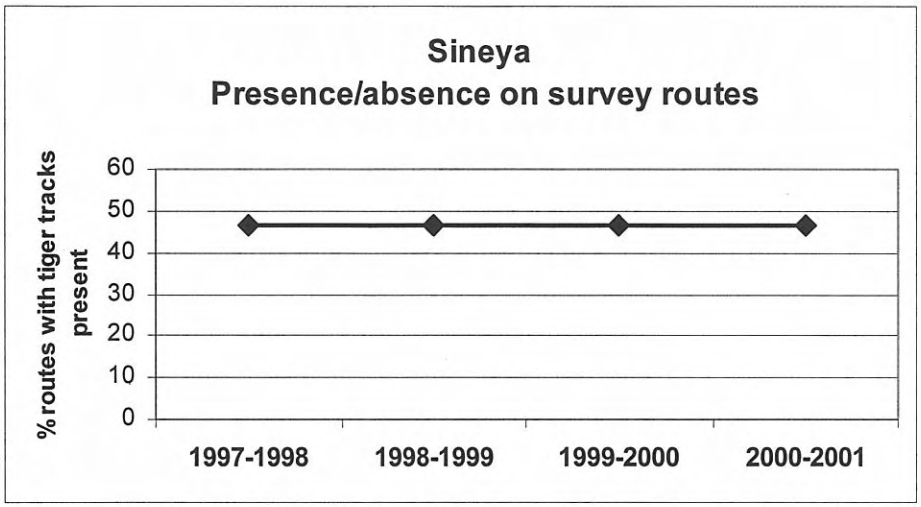
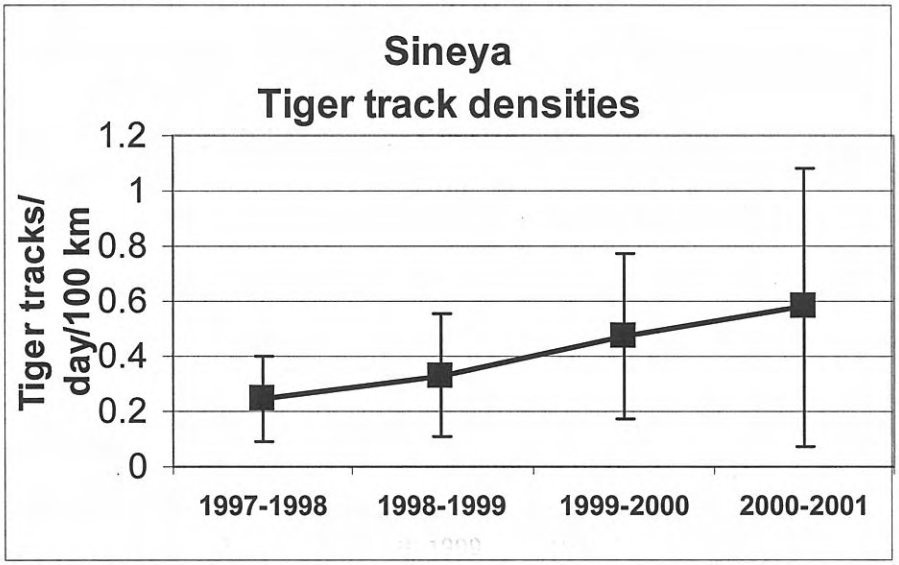
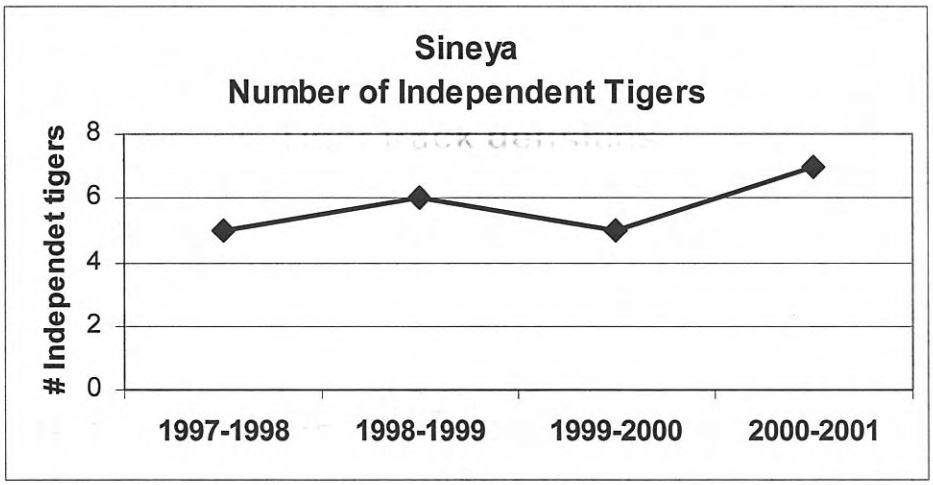


Percentage of routes with tiger tracks reported (both surveys combined).



Comparison of track densities in monitoring site across years



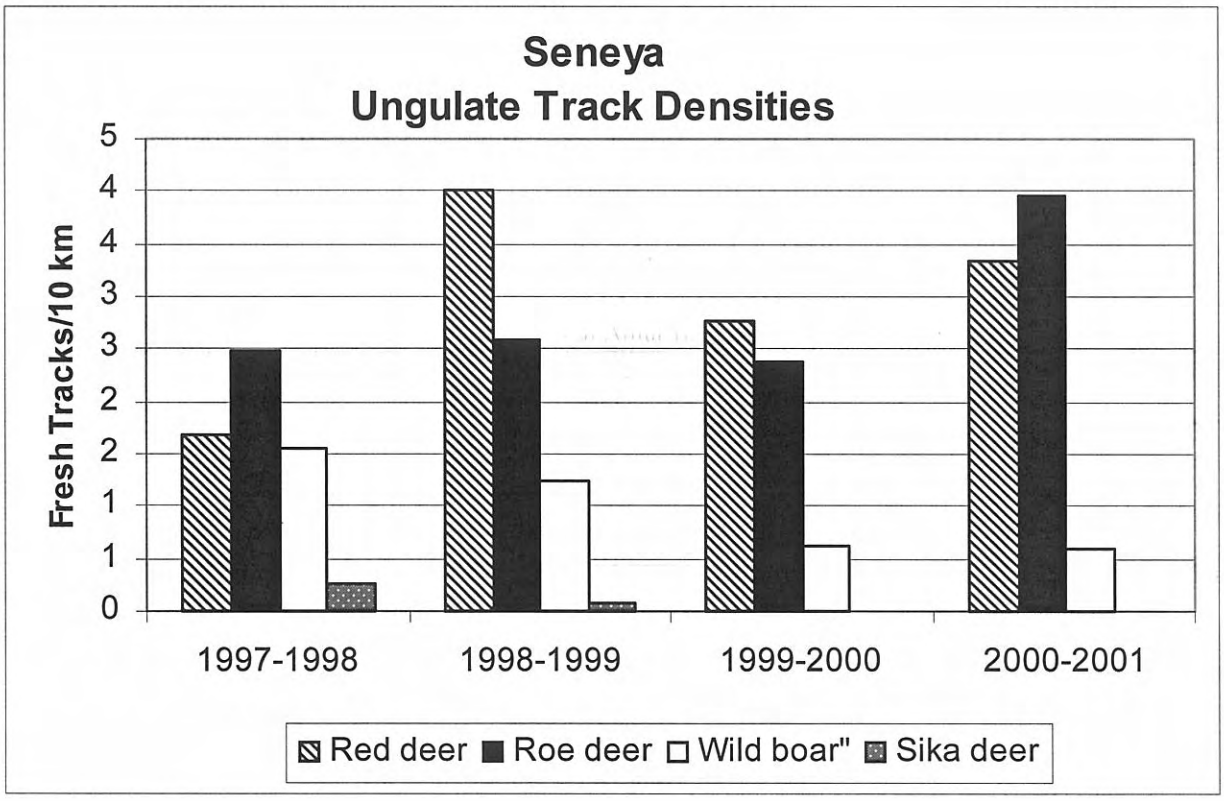
Number of Independent tigers (adults, subadults, unknown) on monitoring site

Number of tigers, by age class, and sex (for adults only) on Amur tiger monitoring sites in winter

			Age						Totals		
			Adults								
#	Site	Year	Males	Females	Un-known	Sub-adults	Cubs	Age unknown	Total adults	Total independents*	Total (all tigers)
15	Sineya	1997-1998	1	0	0	1	1	3	1	5	6
15	Sineya	1998-1999	1	2	0	0	0	3	3	6	6
15	Sineya	1999-2000	2	2	0	1	1	0	4	5	6
15	Sineya	2000-2001	2	3	0	1	3	1	5	7	10

Mean track density (tracks less than 24 hours) of ungulates in Amur tiger monitoring sites for first 4 years.

		Prey		1997		1998		1999		2000		Grand Total	
#	Monitoring Site	species	n	mean	std	mean	std	mean	std	mean	std	mean	std
15	Sineya	Red deer	15	1.68	1.60	4.00	2.60	2.77	3.74	3.35	2.27	2.95	2.74
15	Sineya	Roe deer	15	2.48	2.24	2.59	2.08	2.37	1.83	3.96	2.49	2.85	2.21
15	Sineya	Sika deer	15	0.27	0.78	0.08	0.21	0.00	0.00	0.00	0.00	0.09	0.41
15	Sineya	Wild boar	15	1.56	2.89	1.23	1.82	0.61	1.07	0.60	1.23	1.00	1.89



IMAN
Central Primorski Krai
1999-2000

Report on results of Amur tiger monitoring program in Iman monitoring unit in 2000-2001 winter
Coordinator

I.G. Nikolaev
Institute of Biology and Soils, Far Eastern Branch Russian Academy of Sciences

The Iman monitoring unit is located in the Malinovka river basin (Dalnerechensky Raion, Primorski Krai). The territory of the monitoring unit (140,000 ha) includes the upper basin of Orekhovka river and its tributary - Gornaya river. The border of the monitoring unit lies mostly along the divides of these river basins and only in the west it runs through valleys of Orekhovka and Gornaya rivers, crossing them near cross-road that leads to Polyana and Martynova Polyana villages.

The number of routes on monitoring unit, their numeration and location are the same as in past years.

Field work on the routes was conducted in December 6-8 and in February 19-22.

In December the total length of routes traveled by vehicle was 131 km, on foot – 68 km. In February the total length of routes traveled by vehicle was120 km, on foot - 78 km. Routes were not traveled by snowmobile, which was used only to bring fieldworkers to the routes. A discrepancy in modes of travel during the first and the second counts was caused (as in past years) by a big difference in snow depth in December and February. In December the minimum and maximum snow depth in open sites were 19 cm and 35 cm respectively; in February these figures were 41 cm and 60 cm. Due to snow depth in the second half of the winter several routes which were not passable by vehicle were traveled on skies.

The date of last snow (for the count in December) was November 26 and the February count - January 31. Therefore, before first count there had been an interval of 10 days since the last snow, and before the second count,19 days.

This season as well as the past winter were both unfavorable for local tigers. This situation has developed due to an imbalance in predator-prey numbers. Among tiger prey species, or primary concern is the wild boar population, whose density has remained at very low levels for the past six years. In February no fresh tracks of wild boars were found on routes.

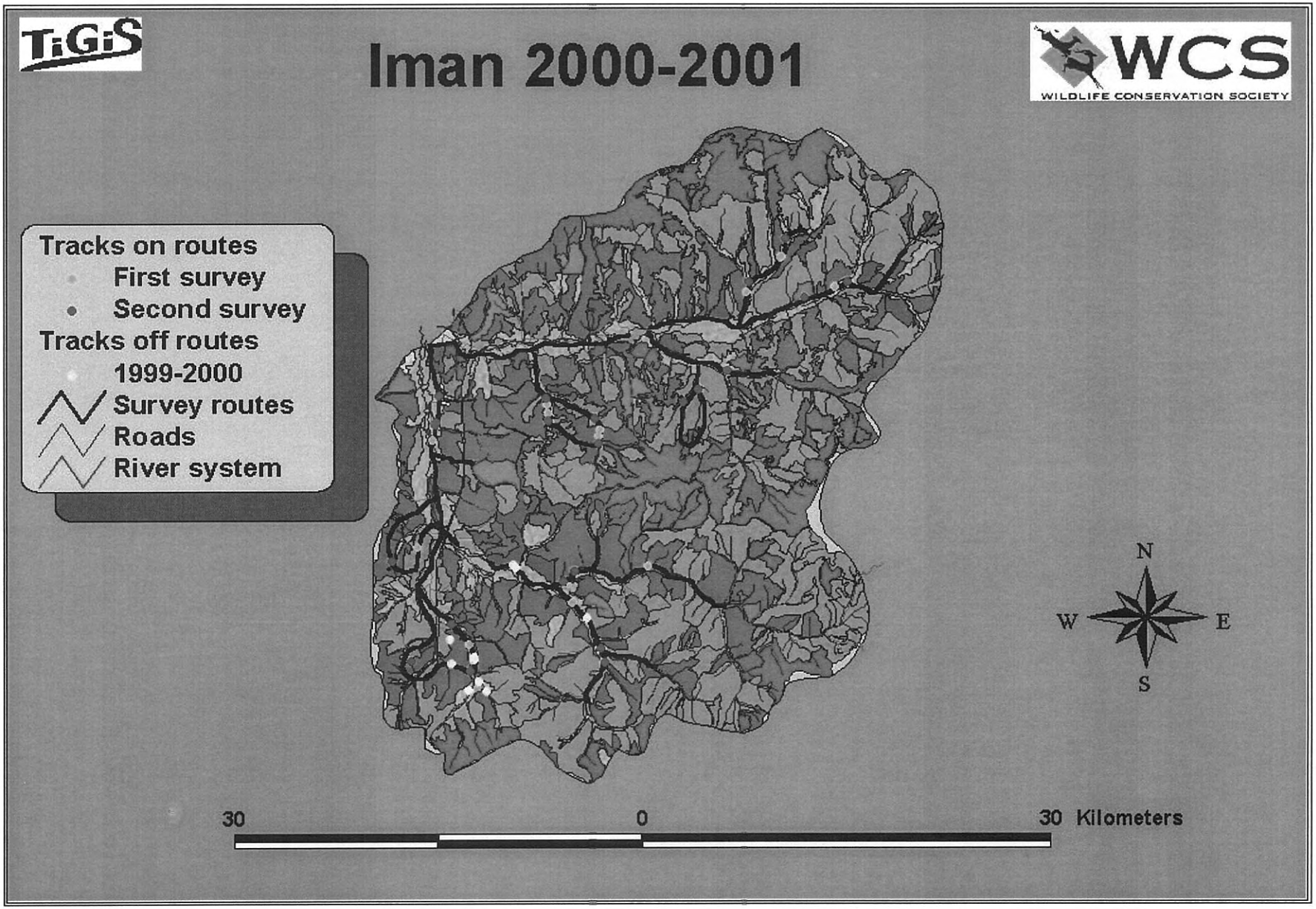
Elk and roe deer populations appear to be in satisfactory condition. There were considerable differences in the number of elk tracks reported in February in comparison with December (81 tracks in December versus 126 in February), which can probably be explained by the difference of snow depth in the first and second surveys. Deep snow (which accumulated in the second part of winter) forced elk to go downslope into river valleys and to concentrate in their middle and lower reaches of river basins as snow depth increased.

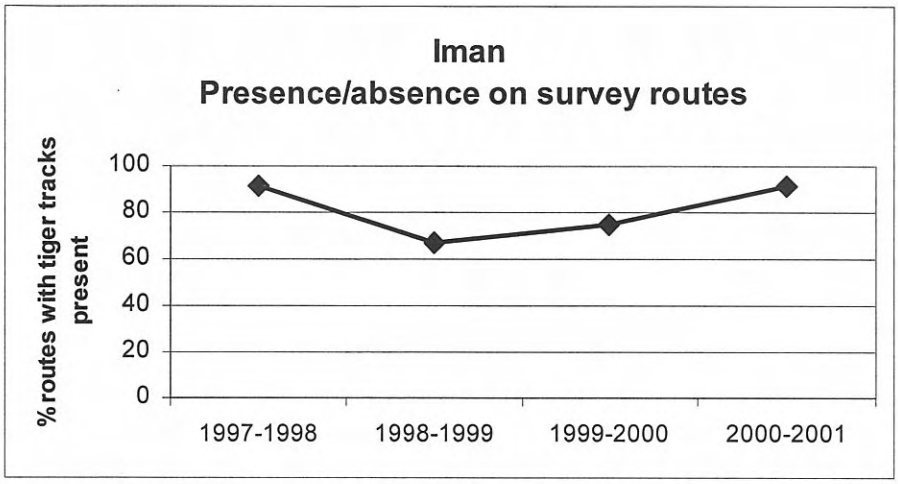
The second important negative factor is human disturbance. The importance of this factor has increased due to more intensive logging. The area being logged has risen mostly due to the activity of a variety of

commercial and illegal logging groups. This factor affects females with cubs most of all. They usually leave areas where logging activity is occurring.

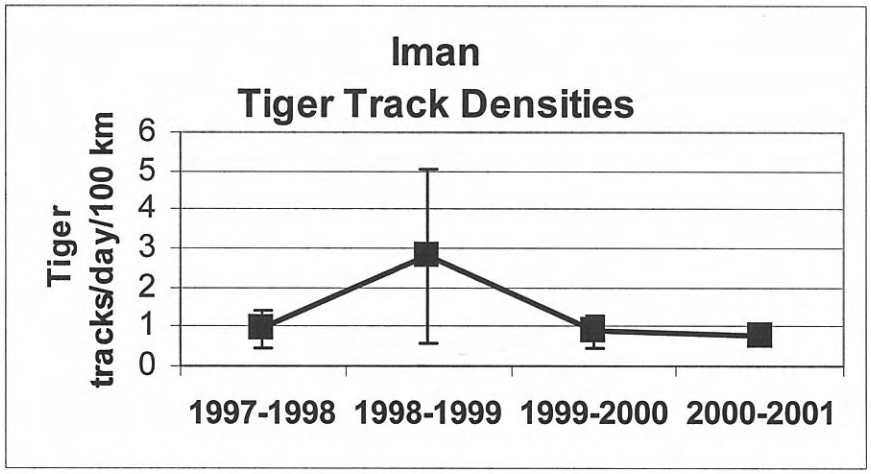
Although the condition of tiger habitat for this winter season was considered not particularly favorable, nevertheless population density here remains at the same high level as before.

Habitat conditions on the monitoring unit still remain at a level suitable for tiger survival in the near future.

