Prey Selection and Feeding Behavior of Eurasian Lynx in South-Central Sweden

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Prey Selection and Feeding Behavior of Eurasian lynx in South-Central Sweden

Bytesval och födobeteende hos Eurasiskt lodjur i södra och centrala sverige

Julia van de Munt

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Abstract

Understanding prey choice and feeding behavior in large carnivores is essential for both ecology and wildlife management. Optimal foraging theory (OFT) predicts that predators should maximize energetic gain while minimizing the costs associated with search of prey as well as capture and consumption. This study investigated whether the feeding ecology of Eurasian lynx (Lynx lynx) in south-central Sweden reflects predictions from OFT by examining prey selection relative to prey availability, and by assessing the influence of wild boar (Sus scrofa) density on handling time and kill rate.

Predation data were collected from 13 GPS-collared lynx monitored between 2023-2025. Kill sites were identified through cluster analysis of GPS locations and prey remains were recorded during field visits. Prey selection were quantified using Jacobs index, while generalized mixed models and linear models were used to evaluate age-related differences in diet composition and the effects of wild boar density on feeding behavior.

Lynx showed a strong positive selection for roe deer (*Capreolus capreolus*) regardless of the availability of alternative ungulate prey. Contradictory to predictions, adult males did not consume a higher proportion of large ungulates than adult females. Subadult lynx consumed significantly more small prey such as hares (*Lepus europaeus*) and birds than adults. Wild boar density was positively associated with handling time, resulting in longer prey utilization periods. No relationship was found between wild boar density and lynx kill rate.

These findings support the hypothesis that roe deer represent the most profitable ungulate prey for lynx in south-central Sweden and suggest that prey choice is influenced by both prey characteristics and predator age. The unexpected positive relationship between wild boar density and handling time highlights the need for further research on how scavengers influence lynx feeding ecology.

Keywords: Eurasian lynx, *Lynx lynx,* feeding ecology, handling time, kill rate, Optimal Foraging Theory, prey selection, roe deer, wild boar

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Abbreviations

AIC	Akaike's Information Criterion
GMD	Game Management District (swe. *JVK - Jaktvårdskrets*)
ha	hectare
RMU	Red deer Management Unit (swe. *KSO - Kronhjortsskörselområde*)
ODM	Optimal Diet Model
OFT	Optimal Foraging Theory
SCB	Statistiska centralbyrån (eng. *Statistics Sweden*)

1. Introduction

In behavioral ecology, feeding behavior in animals is a common study topic. Why animals hunt and consume different food sources in the ways they do. Many of these questions can be examined within the framework provided by Optimal Foraging Theory (OFT). A central assumption is that animals attempt to develop foraging strategies that offer maximum benefit at minimum cost, thereby enhancing fitness (MacArthur & Pianka 1966; Charnov 1976a; b; King & Marshall 2022). MacArthur and Pianka (1966) laid the groundwork for the concept of OFT, which Charnov (1976a) later formalized as a theoretical framework. It has since then been expanded to incorporate additional costs beyond energetic expenditure. OFT includes sub-models that each address a different foraging decision, such as which patches to visit (MacArthur & Pianka 1966), how long to stay in one patch (Marginal value theorem) (Charnov 1976b), and which search paths to use (Pyke *et al*. 1977).

The Optimal Diet Model (ODM) is one of these sub-models, which specifically looks at prey choice. This model only assesses which prey an animal should include in their diet to maximize its energy intake. King & Marshall (2022) describe ODM as the mathematical formula E/h where E = energy gained and h = search-, subduction- and consumption time, constituting the cost. Foraging decisions are therefore expected to be influenced by both energetic returns and the time costs associated with locating and utilizing prey.

1.1 Factors shaping prey choice

Although ODM is often expressed mathematically as E/h (energy gained versus energy spent), the variables underlying this ratio emerge from a series of behavioral decisions made by predators during the foraging process. These decisions include which prey to attack, how much to invest in capturing and consuming it, and whether the energetic benefits outweigh the associated costs (MacArthur & Pianka 1966; King & Marshall 2022).

Prey size is one factor influencing energetic gain of the predator (King & Marshall 2022). Larger prey generally provide higher energetic returns, but may also entail greater costs associated with chasing, subduing and killing the prey, as well as increased risk of injuries (Sunquist & Sunquist 1989). Predators must therefore balance the potential benefits and costs when choosing prey. Within the framework of ODT, such trade-offs are expected to influence prey choice governed by the relative profitability of available prey (King & Marshall 2022).

Predator morphology and body size further constrains prey choice, as it determines the range of prey that can be efficiently captured and handled. Carbone *et al*. (1999) demonstrated a relationship between predator body mass and optimal prey size. They proposed that optimal prey size scales proportionally with predator body mass, where large carnivores (>22.5 kg) target prey above their own body mass and small ones (<22.5 kg) target prey below their own body mass. This framework can provide clear and quantitative expectations for prey choice that can be evaluated by comparing predicted optimal prey size with observed prey use. Previous studies have also shown that males of sexual dimorphic species more often target larger prey than solitary females, suggesting the cost might be different depending on both size and social status (Heurich *et al*. 2016).

Handling time represents the period during which a predator kills and consumes a prey and constitutes a cost realized after finding the prey (King & Marshall 2022). While larger prey may provide higher energetic returns, they typically require longer handling times, increasing exposure to various risks as well as energy loss. An extended handling time increases the likelihood of scavenger interference and disturbance, and therefore represents a cost within the ODM by increasing the risk of the predator being detected before consuming the prey (Duľa & Krofel 2020; Oliveira *et al*. 2025). When perceived risks or disturbance exceed expected energetic gain, predators may reduce consumption or abandon the kill entirely, resulting in a loss of both invested effort and potential energetic gain from the prey (Allen *et al*. 2021; Rabe *et al*. 2025). Such losses may be compensated by increased kill rates in order to meet energetic requirements (Krofel *et al*. 2012; Oliveira *et al*. 2025).

1.2 Ecological aspects modifying prey choice

Regardless of predator adaptations or hunting strategies, prey availability ultimately constrains prey choice since predators are limited to the prey species present in their environment which they are able to kill. Abundance of a suboptimal prey might influence predation on the otherwise selected prey species (Murdoch 1969; Oaten & Murdoch 1975; Charnov 1976a). For example, Sand *et al*. (2016) demonstrated that the proportion of roe deer in the diet of Scandinavian wolves increased with roe deer abundance, suggesting that prey choice might reflect relative availability rather than fixed preferences.

However, prey availability alone does not fully determine choice of prey, as predators also respond to variation in prey vulnerability and detectability (Heurich *et al*. 2016; Coon *et al*. 2020). Prey vulnerability can vary across seasons, age classes and behavioral states (Heurich *et al*. 2016). For instance, during fawning season there is a rapid increase in juvenile prey that have lower energetic value but are substantially easier to capture (Sunquist & Sunquist 1989; Johansson *et al*. 2025). As a result, such prey may be more profitable despite providing less energy per individual, as their reduced mobility and anti-predator behavior makes them more vulnerable to predation (Heurich *et al*. 2016; Reimer *et al*. 2019).

Prey may alter temporal activity and spatial distribution as a result of threats (Norum *et al.* 2015; Heurich *et al.* 2016; Makin *et al.* 2017). Further, prey use different anti-predator behaviors depending on the predator hunting them. For instance, according to Palmer & Packer (2021), increased vigilance is universal for prey when predator capture success is high. However, the study also showed that responses such as alarm-calling, grouping and time before flight initiation are dependent on predator hunting mode and prey preference, as well as prey social organization and habitat.

The prey behaviors mentioned may also affect a predator's ability to detect prey. As Heurich *et al.* (2016) discusses in their paper, prey in motion, as well as prey occurring in open landscapes are generally easier detected by predators relying on their vision when hunting. They also reason that in contrast, species inhabiting dense or forested areas are generally more difficult to locate, especially when inactive.

