
Supplemental Material

How do hunters hunt wild boar?

Inquiries on hunting methods in Lower Saxony, northern Germany, as a basic for management considerations

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Supplemental Material S1

Definition of the German hunting regime

The German hunting regime is regulated in the hunting act (Bundesjagdgesetz BJagdG) [92]: Section II, §4-§10a.

In the Federal Republic of Germany (and thus, in the Federal State of Lower Saxony) hunting regime is organised in hunting grounds (see Tab. SM1). The shooting right (concession for hunting at all) is by law strictly connected to the land ownership. This concession may be leased to legal hunters. Hunting (management) on land owned by private landowners (persons or companies) usually is conducted in own property (EJB) or leased to other private hunters (EJB and GJB, see Tab. S1). Land in property of the Federal Republic of Germany, the 16 Federal States, or of church, municipalities etc. is also regulated under the definitions in Table S1. Larger state owned areas are EJB, smaller areas than 75 ha are belonging to common hunting grounds (GJB). State owned hunting grounds (states forestry, church, municipalities...) are usually under supervision of forestry officers, who are by definition and education professional hunters (PH). Owners or tenants of the private hunting grounds hunt in personal responsibility with a compulsory duty for wildlife management (given by hunting law: "Pflicht zur Hege"; duty for population regulation, custody and conservation, BMEL 2015). Game species populations must not increase above a certain density compatible with agricultural or social interests. In Germany, no additional management of game species by official game keepers (like the "Wildhut" in Switzerland) is conducted.

Table S1: Definition and minimum sizes of hunting grounds

"Eigenjagdbezirk" EJB hunting ground in one selves property	min. 75 ha consecutive area owned by one single person, or e.g. corporation, association, company, or governmental/administrative institution no upper limit
"Gemeinschaftlicher Jagdbezirk" GJB common hunting ground	min. 150ha larger GJB may be divided into smaller subdivisions with at least 250 ha each several landowners, belonging to one village district no upper limit

It is important to distinguish between private hunters (own responsibility for hunting ground and game), professional hunters (employed professional hunters or forestry officers, responsible for common or private hunting grounds, professionally educated) and some few recreational hunters (using a kind of license hunting system without any responsibilities just for leisure).

Hunting licenses are handed out by authorities solely after passing a high quality exam and may be renewed every three years regardless of the status private or professional hunter.

References SM1

92. BMEL (2015) Bundesjagdgesetz in der Fassung der Bekanntmachung vom 29. September 1976 (BGBl. I S. 2849), das zuletzt durch Artikel 422 der Verordnung vom 31. August 2015 (BGBl. I S. 1474) geändert worden ist. Bundesministerium für Ernährung und Landwirtschaft, Bonn

Supplemental Material S2

Presentation of Questions

The typical head of the front-page contains data on the hunting ground in every year: corresponding number of hunting ground, local and regional hunting association, municipality, size of hunting ground and different habitat proportions within hunting ground.

Surveys 2004-2008:

Census of wild boar in Lower Saxony

Please help to get an overview on the wild boar population and the hunting conducted:

Number of shot wild boar in total in your hunting ground	N =
Thereof:	
Single hunt (stalking, hiding)	N =
Drive hunt within own hunting ground	N =
Comprehensive drive hunt (only shot in own HG)	N =

Do you have serious damages in you HG?	yes no
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In 2009 this question was supplemented with a question on sex and age of these individuals within the total annual hunting bag.

Hunting bag wild boar 2009/10 shot in hunting ground (total): N= _____	found dead: N= _____					
	piglets		yearlings		adults	
	female	male	female	male	sow	boar
Hunting bag (without found dead)						
Found dead at traffic						
Out of piglets were shot in summer (May 1 st –Sept 30 th)			N= _____		<input type="checkbox"/> not specified	

From 2010 on the questions were supplemented as follows:

Wild boar population			
Does wild boar occur in your hunting ground?		<input type="checkbox"/> no	<input type="checkbox"/> yes, as <input type="checkbox"/> resident game <input type="checkbox"/> frequent <input type="checkbox"/> rare transient
How high do you estimate the spring stock (basic stock before birth of piglets)?		N=	<input type="checkbox"/> not specified

In the years 2010, 2011, and 2012 some questions on hunting were in much more detail:

Your opinion matters!