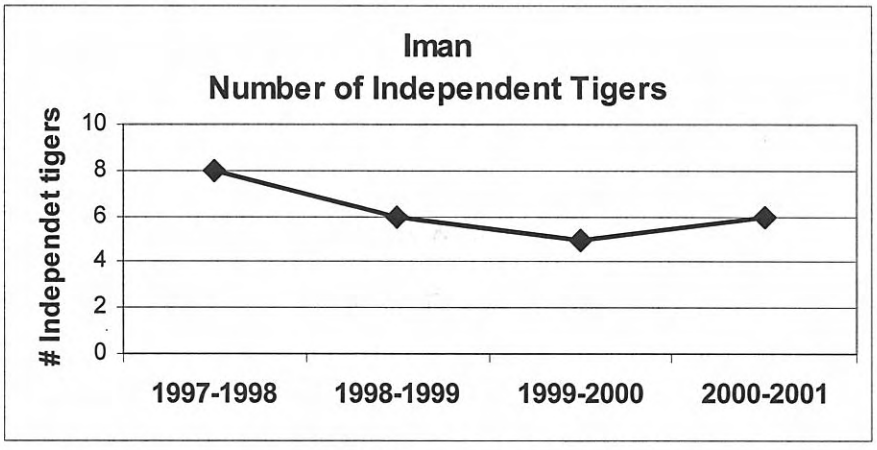

TiGiS
Iman 2000-2001
WCS
WILDLIFE CONSERVATION SOCIETY
Tracks on routes
First survey
Second survey
Tracks off routes
1999-2000
Survey routes
Roads
River system
N
W
E
S
30
0
30 Kilometers



Percentage of routes with tiger tracks reported (both surveys combined).



Comparison of track densities in monitoring site across years



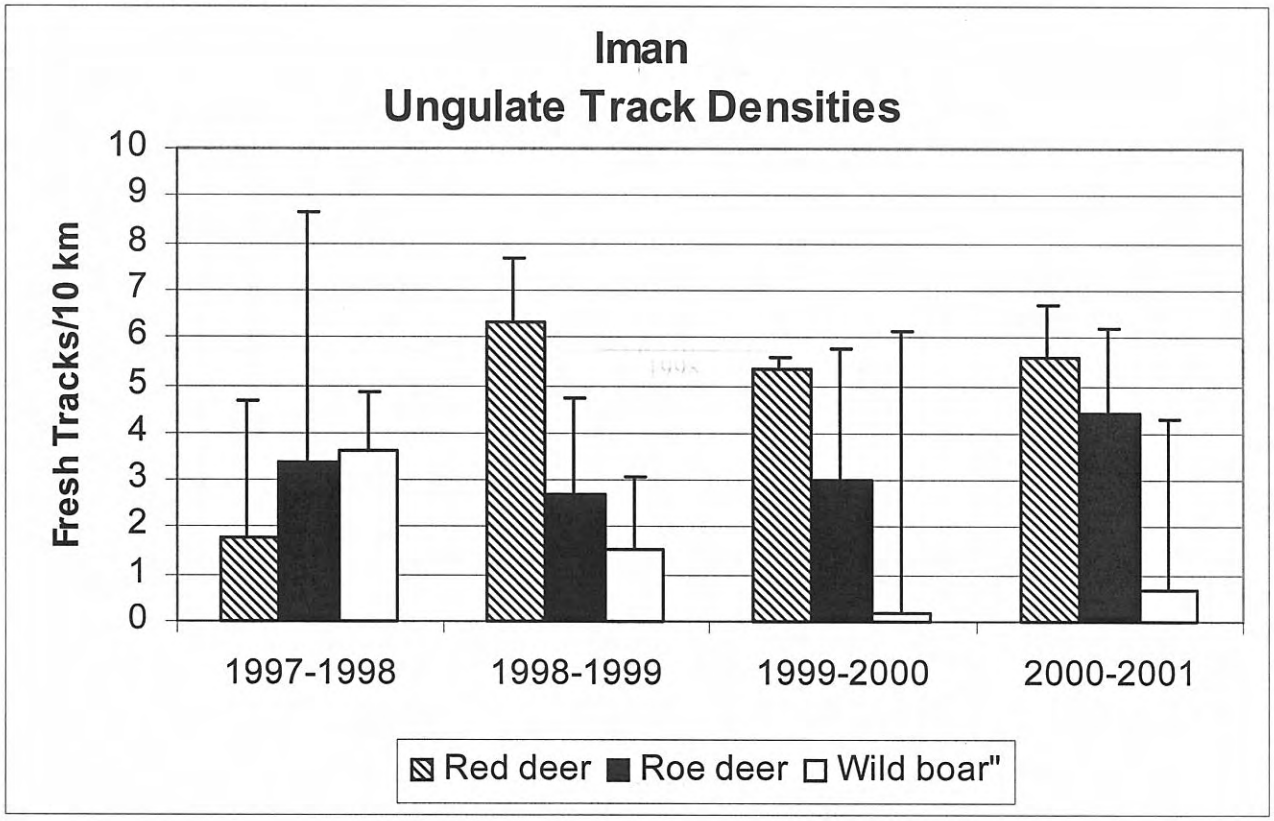
Number of Independent tigers (adults, subadults, unknown) on monitoring site

Number of tigers, by age class, and sex (for adults only) on Amur tiger monitoring sites in winter

			Age						Totals		
			Adults								
#	Site	Year	Males	Females	Un-known	Sub-adults	Cubs	Age unknown	Total adults	Total independents*	Total (all tigers)
4	Iman	1997-1998	3	1	0	2	0	2	4	8	8
4	Iman	1998-1999	3	2	0	1	2	0	5	6	8
4	Iman	1999-2000	2	1	0	1	2	1	3	5	7
4	Iman	2000-2001	2	3	0	1	2	0	5	6	8

Mean track density (tracks less than 24 hours) of ungulates in Amur tiger monitoring sites for first 4 years.

		Prey		1997		1998		1999		2000		Grand Total	
#	Monitoring Site	species	n	mean	std	mean	std	mean	std	mean	std	mean	std
4	Iman	Red deer	12	1.79	2.88	6.33	5.27	5.34	7.23	5.56	3.71	4.76	5.20
4	Iman	Roe deer	12	3.38	5.33	2.68	2.28	2.98	3.94	4.45	7.10	3.37	4.87
4	Iman	Wild boar	12	3.63	5.07	1.55	2.37	0.19	0.40	0.66	2.03	1.51	3.18



BIKIN RIVER TIGER MONITORING SITE
Central Sikhote-Alin, Northern Primorski Krai

Report on results of Amur tiger monitoring program in Bikin monitoring unit in winter 2000-2001 Coordinator

D.G. Pikunov
Pacific Institute of Geography, Far Eastern Branch Russian Academy of Sciences

Simultaneous monitoring counts were conducted on January 5-14, 2001 and on February 22-28, 2001. As in past years 16 routes (total length 191 km) were traveled in Bikin monitoring unit. Routes # 1, 2, 5, 10, 11 - total 68 km - were traveled by snowmobile. Routes # 3, 4, 6, 7, 12, 13, 14, 15, 16 - total 101 km - were traveled on skies. Routes # 8 and 9 were traveled both on snowmobile and on skies - total 22 km.

By the first count, snow cover had developed without an icy crust. Snow was 28-40 cm deep, making it favorable for an efficient count. The first and second counts began 7-10 days after heavy snowfalls. From time to time light snow fell that helped to identify the age of tiger tracks correctly. Some difficulties were associated with snow cover: movements of ungulates were extremely limited in associated with short heavy snowfalls. As with ungulates, tigers also moved mostly within limited portions of their home ranges. Tiger tracks persisted for a long time because snowfalls were heavy but rare enough so there were many tiger tracks, increasing the ability to identify individual tigers.

During the second count most of professional hunters had already left the forest because low sable densities made trapping efforts mostly ineffectiveness. Their absence prevented us from obtaining additional information via personal interviews on tiger distribution over the territory, and, additionally, as there were no snowmobile trails, ski trails and hunter trails several routes that we previously counted from snowmobile had to covered on skies (a deviation from our normal monitoring protocol). Low winter temperatures (- 30-40^{o}) made our work on routes more difficult, especially travel on snowmobiles.

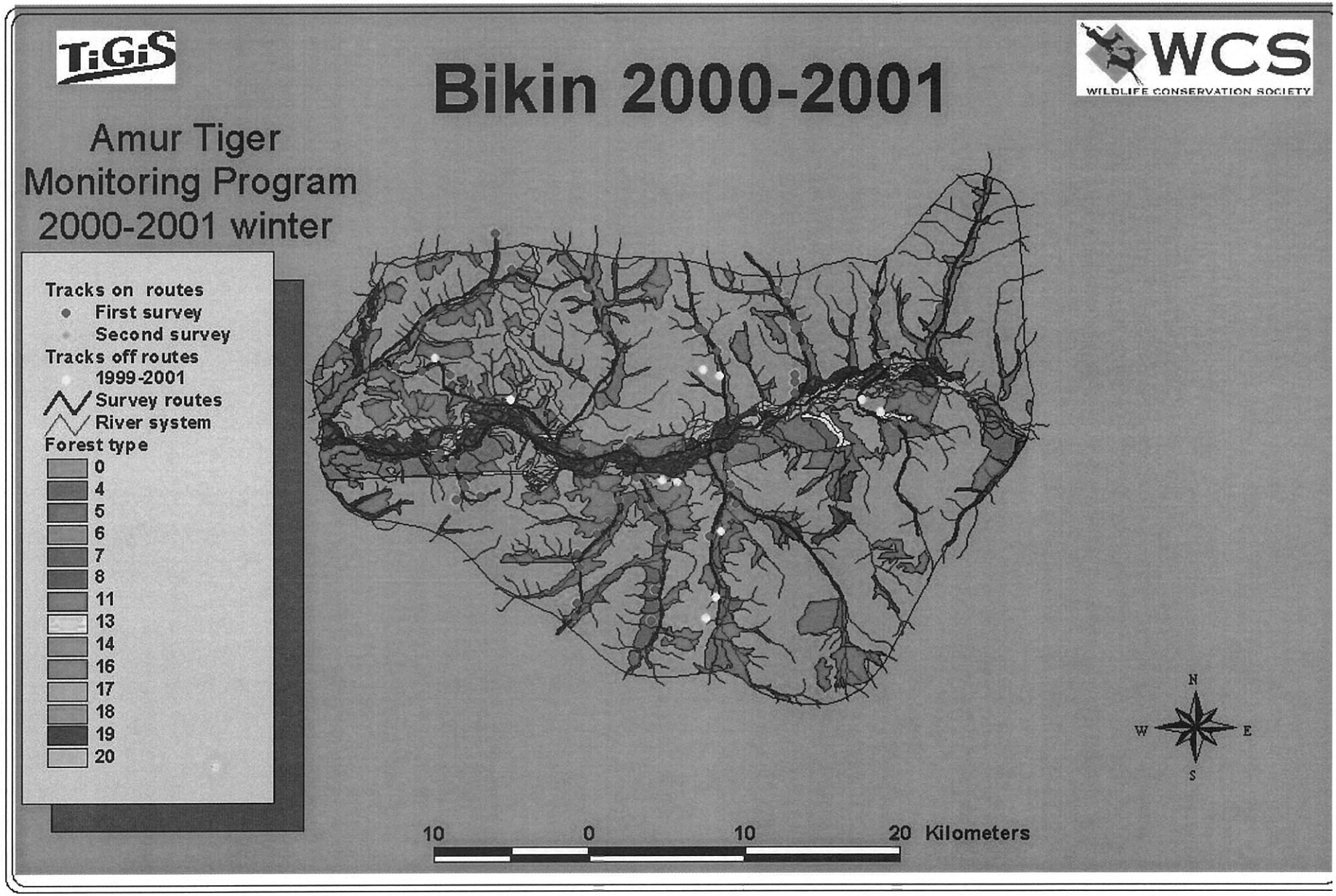
Nevertheless, both counts provided sufficient information to define tiger numbers and distribution over the monitoring unit. The yearly trend of decreasing of ungulate numbers was clearly discernable along the main bed of Bikin river, where a primary snowmobile road is situated. The presence of several wild boar herds and a slight increase of in numbers of this species in western part of monitoring unit improved the quality of tiger habitat there. The large pine cone crop that developed in most areas of Primorski Krai did not occur in the Bikin basin. However, there was an abundant acorn crop in localized sites of mature oak forests that concentrated wild boar (and correspondingly tigers) in these territories. On the whole a great number of tracks on some routes and the complete absence of track on other routes, as well as an absence of tiger litters, confirmed that population status has became worse and tiger numbers have decreased. We were able to confirm a considerable number of poaching incidents of tigers in previous years, but people still appear unwilling to provide recent information.

The status of the ungulate populations is poor and in most regions of monitoring unit ungulate densities do not exceed 1-3 elk and 2-3 wild boar per 1,000 ha. Given this situation, survival for tigers is difficult. Low ungulate densities have influenced hunting behavior of tigers, which has become atypical, with isolated wild boar herds being followed by 1-2 tigers. Low ungulate numbers are probably the main reason for the absence of tiger litters. Under such conditions females are simply unable to raise viable cubs. This was

confirmed by the report of hunters that dead cubs were found, and that a female had apparently abandoned cubs 7-8 months old. In winter, such cubs left by female will usually die.

As an recommendation for monitoring methods, it should be noted that on the relatively flat western slopes of Sikhote-Alin range snow depth does not depend on aspect and topography very much. Snow depth depends more on canopy density. Probably in the future it will be reasonable to note canopy density in the places where snow depth is measured (and to write down this information into the diary). This is important because availability of food for ungulates (and as a result ungulate and tiger distribution over the territory) directly depends on snow distribution.

Survey results confirmed the presence of two or three resident males and three adult females in the monitoring unit. As we mentioned above no females with cubs as well as subadults were found.


TiGiS
Bikin 2000-2001
WCS
WILDLIFE CONSERVATION SOCIETY
Amur Tiger
Monitoring Program
2000-2001 winter
Tracks on routes
First survey
Second survey
Tracks off routes
1999-2001
Survey routes
River system
Forest type
0
4
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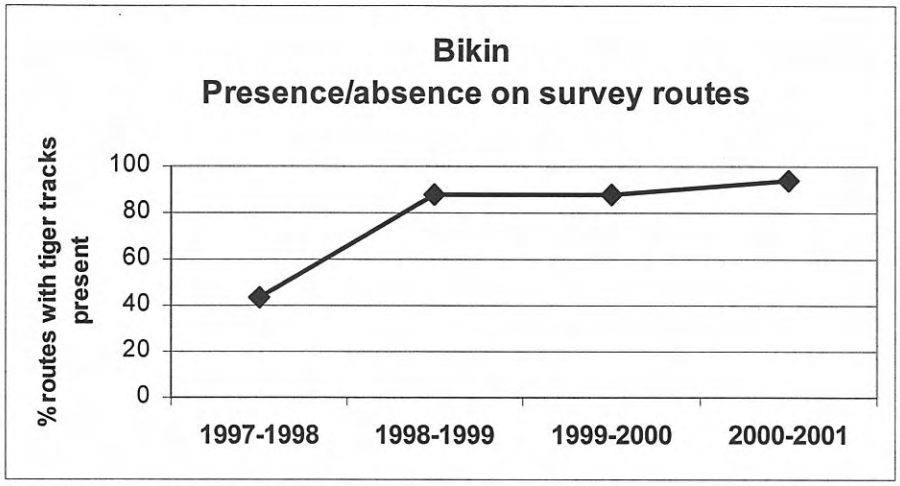
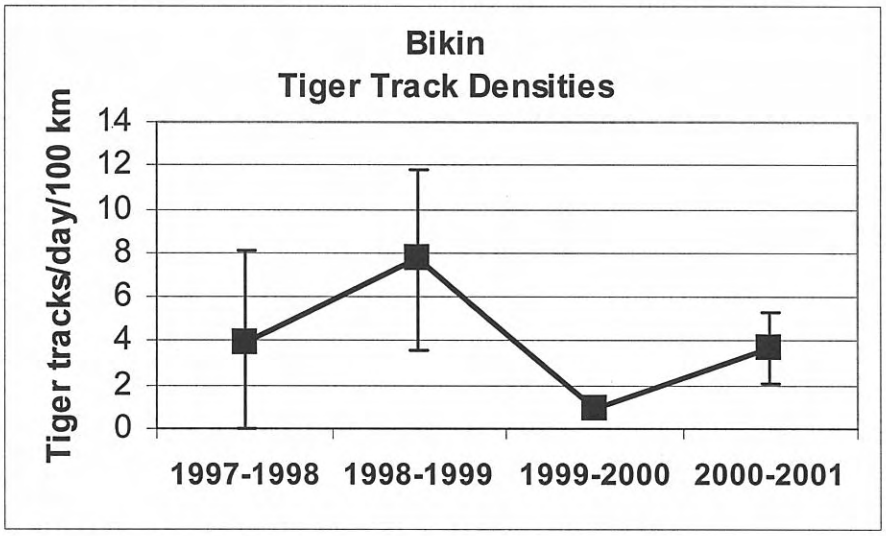
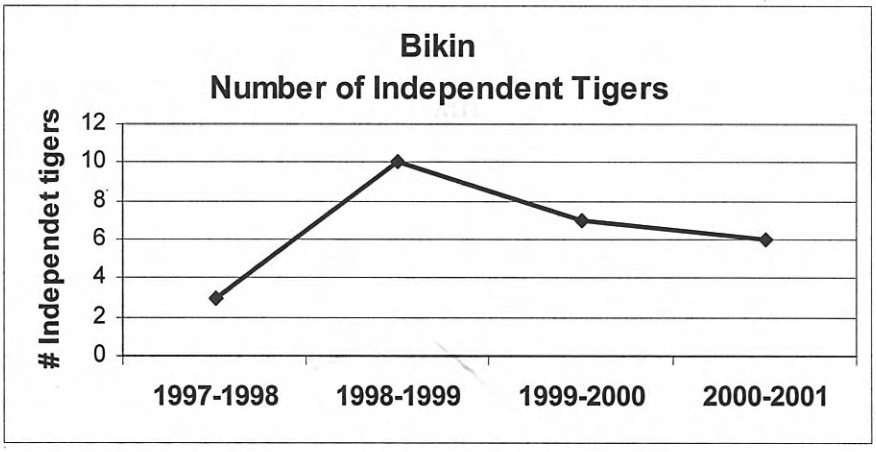


Percentage of routes with tiger tracks reported (both surveys combined).



