park covers an area of 1,147,500 ha but the study area extends out of WNP in the Greater Park Ecosystem (GPE) and reaches 2,341,900 ha.



Location of Wapusk National Park.



Wapusk National Park and Greater Park Ecosystem.

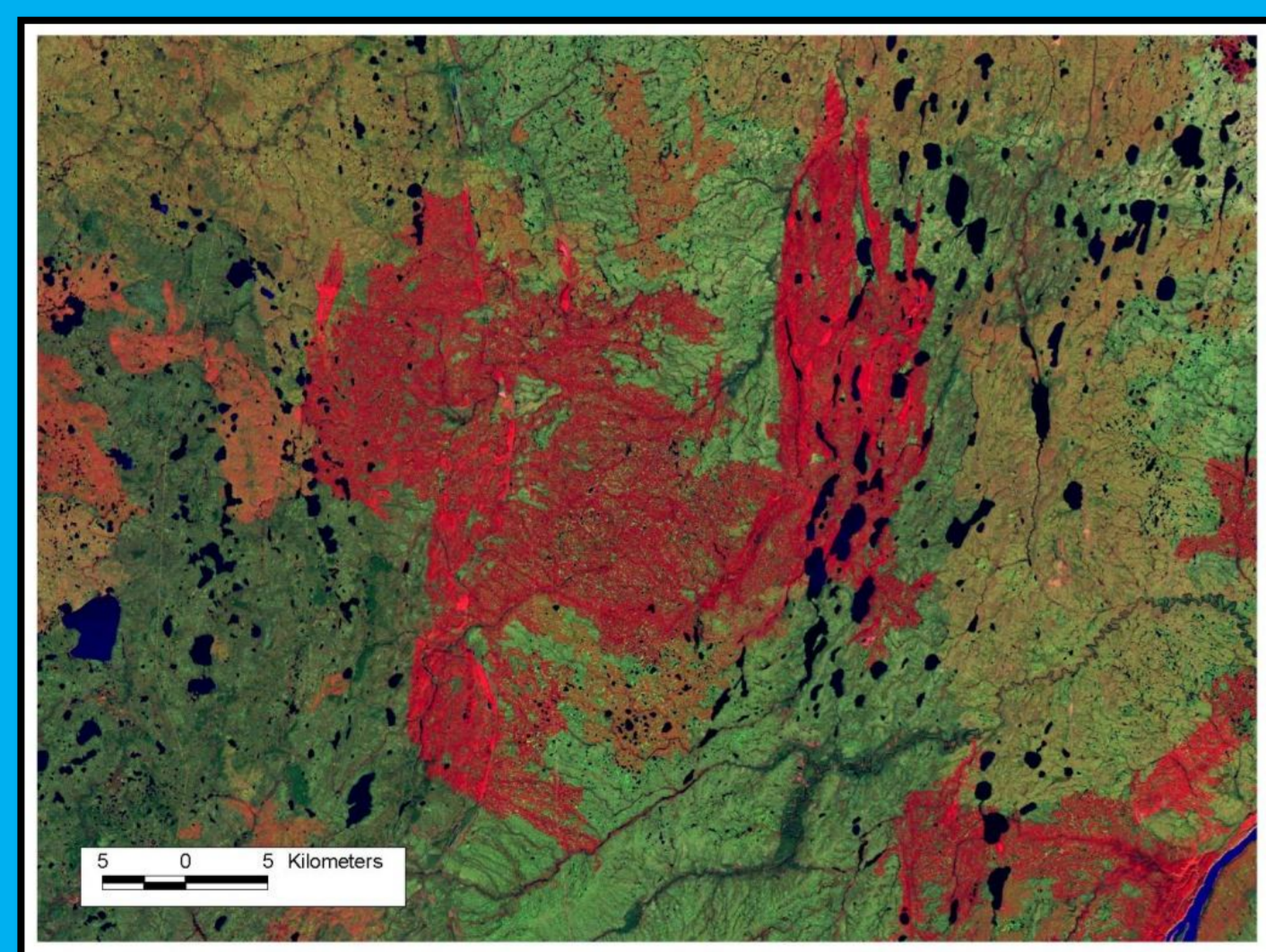


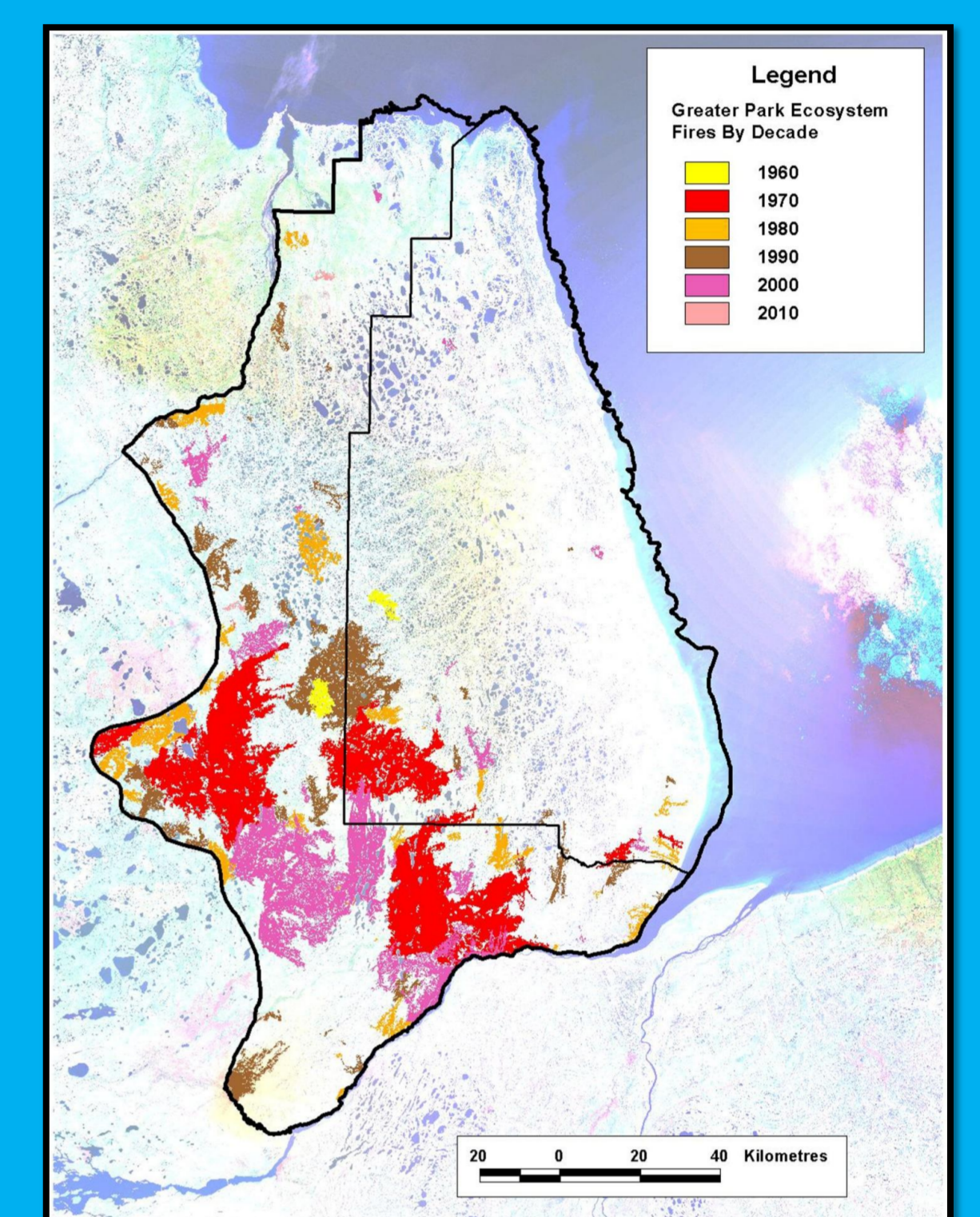
Image displaying bands 7, 4 and 2 (red = recent fire).

## Recent Fire History

A very active fire regime with several large wildfires exists in the southwestern portion of the WNP, along the WNP southern boundary and areas south and west of the park. In the last 52 years, the GPE had 118 fires that were larger than 25 ha. These fires accounted for 440,865 ha. Wildfire perimeters were highly irregular with many small unburned

Fires and area burned 1960-2011.