Regionally high wild boar populations require regulatory measures. In order to avoid unpleasant measures threatened by the EU, we hunters must succeed in reducing the wild boar population. Therefore, your experience and opinion in dealing with wild boar are important to us in order to develop problem-solving approaches based on your opinion. For this reason, in the next few years we will be asking you about various topics concerning wild boar, which may well provoke controversial discussions.

Your answers will of course be treated strictly confidentially. Nevertheless, you have the option of leaving the further block of questions on wild boar unfilled, independently of the other questions.

I cannot/would not like to give any information on the questions concerning the opinion of wild boar ☐

When were wild boar confirmed/shot for the first time in your hunting area?				<input type="checkbox"/> „always there“											
before 1980	<input type="checkbox"/> confirmed <input type="checkbox"/> shot <input type="checkbox"/> unknown	1980- 1989	<input type="checkbox"/> confirmed <input type="checkbox"/> shot <input type="checkbox"/> unknown	1990- 1999	<input type="checkbox"/> confirmed <input type="checkbox"/> shot <input type="checkbox"/> unknown	after 2000	<input type="checkbox"/> confirmed <input type="checkbox"/> shot <input type="checkbox"/> unknown								
In which months do the wild boar mainly give birth in your hunting area?						<table border="1"> <tr> <td>April</td> <td>M</td> <td>J</td> <td>J</td> <td>A</td> <td>S</td> <td>O</td> <td>N</td> </tr> </table>		April	M	J	J	A	S	O	N
April	M	J	J	A	S	O	N								
<input type="checkbox"/> no occurrence/reproduction <input type="checkbox"/> unknown						(please tick, multiple answers possible)									

How many wild boar have been shot during which kind of hunt (own hunting ground in 2009/10)?			
N		N	
Hide at bait	_____	Drive hunt in own hunting ground	_____
Hide at damage within fields	_____	Comprehensive drive hunt (only N of shot in own HG)	_____
Accidentally during hide for other game	_____	Specific wild boar drives (e.g in small bushes)	_____
stalking	_____	During harvest (e.g corn)	_____
collective hide with several hunters in parallel	_____	Small game drive hunt	_____

How many wild boars did you shoot in which months in your hunting area?											
April	M	J	J	A	S	O	N	D	J	F	March

Do you allow shooting of wild boar on small game drives?	<input type="checkbox"/> only piglets	<input type="checkbox"/> only animals not leading piglets	<input type="checkbox"/> no
<input type="checkbox"/> we do not conduct small game drives	<input type="checkbox"/> yes	<input type="checkbox"/> any wild boar	
Are drive hunts in your hunting ground	<input type="checkbox"/> conductable	<input type="checkbox"/> not practical	?
Are comprehensive drive hunts	<input type="checkbox"/> conductable	<input type="checkbox"/> not practical	?