1.3 Ecological context of the lynx-prey system

The Eurasian Lynx (*Lynx lynx*) (hereafter referred to as lynx) is one of Sweden's native large carnivores and is continuously distributed all throughout the Swedish mainland (Frank & Brøseth 2025; Breitenmoser & Breitenmoser-Würsten 2026). It is a medium-sized felid, with males typically weighing 20-25 kg and females 14-20 kg (Sunde & Kvam 1997; SLU Artdatabanken 2026). Lynx are predominantly solitary, except during breeding season and when females have dependent young (Holmala *et al.* 2018; Aronsson *et al.* 2020). Hunting by stalking and ambushing, lynx in southern and central Sweden primarily prey on ungulates, hares and forest grouse (Odden *et al.* 2006; Gervasi *et al.* 2014; Andrén & Liberg 2015; Heurich *et al.* 2016), while lynx in the reindeer husbandry area mainly prey on reindeer (*Rangifer tarandus*) (Mattisson *et al.* 2011). Previous studies have specifically shown a high proportion of European roe deer (*Capreolus capreolus*) (hereafter referred to as roe deer) in the diet of lynx in central Sweden, to the extent that their population cycles have a dynamic interaction (Andrén & Liberg 2024). Lynx in south-central Sweden tend to seek refuge in densely vegetated forests and rocky terrain, but are also frequently found in agricultural lands due to higher prey abundance in those areas (Filla *et al.* 2017).

In Sweden, public attitudes towards lynx are mixed, with both positive and negative perceptions (Dressel *et al.* 2021). At the same time, the species is classified as "vulnerable" (SLU Artdatabanken 2026), highlighting the need for conservation and management. Hunting is an important recreational activity in Sweden, while roe deer can have impacts on forestry. Therefore, understanding the ecological relationship between lynx and their prey is important for informing management decisions. Such knowledge may contribute to sustainable management strategies that balance biodiversity conservation with the social and economic interests associated with hunting and forestry.

1.4 Objectives

The aim of this study was to assess whether feeding ecology of lynx in south-central Sweden reflects predictions from optimal foraging theory by examining prey choice and prey utilization patterns. Specifically, the study evaluates whether lynx select prey disproportionate to its local availability, and if wild boar (*Sus scrofa*) density is associated with a shorter handling time and kill rate.

To examine confirmatory tests of optimal foraging theory, the following prediction was made:

P1: Lynx will select roe deer disproportionally to their local availability, despite abundance of alternative prey, due to roe deer representing the most profitable prey.

To assess how demographic differences may influence foraging behavior, additional predictions were as follows:

P2: Male lynx will have a higher proportion of large ungulate prey (fallow deer (*Dama dama*) and red deer (*Cervus elaphus*)) in their diet compared to females, as their larger body size likely increase their ability to subdue large prey while reducing relative costs associated with handling.

P3: Subadult lynx will have a higher proportion of small prey such as hare and forest grouse in their diet relative to adults, reflecting limited hunting experience and efficiency as well as smaller body size, likely making large prey more difficult to capture and subdue.

To evaluate how interspecific competition may modify OFT predictions, the following predictions were made:

P4: Handling time at kill sites will be shorter in areas with high wild boar density due to wild boar interfering at kill sites, by for example disturbing the lynx or by stealing prey through kleptoparasitism.

P5: Kill rate will increase in response to high wild boar abundance, reflecting shorter handling time and reduced energy intake per kill due to interference competition.

2. Methods

2.1 Study area

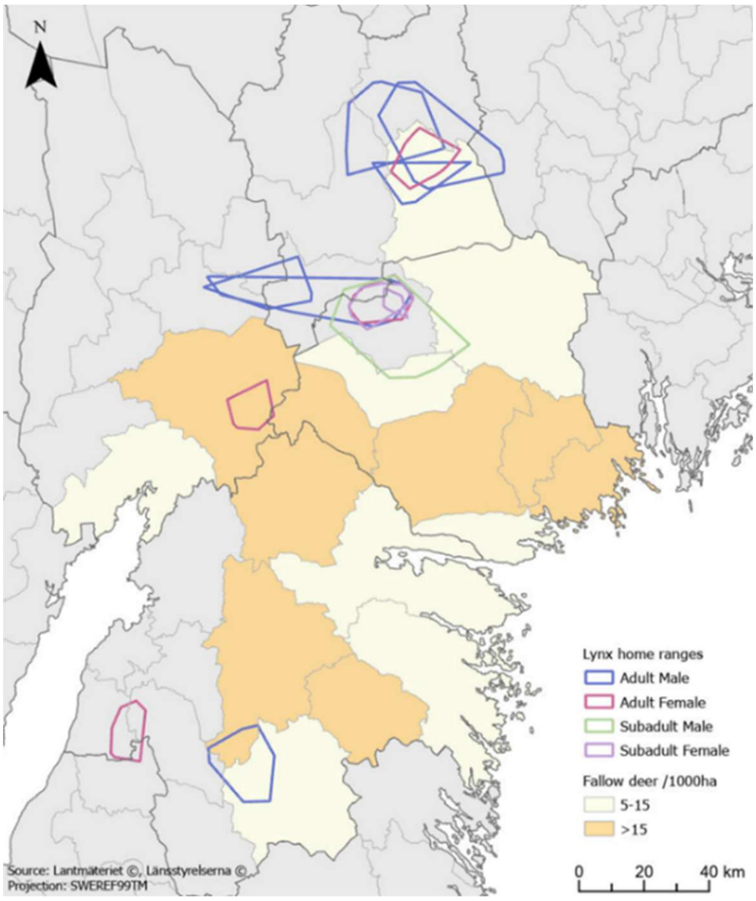

Figure 1. Illustration of areas with mid and high fallow deer density based on data from viltdata.se (Svenska jägareförbundet 2026). Yellow fields are mid density (5-15 harvests/1000 ha) and orange is high density (>15 harvests/1000 ha). Grey areas indicate a fallow deer density of <5 harvests /1000 ha and includes areas where fallow deer are absent. Polygons are lynx home ranges, based on kill sites. Blue = adult male, pink = adult female, green = subadult male and purple = subadult female.

The study was conducted in south-central Sweden (Figure 1). The study area was dominated by coniferous forest plantations (Norway spruce (*Picea abies*), Scots pine (*Pinus sylvestris*)) and agricultural land, with a smaller proportion of mixed forest with deciduous trees (Birch (*Betula sp.*), Aspen (*Populus tremula*) and Oak (*Quercus robur*)) (SCB 2023; SLU Riksskogstaxeringen 2026). This variation in habitat composition exists both across the study area as a whole and within individual lynx home ranges. Within lynx home ranges, different areas varied in their proximity to human settlements (SCB 2023). Some parts overlapped agricultural landscapes and infrastructure, while others were located in more remote forested areas.

Further, the study area consists of different management units and areas, with most species being inventoried by Game Management District (GMD), except for red deer being managed by Red Deer Management Units (RMU).

The potential ungulate prey species for lynx in the study area are roe deer (adult bucks post-rut 20-30 kg, does 17-20 kg), fallow deer (stags post-rut 50-80 kg, hinds 35-50 kg), and red deer (stags post-rut 110-220 kg, hinds 75-120 kg) (Wilson & Mittermeier 2011). In addition, wild boar, moose (*Alces alces*) and beaver (*Castor fiber*) are present in the area, which may be seen as possible prey for the lynx, although there are little research on the subject. The importance of wild boar as a scavenger is well-known however *(*Dul'a & Krofel 2020; Oliveira *et al*. 2025)

Smaller prey include mountain hare (*Lepus timidus*) (2.5 – 4.3 kg) and European hare (*Lepus europaeus*) (2.5 – 8 kg) (Angerbjörn & Flux 1995; Angerbjörn & Schai-Braun 2022; Hackländer 2022). In addition, forest grouse such as capercaillie (*Tetrao urogallus*), black grouse (*Lyrurus tetrix*) and hazel grouse (*Tetrastes bonasia*) occur in the lynx diet, however they are not seen as vital prey for the lynx in this area.

The differences in prey body size influence energetic profitability of prey and the costs associated with capturing and consuming them. In addition, prey species differ in their spatial distribution and abundance within the landscape, which may influence prey availability to lynx across different areas. According to data from viltdata.se (Svenska jägareförbundet 2026), roe deer were evenly distributed throughout the study area, whereas fallow deer and red deer showed a more clustered spatial distribution. Ungulate species also differ in their behavior and social organization; factors that can influence their vulnerability to predation (Appendix 1).