Year	GPE		WNP
	Fires	Area (ha)	Area (ha)
1963	1	2184.2	2184.2
1966	1	3768.7	0
1970	1	722.4	722.4
1973	1	2311.8	2015.2
1975	1	4636.8	0
1976	5	178275.2	35623.3
1980-1984	24	44384.0	4900.5
1985	2	10108.8	0
1988	2	784.1	647.9
1989	2	5039.1	0
1991	1	93.4	93.4
1992	3	9748.9	0
1993	9	7680.7	0
1994	5	4841.0	0
1996	3	5650.1	83.4
1998	3	694.3	621.6
1999	24	51394.6	16889.5
2000	10	6044.6	776.3
2003	11	94228.4	7648.6
2005	4	1422.3	573.0
2008	1	5454.0	0
2009	1	66.0	0
2010	1	634.4	0
2011	2	697.2	0
<b>TOTAL</b>	<b>118</b>	<b>440864.5</b>	<b>72779.3</b>



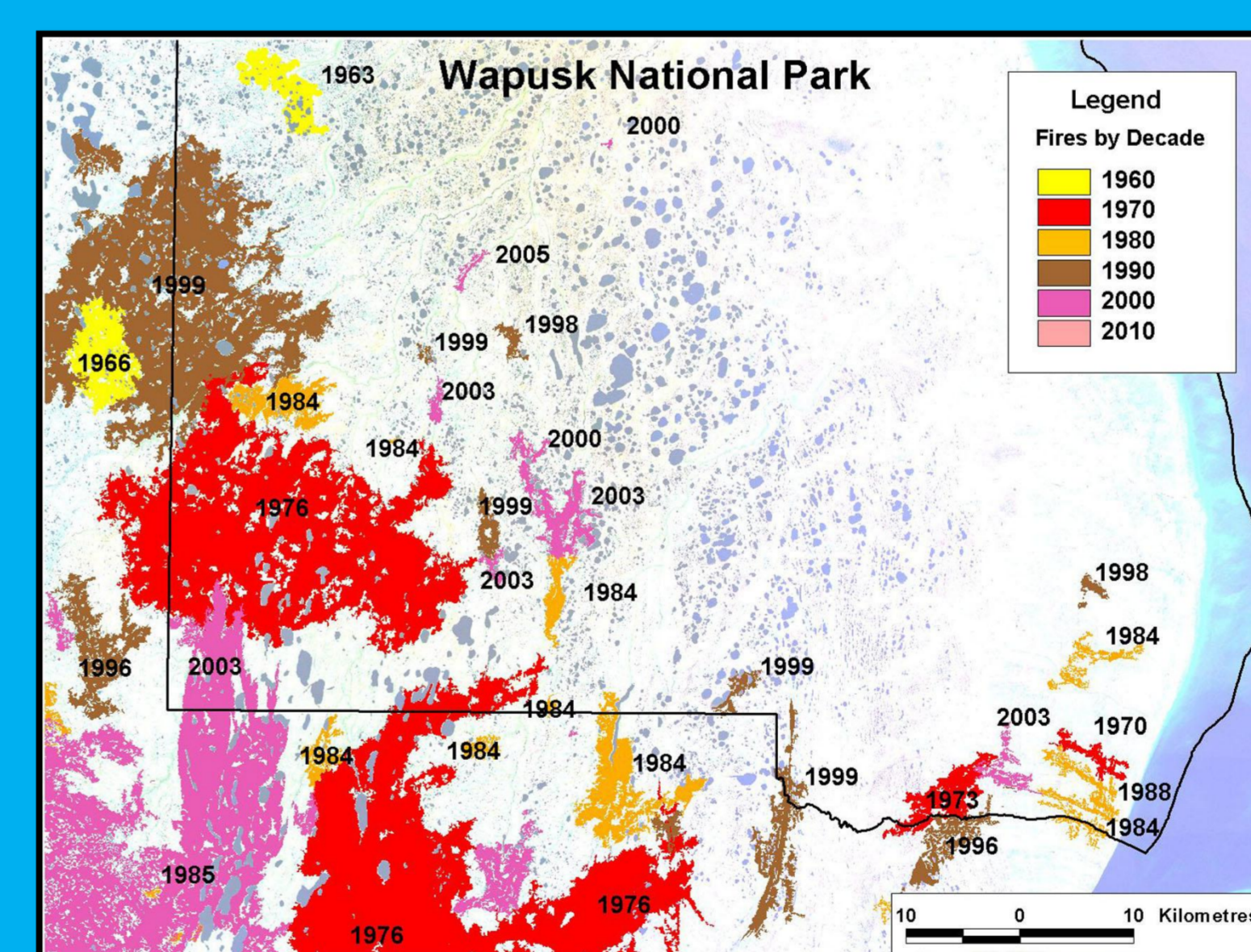
Fires in GPE 1960-2011.