Do you conduct common hunts on wild boar?		<input type="checkbox"/> yes		<input type="checkbox"/> no																
<input style="width: 50px;" type="text"/> N hunts (hunting year Jagdjahr 2011/12)	hunt number <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">1</td></tr> <tr><td style="text-align: center;">2</td></tr> <tr><td style="text-align: center;">3</td></tr> <tr><td style="text-align: center;">4</td></tr> </table>	1	2	3	4	N hunters <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="height: 20px;"></td></tr> <tr><td style="height: 20px;"></td></tr> <tr><td style="height: 20px;"></td></tr> <tr><td style="height: 20px;"></td></tr> </table>					N beaters <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="height: 20px;"></td></tr> <tr><td style="height: 20px;"></td></tr> <tr><td style="height: 20px;"></td></tr> <tr><td style="height: 20px;"></td></tr> </table>					N dogs <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="height: 20px;"></td></tr> <tr><td style="height: 20px;"></td></tr> <tr><td style="height: 20px;"></td></tr> <tr><td style="height: 20px;"></td></tr> </table>				
1																				
2																				
3																				
4																				
How do you conduct common hunts? (multiple answers possible!)		<input type="checkbox"/> no answer																		
Procedure		Hunting party																		
Encircling and beating <input type="checkbox"/> thickets <input type="checkbox"/> with dogs <input type="checkbox"/> reed <input type="checkbox"/> no dogs <input type="checkbox"/> field copses Beating of cropfields <input type="checkbox"/> maize <input type="checkbox"/> with dogs <input type="checkbox"/> intertillage (e.g. charlock, radish) <input type="checkbox"/> no dogs <input type="checkbox"/> sunflower <input type="checkbox"/> others _____		<input type="checkbox"/> solely few friends and colleagues <input type="checkbox"/> incl. invited guests <input type="checkbox"/> incl. paying guests																		
<input type="checkbox"/> Poking (stirring hunt with low pressure, few calm beaters, dogs at heel) <input type="checkbox"/> Drive hunt with high pressure (loud beaters, barking dogs) <input type="checkbox"/> Rummage (only dogs roaming independently)		Stands (predominantly) <input type="checkbox"/> ground level <input type="checkbox"/> battue stands (<1,5m) <input type="checkbox"/> raised hide (>3m)																		
<input type="checkbox"/> Collective hide <div style="display: inline-block; vertical-align: middle;"> <input type="checkbox"/> dawn <input type="checkbox"/> dusk <input type="checkbox"/> moonlight </div> <div style="display: inline-block; vertical-align: middle; margin-left: 10px;"> <input type="checkbox"/> with stirring <input type="checkbox"/> without stirring </div>		Allowed munition <input type="checkbox"/> rifle, lead-free <input type="checkbox"/> rifle, leaded <input type="checkbox"/> shotgun slugs																		
		Organisation <input type="checkbox"/> solely own hunting ground <input type="checkbox"/> comprehensive with neighbours																		
What other game species are hunted?		<input type="checkbox"/> red deer	<input type="checkbox"/> roe deer	<input type="checkbox"/> predatory game																
		<input type="checkbox"/> fallow deer	<input type="checkbox"/> mouflon	<input type="checkbox"/> small game																
During these hunts wild boar is...		<input type="checkbox"/> main or target species.		<input type="checkbox"/> by-catch.																
What difficulties do you encounter in conducting driven hunts?		<input type="checkbox"/> not specified																		
<input type="checkbox"/> no difficulties <input type="checkbox"/> organisation of hunting event <input type="checkbox"/> building of stands <input type="checkbox"/> „Not worth the effort“ (low wild boar density) <input type="checkbox"/> bad shooting opportunities (e.g. lot of understorey)		<input type="checkbox"/> too few good shooters <input type="checkbox"/> to few good beating dogs <input type="checkbox"/> to few good trailing dogs <input type="checkbox"/> problems with cooling game meat <input type="checkbox"/> marketing problems																		

Do you bait wild boar in you hunting ground?	<input type="checkbox"/> yes	<input type="checkbox"/> no	_____ N baiting sites
Do you run diversionary feedings?	<input type="checkbox"/> yes	<input type="checkbox"/> no	_____ N feeding stations
Which bait do you use mainly? (only one possibility)	<input type="checkbox"/> maize <input type="checkbox"/> other crops	<input type="checkbox"/> grain <input type="checkbox"/> others	<input type="checkbox"/> acorn / horse chestnut
Which additional bait do you use? (multiple possibilities)	<input type="checkbox"/> maize <input type="checkbox"/> other crops	<input type="checkbox"/> grain <input type="checkbox"/> pellets	<input type="checkbox"/> acorn, / horse chestnut <input type="checkbox"/> anderes
How much bait do you use up per year?	_____ kg		

Supplemental Material
Explanation of hunting methods

Table S3: Explanation of hunting methods:

<ul style="list-style-type: none"> single hunt <ul style="list-style-type: none"> a. from a hide (raised stand) b. hiding within fields c. stalking d. accidental collective hiding drive hunts might be conducted: <ul style="list-style-type: none"> a. in own hunting ground solely b. comprehensive/simultaneously in several neighbouring hunting grounds 	solitary hunter with or without baiting (little amount of food just for baiting – not feeding) e.g. close to damages by chance during a single hunt on other game simultaneous organised single hunt from hides conducted with dogs and beaters to hunt on hoofed game within forest
with different “hunting pressure”: <ul style="list-style-type: none"> a. poking b. slow beating c. heavy drive hunts selective wild boar drives <ul style="list-style-type: none"> a. thickets b. groves c. reed d. intertillages e. other crops harvest small game drive hunts 	only dogs beating, without beaters only beaters without dogs, slowly walking heavy beating with dogs and beaters specific small drive hunts just searching for wb wild boar shot during harvest (hunters waiting at the edges outside harvested fields) by chance during a hunt on small game