Furthermore, the main terrestrial scavengers in this habitat are wild boar, red fox (*Vulpes vulpes*) and badger (*Meles meles*). Of these, wild boar represent the largest and most competitive scavenger and are likely to cause substantial interference at kill sites by potentially altering handling time and kill rates (Dul'a & Krofel 2020; Oliveira *et al*. 2025).

2.2 Data collection

Predation data were collected as part of an ongoing research project on lynx in 2023 – 2025 over a total of four study periods (three during spring and one during fall). In total, 13 GPS-collared lynx were included in this study, of which 10 were adults and three subadults (Appendix 2). Two of them were studied during the fall season, one of which was also included in the spring period the same year. Individuals were classified as subadults in their second year (1-2) and adults once they reached two years age (≥2). During study periods, the GPS-collars were programmed to acquire a GPS-location every two-hours. This interval is generally enough to find large prey such as ungulates, while at the time enabling longer study periods before the battery drains (Kindschuh *et al.* 2016). Location data was transmitted via Iridium satellites or GSM-network to the Inventa wildlife monitoring app (Vectronic Aerospace Gmbh 2026) every 12 hours.

All procedures related to lynx capture, handling and collaring were conducted under approval from the Swedish Animal Ethics Committee, see Arnemo & Evans (2017) for details on capture methods.

2.2.1 Cluster analysis

GPS locations were exported from Inventa (Vectronic Aerospace Gmbh 2026) and analyzed to identify clusters using external applications such as "ClusterApp" (Märtz *et al.* 2024). The coordinates were then transferred to Garmin BaseCamp and from there to a handheld GPS-unit (Garmin GPSMAP 67).

A cluster was defined as ≥ 2 points within a 50 meter radius, recorded less than 96 hours apart (Knopff *et al.* 2009; Elbroch & Wittmer 2013; Svoboda *et al.* 2013; Tallian *et al.* 2017). Having a 50 m radius instead of a smaller one, as well as locations being acquired both day and night increases the certainty to find small prey as well (Kindschuh *et al.* 2016; Oliveira *et al.* 2023). Clusters consisting of two locations separated by more than 96 hours were classified as pseudo clusters and not visited in field.

Inventa was checked before visiting the site to make sure the lynx was not in the proximity. As long as the lynx's last known location was at the cluster, the visit was postponed until a new position was acquired. This was done to minimize the risk of disturbing the lynx, despite it resulting in the kill being more degraded by the time of visit. Additionally, to respect people living in the area, an open conversation was held with the landowner on why the area was visited if private land had to be entered.

Kill sites were defined as clusters where prey remains that matched the dates when the cluster was generated were found. This included sites with little remains left, such as only a few body parts, hair or feathers from the prey.

Carcasses were classified as "probably lynx killed", "confirmed lynx killed" or "unknown". As for the confirmed lynx kills, bite marks had to be visual, either on the outside or inside of the skin at the throat. Carcasses classified as "probably lynx killed" showed signs of lynx predation, such as only muscles and red organs ingested, intact ligaments or kill covered with vegetation, but throat bites were not found, in most cases because the neck was consumed (Vogt *et al.* 2024; Breitenmoser & Breitenmoser-Würsten 2026). Carcasses assessed as not killed by the lynx were classified as "Unknown" during the cluster visit and therefore not included in this project. This was primarily used when decomposition did not match cluster age.

Prey species were identified by the field worker. If remains were scarce, the prey could usually be identified through hairs and body parts such as hooves. In addition, trained dogs were used in field to more easily find prey remains. When needed, the identification was confirmed by a more experienced researcher.

For ungulate prey, sex was determined based on the presence or absence of antlers (Wilson & Mittermeier 2011), while age was assessed based on body size and dental characteristics according to Nilsson (n.d). If too few body parts were found to determine age or sex it was classified as unknown. For smaller animals such as hares, sex and age determination were not possible due to lack of identifying remains. Therefore, all hares were classified as adults and sex unknown.

2.3 Data analysis

To assess species availability (fallow deer, red deer, roe deer and wild boar) a proxy was used based on harvest reports from viltdata.se (Svenska jägareförbundet 2026), as well as management plans from county administrative boards. Units for these were Game Management Districts (GMD) for roe deer, fallow deer as well as wild boar, and Red deer Management Units (RMU) for red deer. The mean harvested animals/1000 hectare (ha) for each management area was calculated from hunting years 2022/2023 – 2024/2025 and was then added to shapefiles of the GMDs and RMU through joins ArcGIS Pro (3.6.2, Esri Inc. 2025). Since the species densities in the areas where prey had been captured were of interest, individual lynx home ranges were calculated from the locations of the focal lynx kill sites. This method was possible to apply to all lynx in the study, as opposed to if home ranges were to be calculated by all GPS locations for the specific study periods. Additionally, since only data from the study periods were obtained, differences in home ranges if based on all GPS positions would be negligible. Shape and size (ha) were estimated using Minimum bonding geometry in ArcGIS Pro (3.6.2, Esri Inc. 2025). Species density within each home range was calculated using the proportion of each overlapping GMD's and RMU's species density (Appendix 3).

2.4 Statistical analysis

All statistical analyses were conducted in Rstudio (R Core team 2025). Analyses were performed for each prediction separately based on the structure of response variable and ecological process of interest.

2.4.1 Prey selection and diet composition

To examine whether lynx selected ungulate prey disproportionately to its availability and whether this differed between sexes, prey selection was quantified using Jacobs index (D) (Jacobs 1974). The index ranges from -1 (complete avoidance) to +1 (complete selection), and was calculated as:

$$D = \frac{r - p}{r + p - 2rp}$$

where r represents the proportion of a prey species chosen, and p is the proportion of prey available in the environment (Jacobs 1974). In this study, r was estimated based on proportion of each ungulate prey species found during cluster visits for each lynx individual, while p was estimated from the prey availability proxy, based on roe deer, fallow deer and red deer densities within each lynx home range.

Jacobs index was calculated separately for each individual lynx as well as prey species. To assess general patterns of prey selection, index values were then summarized and compared across individuals, with lynx grouped by age (adults vs subadults) and sex (adult males vs adult females).

In addition, differences in diet composition between adult males and adult females were assessed by calculating the mean proportion of large ungulates (fallow deer and red deer) and medium-sized ungulates (roe deer) for each individual lynx. Differences between sexes were estimated using bootstrapping, where lynx IDs were resampled with replacement 1000 times to obtain confidence intervals for differences.

Lynx for which a given prey species was absent from the home range ($p = 0$) were excluded from calculations of Jacobs index for that species ($n = 2$), as selection relative to availability could not be defined. Instead, these cases were treated as missing data. In addition, one subadult lynx (ID 25-282) was not included in calculations of Jacobs index due to not killing any ungulate prey.

Prey choice for subadults and adults

To test whether subadult lynx have a higher proportion of small prey in their diet, prey species found during cluster visits were classified into categories "ungulates" (fallow deer, red deer, roe deer and moose) and "small animals" (bird, hare and beaver). A generalized linear mixed-effects model was fitted with prey category (ungulates vs small animals) as the response variable and lynx age (adult vs subadult) as a fixed effect. The model was fitted in Rstudio using the glmer function from the lme4 package (Bates *et al.* 2015). Lynx ID was included as a random effect to account for repeated observations because several kills originated from the same lynx individual.

Habitat was not included as a factor due to the assumption that relative access to the different prey types was broadly comparable within individual lynx home ranges, as well as some home ranges among individuals overlapping.

2.4.2 Wild boar effect on lynx feeding ecology

Due to missing data on date and time for GPS positions on the clusters, lynx from study period 2024 was not included in this analysis. The total individuals included in these analyses was 8.

