

COUNTING SUMATRAN TIGERS

lessons from Indonesia



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ARE THERE ONLY 400 (+100) TIGERS?

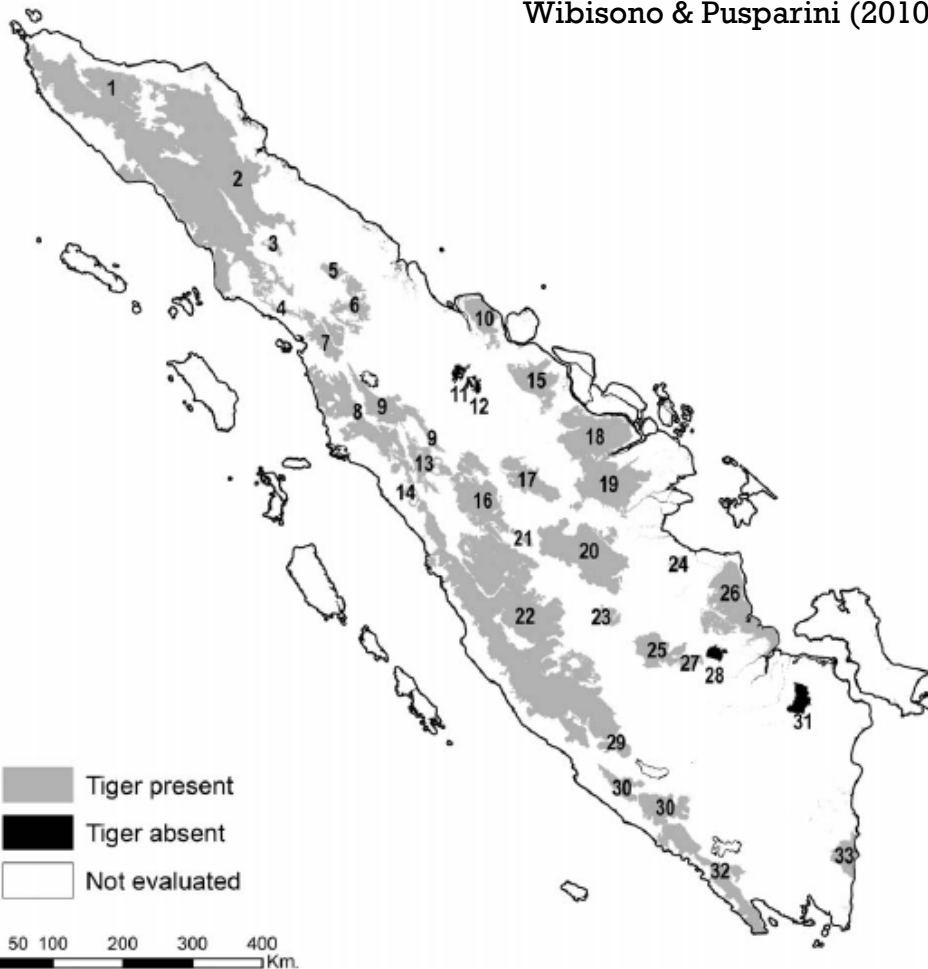
SOURCE	NUMBER	APPLICABLE HABITAT*
MoF/ PHVA (1994)	400 (+100)	16%
Sheppard & Magnus (2004)	342 – 509	24%
Linkie et al. (2008)	441 – 697	33%
Seidensticker (2010)	300	45%
Wibisono et al. (<i>in prep.</i>)**	Min. 475	41%

* Percent habitat follows Laumonier et al. (2010)

** Interpolation based on available CMR studies

CURRENT TIGER DISTRIBUTION

Wibisono & Pusparini (2010)



- 38 available patches (>250km-sq)
- 5 patches were not evaluated
- Presence in 27 + 2 patches
- Locally extinct in 4 patches
- All are fragmented and isolated
- 70% of them > 2,000 km²

CAMERATRAPS

- Population estimates are available for 12 landscapes
- Surveys were conducted between 1998 and 2010
- Partially covers wide array of habitats (0 – 2,950 m usl.)