Supplemental Material

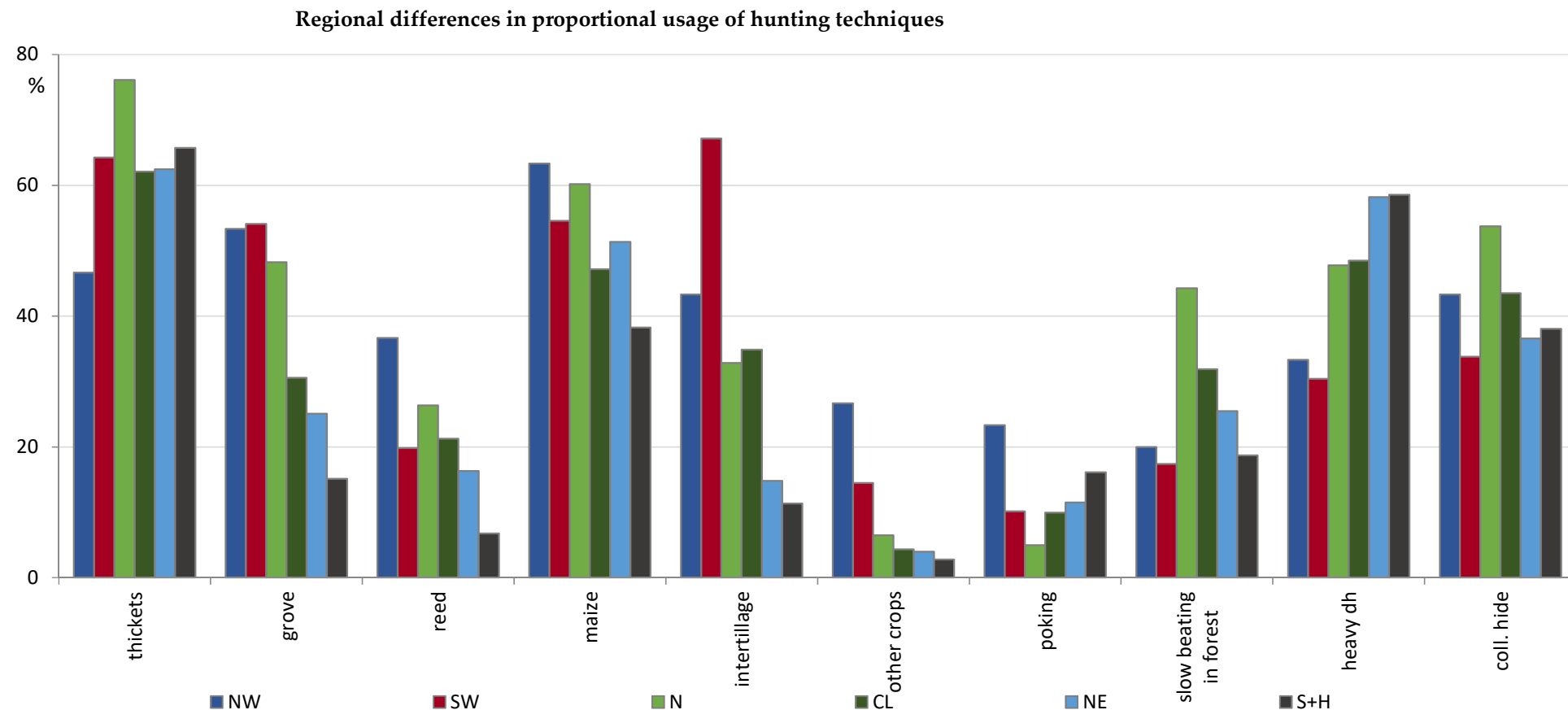


Figure S4: Percentages of hunting grounds conducting specific hunting methods on wild boar within the regions of Lower Saxony, dh = drive hunt, poking= just dogs - no beaters, N = North, S = South, W = West, E = East, CL = central Lowlands, H = Harz mountains, N total= 1,969, WTE 2012

Development of hunting bags in German federal states

Obvious are some stagnations of the increase of hunting bags. In the 1990th classical swine fever (CSF) was roaming in Germany as well as a second epidemics of CSF in the early 2000^s (Fig. SM5-1). Also after highest hunting bags in 2008/09. However, after these stagnations there was always a “jump” to new hunting bag records!