Comparison of track densities in monitoring site across years



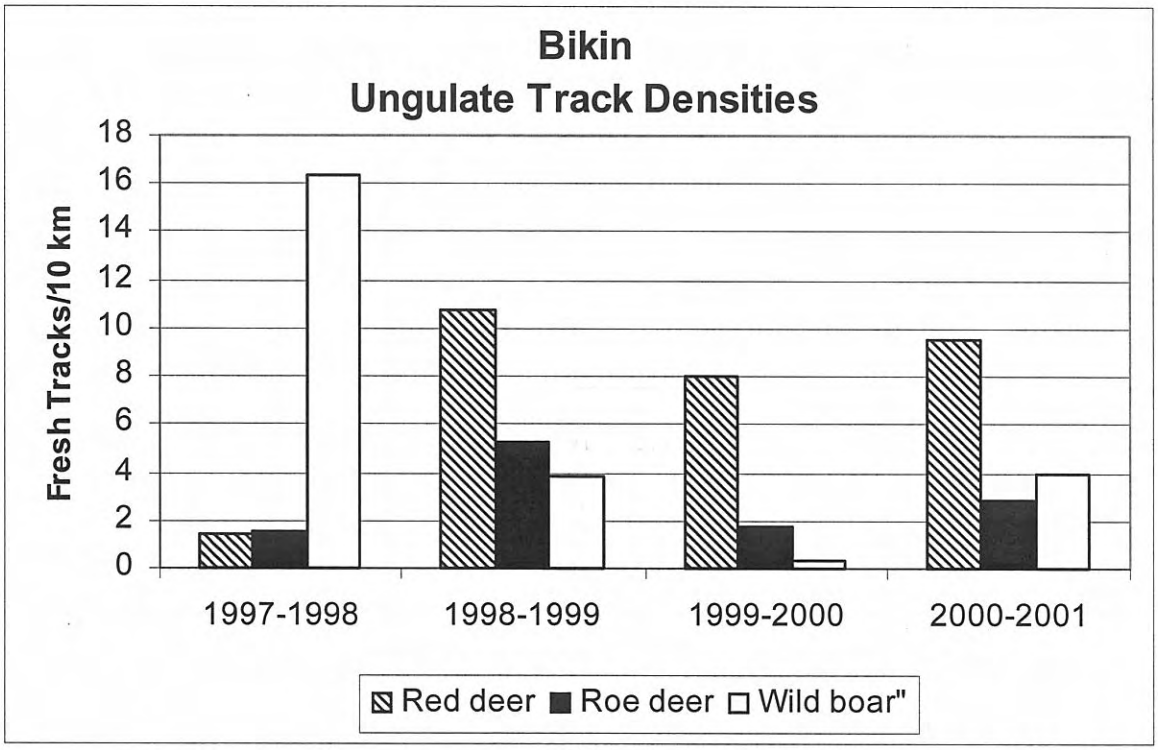
Number of Independent tigers (adults, subadults, unknown) on monitoring site

Number of tigers, by age class, and sex (for adults only) on Amur tiger monitoring sites in winter

			Age						Totals		
			Adults								
#	Site	Year	Males	Females	Un-known	Sub-adults	Cubs	Age unknown	Total adults	Total independents*	Total (all tigers)
5	Bikin	1997-1998	0	3	0	0	3	0	3	3	6
5	Bikin	1998-1999	2	2	1	3	0	2	5	10	10
5	Bikin	1999-2000	2	2	1	1	1	1	5	7	8
5	Bikin	2000-2001	2	4	0	0	0	0	6	6	6

Mean track density (tracks less than 24 hours) of ungulates in Amur tiger monitoring sites for first 4 years.

		Prey		1997		1998		1999		2000		Grand Total	
#	Monitoring Site	species	n	mean	std	mean	std	mean	std	mean	std	mean	std
5	Bikin	Red deer	16	1.37	1.51	10.78	9.97	8.01	6.62	9.53	9.05	7.42	8.22
5	Bikin	Roe deer	16	1.49	1.91	5.30	3.03	1.74	2.85	2.88	3.15	2.85	3.11
5	Bikin	Sika deer	16	0.31	1.05	3.66	8.69	0.00	0.00	0.00	0.00	0.99	4.55
5	Bikin	Wild boar	16	16.32	61.21	3.80	4.56	0.30	0.65	3.97	5.83	6.10	30.70



SIKHOTE-ALIN STATE BIOSPHERE ZAPOVEDNIK AND TERNEY HUNTING SOCIETY

(Coastal, or "eastern macroslope" portion of zapovednik)
Terneiski Raion
Northeast Primorski Krai
2000-2001

Report on results of Amur tiger monitoring program in SABZ and Terney Hunting Lease model units in winter 2001
Coordinator - E. N. Smirnov, Sikhote-Alin State Biosphere Zapovednik

1. Model units: Sikhote-Alin State Biosphere Reserve (SABZ)
Terney Hunting Lease

2. Coordinator: Smirnov E. N.

3. Time of surveys: January 14-20, 2001
February 14-20, 2001

4. Numbers of routes: 1-52

5. Total length of routes: In January 556 km of routes were traveled on foot and 181 km - by vehicle.
In February – 342 km were traveled on foot and 198 km – by vehicle.

6. Conditions: Snow fell on the 10th of January and the count began on 14th of January. Snow cover did not exceed 30-40 cm. Conditions for the survey were favorable. In February the last snowfall was on the 2nd of February and the survey was conducted on February 14-20 in the presence of numerous tracks left on snow (mnogosleditsa). Snow cover, as in January, did not exceed 30-40 cm. Conditions for survey were favorable.

7. Assessment of efficiency: Both counts - in January and February - were successful. Not all forest roads were traveled completely because some of them were in poor condition or not plowed. And I hope they will never be cleaned out. Two routes (18 and 19) were not traveled because a trade hunter (the usual field worker) was absent there. But on the whole these changes did not influence picture of tiger and ungulate densities.

How to assess the efficiency of conducted survey? What are the criteria? Who is the judge? I wrote about it in my previous report. I do not want to repeat.

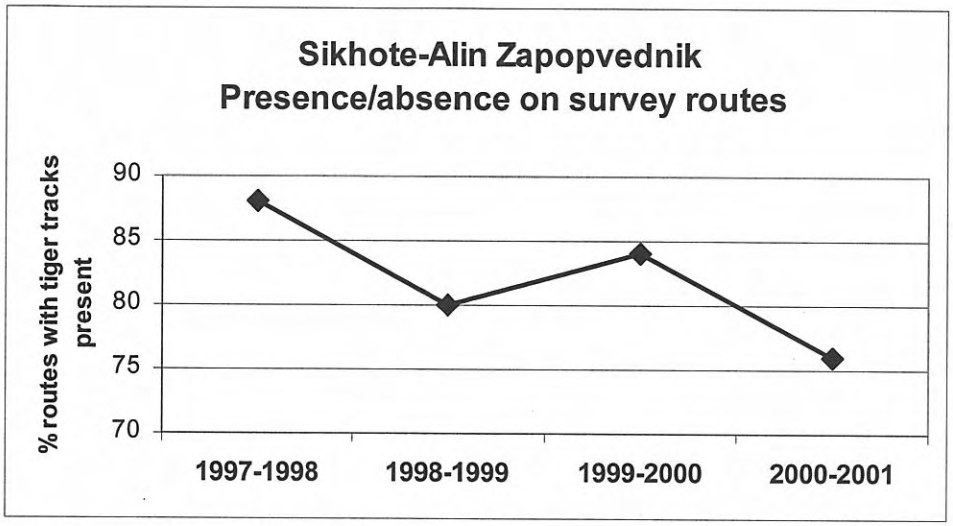
To my mind, no dramatic changes associated with habitat or wild animals have occurred in our model units (SABZ and Terney Hunting lease). I think that situation has been stable for all the years of monitoring (for wild animals). And what about Man - the situation becomes worse and worse. People grow poor, have no job and belief in the future, there is no social support. And to put it mildly - local people have became brutal. They are looking for ways to

survive and find them in Nature. Whether we want to or not, we have to draw attention to people in small villages, situated in taiga – eventually the tigers' fate depends on them.

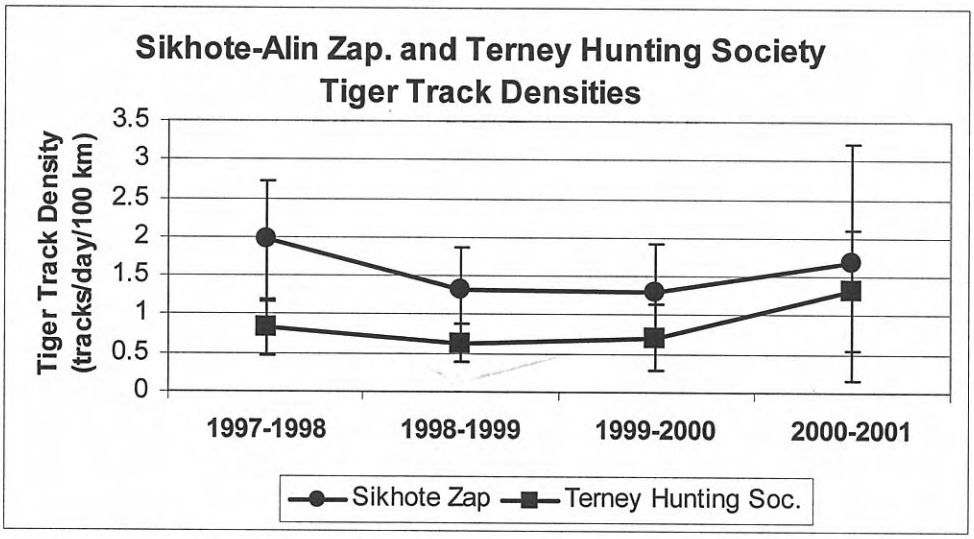
8. Conclusions:

In comparison with previous counts, no drastic changes were found. Status of habitat actually has not changed. Wild animals' density is at the same level. The results of our counts are far from absolute and depending on many factors can differ by order of magnitude. The most difficult situation is with local people. We can do little for them but we must. But this is the theme for separate conversation.

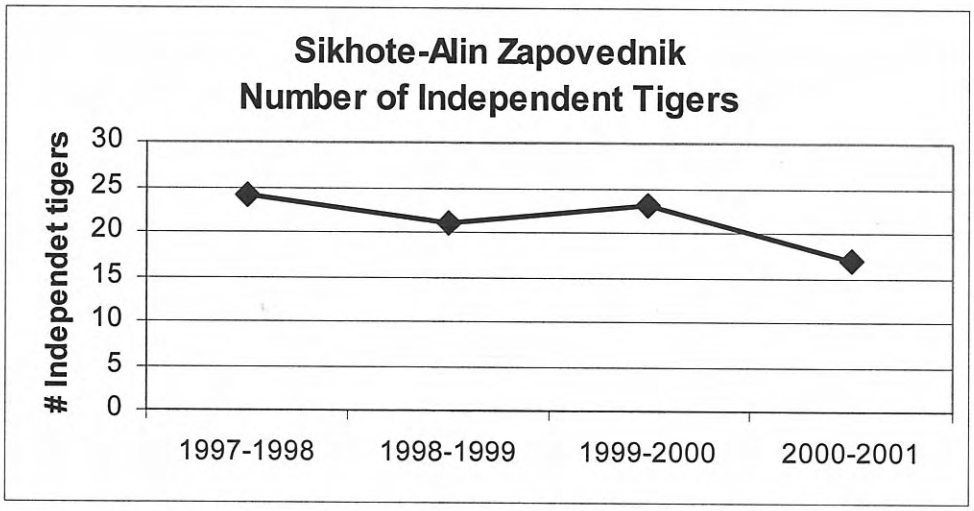

TiGiS
WCS
WILDLIFE CONSERVATION SOCIETY
Sikhote-Alin Zapovednik
(coastal section)
2000-2001
Amur Tiger
Monitoring Program
2000-2001 winter
Tracks on routes
First survey
Second survey
Tracks off routes
2000-2001
Survey routes
River system
Roads
N
W
E
S
20
0
20
40 Kilometers



Percentage of routes with tiger tracks reported (both surveys combined).



Comparison of track densities in Sikhote-Alin Zapovednik and Terney Hunting Society, Terneiski Raion



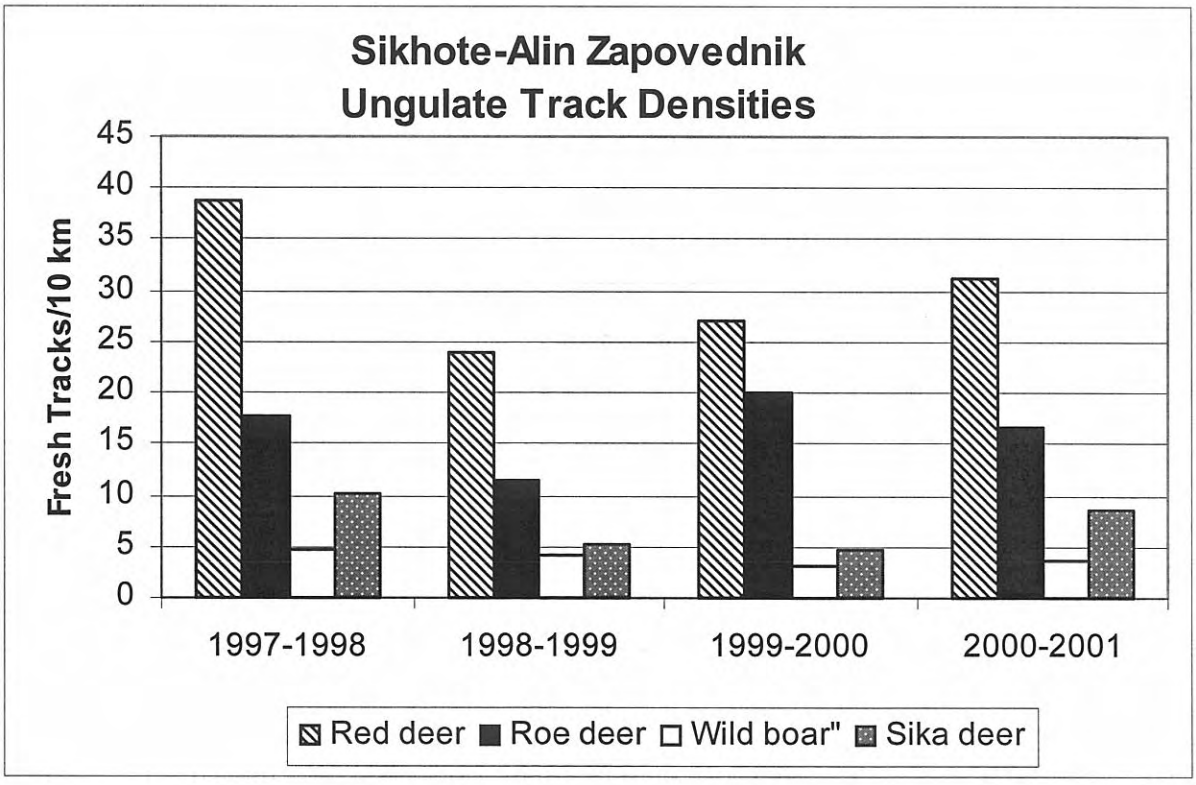
Number of Independent tigers (adults, subadults, unknown) on monitoring site

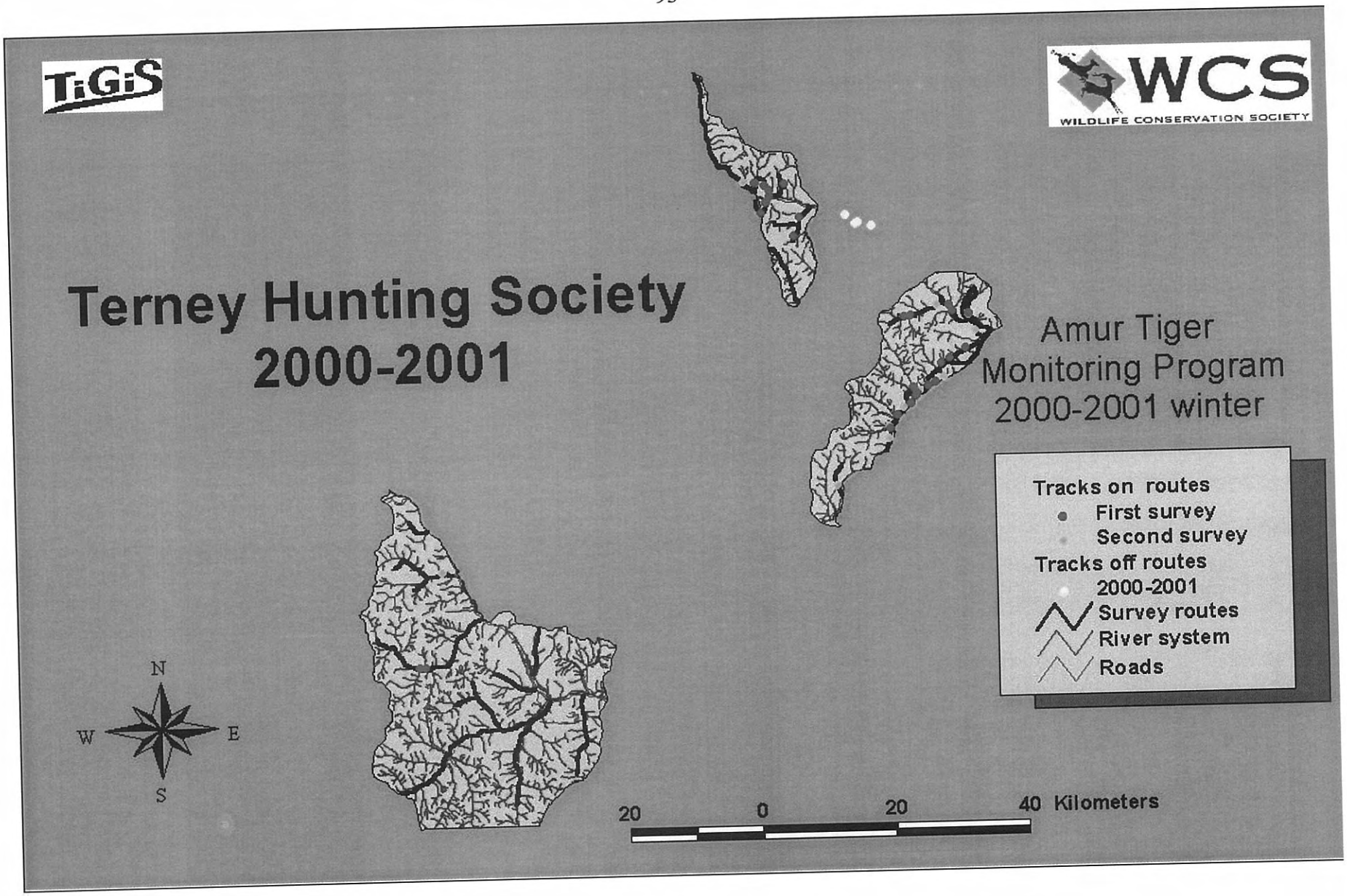
Number of tigers, by age class, and sex (for adults only) on Amur tiger monitoring sites in winter

			Age						Totals		
			Adults								
#	Site	Year	Males	Females	Un-known	Sub-adults	Cubs	Age unknown	Total adults	Total independents*	Total (all tigers)
14	Sikhote-Alin Zap.	1997-1998	10	10	0	0	8	4	20	24	32
14	Sikhote-Alin Zap.	1998-1999	7	5	0	1	0	8	12	21	21
14	Sikhote-Alin Zap.	1999-2000	7	7	0	4	1	5	14	23	24
14	Sikhote-Alin Zap.	2000-2001	3	7	0	2	4	5	10	17	21

Mean track density (tracks less than 24 hours) of ungulates in Amur tiger monitoring sites for first 4 years.