CAMERATRAPS ACROSS SUMATRA

Study area	TCL Status	Forest available in 2008	Forest Type	Elevation	Main forest type/s	Source
KSNP	TCL I	24,049	Rainforest	0-300	Lowland	Linkie et al. 2006
KSNP	TCL I	24,049	Rainforest	300-800	Hill	Linkie et al. 2006
KSNP	TCL I	24,049	Rainforest	194-1064	Hill	Linkie et al. 2008
KSNP	TCL I	24,049	Rainforest	800-1400	Submontane	Linkie et al. 2006
KSNP	TCL I	24,049	Rainforest	1400+	Montane	Linkie et al. 2006
KSNP	TCL I	24,049	Rainforest	363-1745	Hill	Linkie et al. 2008
Batang Hari	TCL I	??	Rainforest	663–2045	Submontane	Dinata 2008
BBS	TCL III	2,749	Rainforest	0 - 1325	Hill - Submontane	O'Brien et al. 2003
BBS	TCL III	2,749	Rainforest	0 - 1325	Hill - Submontane	Wibisono 2005
BBS	TCL III	2,749	Rainforest	0 - 1325	Hill - Submontane	Wibisono 2005
Batang Gadis	TCL III	5,081	Rainforest	300 - 800	Hill - Submontane	Wibisono et al. 2009
WKNP	N/A	462	Mix swamp	< 300	Mix peat swamp	Franklin et al. 2004
Rimbang Baling	N/A	4,015	Rainforest	219 (24.5)	Lowland	Sunarto 2011
Kerumutan	TCL II	3,881	Peat swamp	< 300	Peat swamp	Sunarto 2011
Tesso Nilo	TCL III	1,164	Rainforest	< 300	Lowland	Sunarto 2011
Leuser	TCL I	26,100	Rainforest	800 - 2950	Submontane	WCS/LIF/GLNP 2011, unpubl.
Dangku	N/A	219	Rainforest	< 300	Lowland	Maddox et al. 2006
Jambi	N/A	Various	Rainforest	< 300	Lowland	Maddox et al. 2007
Senepis - Buluhala	N/A	1,623	Peat swamp	< 300	Peat swamp	Wells 2007
Berbak - Sembilang	DD	4,116	Peat swamp	< 300	Peat swamp	ZSL 2011, unpubl.

CAMERATRAPS: PROBLEMS

- Covers a smaller area of a wider landscape (re: closure assumption)
- Commonly dealt with small sample size (0 – 12 individuals)
- Wide Standard Errors (CVs 0.19 – 0.41)
- Effective Coverage (MMDM vs $\frac{1}{2}$ MMDM vs SECR)
- Interpolation is questionable in a large area having wide array of habitat types (e.g. Leuser – Ulu Masen and Kerinci Seblat)

CHALLENGES

- The existing information was rely on cameratrap CMR in smaller areas within larger landscapes:
 - The need of standardized techniques to cover larger areas
 - ... that is able to translate population dynamic parameters
 - ... flexible to be implemented on wide array of habitat types, and
 - ... rapid, logistically doable, and cost effective

PROBLEM SOLVING...

- ◉ A technical meeting hosted by WCS in September 2006
- ◉ Attended by 12 Organizations
- ◉ Occupancy framework was agreed as a common approach
- ◉ No formal agreement was established
- ◉ ... later, WCS Tigers Forever protocol was adopted by partner organizations
- ◉ An exchange on the job training was voluntarily initiated among partners

DETECTION- NON DETECTION SURVEY

IN PARTNERSHIP WITH

◉ International Organizations

- Wildlife Conservation Society
- Fauna Flora International
- WWF
- Zoological Society of London