## Using the Landsat Archives

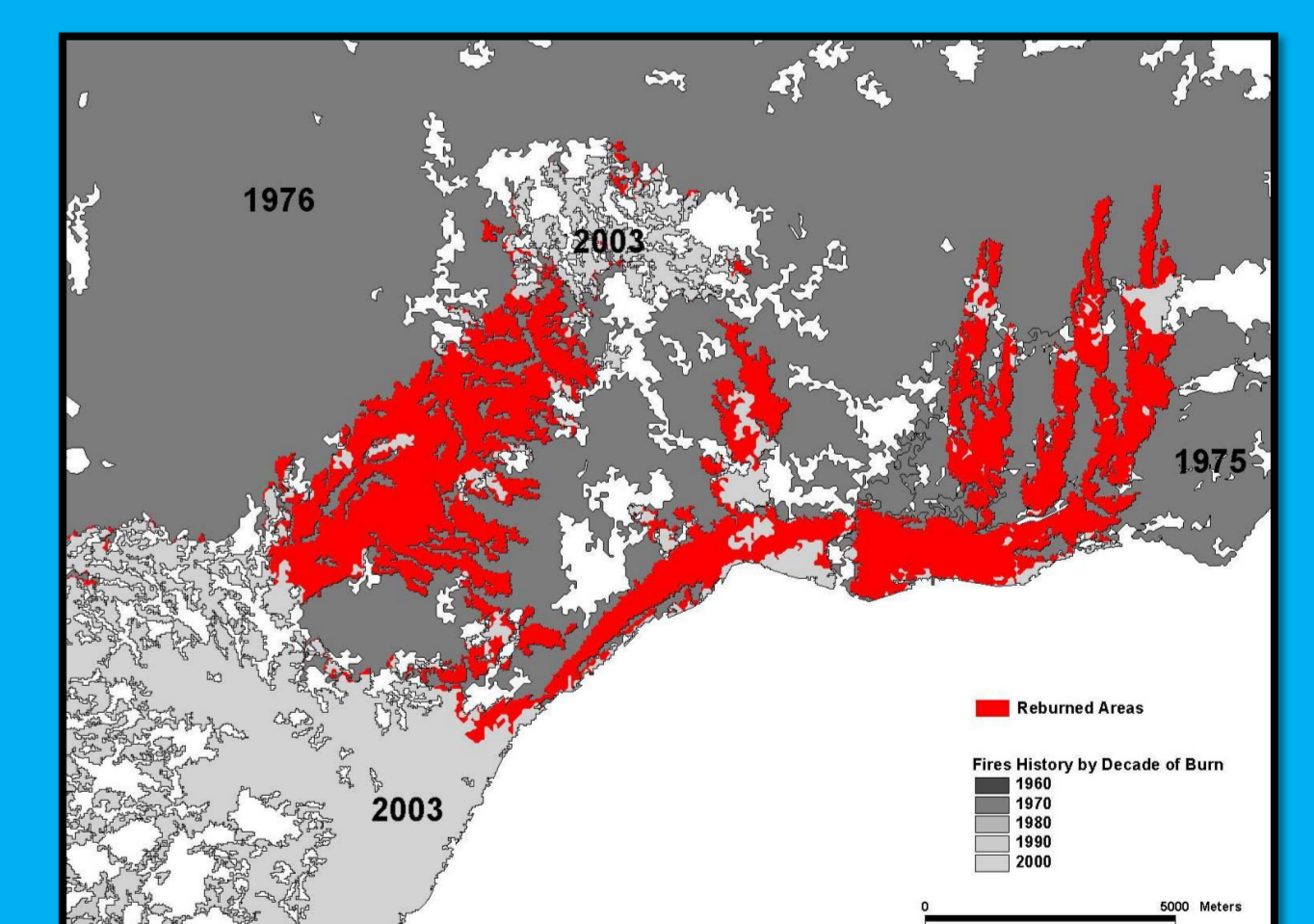
This study uses Landsat imagery with the Normalized Difference Vegetation Index (NDVI) and Normalized Burn Ratio (NBR) to reconstruct recent fire history. The project involves the construction of NDVI and NBR perimeters reflecting the year, size and complexity of the burn pattern for each identified fire. The earliest images in 1972 allow mapping wildfires back to the 1960s.

## Conclusion

The use of the Landsat archive represents a reasonable, efficient and affordable means of reconstructing recent fire history where fire data is unavailable or incomplete. Further statistical analysis will be ongoing. The effect of climate change will be investigated.



Fires in southern region of WNP.



Reburned area 27-28 years later.

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