		Prey		1997		1998		1999		2000		Grand Total	
#	Monitoring Site	species	n	mean	std	mean	std	mean	std	mean	std	mean	std
14	Sikhote Alin Zapovednik	Red deer	25	38.86	56.83	23.98	16.71	27.02	22.64	31.28	16.80	30.28	32.79
14	Sikhote Alin Zapovednik	Roe deer	25	17.60	39.80	11.50	17.62	20.05	21.05	16.77	19.66	16.48	25.89
14	Sikhote Alin Zapovednik	Sika deer	25	10.24	29.29	5.18	12.45	4.68	12.59	8.71	22.33	7.21	20.26
14	Sikhote Alin Zapovednik	Wild boar	25	4.60	4.91	4.21	4.78	3.25	5.09	3.57	4.63	3.90	4.81




TiGiS
WCS
WILDLIFE CONSERVATION SOCIETY
Terney Hunting Society
2000-2001
Amur Tiger
Monitoring Program
2000-2001 winter
Tracks on routes
First survey
Second survey
Tracks off routes
2000-2001
Survey routes
River system
Roads
N
W
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S
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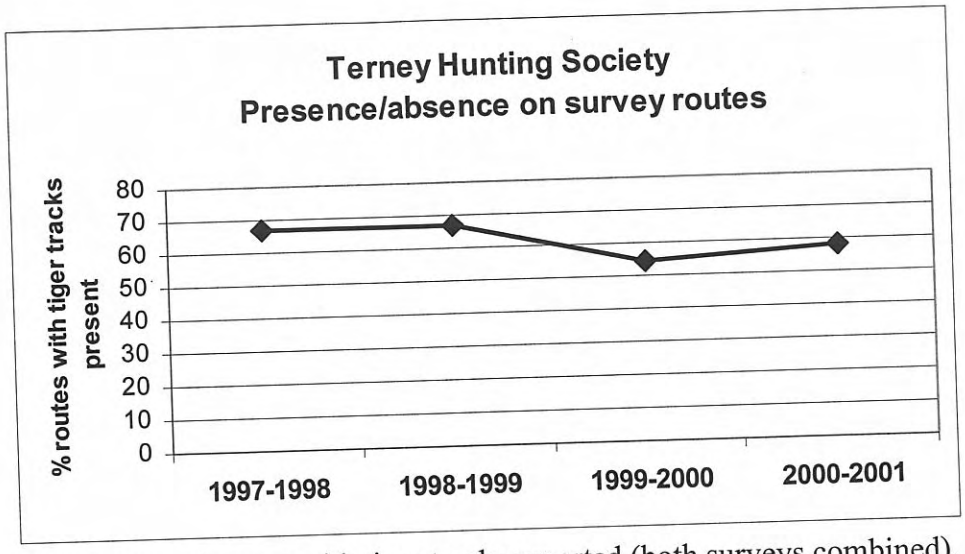
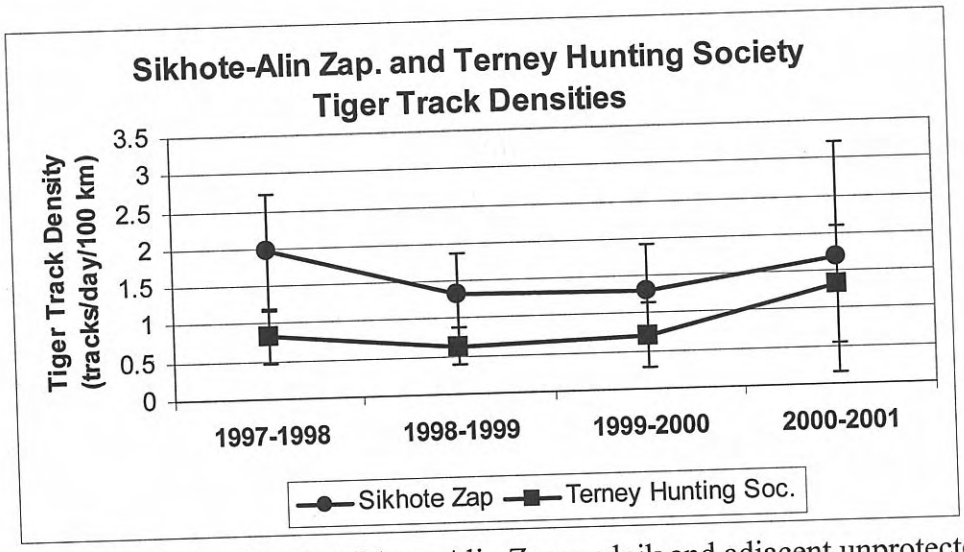
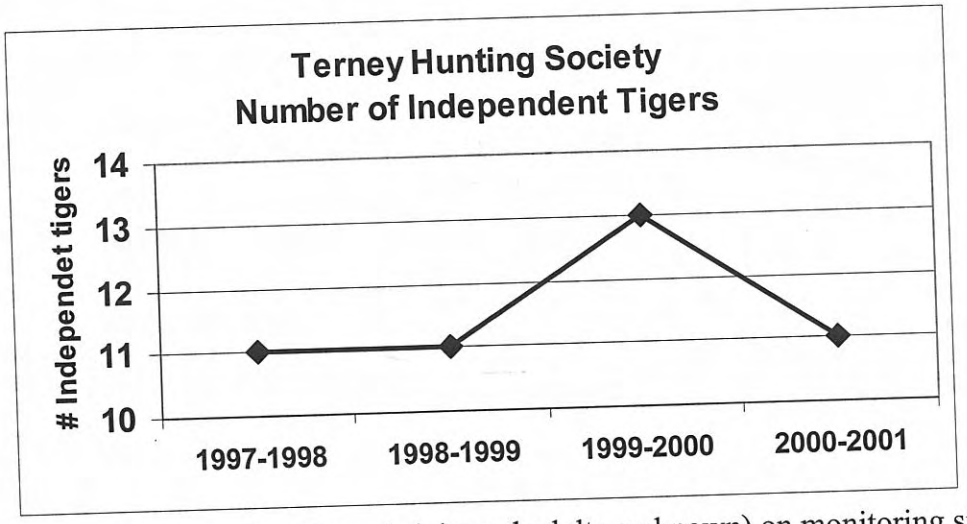
40 Kilometers



Percentage of routes with tiger tracks reported (both surveys combined).



Comparison of track densities in Sikhote-Alin Zapovednik and adjacent unprotected site in Terney Hunting Society, Terneiski Raion



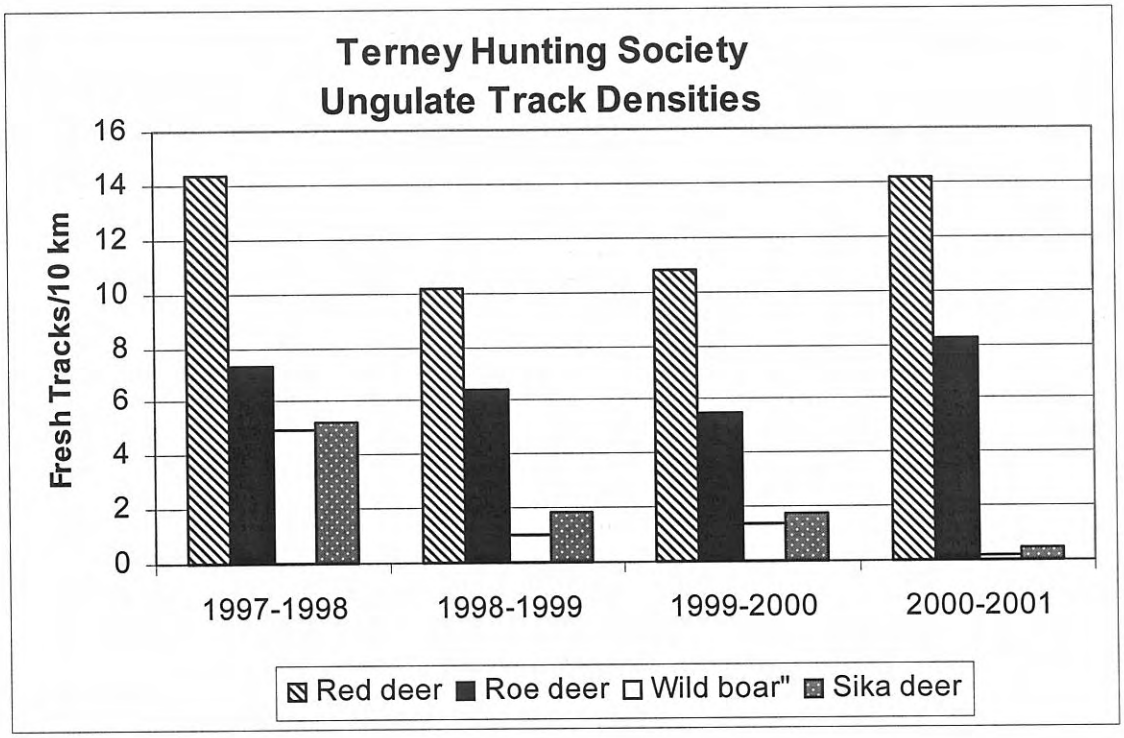
Number of Independent tigers (adults, subadults, unknown) on monitoring site

Number of tigers, by age class, and sex (for adults only) on Amur tiger monitoring sites in winter

			Age						Totals		
			Adults								
#	Site	Year	Males	Females	Un-known	Sub-adults	Cubs	Age unknown	Total adults	Total independents*	Total (all tigers)
16	Terney Hunting Soc.	1997-1998	3	4	0	0	6	4	7	11	17
16	Terney Hunting Soc.	1998-1999	2	3	0	1	0	5	5	11	11
16	Terney Hunting Soc.	1999-2000	5	5	0	0	1	3	10	13	14
16	Terney Hunting Soc.	2000-2001	3	3	0	0	1	5	6	11	12

Mean track density (tracks less than 24 hours) of ungulates in Amur tiger monitoring sites for first 4 years.

		Prey		1997		1998		1999		2000		Grand Total	
#	Monitoring Site	species	n	mean	std	mean	std	mean	std	mean	std	mean	std
16	Terney Hunting Society	Red deer	24	14.40	14.07	10.13	10.73	10.75	11.62	14.13	11.43	12.35	12.00
16	Terney Hunting Society	Roe deer	24	7.32	9.29	6.38	9.68	5.52	8.19	8.24	11.56	6.87	9.66
16	Terney Hunting Society	Sika deer	24	5.20	17.74	1.80	5.45	1.73	5.29	0.47	1.43	2.30	9.68
16	Terney Hunting Society	Wild boar	24	4.98	16.21	0.97	1.94	1.33	2.02	0.15	0.47	1.86	8.31



MATAI
KHOR
TIGRINI DOM
BOLSHE KHEKHTSIRSKI ZAPOVEDNIK
BOTCHINSKI ZAPOVEDNIK
Khabarovski Krai
2000-2001

Report on results of Amur tiger monitoring program in Khabarovski Krai in winter 2000-2001

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The Amur tiger population monitoring survey in the 2000-2001 winter season in Khabarovski Krai was conducted without any methodology changes from previous years. The survey was done according to the schedule, except in Botchinski Zapovednik, where every year the first count is conducted in the second half of January, because it is impossible to do so earlier due to ice conditions on rivers, along which all routes are situated.

Survey conditions were favorable everywhere due to the depth of snow that accumulated later than usually. The absence of wind and snowfall in the first part of winter as well as good acorn crops changed ungulate distribution among habitat types, resulting in greater tiger activity in November, when all roads were littered with tigers tracks. By December this activity abruptly decreased as wild boar movements ceased and intense cold weather had set in.

The second part of winter was abnormally cold. Mean daily temperatures were lower than mean annual (average long-term) temperatures by 7-8° and snow depth was insignificant up to the end of February. Snow was frozen hard, crunching at every step, and there was not muffling of the rustle of frozen leaves. While walking the "crunch" could be heard in frozen dense air over hundreds of meters. Consequently, the ability of predators to stalk prey was dramatically decreased, making it almost impossible to kill elk, while wild boar were distributed in oak habitat mostly outside of tiger range. Even for human hunters it was difficult to find herds that stayed in confined areas. Therefore, these were very difficult conditions for tigers, especially for young and females, which lactated in spring and summer. They had difficulty acquiring sufficient energy to make it through the difficult winter periods. Therefore, predators often traveled along the roads and into settlements in search of food.

Among other characteristics, we should mention that snow cover was uneven in February in Botchinski monitoring unit. Maximum snow depths occurred along the seashore and in the middle basin of the Botchi River, contrary to the norms when upper basins accumulate the most snow.

On the whole all routes were traveled completely and the survey was done as usual (Tables 1.1. and 1.2.)

Table 1.1. Survey schedule and workload in monitoring units, 2000-2001 winter season

Monitoring unit	Time of survey		Number of field-workers	Total length of all routes traveled during 2 counts	Kilometers traveled per 1,000 ha			
	1st count	2nd count			2000-2001	1999-2000	1998-1999	1997-1996
Matai	Dec. 10-30	Feb. 14-Mar. 7	5	754	2.95	2.95	2.81	2.9
Khor	Dec. 18-23	Feb. 17-25	5	478	3.63	3.39	2.96	2.42
Khekhtsir	Dec. 20-22	Feb. 20-21	18	140	3.1	3.1	3.1	3.0
Tigrovy Dom	Dec. 18-27	Feb. 11-25	3	384	1.82	1.82	1.83	1.38
Botchinski	Jan. 14-16	Jan. 21-25	7	320	1.04	1.04	0.95	1.13
			38	**2076**	**2.19**	**2.15**	**2.02**	**1.93**

Table 1.2. Work conducted during tiger monitoring program, winter 2000-2001

Monitoring unit	Area, thousand ha	Number of routes	Total length of routes, km		1st count			2nd count		
			1st count	2nd count	vehicle	snow-mobile	on foot	vehicle	snow-mobile	on foot
Matai	255.4	24	377	377	163	73	141	148	167	62
Khor	131.5	21	239	239	175	12	52	146	29	64
Khekhtsir	45.1	7	70	70	0	0	70	0	0	70
Tigrovy Dom	210.7	14	192	192	116	-	76	105	-	87
Botchinski	307.0	14	160	160	20	89	51	0	109	51
Total	949.7	80	1038	1038	474	174	390	399	305	334

Note: route length was measured with curvimeter and may differ from computer variant

Suggestions for improving organization of work are the same:

1. To reduce the area of Botchinski monitoring unit. To increase the number of routes and not to conduct the count in January.
2. To correct mistakes in Field diary that were repeatedly discussed: point 11 - to replace "Snow depth after last new-fallen snow" with "Depth of last new-fallen snow". Table 1, column 10 - to replace "Snow depth where track was left" with "Depth of track". To make corrections on the picture: front paw is behind.

All these defects cause alternative versions and mistakes.

2. Tiger prey base

In Khabarovski Krai three ungulate species are the main tiger prey in winter: elk, wild boar and roe deer. We have no recent reports of tigers hunting on musk deer or moose, which both occur mostly outside of tiger range.

Elk. Data obtained from hunting leases in tiger range would lead us to believe that the elk population is stable or increasing. However, the following pattern has been observed - the more hunting leases that are created, the more elk number are registered in reports. This relationship is apparently an attempt to inflate elk numbers in order to obtain more hunting licenses (which are based on percentage yield of the existing population). And unfortunately,

it is impossible to check the reliability of this count data, because we have no primary data and no funds to conduct control counts.

Therefore the information annually obtained from 80 monitoring routes is the most reliable available, because these data are collected by qualified and unprejudiced specialists. If we assume that, for the most part, the number of animals encountered on monitoring routes reflects population dynamics, then it can be seen that elk numbers are dramatically decreasing over the entire territory (Table 2.1.). Within past three years elk population decreased by 48% (i.e. 16% per year) in zapovedniks and by 64.4% (21.1% per year) on trade hunting territories. Such widespread decreases are unlikely, but nonetheless are confirmed by other information. Table 2.2. shows that the difference in elk encounters on the routes between the first and second counts (separated by two months) in 2000-2001 was 12.5%, while between the two counts in 2000 the difference was 8.5%. In other words 4.25 - 6.25% for one winter month or 21.5 - 31.2% for 5 winter months. These figures are similar to our calculations above. Reduction in elk numbers can occur not only due to a decrease in population density, but also due to a reduction in range, which also appears to be occurring, based on data on elk encounters (Table 2.3.). In 1998, elk occupied 86.2% of the area of monitoring units, while in 2001 its distribution had decreased by 10%.

We are not inclined to think that the status of the elk population is so disastrous because we do not have enough information to be absolutely sure about our conclusions. Nevertheless, we have other information that confirms that a yearly decline in elk numbers by 4-8% is occurring. The situation is different in different regions, as we can see from Tables 2.1, 2.2. and 2.3., but it is evident that the status of a primary tiger prey species is far from good. The reason of this tendency appears to be that winter mortality is not adequately compensated for by growth.