◉ National Organizations

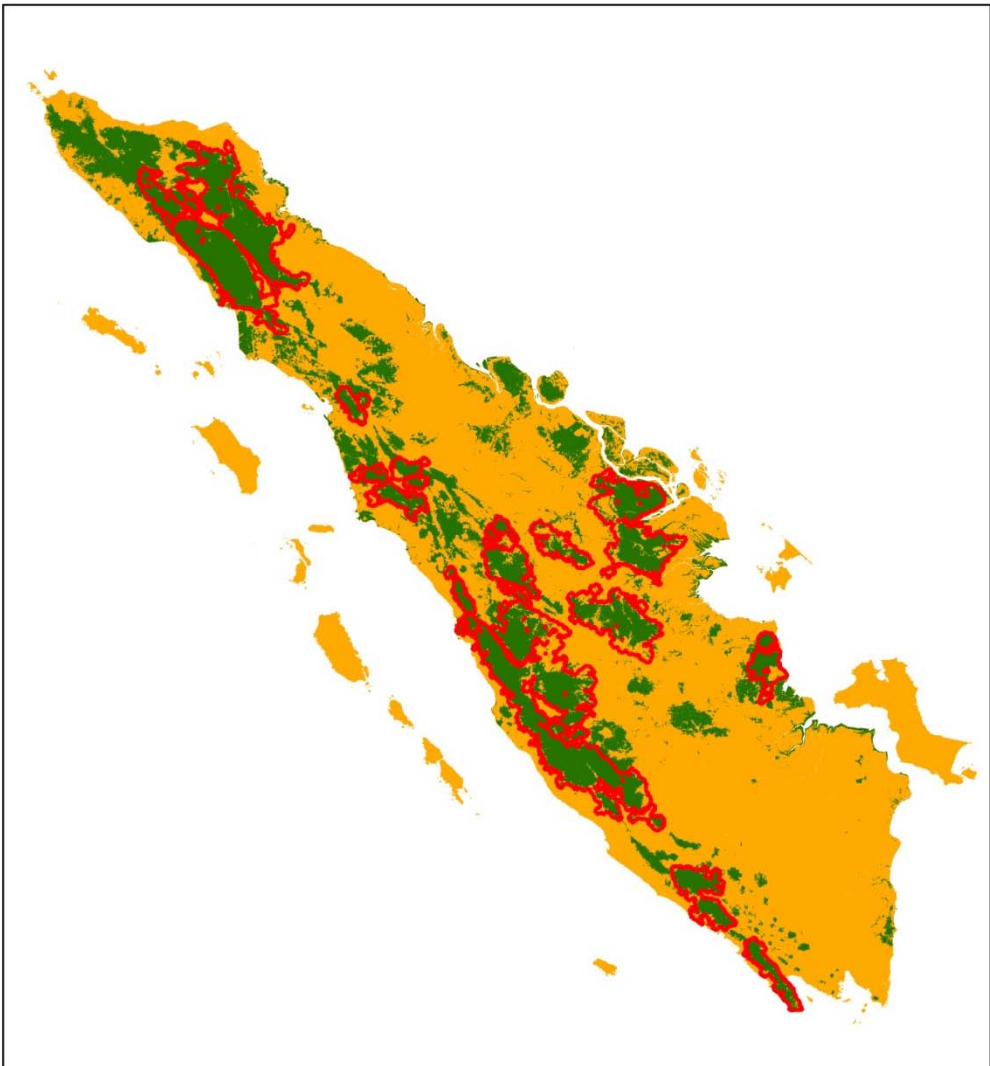
- Leuser International Foundation
- Rhino Foundation of Indonesia
- PKHS (local NGO)