Wild boar impact on handling time

To examine whether wild boar density influenced handling time on ungulate kill sites, handling time was defined as the time between first and last location on the clusters with a recorded kill (Dul'a & Krofel 2020; Tallian *et al*. 2022; Oliveira *et al*. 2025), representing the period of prey capture and consumption (King & Marshall 2022). Locations recorded prior to a kill event were excluded to ensure that handling time reflected post-capture behavior. To avoid including revisits to old kill sites after handling time of the prey was complete, only locations occurring within a maximum interval of 7 days (168 hours) were considered part of handling time of the specific prey. This threshold was chosen based on typical feeding durations and the rapid disturbance of carcasses due to scavenger activity. Prey were classified into categories "ungulate" (fallow deer, red deer, roe deer and moose) and "small animals" (bird, hare and beaver) to account for differences in handling time associated with prey size. Both a linear mixed-effects model and a linear model was fitted with log-transformed handling time (hours) as the response variable. The log transformation was applied to improve normality and reduce heteroscedasticity, as the data was right-skewed. Wild boar density and prey size category (ungulates vs small animals) were included as fixed effects, and Lynx ID was included as a random effect to account for repeated observations from the same individual. Function lmer and lm {lme4} (Bates *et al.* 2015) was used to fit the model in Rstudio. Both functions were tested with only factors, as well as with interactions and then tested by Akaike's Information Criterion (AIC) (Akaike 2025) to find the best supported model. One observation was excluded from the analysis due to an unrealistically high handling time (282 hours) that may have resulted from inaccurate documentation.

Wild boar impact on kill rate

Lastly, to evaluate the effect of wild boar density on lynx kill rate on ungulates, kill rate was defined as the number of killed ungulates per 30 days (Andrén & Liberg 2015) and for each lynx based on total number of ungulate kills recorded during its study period. A linear model was fitted with kill rate as the response variable and wild boar density as a fixed effect. The model was fitted in Rstudio using the lm function {lme4} (Bates *et al.* 2015).

3. Results

A total of 231 kill site clusters were included in the first analysis, of which 147 were ungulate kills. In the second analysis, 111 kill site clusters were included, of which 90 were ungulate kills.

3.1 Prey selection and diet composition

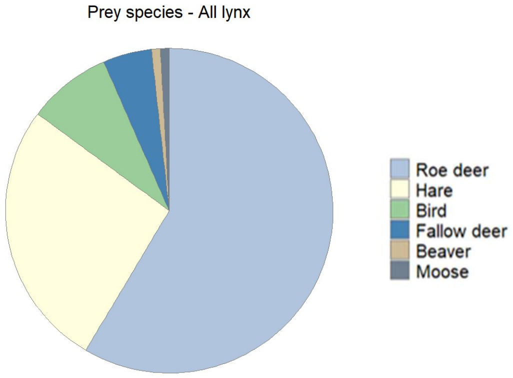

Figure 2. Overview over prey species killed by lynx (n = 13) in south-central Sweden during four study periods of predation during summer and fall, 2023-2025.

Jacobs index indicated a strong selection for roe deer across all individual lynx (mean = 0.926) and within all classes (Figure 2 & 3, Appendix 4). Fallow deer were consistently avoided (mean = -0.869), although avoidance was less pronounced in adult females (mean = -0.574). Red deer were not targeted by any of the lynx in this study, with all individuals having D = -1 for this species.

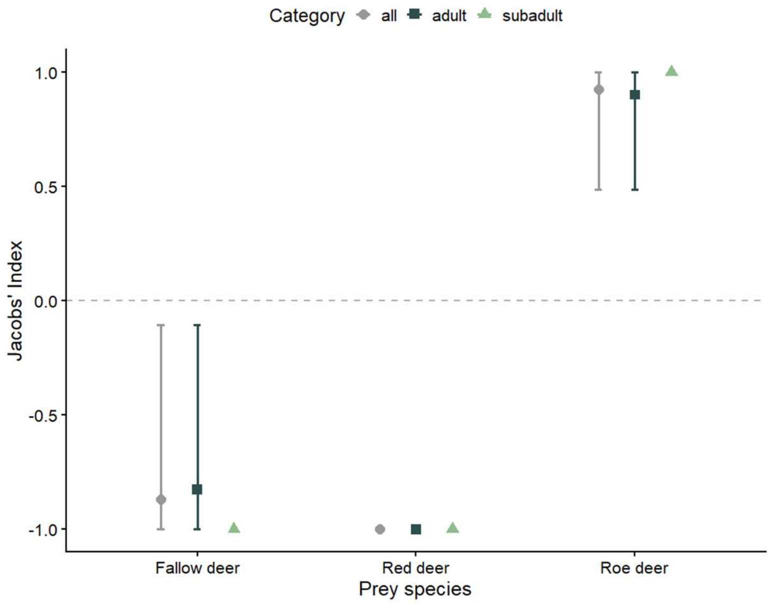

Figure 3. Jacobs index for lynx studied (n=13) in south-central Sweden during the years 2023-2025, as well as adults (n=10) and subadults (n=2) separately. Points represent means, and bars indicate maximum and minimum values.

The mean proportion of large ungulate prey was 0.25 lower in adult males than in adult females (mean males = 0.08, mean females = 0.33, 95% CI: -0.500 – 0.0833) (Figure 4), indicating that the males in this study consumed on average 25 percentage points less large ungulate prey than the females. However, as the confidence interval included zero, there is no evidence of a difference between the sexes.

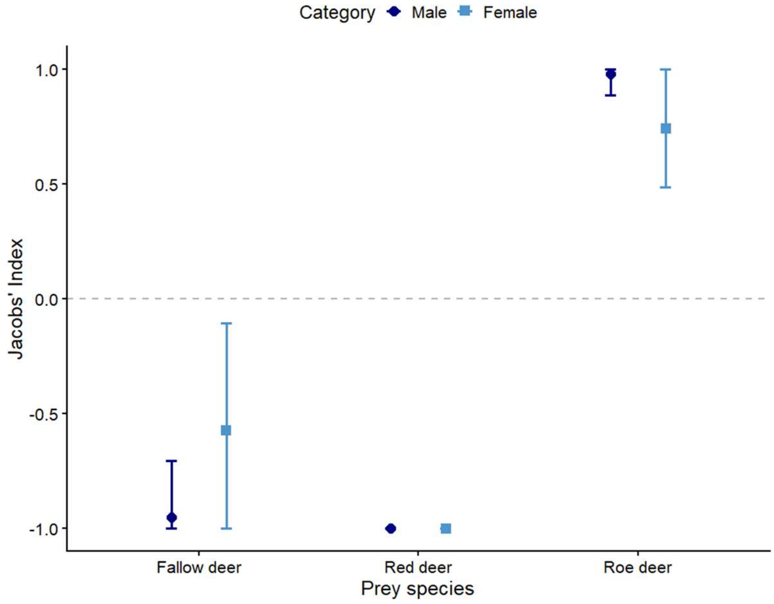

Figure 5. Jacobs index for adult male lynx (n=6) and adult female lynx (n=4) studied in south-central Sweden during the years 2023-2025. Points represent means, and bars indicate maximum and minimum values.

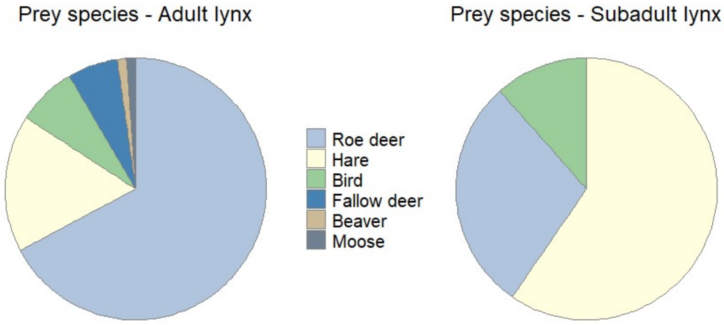

Figure 4. Overview over prey in adult lynx (n = 10) versus subadult lynx (n = 3) diets in south-central Sweden during four study periods of predation during summer and fall, 2023-2025

Subadults had a majority of hares in their diet (Figure 5), and the generalized linear mixed model showed that subadult lynx had a significantly higher proportion of small prey in their diet than adult lynx ($\beta = 2.88 \pm 0.81$ SE, $z = 3.54$, $p = 4.07 \times 10^{-4}$) (Figure 6). The proportion of small prey in diets were approximately 18 times higher for subadult lynx than for adults.