Table 2.1. Wild ungulates encountered (individuals per 10 km of route) in total of two counts during different years

Monitoring unit	Elk			Wild boar			Roe deer		
	1998-1999	1999-2000	2000-2001	1998-1999	1999-2000	2000-2001	1998-1999	1999-2000	2000-2001
Matai	4.68	3.63	1.64	1.07	2.07	1.31	2.51	2.08	1.24
Khor	5.82	3.18	2.99	0.77	0.22	1.56	6.56	2.20	1.78
Khekhtsir	16.64	14.57	10.57	3.21	0.78	1.28	1.36	0.14	1.0
Tigrovy Dom	4.69	1.20	0.94	0.83	0.96	0.34	0.91	0.31	0.23
Botchinski	7.94	4.25	2.21	0	0	0	3.49	2.75	3.34
Total	6.28	3.52	3.67	0.95	1.05	0.9	3.07	1.74	1.51

Table 2.2. Wild ungulates encountered on routes during winter season 2000-2001

Monitoring unit	Number of individuals per 10 km of route								Difference (+/-%) between counts
	1st count				2nd count				
	elk	wild boar	roe deer	Total	elk	wild boar	roe deer	Total	
Matai	1.06	1.06	0.93	3.05	2.23	1.56	1.56	5.35	+75.4
Khor	2.63	3.01	2.26	7.9	3.35	0.12	1.30	4.77	-39.6
Khekhtsir	12.14	2.43	0.86	15.43	9.0	0.14	1.14	10.28	-33.3
Tigrovy Dom	1.2	0.47	0.21	1.88	0.68	0.21	0.26	1.15	-38.8
Botchinski	2.56	0	4.06	6.62	1.87	0	2.62	4.49	-32.2
Total	3.92	1.39	1.66	6.81	3.43	0.41	1.37	5.21	-23.5

Table 2.3. Wild ungulates encountered on routes during February of each year

Monitoring unit	Number of routes (%) with ungulate tracks											
	elk				wild boar				roe deer			
	1998	1999	2000	2001	1998	1999	2000	2001	1998	1999	2000	2001
Matai	90.0	91.7	75.0	83.3	60.0	37.5	66.7	54.2	90.0	83.3	79.2	83.3
Khor	82.3	82.3	47.6	66.7	17.6	17.6	9.5	14.3	52.9	52.9	38.1	42.8
Khekhtsir	85.7	100	85.7	100	0	14.3	14.3	14.3	28.6	28.6	0	42.8
Tigrovy Dom	90.0	92.8	64.3	57.1	20.0	21.4	0	21.4	40.0	21.4	7.1	21.4
Botchinski	85.7	100	100	85.7	0	0	0	0	100	57.1	42.8	71.4
Total	86.2	92.1	71.2	76.2	18.9	21.0	23.7	25.0	65.5	55.2	52.5	55.0

Wild boar. The same data indicate that the wild population appears to be stable or increasing. The area occupied by wild boar increased by 32.2% since 1998 (on average by 8% each year, see Table 2.3.), and the number of tracks increased each year (in 1997-1998 it averaged 0.7 tracks per 10 km of route). However, the reduction (loss) between winter months (from first to second count) varied from 52.3 % to 75.5% (based on number of animals found on routes). Such considerable mortality can not be compensated for by effective growth rates, which are mostly consumed by predators. Hunting is also a significant impact, since there are distinct preferences for killing females. Tigers act more wisely - they usually prey on piglets and young boar first.

In November wild boar were more abundant than the past winter, but its numbers were reduced very quickly because, in addition to predation, limited hunting was allowed (actually it was hunting was essentially unlimited due to poor protection capacity). Nevertheless, we think that population is increasing because food was abundant and the winter was favorable for animals.

Winter roe deer numbers probably were more or less stable at their low levels (see Tables 2.1, 2.2, 2.3). Our prognosis is that that abundant food and favorable winter conditions will change this trend and result in an increase in numbers, if there is not severe mortality associated with heavy snowfalls that took place all over the territory in March.

Thus according to the estimates of total encounter rates of ungulates on routes in December and February a tiger could find 10.3 tracks (per 10 km of route) of potential prey in 1998-1999, 6.71 tracks in 1999-2000, and 6.08 tracks in 2000-2001. This translates into an overall decrease of 41% during 3 years, 13.6% per year. If these figures are converted into available biomass this change decreases in amount, but is still significant – no less than 8% a year.

We conclude that it is necessary to conduct an inventory of tiger prey resources and, based on the results, develop specific recommendations for recovery of ungulate populations, in coordination with the interests of hunting industry. If such measures are not taken, we believe the tiger population will begin a progressive decline.

3. Changes in habitat

Monitoring changes in habitat is a supplemental part of the monitoring that cannot be obtained during data collection on routes. To get this information requires a great amount of additional work to visit logging areas and forest districts, and (in view of intensive illegal

logging trade), to make a field inventory because official data on habitat changes are largely unreliable. Moreover, the Forest Service districts do not provide official data for a variety of reasons. Consequently, we cannot guarantee the accuracy of information we give in this report (Table 3.1.).

Table 3.1. Changes of tiger habitat in winter 2000-2001

Monitoring unit	Human impacts					
	New roads construction, km		Number of logging areas		Logging area, ha	
	2000	2001	2000	2001	2000	2001
Matai	24	52	27	65	2,002	2,500
Khor	16	-	10	7	850	260
Khekhtsir	0	0	0	0	0	0
Tigrovy Dom	0	0	7	13	520	50
Botchinski	0	0	0	0	0	0
Total	40	52	44	85	3,372	2,810

The most serious changes in tiger habitat have occur due to an increased demand for oak wood, and consequent increasing in logging of oak forests. Ash and lime (basswood) are also logged, as well as pine (whenever it is possible).

All these species grow in quality tiger habitat, which were further damaged by logging of pine. Therefore, the best habitats, i.e., those areas where good tiger reproduction could occur, are being destructed. Despite its status as a zakaznik, much of the forest in the Matai river basin is being logged. Habitat tracts situated along the newly created Khabarovsk-Nakhodka highway is deteriorating quickly, and may likely result in fragmentation of the existing tiger range.

Logging goes on in other areas as well, with the primary targets being the most valuable tree species. Of most concern is logging of oak trees. A decrease in the number of mature oak trees will surely lead to negative changes for wild boar, elk and roe deer populations for whom acorns represent a key forage for fat accumulation and successful overwintering.

Forest roads are in a constant state of flux, and it is nearly impossible to monitor them because loggers are constantly moving.

On the whole, forests have been logged for a 100 years in all monitoring units except zapovedniks and their appearance is far from that of the primeval virgin Ussuri taiga. Productive habitat, where potential tiger prey is abundant, represents is less than 20% of all forests. And even in this habitat "abundance" is relative and by an order of magnitude less than it was 50-70 years ago.

Recovery measures are necessary equivalent to deterioration size.

4. Results of tiger numbers monitoring

According to the information received from different parts of tiger range it appears that tiger numbers have decreased greatly in comparison to last year. Tigers were not observed in upper reaches of Katen, 10 km up from the mouth of the Chuken, nor in the mouth of the

Sukpay area, and only single individuals were found along the right bank of Khor above Kutuzovka village. It appears that the range has been reduced in the east as well, and an expected growth of the population in primary habitat did not occur.

Within the monitoring units, the number of tigers is virtually unchanged (Table 4.1), except in the Matai, where tiger numbers are reduced. In the beginning of March, there were five tigers here, but between March 15-18 one tiger, which attacked dogs in Dolmi village, was shot.

Table 4.1. Tiger numbers and density in monitoring units in different years

Monitoring unit	Number of registered tigers				Population density per 100,000 ha			
	1998	1999	2000	2001	1998	1999	2000	2001
Matai	5	5	5	4	1.96	1.96	1.96	1.57
Khor	2	4	4	4	1.52	3.04	3.04	3.04
Khekhtsir	2	2	1	1	4.43	4.43	2.21	2.21
Tigrovy Dom	2	5	5	5	0.94	2.37	2.37	2.37
Botchinski	3	4	6	6	0.98	1.3	1.95	1.95
Total	14	20	21	20	1.47	2.10	2.21	2.10

It is necessary to mention that data obtained during survey in monitoring units are supplemented by additional information and appear to be quite accurate. So the annual increase of number of tiger tracks found on routes cannot be explained by a growth in tiger numbers but by their extensive movements (due to the lack of prey) and favorable conditions of the survey.

Table 4.2. The number of tiger tracks less than 7 days old

Monitoring unit	1st count				2nd count			
	1997	1998	1999	2000	1998	1999	2000	2001
Matai	7	5	6	13	6	4	20	19
Khor	8	14	15	5	15	3	3	10
Khekhtsir	8	3	1	0	1	4	1	2
Tigrovy Dom	6	7	6	16	6	13	8	11
Botchinski	4	8	7	7	7	6	6	13
Total	33	37	35	41	30	38	47	55

Insignificant changes in tiger numbers within monitoring units (despite the repeated reports of population decreases in other parts of its range) are probably explained by the specific location of monitoring units, which occupy the best tiger habitat. But on the whole, we will be able to better assess the population status after our survey next year, because this year the conditions were very poor and the animal mortality rate was extremely high.

A unique situation has developed on the eastern macroslopes of the Sikhote-Alin, where elk and roe deer numbers have risen for the past 8 years due to the absence of deep snow (which usually causes ungulate mortality). Stable prey resources support a stable tiger population, which disperses from year to year.

5. Tiger population structure

At the beginning of the winter season an increase in litter size had been observed all over the range. Females with 2-3 cubs were found often, and there were more females with cubs. However, by the end of the season virtually all of them had died. Therefore, population structure at the end of February 2001 was as follows:

Table 5.1. Tiger population structure in winter season 2000-2001

Monitoring unit	Males	Females without cubs	Females with cubs	Cubs	Unknown sex and age	Total
Matai	2	1	0	0	1	4
Khor	1	1	1	1	0	4
Khekhtsir	0	1	0	0	0	1
Tigrovy Dom	2	0	1	1	1	5
Botchinski	3	0	1	2	0	6
Total	8	3	3	4	2	20

But according to the information obtained during 4 years of the monitoring program there has been a significant reduction of the percentage of cubs in the population (Table 5.2).

Table 5.2. General changes of tiger population structure in monitoring units during different years

Monitoring unit	1997-1998		1998-1999		1999-2000		2000-2001	
	Ind.	%	Ind.	%	Ind.	%	Ind.	%
Matai	4	28.6	6	30.0	8	38.1	8	40.0
Khor	3	21.4	1	5.0	2	9.5	3	15.0
Khekhtsir	2	14.3	5	25.0	4	19.0	3	15.0
Tigrovy Dom	4	28.6	5	25.0	5	23.9	4	20.0
Botchinski	1	7.1	3	15.0	2	9.5	2	10.0
Total	14	100	20	100	21	100	20	100

From these data it can be seen that in the past 4 years the percentage of cubs in the population has decreased by 30.1%, on average by 7.5% annually. It is reasonable to believe that not only cub numbers are decreasing, but the entire tiger subpopulation in Khabarovsky Krai. If the situation does not change then rate decrease will reach the same level in 2-3 years because population growth during the past years has hardly compensated for animal mortality. In any case, population growth was not observed.

As we said above, an insignificant growth of litter size has been observed during the past two years. Information obtained from the monitoring units also provides evidence for this fact despite the small amount of data (Table 5.3).

Table 5.3. Data on tiger litters in monitoring units, winter 2000-2001

Monitoring unit	Number of adult females		Total number of cubs in litters	Mean litter size				
	With cubs	Without cubs		1996	1998	1999	2000	2001
Matai	0	1	0	-	2.0	1.0	2.0	0
Khor	1	1	1	-	-	-	-	1.0
Khekhtsir	0	1	0	-	1.0	1.0	-	0
Tigrovy Dom	1	0	1	-	-	1.0	1.0	1.0
Botchinski	1	0	2	-	-	1.0	1.0	2.0
Total	3	3	4	1.67	1.5	1.0	1.25	1.33

We are concerned that since 1999 the number of females with cubs has been steadily decreased (on average by 13.5% annually). The number of females without cubs has increased proportionally (from 5% to 15% for 3 years!). At present 50% of females either do not reproduce or had lost their cubs by the beginning of February. At the same time, the percentage of adult males is increasing in the population. Since 1998, their contribution to the population has increased from 28.6% to 40% and now the sex ratio between mature (adult) tigers is not conducive to high productivity. Population reproductive potential has decreased distinctly. This is either a sign of the beginning of a long-term trend towards population decrease or the result of a temporary reduction in prey resources. But the cause may have more serious reasons which could threaten survival of the species, including progressive habitat deterioration. In any case low productivity is an extreme alarm signal, which is more reliable than data on tiger numbers and which warns us about a possible population collapse. In connection with this, it is necessary to conduct a full survey of the entire tiger range, and to develop specific conservation recommendations, which will be able to reduce the rate of decline, even if it will be impossible to prevent it. At this stage, primary attention should be paid not on control of poaching.

6. Monitoring of tiger range

Based on inventory of the entirety of tiger range at the end of 2000, total area was 3,815,300 ha, which was an increase of 452,000 ha in comparison with the 1996 tiger census. Expansion of tiger range occurred mostly due to dispersal of tigers to the north on the eastern macroslopes of Sikhote-Alin and in the Gur River basin. All existing semi-isolated tiger groups still remain.

7. Monitoring of tiger mortality

Within the Khabarovsk part of tiger range during 2000-2002 winter season the following cases of tiger deaths and removal from the wild were recorded:

1. Three cubs 8-9 months old (two males and one female) died from starvation and cold in Bolshe Khekhtsir Range. The adult female could not feed them despite the high elk density. She often killed dogs in adjacent settlements but could not save her cubs. At last, she left the male cubs that could walk yet near the cabin of game inspector V. Koval and brought the dying female cub to a dog she had killed. The female cub died while the tigress was carrying her. One male cub was taken by a game inspector and transported to the Khabarovsk rehabilitation center, where he died in 24 hours. The second male cub died near the cabin.

2. A young male was caught in Svyatogorie village in kennel, where he was killing and eating dogs and refused to leave the area. He was moved to the Khabarovsk rehabilitation center.
3. A atiger cub 7-9 months old was picked up near Lermontovka village, in an extremely emaciated condition. He is now in the Khabarovsk rehabilitation center.
4. A young tiger was poached in Dolmi village. The place of death was found but it was completely inundated by an overflow on the ice, eliminating any investigation.
5. A tiger cub of approximately the same age was brought to the rehabilitation center from Nanaisky raion at the end of March 2001.
6. Last year's monitoring report did not contain information about a tiger cub that was caught in summer 2000 in Troitskoe village. She was emaciated and came to the bank of the Amur river. This female cub is also in "Utyos" rehabilitation center now.

Thus, we know for sure about eight tigers withdrawn from the wild. Moreover, it was reported (but not verified) that two more cubs died in Vyazemsky raion and one cub in Lazo raion.

Probably several tigers were poached in other areas because in there was snowfall in March and snow depth was from 40 cm in the southern part of range to 87 cm the northern part of range. Such deep snow could force tigers out onto roads and into settlements. Probably other cubs (especially very young) also died. Such a significant loss/mortality will have a considerable impact on the status of this population , especially because most reproductive females sustained a loss.

It is necessary to mention that this is the first time such an unfavorable combination of winter conditions was observed during the 4-year monitoring program. And we arrive at rather unexpected conclusions: that extremely cold weather with low snow cover has a greater impact on tigers than than high snow cover with normal temperatures. Probably tiger mortality would have been much less if wild boar was more abundant.

8. Conclusions and recommendations

The work on monitoring the tiger population in Khabarovski Krai was conducted according to the established methods and schedule. The available information indicates that prey resources continue to decline. Elk numbers are decreasing by 21.5-31.2% each winter, and this decline is not completely compensated by population growth, resulting in an overall negative balance. The area occupied by tigers is shrinking except on the eastern macroslopes (coastal areas) of the Sikhote-Alin.

The same situation exists with roe deer population, which has been consistently decreasing within tiger range during four past years. We hypothesize that beginning in 2001 population trend will change for the better.

Stable growth of wild boar numbers (on average 8% annually), which has been occurring since 1998, is constrained by high mortality during the winter season (from 52.3% to 75.5% based on the difference in track encounters) and cannot compensate for the lack of prey

resources. An overall reduction of tracks found on routes is averaging 13.6% annually and, converting to biomass, the total reduction of animals is about 8%.

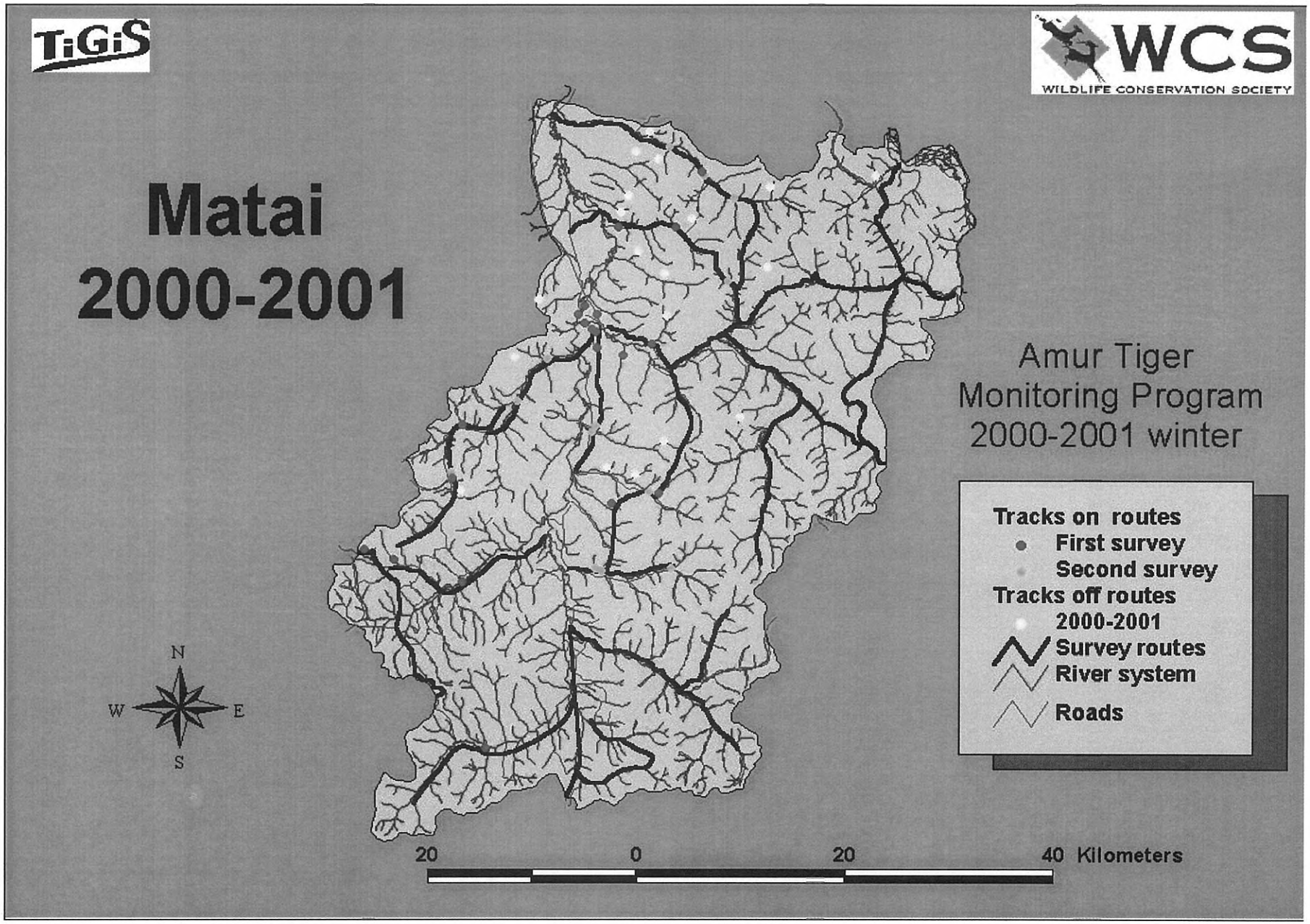
Habitat deterioration continues and is aggravated due to intensive logging of oak forests, which provide food for wild boar, elk and roe deer.