Trends for hunting bag statistics show that stagnations of the increase of hunting bags are just an intermediate pause, the trends are still exponential (Fig. SM5-2).

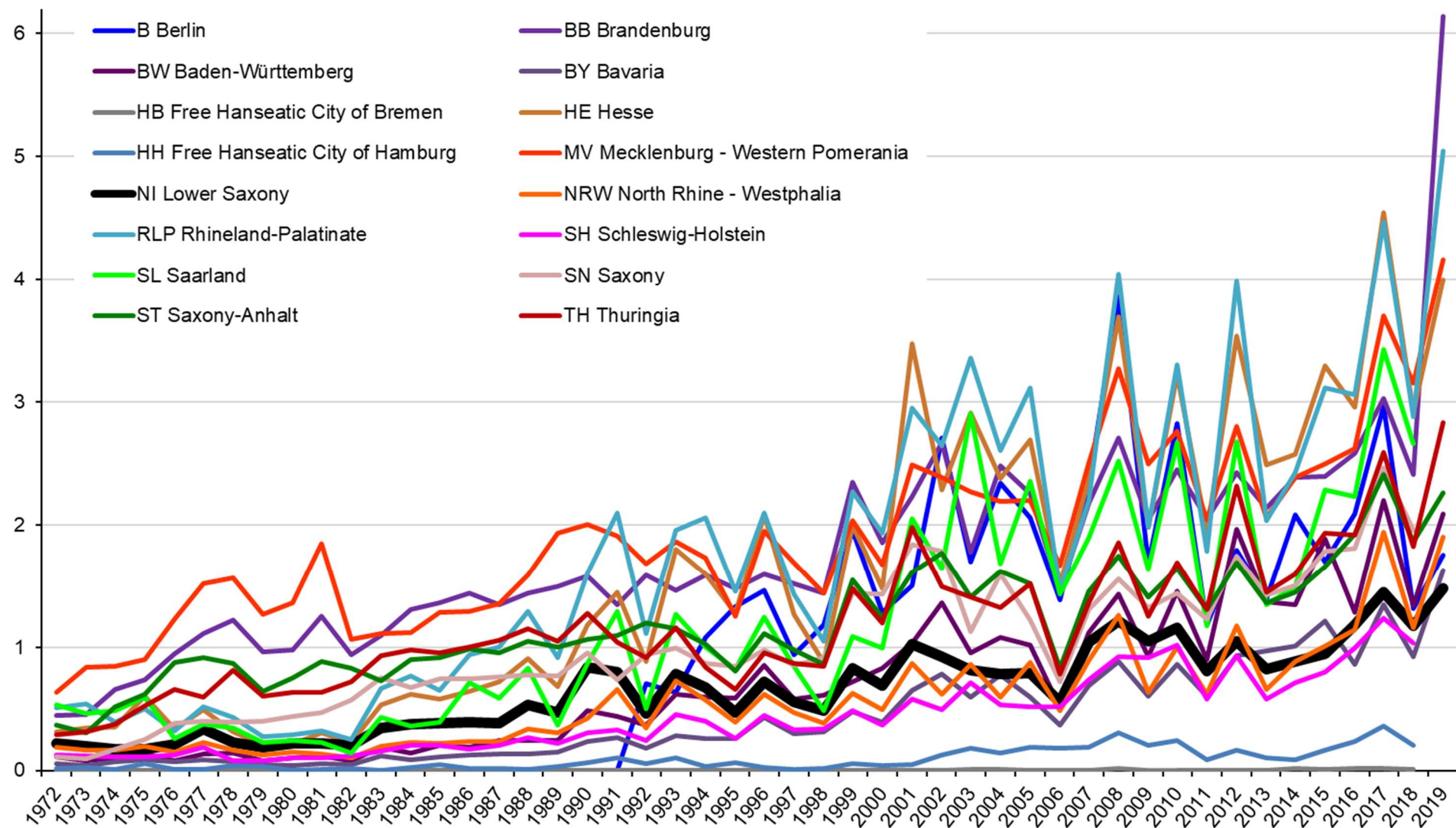


Figure S5-1: Official hunting bags statistics for the German Federal States from 1972/73 until 2019/20, expressed as HI (hunting index = shot/km²)