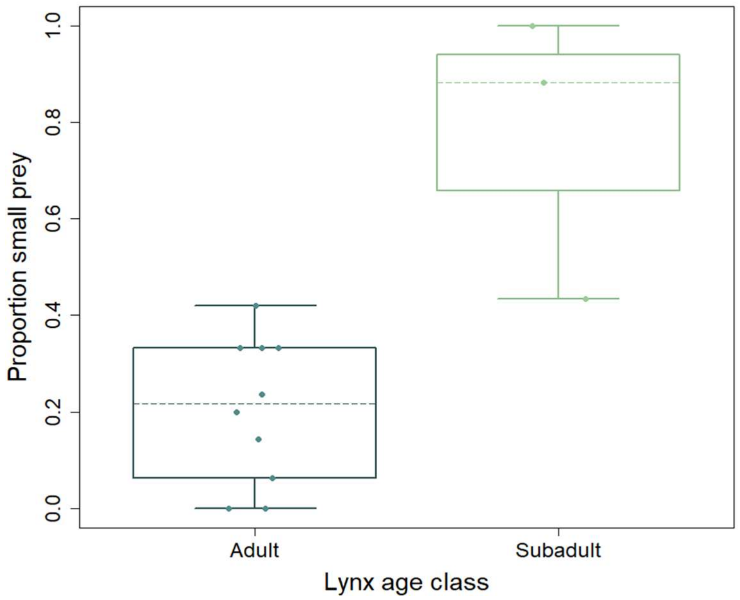

Figure 6. Proportion small prey in diet of adult (n=10) and subadult lynx (n=3) studied in south-central Sweden during the years 2023-2025. Dotted horizontal line represents mean, and bars are max and min value

3.2 Wild boar impact – external factors affecting feeding ecology

The variance associated with Lynx ID was estimated as zero, indicating no detectable differences in handling time among the eight individuals included. Thus, the linear mixed-effects models and standard linear models returned identical estimates, and the simpler linear model was therefore chosen for conclusions. Model comparison based on AIC identified the model including wild boar and prey size as the best-supported model (AIC = 317.9). Including the interaction between the two variables did not improve model fit (AIC = 319.9).

Results showed an increase in handling time with wild boar density ($\beta = 0.084 \pm 0.03$ SE, $p = 0.006$), which corresponds to an approximate 8.8% increase in handling time with every one-unit increase in wild boar density (Figure 7). Handling time was also significantly longer for ungulate prey than for small prey.

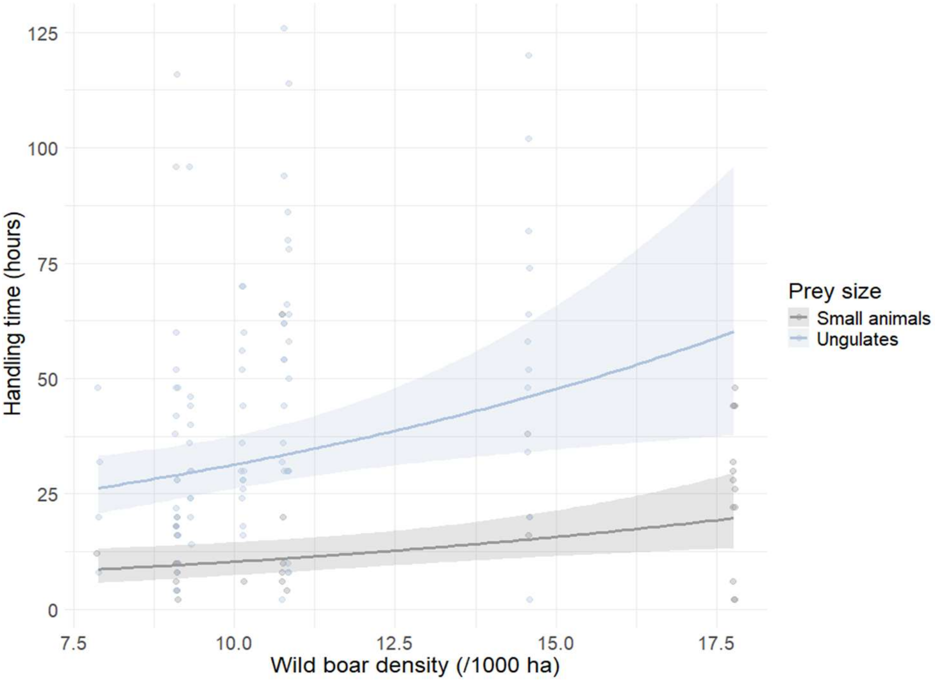

Figure 7. Wild boar effect on handling time of lynx in south-central Sweden during three study periods in years 2023 & 2025, where the points represent handling time for each kill. Wild boar density is the proxy of harvested animals /1000 ha in the lynx's home range.

The linear model showed no relationship between wild boar density and kill rate (β = -0.087 ± 0.22 SE, *p* = 0.706) (Figure 8), with only a minor proportion of variation explained in kill rate (R^2 = 0.025).

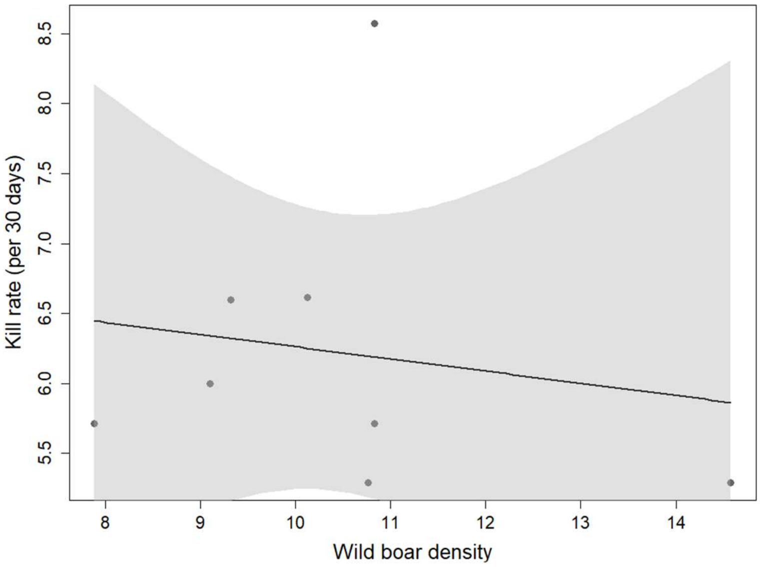

Figure 8. Wild boar density effect on lynx kill rate (ungulate kills per 30 days) in south-central Sweden during three study periods in years 2023 & 2025, where points represent individual lynx's kill rate, and the grey area CI. Wild boar density is the proxy of harvested animals /1000 ha in the lynx's home range.

4. Discussion

The results in this study showed no interaction between availability and ungulate prey choice in lynx, suggesting lynx choose roe deer regardless of abundance of other ungulate species. These findings support the first prediction and suggest that roe deer represent the most profitable prey in the study system, although several ecological explanations may underlie this pattern.

4.1 Application of optimal diet model on lynx in south-central Sweden

4.1.1 The costs of finding the prey

As long as roe deer are present in high enough densities, the density of alternative prey does not seem to influence ungulate prey choice in lynx. Another factor is prey ecology, which affect which prey are available for the lynx in a specific area (Wilson & Mittermeier 2011). For instance, in this study system roe deer live mainly solitary while fallow deer are group living. This could affect the lynx's hunting success and cause them to target roe deer despite fallow deer being more abundant since it may be more challenging for a lynx to ambush a prey within a larger group, due to a higher number of animals in the same spot being vigilant.

Differences in selection for fallow deer between adult lynx

On average, male lynx had a 25 percent points lower proportion of large ungulate prey (fallow deer) in their diet than females, however the difference was not statistically significant. Three out of 13 lynx (two females and one male) in this study predated on fallow deer. These three lynx were distributed in different regions of the study area, all of which had different fallow deer densities (one high, one medium and one low). Despite overlapping home ranges for two of these lynx (medium and low fallow deer density), other individuals in the same areas did not kill any fallow deer.

The males deviated little in their prey selection. Due to their larger body size, OFT would suggest they can handle roe deer more efficiently, possibly reinforcing specialization on that class of prey. However, the females had a greater variation in ungulate prey choice, with a few individuals showing lower avoidance of fallow deer. This suggests females might be operating with a broader prey choice. OFT further predicts that diet breadth should expand when preferred prey becomes less available (Charnov 1976a). If roe deer availability is the same for both sexes within the same landscape, availability alone cannot explain the difference. Instead, individual differences and specialization might affect prey choice more than both prey density and lynx social status, which may explain why prediction two was not supported.