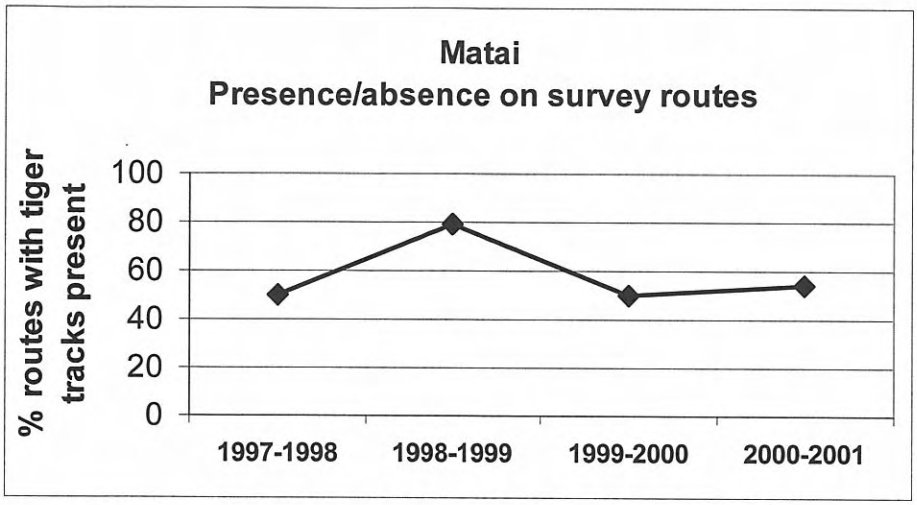
Habitat deterioration may also be responsible for a reduction in the tiger population, which is confirmed by negative changes in its population structure. During the past four years the percentage of cubs in the population has been constantly decreasing (on average by 7.5% annually), which approximates an equal reduction in prey resources. The percentage of females with cubs which survive through February, has been decreasing for three years from 25% to 15%. The sex ratio of adult tigers is not skewed in favor of males, reducing the potential for reproduction, but such changes are consistent across the range. Range expansion to the north continues on the eastern macroslopes of Sikhote-Alin, resulting in an increase of the total area populated by tigers up to 9,815,300 ha. However, this increase in area will not help the tiger population because the potential prey are under the constant threat of overwinter mortality associated with deep snow.

In addition these the general negative trends, the number of tigers has significantly decreased due to extremely cold weather, and a great number of cubs and young animals have died. Death of eight tigers has been officially recorded.

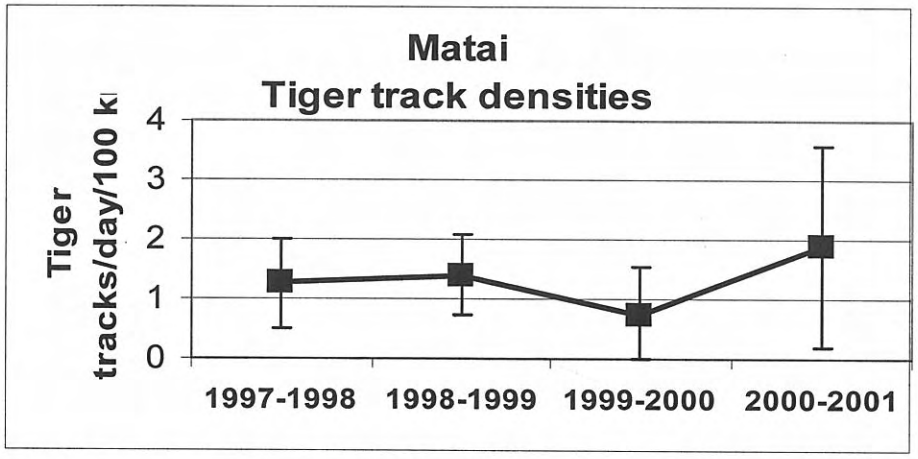
To improve the situation it is necessary:

1. to begin preparations and search for funds for a complete survey of tigers and ungulates;
2. to develop a long-term recovery program for elk, wild boar and roe deer populations and to initiate it immediately;
3. to redistribute the allocation of funds for Amur tiger conservation. Prey base recovery actions should be financed first of all, in the second place habitat conservation should be financed and poaching patrol should be considered third;
4. to remind the Government of Russian Federation about National Strategy of Amur tiger conservation and to request funds for realization of its most important sections;
5. to prohibit hunting for wild boar in Khabarovski and Primorski Krais for 2-3 years;
6. to draw attention of non-governmental nature protection organizations and mass-media to intensive logging of oak forests and to provide adequate control of its export to adjacent countries;
7. to establish the regulations for obligatory environmental assessments (expertisa) of nature use in tiger range and to use funds (obtained as compensation for damage) for realization of the national strategy of tiger conservation.

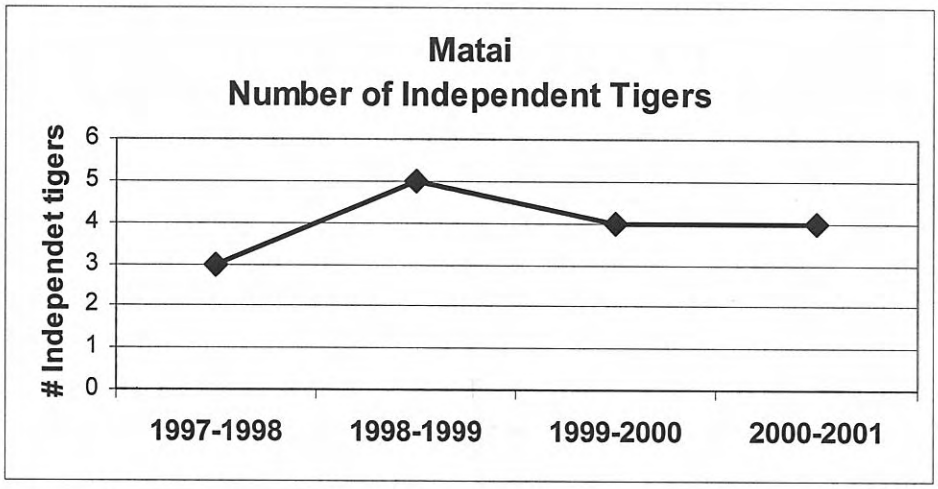

TiGiS
WCS
WILDLIFE CONSERVATION SOCIETY
Matai
2000-2001
Amur Tiger
Monitoring Program
2000-2001 winter
Tracks on routes
First survey
Second survey
Tracks off routes
2000-2001
Survey routes
River system
Roads
N
W
E
S
20
0
20
40 Kilometers



Percentage of routes with tiger tracks reported (both surveys combined).



Comparison of track densities in monitoring site across years



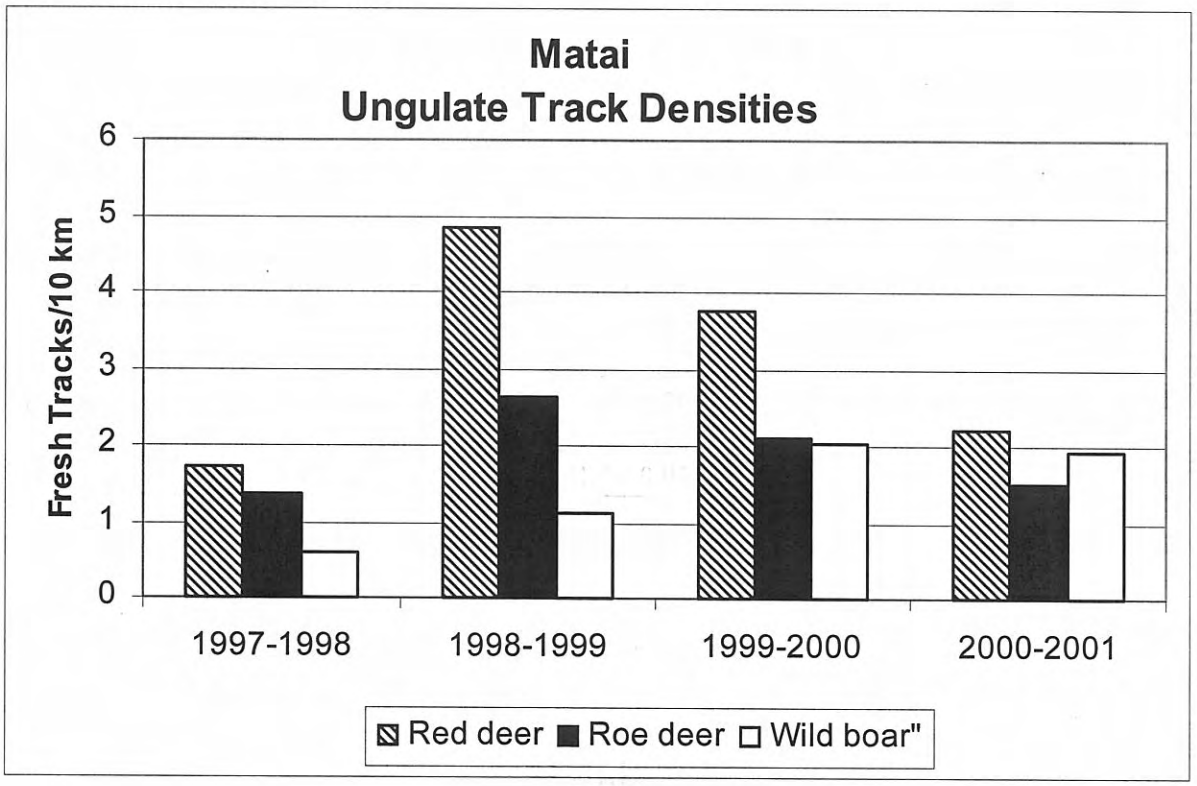
Number of Independent tigers (adults, subadults, unknown) on monitoring site

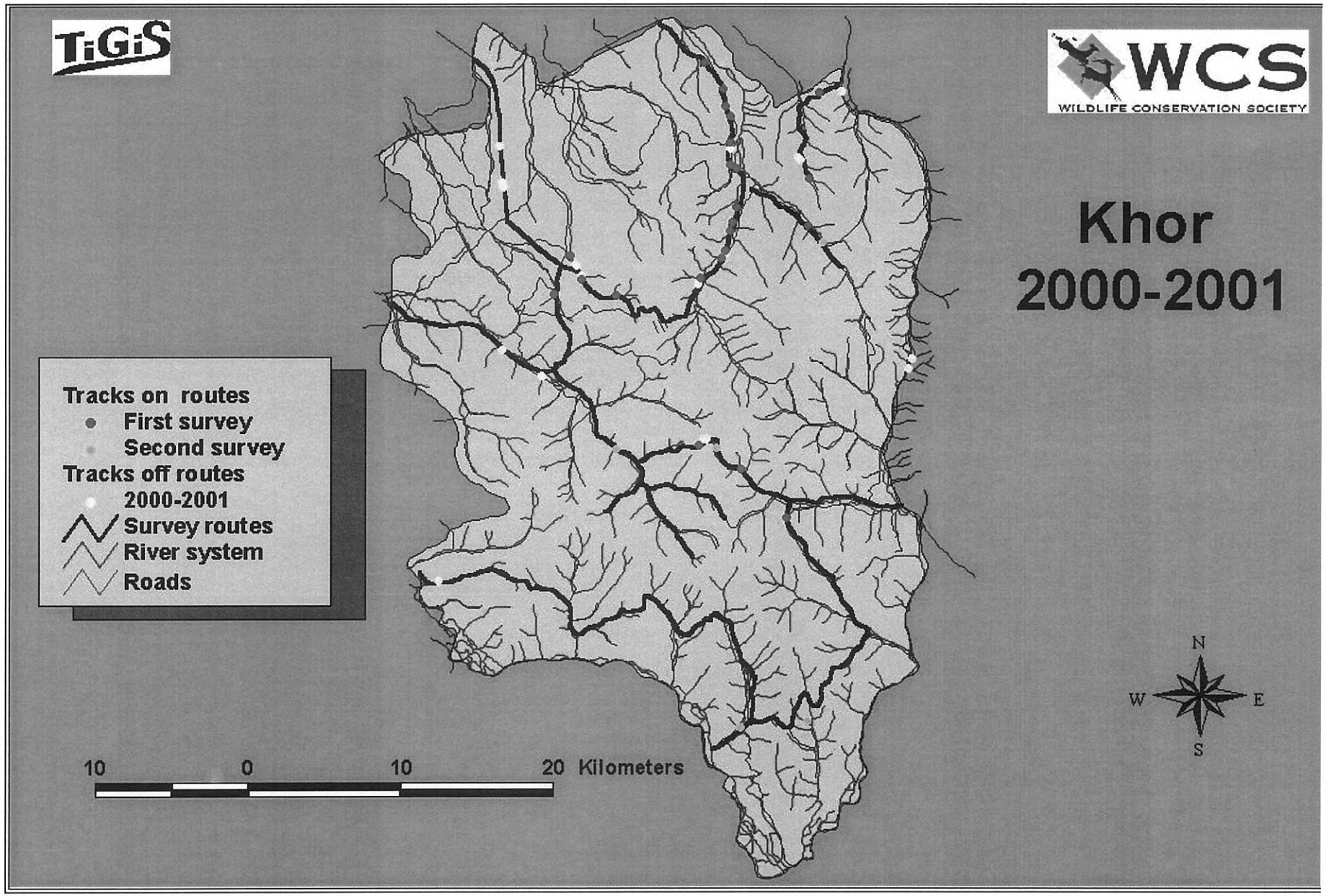
Number of tigers, by age class, and sex (for adults only) on Amur tiger monitoring sites in winter

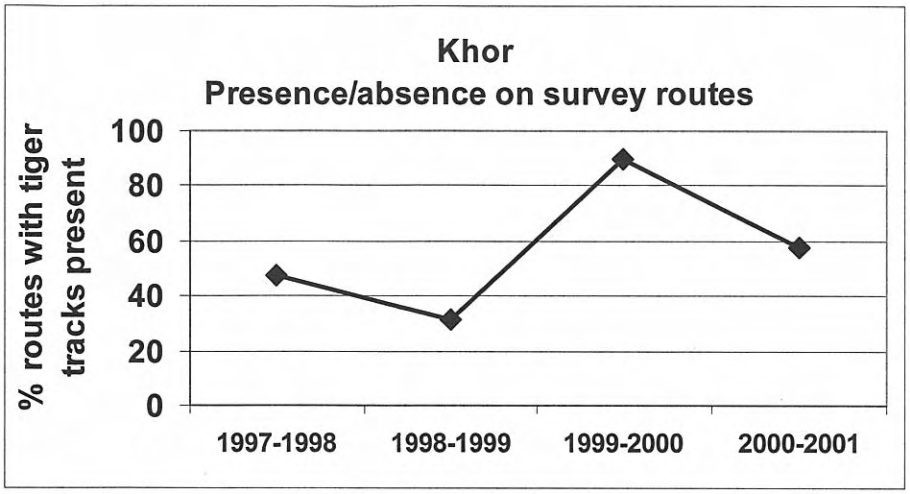
			Age						Totals		
			Adults								
#	Site	Year	Males	Females	Un-known	Sub-adults	Cubs	Age unknown	Total adults	Total independents*	Total (all tigers)
12	Matai	1997-1998	1	2	0	0	0	0	3	3	3
12	Matai	1998-1999	0	2	0	2	0	1	2	5	5
12	Matai	1999-2000	1	1	0	2	2	0	2	4	6
12	Matai	2000-2001	1	2	1	0	2	0	4	4	6

Mean track density (tracks less than 24 hours) of ungulates in Amur tiger monitoring sites for first 3 years.

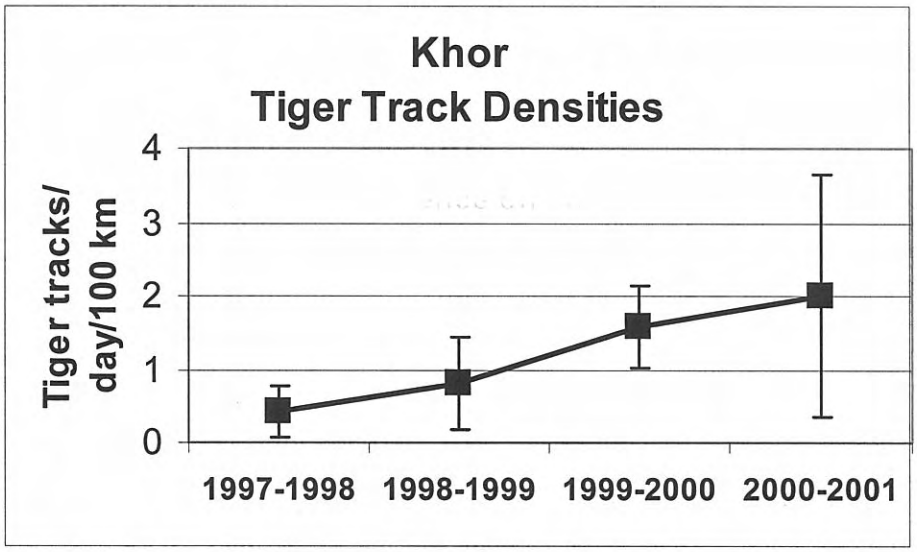
#	Monitoring Site		n	1997		1998		1999		Total
				mean	std	mean	std	mean	std	mean
12	Matai	Red deer	24	1.714	1.768	4.852	4.043	3.764	3.974	3.134
12	Matai	Roe deer	24	1.371	1.761	2.618	2.119	2.102	1.221	1.905
12	Matai	Wild boar	24	0.591	0.939	1.111	1.093	2.052	2.026	1.424



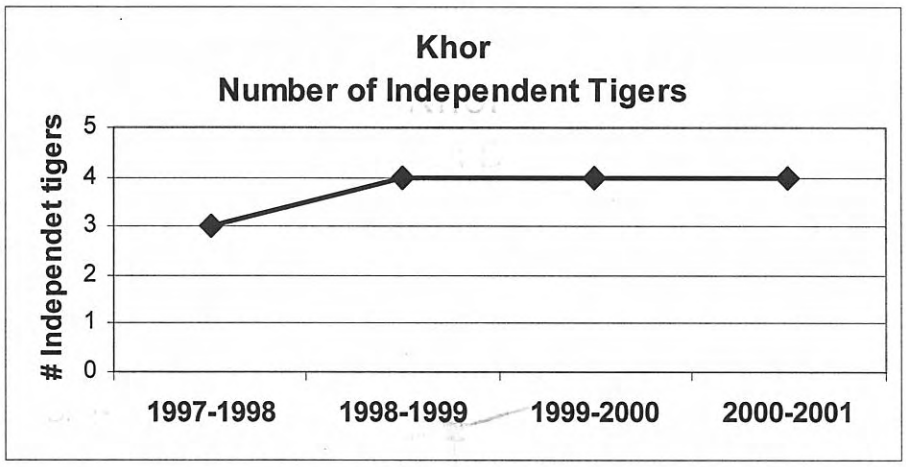

TiGiS
WCS
WILDLIFE CONSERVATION SOCIETY
Khor
2000-2001
Tracks on routes
First survey
Second survey
Tracks off routes
2000-2001
Survey routes
River system
Roads
N
W
E
S
10 0 10 20 Kilometers



Percentage of routes with tiger tracks reported (both surveys combined).