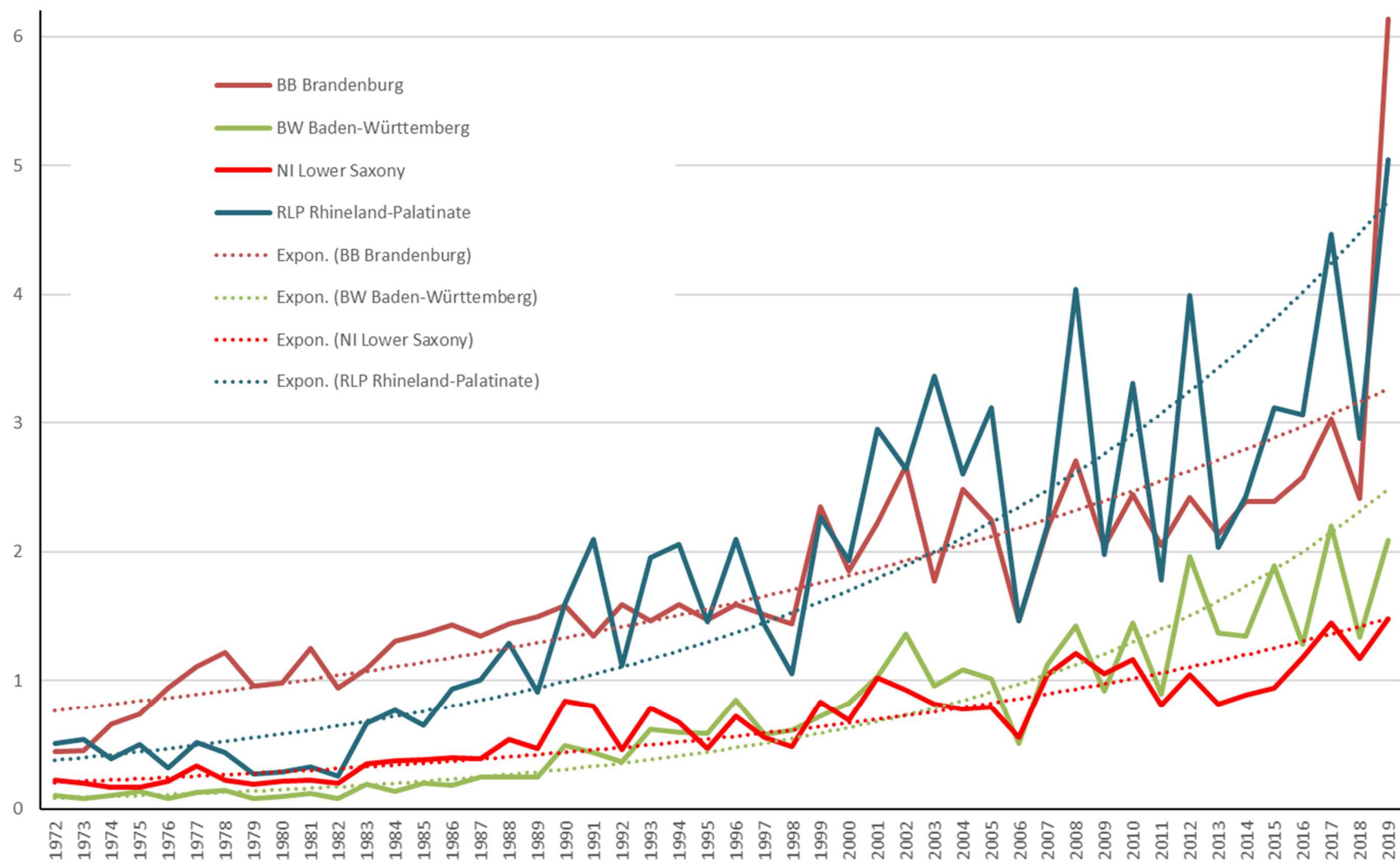


Figure S5-2: Official hunting bags statistics for the German Federal States from 1972/73 until 2019/20, expressed as HI (hunting index = shot/km²) for four federal states of Germany exemplarily.