Only one of the lynx included in this study, an adult female (ID 25-291), was resident in an area densely populated by fallow deer. High fallow deer abundance may reduce roe deer abundance due to competition (Ferretti & Mori 2020). The larger group size of fallow deer might thus result in competitive displacement of roe deer from such areas. Despite this, 50% of lynx (25-291) total kills consisted of roe deer (the other 50% being fallow deer). This possibly affected the result of the analysis regarding differences in prey choice between adult males and adult females. The relatively small sample size of lynx may cause individual differences to influence the results in prey choice to a larger extent.

In addition, seasonal differences may have an effect on prey choice (Sunquist & Sunquist 1989; Johansson *et al.* 2025). In this study, one male lynx caught two moose calves during calving season. Furthermore, a majority of the fallow deer killed were classified as juveniles in field. This might suggest lynx targeting the most vulnerable individuals within a species, enabling the lynx to utilize a species of which the adult counterpart would carry a too high risk (Heurich *et al.* 2016). When subduing an adult fallow deer, the lynx has to put in more effort than when subduing a juvenile of the same species. In turn, this might lead to a higher risk of injury in regards to the prolonged time of the catch itself, possibly tiring the lynx to a higher extent or increasing risk of injury from the habitat around (Heurich *et al.* 2016).

4.1.2 The cost of subduing the kill

In the seminal paper by Carbone *et al.* (1999), a threshold in predator body mass was proposed at approximately 22.5 kg. According to their model, predators below this threshold primarily consume prey weighing <0.45× predator body mass, whereas predators above used prey averaging 1.19× predator body mass. The analysis included predators of various taxa, social organization, as well as omnivores and obligate carnivores.

If focusing on solitary felids, research have shown that they generally target prey below their own body mass (Sunquist & Sunquist 1989). A similar pattern has been observed in leopards (*Panthera pardus*), cheetahs (*Acinonyx jubatus*) and tigers (*Panthera tigris*)(Hayward *et al.* 2006a; b; 2012). Thus, none of these felid species follow the reasoning of Carbone *et al.* (1999) regarding large carnivores and omnivores (>22.5 kg).

Adult lynx in this study weighed on average 18.8 kg (males 20 kg, females 16.4 kg), placing them below the threshold proposed by Carbone *et al.* (1999) and are therefore expected to choose prey weighing < 9 kg. Calculating roe deer mass as a function of adult lynx weight, the mean proportion is 1.3× predator mass (0.85 – 1.8 depending on both lynx and prey sex) despite being under the threshold, thus contradicting the proposition of Carbone *et al.* (1999). However, weight of the actual kills made by the lynx is hard to estimate, and therefore they could be closer to the ratio of 1.19× than expected (optimal prey mass being 19.5 kg – 23.8 kg).

Lynx fall on the threshold of small versus large carnivores, leaning slightly toward the smaller end of the spectrum. Other lynx subspecies reflect this, with both Iberian lynx (*Lynx pardinus*) and Canada lynx (*Lynx canadensis*) targeting small prey such as rabbits (*Oryctolagus cuniculus*) and hares (*Lepus americanus*), respectively (Relimpio *et al.* 2025; Crowley *et al.* 2026). Yet the lynx in Sweden and other parts of Europe still behave as a large felid in regard to prey choice, generally catching prey that weighs more relative to their own body weight than other felids. This is similar to snow leopards (*Panthera uncia*) (Johansson *et al.* 2015) as well as pumas (*Puma concolor*) in certain areas (Bates-Mundell *et al.* 2024). This might be a result of available prey for the felids mentioned. The latter study found that pumas select for smaller ungulate prey if both large and small are available, a pattern that is similar to lynx in Sweden.

4.1.3 The cost of utilization

Lynx generally don’t target larger prey than roe deer (fallow deer and red deer) even though available, which could be that there is little or no gain compared to roe deer due to the lynx not being able to utilize the extra energy before the meat starts to rot. Lynx in northern Sweden kill reindeer (adult bulls 65-170 kg adult females 55-110 kg) (Mattisson *et al.* 2011), which shows that lynx have the ability to kill prey even larger than fallow deer. To understand why that is, it is vital to know the ecosystems in which a predator lives. In northern Sweden, prey are scarce and the alternative prey are smaller mammals and birds (Mattisson *et al.* 2011). The colder climate might enable a cached prey to stay fresh for longer, which in addition to scavengers being less abundant, might enable complete utilization of the kill. On the other hand, in southern and central Sweden, caching availabilities might be less available, both due to habitat and warmer climate, leading to faster decomposition.

The habitat can have an impact on a lynx’s opportunity to cover their prey. If the prey was killed in agricultural land, available biomaterial to cover the prey is scarce. On the other hand, if the carcass occurs in a forest, there are a larger possibility of covering it. Teurlings *et al.* (2020) showed that covered remains were less visited by scavengers. However, wild boar mainly relies on scent and therefore it is probably difficult for the lynx to prevent them completely from finding the kills.

Even though this study did not show a decrease in handling time with wild boar abundance, previous studies have. This indicates that the higher wild boar density might drive lynx to utilize a prey faster (Duľa & Krofel 2020; Oliveira *et al.* 2025). Lynx may consume prey more cautiously in areas with high wild boar density, as a response of risk perception. They may eat the most profitable parts (highest energy content) of the prey first, as well as leave and return more frequently and for longer periods to minimize risk of encountering wild boar. In turn, for a lynx to utilize a fallow deer quickly might be difficult, as the lynx only can eat so much at a time strictly physiologically. This reasoning is shared with Krofel *et al.* (2012). If not able to consume prey completely, the cost of subduing it will be too high for the lynx to outweigh the benefit. This is supported by Krebs (1978), who states: ”Predators should (i) prefer more profitable prey, (ii) be more selective when profitable prey are common, (iii) ignore unprofitable prey which are outside the optimal set regardless of how common they are”.

In south-central Sweden, where both large as well as small ungulates are abundant, lynx generally choose roe deer. This choice is most likely a result of utilization possibilities, indicating that roe deer are more profitable than other ungulate prey.

4.1.4 Why not smaller prey?

If lynx would target only small mammals and birds, they might have to hunt more frequently to meet their energetic requirements. It would also imply a high enough abundance of these prey species. If the prey density is low, the lynx’s search time would be extended, leading to a higher cost (King & Marshall 2022). This would then increase the need for energetic benefit of that specific prey even more, something that is impossible due to the animals’ small body size. Therefore, the cost might outweigh the benefit of only hunting small prey species.

The higher proportion of small prey in the diet of subadult lynx may reflect both biological differences as well as methodological factors. Small prey is likely a more significant energetic source for subadults than for adults, causing the subadult to use more time for each small prey and thus generating a GPS cluster consisting of more locations. On the contrary, small prey killed by adults represent a relatively minor food, causing the lynx to possibly abandon the kill faster. Therefore, some small prey of adult lynx might have been missed in field because the lynx did not spend enough time at the kill to generate a cluster. The differences in prey choice between adults and subadults is however so large that methodology cannot explain all of it.

Since the density of small prey is expected to be similar among different home ranges, the observed difference in diet composition is unlikely to be driven by availability only. For instance, in one region of the study area, two subadult lynx’s home ranges overlapped with those of adult lynx’s (Figure 1). Here, availability of prey species was similar for all lynx, even so, the proportion of small prey in the diets varied between age classes.

As opposed to adult lynx, subadults (mean weight in this study 11.2 kg) follow the formulae of Carbone *et al.* (1999) regarding small predators since it indicates their optimal prey size is less than 5 kg. This is a weight similar to that of hares and forest grouse (see section 2.1), which is also reflected in the results of proportion small prey in subadult lynx diet. In addition to size, this may also be a result of their lacking hunting experience. Data from this study showed that when subadult lynx have taken their first roe deer, they will continue to do so, indicating experience is the main factor keeping them from successfully subduing ungulates. Together, these findings support prediction three, suggesting that both body size and hunting experience influence prey choice in subadult lynx.

In summary, based on the theory that an animal should select for a prey that maximizes benefit while minimizing costs, ODM would support roe deer as the optimal prey for lynx in this study area. Roe deer are large enough to provide substantial energy, while being small enough for a lynx to subdue, as well as utilize without increasing the risk of disturbance from other species.