Comparison of track densities in monitoring site across years



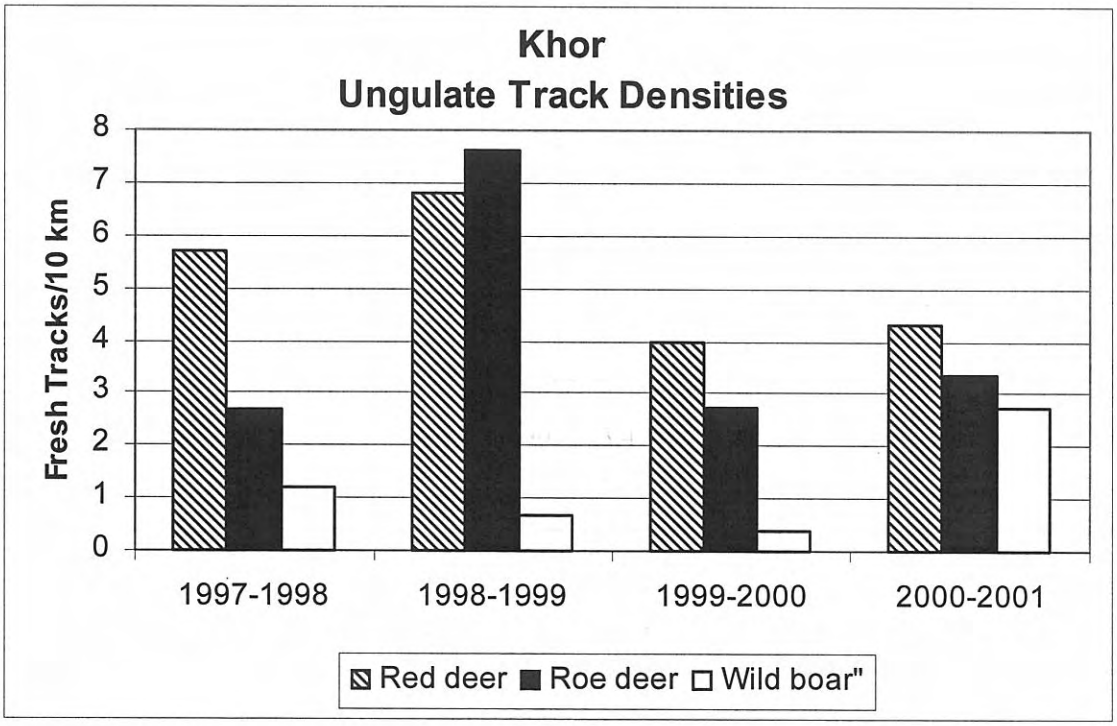
Number of Independent tigers (adults, subadults, unknown) on monitoring site

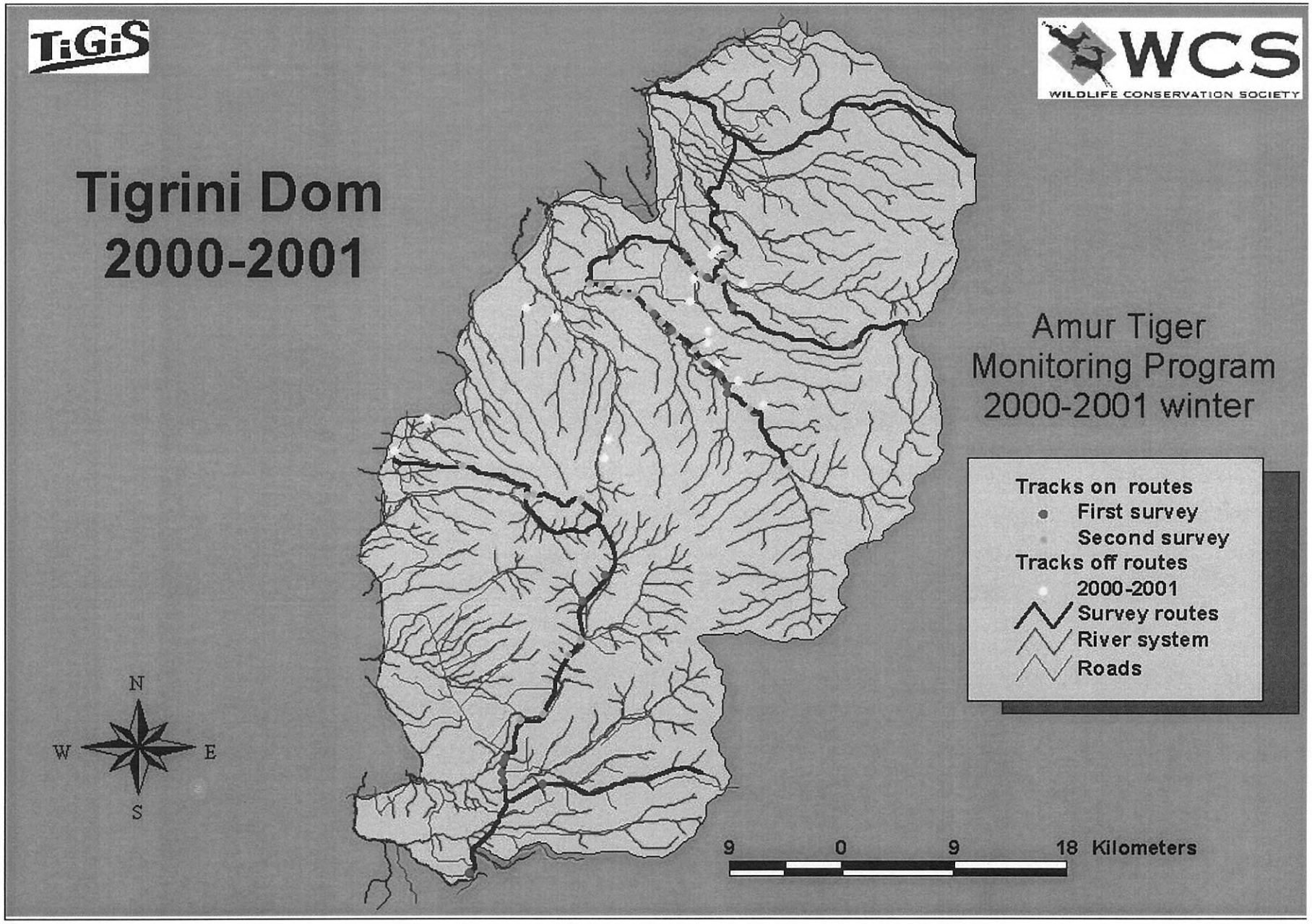
Number of tigers, by age class, and sex (for adults only) on Amur tiger monitoring sites in winter

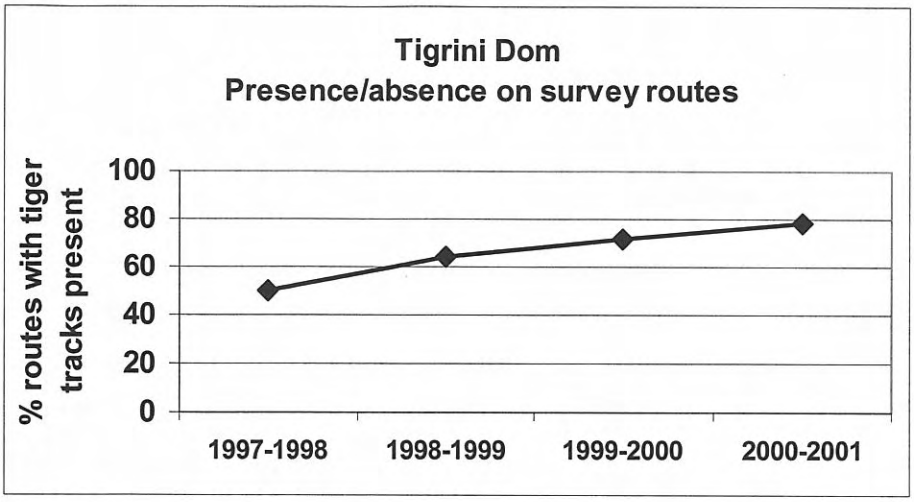
			Age						Totals		
			Adults								
#	Site	Year	Males	Females	Un-known	Sub-adults	Cubs	Age unknown	Total adults	Total independents*	Total (all tigers)
8	Khor	1997-1998	2	1	0	0	1	0	3	3	4
8	Khor	1998-1999	2	2	0	0	2	0	4	4	6
8	Khor	1999-2000	2	2	0	0	0	0	4	4	4
8	Khor	2000-2001	2	2	0	0	1	0	4	4	5

Mean track density (tracks less than 24 hours) of ungulates in Amur tiger monitoring sites for first 3 years.

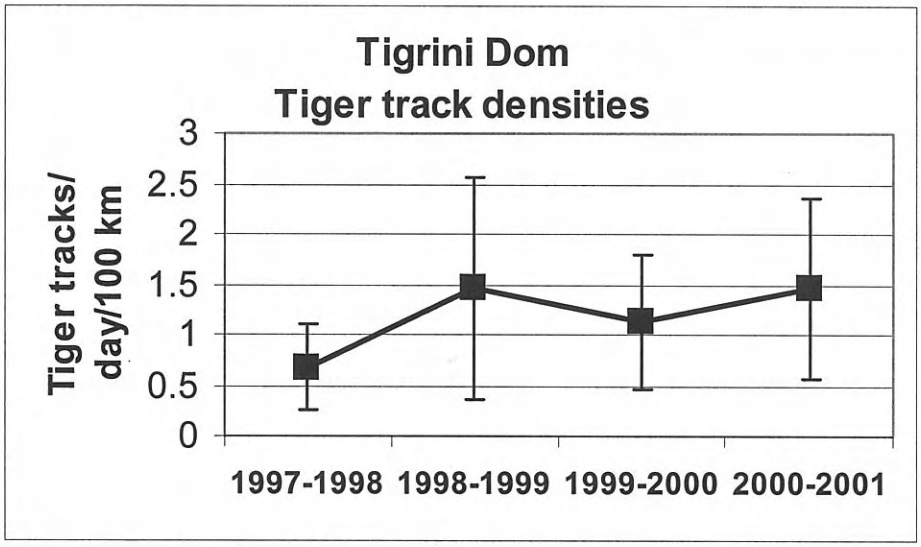
#	Monitoring Site		n	1997		1998		1999		Total
				mean	std	mean	std	mean	std	mean
8	Khor	Red deer	19	5.690	5.429	6.821	5.892	3.978	4.456	5.195
8	Khor	Roe deer	19	2.690	3.474	7.601	5.358	2.731	3.380	4.094
8	Khor	Sika deer	19	0.058	0.252	0.000	0.000	0.000	0.000	0.014
8	Khor	Wild boar	19	1.181	2.330	0.658	0.980	0.373	0.736	1.237



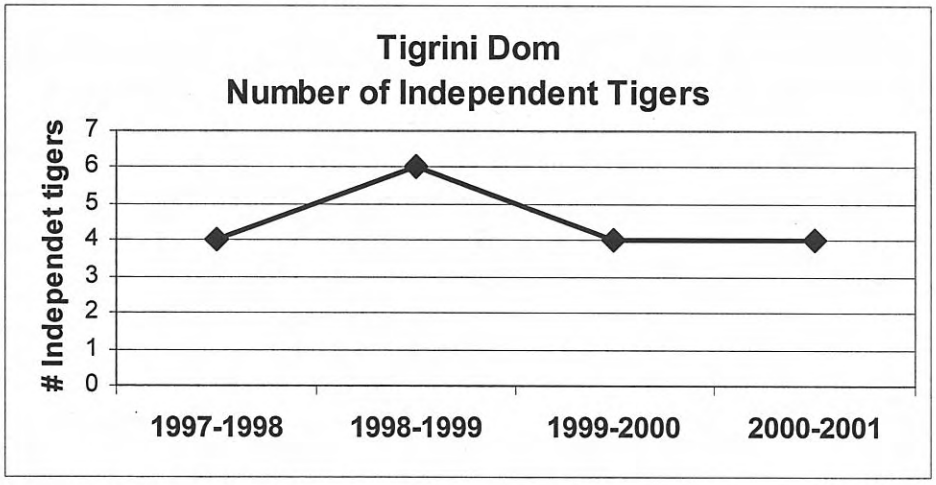

TiGiS
WCS
WILDLIFE CONSERVATION SOCIETY
Tigrini Dom
2000-2001
Amur Tiger
Monitoring Program
2000-2001 winter
Tracks on routes
First survey
Second survey
Tracks off routes
2000-2001
Survey routes
River system
Roads
N
W
E
S
9 0 9 18 Kilometers



Percentage of routes with tiger tracks reported (both surveys combined).



Comparison of track densities in monitoring site across years



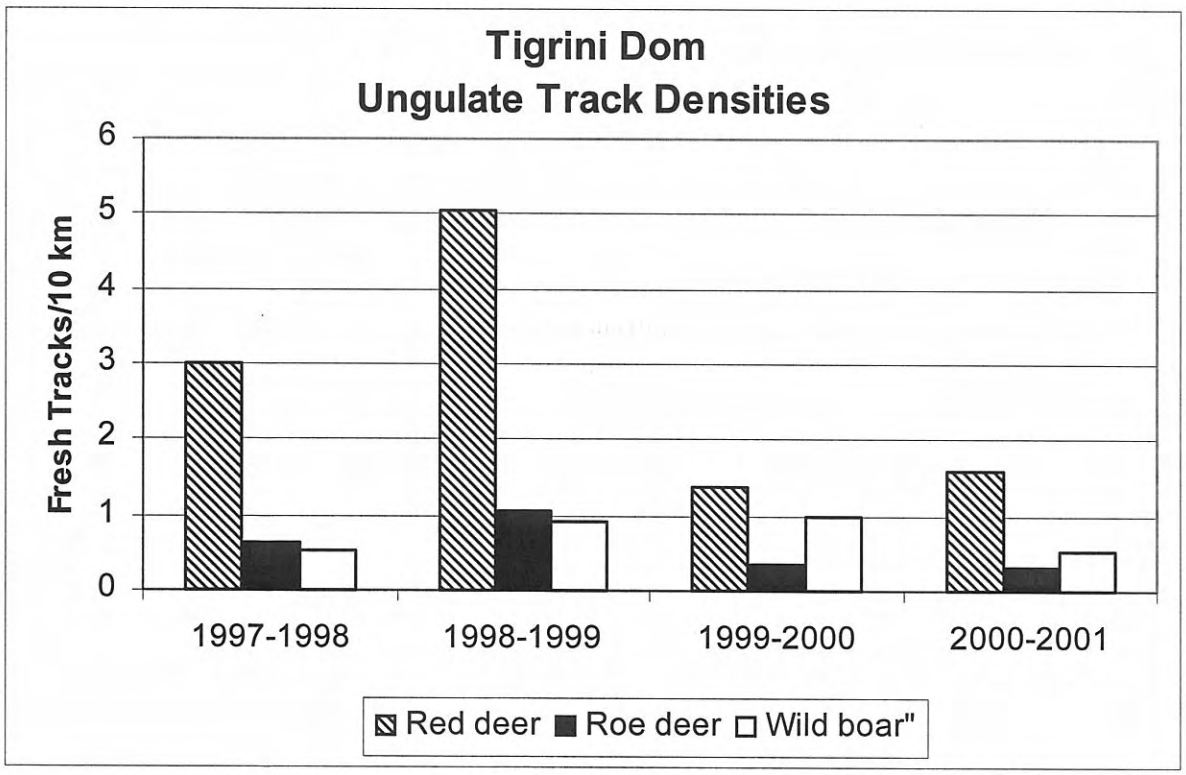
Number of Independent tigers (adults, subadults, unknown) on monitoring site