HABITAT AVAILABLE



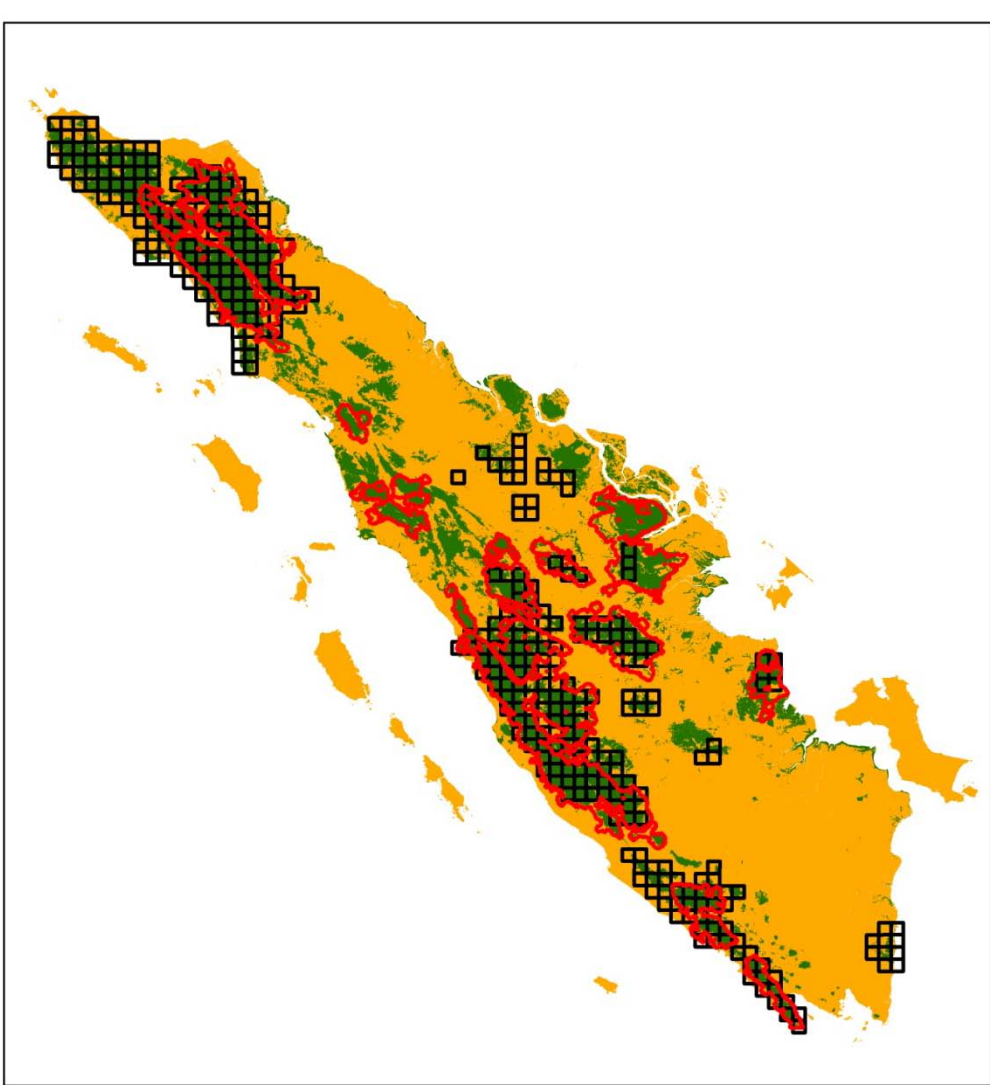
- 130,000 sq-km (Laumonier et al. 2010)
- Only 29% are protected
- 38 patches > 250 sq-km (Wibisono & Pusparini 2010)
- 27 + 2 patches occupied by tigers (Wibisono & Pusparini 2010)

THE TIGER CONSERVATION LANDSCAPES



- 12 Tiger Conservation Landscapes (Dinnerstein et al. 2006)
- 2 Global Priorities
- 2 Regional Priorities
- 5 Long-term Priorities
- 3 Data Deficiencies