4.2 Influence of wild boar on handling time and kill rate

Contradictory to both the fourth prediction as well as previous studies, the results in this study showed an increase in handling time with wild boar density. The difference compared to previous studies could stem from contrasting methods and study areas. For instance, while Dul’a & Krofel (2020) used a proxy of wild boar shot per km2 in addition to presence based on camera traps, while Oliveira *et al.* (2025) only used camera traps. On the one hand, camera traps gives a good estimation of whether wild boar has been present on the kill site or not. On the other hand, due to risk of disturbing the animal, the researchers waited for a couple of days before putting up the cameras. Even with the delay, chances are that they disturbed the lynx when visiting the kill, causing the handling time to be affected by them, and not only by the wild boar. As Oliveira *et al.* (2025) stated in their study, seasons within the year might affect wild boar impact on handling time (increasing by 0.5 days over different seasons). According to their study, seasonal changes had a larger impact on kill rate, with it increasing in early summer, specifically for females with kittens. During early summer, prey may be more abundant, as well as more vulnerable due to fawning season, which may cause lynx to abandon kills more easily following disturbances. In this study, only one individual was studied over two seasons, making it impossible to identify variations. Further, in the article by Dul’a & Krofel (2020) the roe deer were classified as naïve prey (i.e. easy to subdue), and yet the handling time decreased with wild boar density.

An explanation for the increased handling time in this study could be if the lynx revisited the cluster after the prey was consumed by wild boar. This would cause the handling time to be miscalculated and include time that was not part of the actual handling time. However, Dul’a & Krofel (2020) used the same definition of handling time and still got the opposite result.

The absence of evidence for wild boar density affecting kill rate in lynx in this study indicates that the fifth prediction was not supported, although this might be a result of a too small sample size. It could also be because lynx do not have to compensate for an eventual loss of prey to wild boar. This may be due to prey being abundant, or that the prey is of such a size that the lynx are able to utilize enough of the prey even when losing part of it. If the lynx were to be continuously disturbed directly after killing a prey, the kill rate might however increase.

4.3 Implications for future research

An important factor to consider is that harvest statistics is ultimately a reflection of hunting effort. GMDs with low wild boar density proxy may be underestimated due to low hunting pressure. Using this data for analysis might therefore give a false positive, where wild boar density impact on handling time and kill rate would be lower if density estimates were more cohesive.

Further, it is possible that the effect on handling time is due to the hunting itself rather than the wild boar. Hunting is permitted for both roe deer and wild boar during the study season (Jaktförordningen, SFS 1087:905, Appendix 1, points 8 and 11), and a high wild boar proxy might therefore indicate higher disruption from the hunt itself.

In addition, harvest statistics is a general proxy and does not capture density differences on a micro-habitat level. For future research it would therefore be beneficial to look at a smaller scale, measuring wild boar density in the area surrounding the actual kill site. Moreover, habitat at kill site can be included in that analysis, comparing differences in handling time for open landscapes versus closed.

Another aim of future studies could also be to look at prey choice and handling time over different seasons since this would give a more comprehensive understanding of how lynx select for prey when individuals of different age classes are available. This would enable us to further distinguish between choices based on prey ecology as opposed to species' sizes. Additionally, a seasonal perspective would widen our insight into both scavenger impact as well as influence of hunting on lynx feeding ecology.

Lastly, other sub-models within OFT might be applied to further investigate differences in prey choice between adult males and adult females. For instance, one may incorporate state-dependent foraging to examine how internal states of the lynx affect prey choice (Houston & McNamara 2014). Central-place foraging would also be a relevant theory to incorporate in future studies, as it implies feeding behavior in animals hunting before returning to a fixed place (Higginson & Houston 2015). This would be relevant when studying feeding behavior in denning female lynx.

5. Conclusion

This study examined whether the feeding ecology of Eurasian lynx in south-central Sweden reflects predictions from Optimal Foraging Theory by investigating prey selection relative to prey availability and the influence of wild boar density on handling time and kill rate. Overall, the findings provide partial support for the theory. Lynx consistently selected roe deer despite the presence of alternative ungulate prey, indicating that prey profitability rather than prey availability is the primary determinant of prey choice. In addition, subadult lynx consumed a greater proportion of small prey than adults, suggesting that age and hunting experience influence foraging behavior. In contrast, there was no evidence that adult males consumed a higher proportion of large ungulate prey than females.

Contrary to the original predictions, higher wild boar density was associated with longer handling times rather than shorter ones, while no relationship was found between wild boar density and lynx kill rate. These findings indicate that interactions between lynx and competitive scavengers such as wild boar are more complex than expected and may not always lead to reduced prey utilization or compensatory increases in predation.

This study contributes to our understanding of prey selection and feeding behavior in lynx while also highlighting the importance of considering interactions between predators, prey and scavengers when studying lynx predation. Such knowledge provides a stronger scientific basis for management and may contribute to more informed discussions regarding lynx conservation.

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Popular science summary

The Eurasian lynx in south-central Sweden is known for selecting roe deer as their main prey, but why is not yet examined. Nor have the effect of scavengers on lynx feeding behavior been studied. These factors are important to know to be able to manage lynx in a way that is sustainable in both the perspective of biodiversity and society.

The aim of this study was therefore to investigate the underlying processes of prey choice for lynx in south-central Sweden, and to examine if wild boar affects lynx´s utilization of prey.

The study used GPS locations from 13 lynx of different sex and age from the years 2023-2025 to examine factors affecting prey choice and how much time a lynx spends at the site after killing a prey (handling time). Kills from the lynx were identified in field, and proxies of available prey were estimated based on hunting statistics recorded by Game Management Districts (swe. *Jaktvårdskrets*) and Red deer Management Units (swe. *Kronhjortsskörselområde*). Statistical models were used to evaluate prey selection by comparing prey used to prey available. In addition, prey choice in adult versus subadults were examined by comparing proportions small (hares and birds) and large (ungulates) prey for the two age classes. Lastly, to examine to what extent wild boar affect lynx handling time and how often they kill larger prey (kill rate), statistical models including wild boar density were analyzed.

The results showed that all lynx select roe deer disproportionately to what is available to them, suggesting they constitute the optimal prey for lynx in this study area. There were no significant differences between male and female lynx, except a few individual variations. Furthermore, results showed that the subadult lynx in this study had an approximately 18 times higher proportion small prey in their diet compared to adults. This suggests that small prey are more easy to subdue, especially when the lynx hunting experience and efficiency is low.

Lastly, contradictory to previous studies, handling time increased with wild boar density, but there was no effect on kill rate. At the moment, there is no simple explanation for this result, but underline the need for further research on the question. Since hunting statistics is directly affected by hunting pressure, these results might however indicate that it is the hunting itself that affect lynx handling time, rather than wild boar density.

The knowledge gained in this study can contribute to more informed management of lynx and their prey and provides a foundation for future studies of interactions between predators and scavengers.

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Appendix 1

Appendix 1. Description of the possible ungulate prey species for lynx in south-central Sweden (Wilson & Mittermeier 2011).

	Roe deer	**Fallow deer**	**Red deer**
Distribution	Evenly over Sweden	Spatially over south and central Sweden	Unevenly over Sweden
Habitat	Productive areas, agricultural land, dense forest	Broadleaved woodlands, open landscape	Deciduous forest interspersed with large fields
Social organization	Solitary or in small groups	Stags: Solitary Hinds: family groups Gather in large herds during rut	Stags: solitary Hinds: matrilineal family groups Stags have harems during rut
Behavior	Highly vigilant, decreasing after sundown	Adjust activity in response to disturbance, increased activity when disturbance is high	Crepuscular activity that increases with disturbance

Appendix 2

Appendix 2. Studied Lynx, where comment is relations to another lynx

Lynx ID	Sex	Age class	Comment
21-263	Male	Adult	
23-273	Male	Adult	
23-274	Male	Adult	
24-275	Female	Adult	Mother of 24-276 and 24-277
24-276	Male	Subadult	Sibling with 24-277, offspring of 24-275
24-277	Female	Subadult	Sibling with 24-276, offspring of 24-275
24-279	Male	Adult	
24-280	Female	Adult	
24-282	Female	Subadult	Daughter of 24-275
25-285	Male	Adult	
25-289	Male	Adult	
25-290	Female	Adult	
25-291	Female	Adult	Lost her litter in May 2025

Appendix 3

Appendix 3a. Lynx home range overlaps with Game Management Districts, where Mean density /1000 ha is the mean harvest for the whole management area (Svenska jägareförbundet 2026)