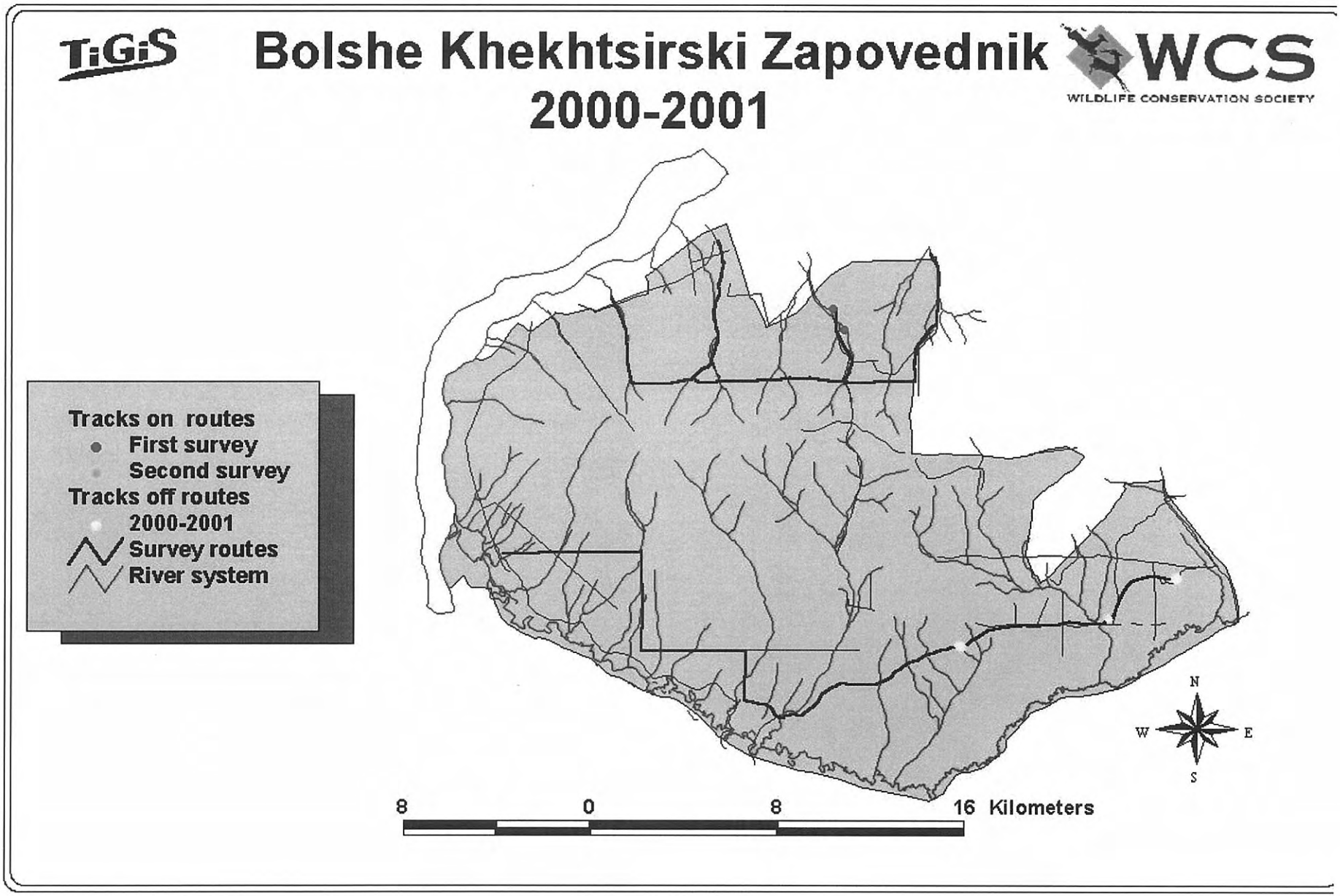
Number of tigers, by age class, and sex (for adults only) on Amur tiger monitoring sites in winter

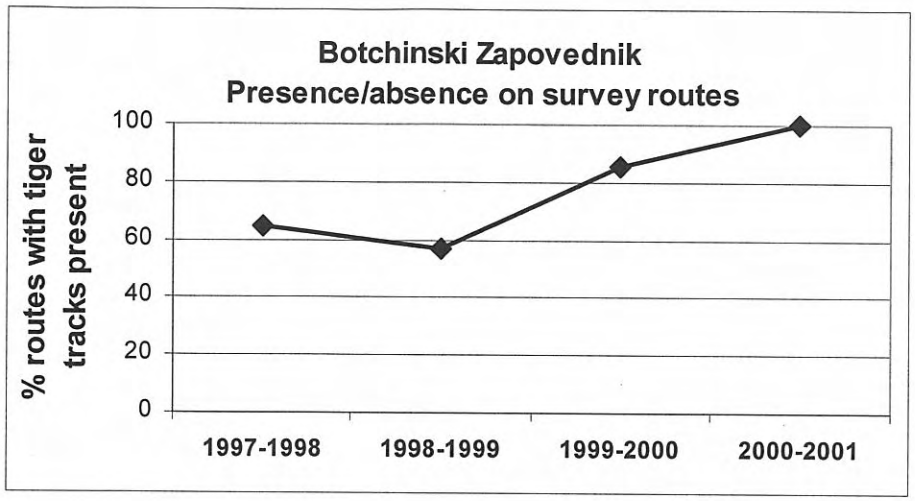
			Age						Totals		
			Adults								
#	Site	Year	Males	Females	Un-known	Sub-adults	Cubs	Age unknown	Total adults	Total independents*	Total (all tigers)
11	Tigrini Dom	1997-1998	2	0	1	1	0	0	3	4	4
11	Tigrini Dom	1998-1999	2	0	2	2	0	0	4	6	6
11	Tigrini Dom	1999-2000	3	1	0	0	1	0	4	4	5
11	Tigrini Dom	2000-2001	2	1	0	1	1	0	3	4	5

Mean track density (tracks less than 24 hours) of ungulates in Amur tiger monitoring sites for first 3 years.

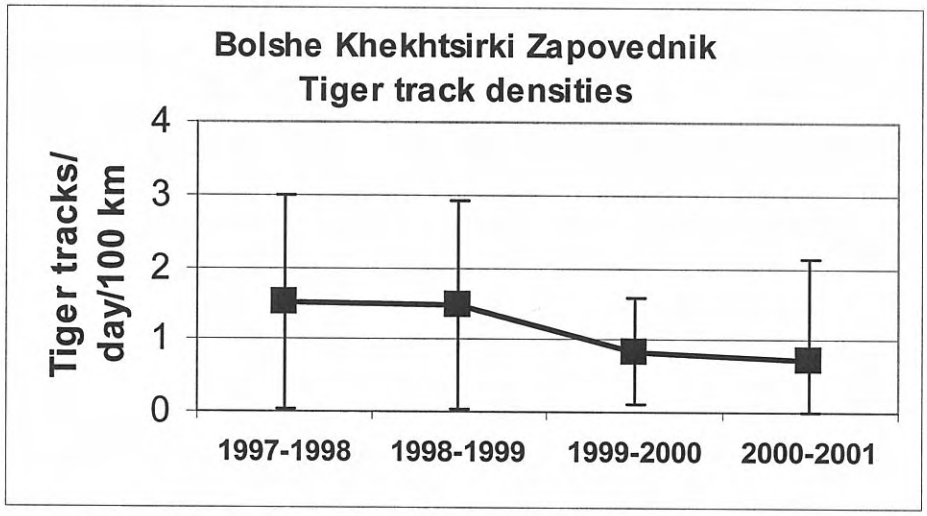
#	Monitoring Site		n	1997		1998		1999		Total
				mean	std	mean	std	mean	std	mean
11	Tigrini Dom	Red deer	14	3.003	3.916	5.060	3.404	1.377	1.386	2.760
11	Tigrini Dom	Roe deer	14	0.647	0.817	1.044	2.602	0.362	0.739	0.593
11	Tigrini Dom	Wild boar	14	0.537	1.203	0.935	1.572	0.997	0.896	0.749



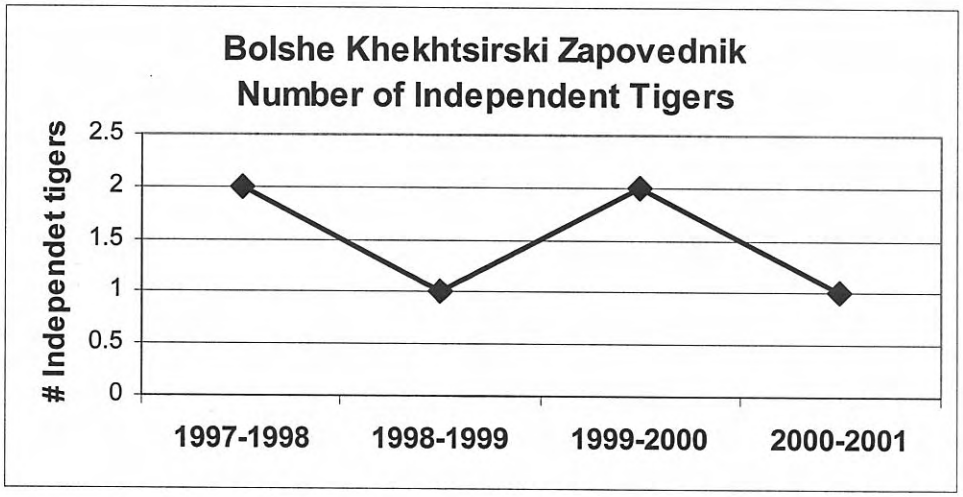

TiGiS
Bolshe Khekhtsirski Zapovednik
2000-2001
WCS
WILDLIFE CONSERVATION SOCIETY
Tracks on routes
First survey
Second survey
Tracks off routes
2000-2001
Survey routes
River system
N
W
E
S
8
0
8
16 Kilometers



Percentage of routes with tiger tracks reported (both surveys combined).



Comparison of track densities in monitoring site across years



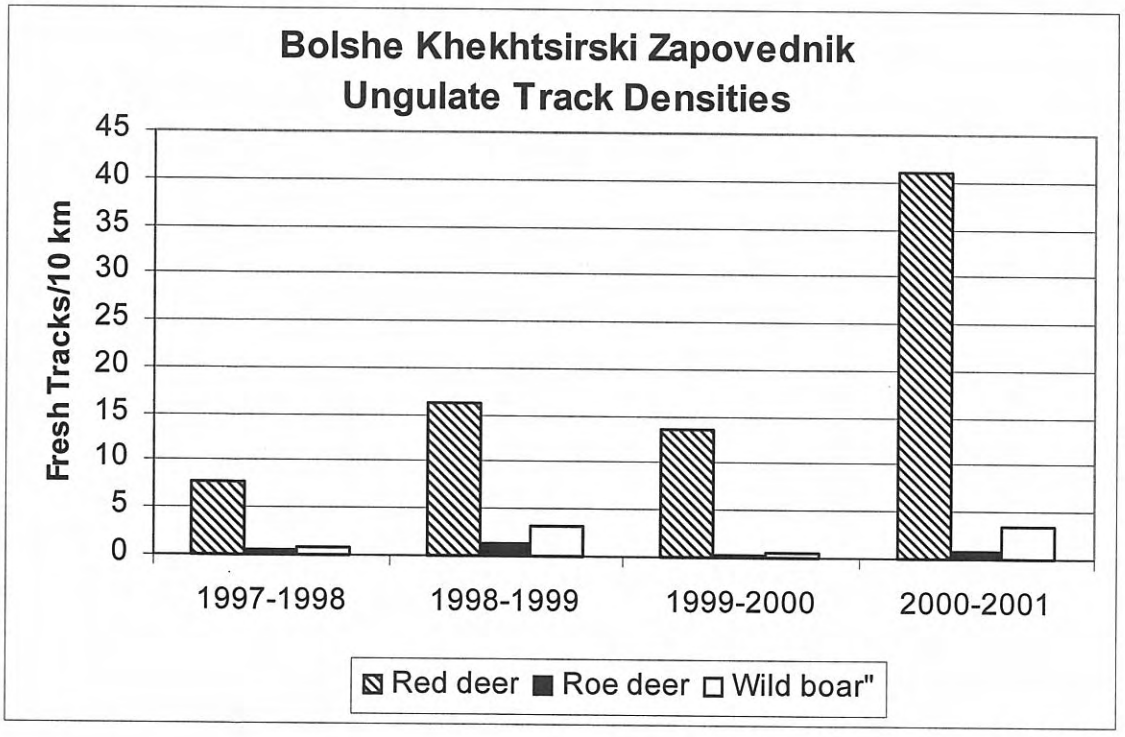
Number of Independent tigers (adults, subadults, unknown) on monitoring site

Number of tigers, by age class, and sex (for adults only) on Amur tiger monitoring sites in winter

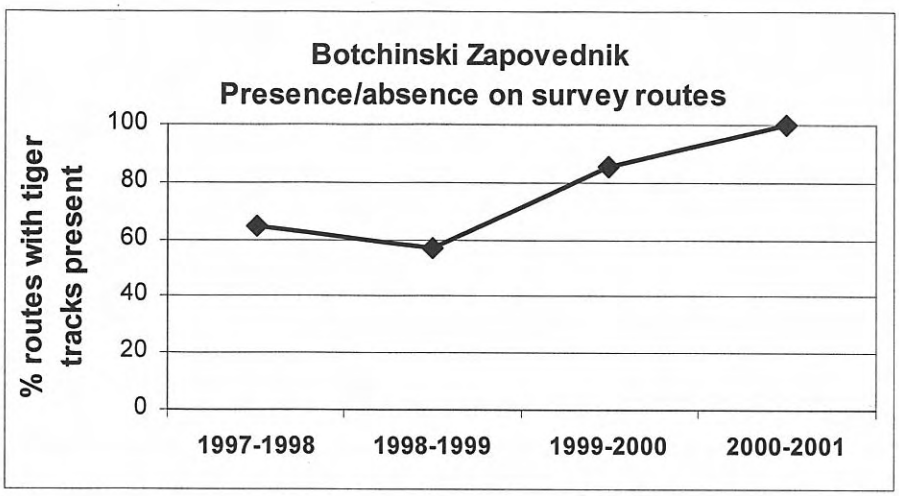
			Age						Totals		
			Adults								
#	Site	Year	Males	Females	Un-known	Sub-adults	Cubs	Age unknown	Total adults	Total independents*	Total (all tigers)
10	BolsheKhekhtsir Zap.	1997-1998	1	1	0	0	0	0	2	2	2
10	BolsheKhekhtsir Zap.	1998-1999	0	1	0	0	1	0	1	1	2
10	BolsheKhekhtsir Zap.	1999-2000	1	1	0	0	0	0	2	2	2
10	BolsheKhekhtsir Zap.	2000-2001	0	1	0	0	3	0	1	1	4

Mean track density (tracks less than 24 hours) of ungulates in Amur tiger monitoring sites for first 3 years.

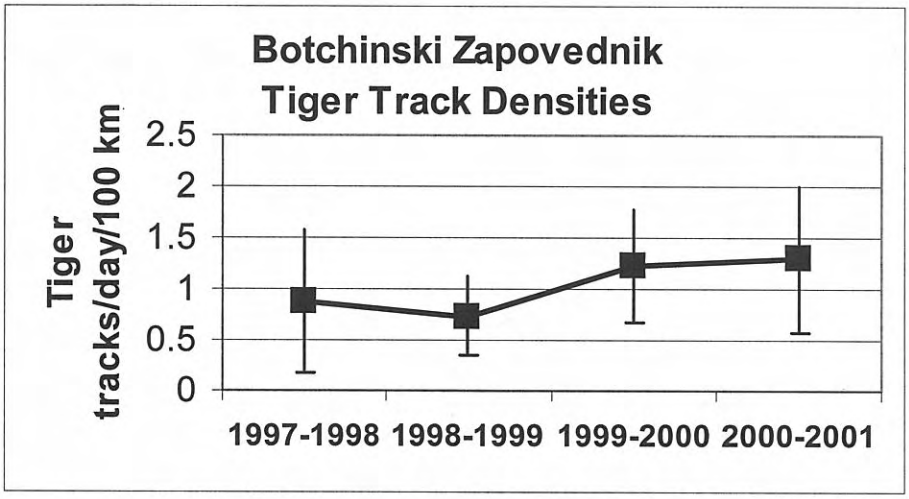
#	Monitoring Site		n	1997		1998		1999		Total
				mean	std	mean	std	mean	std	mean
10	BolsheKhekhtsir Zapovednik	Red deer	7	7.801	7.713	16.294	14.121	13.652	12.746	19.680
10	BolsheKhekhtsir Zapovednik	Roe deer	7	0.452	0.370	1.272	1.546	0.157	0.416	0.699
10	BolsheKhekhtsir Zapovednik	Wild boar	7	0.800	1.049	3.160	3.450	0.611	1.095	2.022



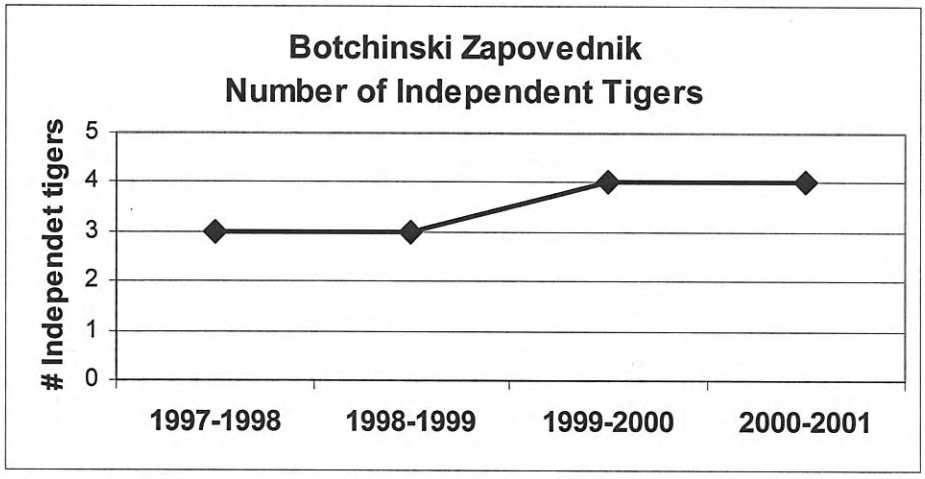

TiGiS
Botchinski Zapovednik
2000-2001
WCS
WILDLIFE CONSERVATION SOCIETY
Tracks on routes
First survey
Second survey
Tracks off routes
2000-2001
Survey routes
River system
N
W
E
S
20
0
20
40 Kilometers



Percentage of routes with tiger tracks reported (both surveys combined).



Comparison of track densities in monitoring site across years



Number of Independent tigers (adults, subadults, unknown) on monitoring site

Number of tigers, by age class, and sex (for adults only) on Amur tiger monitoring sites in winter

			Age						Totals		
			Adults								
#	Site	Year	Males	Females	Un-known	Sub-adults	Cubs	Age unknown	Total adults	Total independents*	Total (all tigers)
9	Botchinski Zap.	1997-1998	1	2	0	0	0	0	3	3	3
9	Botchinski Zap.	1998-1999	1	0	1	1	1	0	2	3	4
9	Botchinski Zap.	1999-2000	2	2	0	0	2	0	4	4	6
9	Botchinski Zap.	2000-2001	2	1	0	1	2	0	3	4	6

Mean track density (tracks less than 24 hours) of ungulates in Amur tiger monitoring sites for first 3 years.

#	Monitoring Site		n	1997		1998		1999		Total
				mean	std	mean	std	mean	std	mean
9	Botchinski Zapovednik	Red deer	14	1.753	1.192	6.866	5.062	4.328	2.501	3.968
9	Botchinski Zapovednik	Roe deer	14	0.421	0.628	2.995	3.158	2.688	2.846	2.585
9	Botchinski Zapovednik	Wild boar	14	0.027	0.102	0.000	0.000	0.000	0.000	0.007