SURVEY COVERAGE AGAINST TCLs



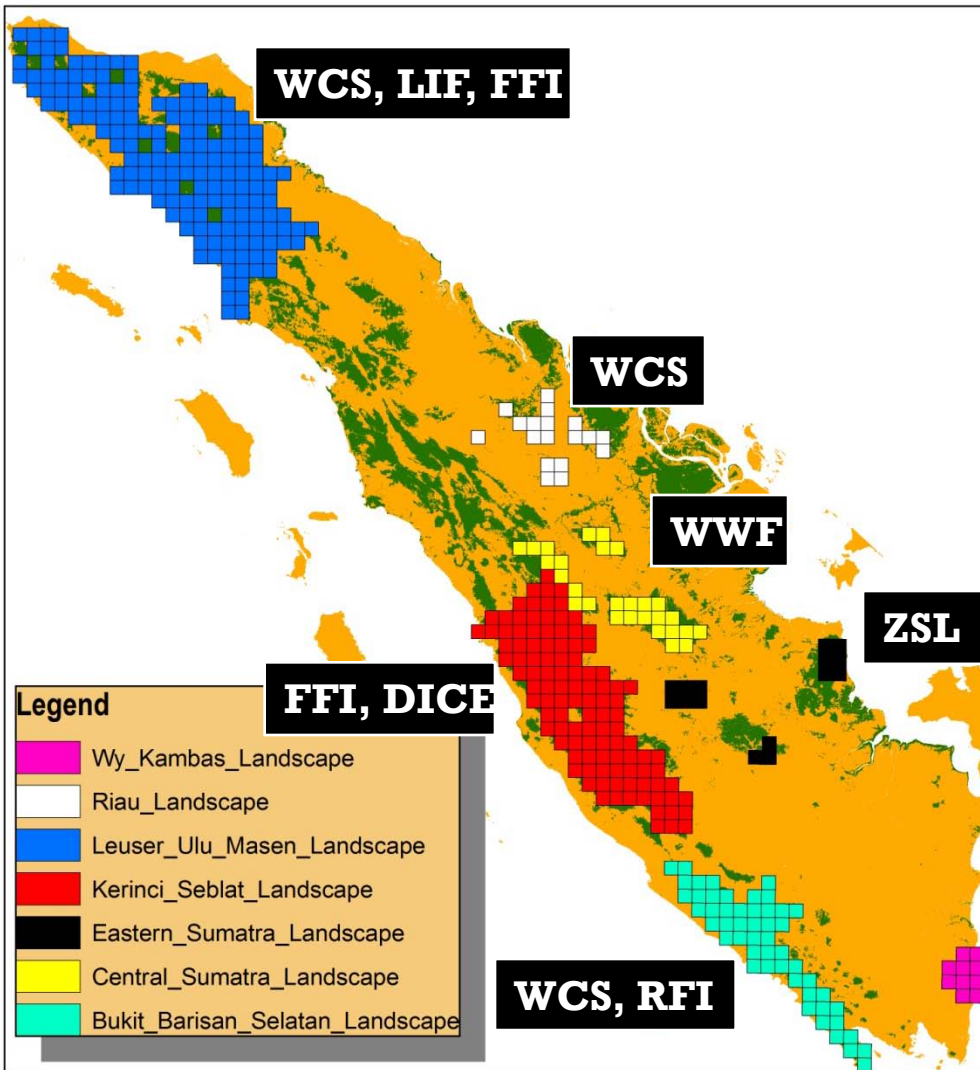
- 8 TCLs fully covered
- 1 TCL partially covered
- 3 TCLs remains not covered
- Went beyond the TCLs

SURVEY EFFORT



- Completed within 3 years (2007 – 2008)
- A total of 394 grids or 113,866 sq-km
- A total 13,511 km searching routes (= 7.5 times length of Sumatra island)
- Covered 58% of the remaining tiger landscapes across Sumatra (Wibisono & Pusparini 2008)
- The Naïve was 0.52

LANDSCAPE SPECIFIC RATES OF OCCUPANCY ARE AVAILABLE



- 7 clusters
- Occupancy rates are available for each cluster
- The best predictors are identified
- A draft of manuscript is completed

DETECTION-NON DETECTION: SUMATRA SPECIFIC CHALLENGES

- ... Still, we needed three years to cover 58% remaining habitats
- Costing more than USD1 millions
- Difficult to maintain equal replicates → 34 (± 16 , 1 – 98) km.
- Issue of spatial auto-correlation
- The higher the grids, the more difficult to achieve the targeted replicates and thus, to maintain spatial coverage

THANK YOU