			Mean density /1000 ha		
Lynx ID	**Game Management District**	**Overlap**	**Roe deer**	**Fallow deer**	**Wild boar**
21-263	Rekarne	0.34	7.73	4.7	17.70
	Arboga - Kungsör	0.57	6.73	6.42	19.07
	Örebro	0.04	4.26	3.15	8.17
	Fellingsbro Näsby	0.05	4.27	0.37	12.80
	Total in lynx home range		**6.85**	**5.40**	**17.80**
23-273	Salaorten	0.45	5.23	0.00	6.83
	Västerås	0.28	7.57	8.84	10.83
	Köping-Hallstahammar	0.27	3.7	0.003	6.57
	Total in lynx home range		**5.47**	**2.48**	**7.89**
23-274	Västerås	1.00	7.57	8.84	10.83
	Total in lynx home range		**7.57**	**8.84**	**10.83**
24-275	Rekarne	0.79	7.73	4.7	17.70
	Arboga - Kungsör	0.21	6.73	6.42	19.07
	Total in lynx home range		**7.52**	**5.06**	**17.98**
24-276	Arboga - Kungsör	0.01	6.73	6.42	19.07
	Norra Sörmland	0.02	6.97	5.5	12.50
	Rekarne	0.87	7.73	4.7	17.70
	VFO 7 Södermanland	0.10	8.93	13.1	12.37
	Total in lynx home range		**7.82**	**5.57**	**17.05**
24-277	Rekarne	0.70	7.73	4.7	17.70
	Arboga - Kungsör	0.30	6.73	6.42	19.07
	Total in lynx home range		**7.43**	**5.22**	**18.11**
24-279	Linköping	0.33	7.97	24.1	11.57
	Kinda	0.61	5.5	11.77	0.27
	Boxholm	0.06	5.47	0.17	11.13
	Total in lynx home range		**6.31**	**15.14**	**10.13**
24-280	Boxholm	0.33	5.47	0.17	11.13
	Ödeshög	0.56	7.00	0.10	12.63
	Tranås	0.11	8.7	0.34	-
	Total in lynx home range		**6.68**	**0.15**	**10.76**
25-285	Arboga - Kungsör	0.48	6.73	6.42	19.07
	Örebro	0.26	4.27	3.15	8.17
	Fellingsbro Näsby	0.26	4.27	0.37	12.80
	Total in lynx home range		**5.45**	**4.00**	**14.58**
25-289	Salaorten	0.44	5.23	0.00	6.83
	Västerås	0.44	7.57	8.84	10.83

	Enabygdens Nordvästra	0.12	5.17	2.58	11.20
	Total in lynx home range		**6.25**	**4.20**	**9.10**
25-290	Västerås	1.00	7.57	8.84	10.83
	Total in lynx home range		**7.57**	**8.84**	**10.83**
25-291	Hallsberg	0.98	3.27	24.2	9.33
	Vingåker Österåker	0.02	5.5	43.87	8.57
	Total in lynx home range		**3.31**	**24.59**	**9.32**

Appendix 3b. Lynx home range overlaps with Red deer Management Units, where Mean density /1000 ha is the mean harvest for the whole management unit (Svenska jägareförbundet 2026). Lynx 25-280 is not included due to no overlap with an RMU

Lynx_ID	**Red deer Management Unit**	**Overlap**	**Mean density /1000 ha**
21-263	ÖJA LISTA ÄLGSKÖTSELOMRÅDE	0.16	1.54
	Råbyhed-Torpa KSO	0.11	2.11
	Kungsörs KSO	0.13	0.58
	Västermo ÄSO	0.12	2.39
	Fellingsbro-Näsby älg- och kronhjortsskötselomr	0.01	-
	Arboga KSO	0.28	12.18
	Käglans kronhjortsskötselområde	0.10	0.37
	Total in lynx home range		**4.31**
23-273	Surahammar	0.26	1.36
	Svanå KSO	0.05	7.05
	Färna	0.07	0.12
	SNYTSBO ÄSO	0.10	1.61
	Fläckebo-Haraker KSO	0.13	4.06
	Skultuna Västra KSO	0.01	8.01
	Västerfärnebo Östra KSO	0.05	2.02
	Kila Norra KSO	0.01	1.24
	Gärdsbo-Hällby-Islingby KSO	0.07	1.85
	Toppenbergs KSO	0.04	2.31
	Västerfärnebo Västra KSO	0.02	2.96
	Romfartuna-Haraker KSO	0.08	6.34
	Total in lynx home range		**2.40**
23-274	Toppenbergs KSO	0.12	2.31
	Skultuna Västra KSO	0.23	8.01
	Romfartuna-Haraker KSO	0.34	6.34
	Tortuna KSO	0.09	0.73
	Västerås-Hallstahammar-Surahammar KSO	0.14	1.89
	Total in lynx home range		**4.60**
24-275	ÖJA LISTA ÄLGSKÖTSELOMRÅDE	0.58	1.54
	Råbyhed-Torpa KSO	0.32	2.11
	Västermo ÄSO	0.04	2.39
	Total in lynx home range		**1.65**
24-276	HEDMOSSENS ÄLGSKÖTSELOMRÅDE	0.01	2.17
	GRANHEDS ÄLGSKÖTSELOMRÅDE	0.04	2.53
	MÄLARMÅRDENS VÄSTRA ÄSO	0.12	1.27
	ÖJA LISTA ÄLGSKÖTSELOMRÅDE	0.27	1.54
	Västermo ÄSO	0.03	2.39
	HUSBY-REKARNE ÄLGSKÖTSELOMRÅDE	0.23	0.17
	Näshulta älg och kronskötselområde	0.13	0.00
	Råbyhed-Torpa KSO	0.06	2.11
	Total in lynx home range		**0.93**

24-277	ÖJA LISTA ÄLGSKÖTSELOMRÅDE	0.58	1.54
	Råbyhed-Torpa KSO	0.21	2.11
	Kungsörs KSO	0.01	0.58
	Västermo ÄSO	0.15	2.39
	Total in lynx home range		**1.70**
24-279	Norra Tidersrums älgskötselområde	0.02	0.00
	SÖDRA KISA-VÄSTRA HORN ÄSO	0.02	0.00
	BOXHOLM SKOGAR ÄSO	0.09	0.00
	ULRIKA ÄLGSKÖTSELOMRÅDE	0.21	0.00
	Total in lynx home range		**0.00**
25-285	Fellingsbro-Näsby älg- och kronhjortsskötselomr	0.15	0.50
	Arboga KSO	0.31	12.18
	Hedströmmen KSO	0.08	0.44
	Käglans kronhjortsskötselområde	0.36	0.37
	Total in lynx home range		**3.96**
25-289	Surahammar	0.07	1.36
	Svanå KSO	0.03	7.05
	SIMTUNAORTENS ÄLGSKÖTSELOMRÅDE	0.12	2.77
	Tortuna KSO	0.07	0.73
	Fläckebo-Haraker KSO	0.08	4.06
	Västerfärnebo Östra KSO	0.06	2.02
	Kila Norra KSO	0.08	1.24
	Toppenbergs KSO	0.28	2.31
	Romfartuna-Haraker KSO	0.14	6.34
	Total in lynx home range		**2.78**
25-290	Toppenbergs KSO	0.22	2.31
	Skultuna Västra KSO	0.08	8.01
	Romfartuna-Haraker KSO	0.48	6.34
	Surahammar	0.15	1.36
	Total in lynx home range		**4.36**
25-291	Brevens bruk AB kronhjortsskötselområde	0.55	1.90
	Kvismardalens älg- och kronhjortsskötselområde	0.01	1.67
	NORDVÄSTRA VINGÅKERS ÄSO	0.02	1.63
	Södra Vingåkers älg och kronskötselområde	0.01	0.00
	Sköllerstabygdens kronhjortsskötselområde	0.20	2.17
	Total in lynx home range		**1.54**

Appendix 4

Appendix 4. Jacobs index values

Lynx class	Roe deer	Fallow deer	Red deer
All	0.926	-0.869	-1.000
Adults	0.901	-0.825	-1.000
Subadults	1.000	-1.000	-1.000
Adult males	0.982	-0.951	-1.000
Adult females	0.741	-0.574	-1.000

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