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# From Menace to Market: The Economic Transformation of Invasive Species

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## ABSTRACT

**Invasive species, encompassing both plants and animals, are prevalent across much of Europe. The European Union currently lists 88 invasive species, which, lacking natural predators, tend to spread uncontrollably in various regions. While these species may have some positive effects, they predominantly present significant ecological and economic challenges. This paper explores the potential for human intervention as a "natural" predator or consumer of these invasive species. It examines how established companies and innovative start-ups mainly in the DACH region (Germany, Austria and Switzerland) are addressing the issue of invasive species, including logistical considerations and the challenges they encounter. The paper also provides practical recommendations for improvement on scientific, practical, economic, and political levels. This study demonstrates that innovative economic business models can enable companies to both mitigate the spread of invasive species and utilize them as valuable resources. However, compared to conventional enterprises in agriculture or animal husbandry, these companies face greater challenges in sourcing such species—primarily due to logistical constraints. Since invasive species are neither cultivated nor bred, they often occur in remote areas and must be hunted or gathered in the wild, which complicates their systematic use.**

*Invasive Arten, darunter sowohl Pflanzen als auch Tiere, sind in weiten Teilen Europas verbreitet. Die Europäische Union listet derzeit 88 invasive Arten auf, die sich aufgrund fehlender natürlicher Fressfeinde in verschiedenen Regionen unkontrolliert ausbreiten. Diese Arten können zwar auch positive Auswirkungen haben, stellen jedoch überwiegend erhebliche ökologische und wirtschaftliche Herausforderungen dar. In diesem Beitrag wird das Potenzial menschlicher Eingriffe als „natürliche" Fressfeinde oder Konsumenten dieser invasiven Arten untersucht. Es wird beleuchtet, wie etablierte Unternehmen und innovative Start-ups vor allem in der DACH-Region (Deutschland, Österreich und Schweiz) mit dem Problem invasiver Arten umgehen, einschließlich logistischer Überlegungen und der Herausforderungen, denen sie dabei begegnen. Der Beitrag enthält auch praktische Empfehlungen für Verbesserungen auf wissenschaftlicher, praktischer, wirtschaftlicher und politischer Ebene. Diese Studie zeigt, dass innovative wirtschaftliche Geschäftsmodelle es Unternehmen ermöglichen können, sowohl die Ausbreitung invasiver Arten einzudämmen als auch diese als wertvolle Ressourcen zu nutzen. Im Vergleich zu konventionellen Unternehmen in der Landwirtschaft oder Tierhaltung stehen diese Unternehmen jedoch vor größeren Herausforderungen bei der Besorgung solcher invasiven Arten als Rohstoffe – vor allem aufgrund logistischer Einschränkungen. Da invasive Arten weder angebaut noch gezüchtet werden, kommen sie oft in abgelegenen Gebieten vor und müssen in freier Wildbahn gejagt oder gesammelt werden, was ihre systematische Nutzung erschwert.*

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KEYWORDS

**Sustainable business, food supply chain, entrepreneurship, bioeconomy**

*Nachhaltiges Wirtschaften, Lebensmittelversorgungskette, Unternehmertum, Bioökonomie*

## 1. Introduction

In Europe, native flora and fauna face growing threats from invasive species—non-native plants and animals spreading through natural migration and human activity. Such invasions disrupt ecosystems (Shine, Kettunen, & ten Brink, 2009), endanger food security (Genovesi & Shine, 2004), and harm regional economies (Pimentel, 2011). Annual damages are estimated at €26.64 billion by the European Union (Jördens, 2023). Their spread is driven by human behaviour, climate change, and natural dispersal (Ricciardi & MacIsaac, 2011). Management often requires hunting, harvesting, or eradication to mitigate severe impacts (Simberoff, 2003). Examples include nutria, a South American rodent damaging dikes, and raccoons preying on bird eggs. Using these species as resources once culled aligns with sustainability principles.

The European Commission lists 88 invasive species—47 animals and 41 plants (European Commission, 2024)—spurring business interest. Some companies integrate these species into products or build business models around them. For example, Berlin's Holy Crab! (INWERT GmbH, 2024) processes invasive American red swamp crayfish. Most ventures remain small-scale, but exceptions exist: Norway's seafood industry exploits invasive king crabs (Lorentzen et al., 2017), Teton Leather (USA) produces luxury goods from invasive pythons (Texfash, 2022), and Austria's WeLoveFurs (WeLoveFurs GmbH, 2024) specializes in fur fashion.

This study examines what sets successful businesses in the invasive species sector apart from less successful ones, highlighting obstacles and opportunities to extract lessons for the industry. Whereas existing research often emphasises biodiversity or macroeconomic perspectives, this paper focuses on microeconomic factors and entrepreneurial approaches in managing and utilising invasive species, related supply chains, and the creation of new markets ("market shaping"). To our knowledge, only one study has explored macroeconomic aspects (Meadows & Sims, 2023). We contribute by analysing the microeconomic dimensions of companies working with invasive species.

The evolving invasive species market provides an excellent opportunity to study how companies can both conserve resources and contribute to ecosystem conservation through their business activities and removal of endangered species from the ecosystem. There are many different market players that collect, hunt or process different species. It is important to find out whether these businesses must contend with similar framework conditions, opportunities and risks and perhaps also obstacles. The diversity of the players makes it exciting to find out, whether common practices exist. This research also looks at various players in the corresponding supply chains, from companies that extract raw materials to processors and traders, a large part of the value chain is present.

**Research Question:**

**"What business models are being developed by companies to commercialise products from invasive species, and what opportunities and challenges do they face in comparison to conventional companies in their business processes?**

## 2. Scientific state of the art

**Creation of value**

Value creation theory (Windsor, 2017), commonly applied in business and management contexts, explores how companies and organisations create, sustain, and enhance value. The use of invasive species provides intriguing perspectives within this framework since currently, invasive species often yield little to no

economic value (Lepak, Smith, & Taylor, 2007; Vilá, et al., 2010).

Companies have the potential to generate new products and markets using invasive species, as well as offer cost-effective and/or sustainable solutions to existing products. Additionally, their utilisation can contribute to waste reduction and enhance the sustainability of ecosystems (Nunez et al, 2012). Beyond ecological benefits, the use of invasive species can also create new job opportunities and raise public awareness about biological balance. These points highlight the multifaceted opportunities for value creation through invasive species and their significance for sustainable development (Shackleton, Shackleton, & Kull, 2019).

**Circularity, bioeconomy and the food waste hierarchy**

The issue of invasive species and the underutilisation of their products and by-products is closely linked to the broader challenge of food waste. While some invasive species are edible and can contribute to food systems, others may not be suitable for consumption. Nevertheless, their by-products and residues can be valorised through material applications within the framework of the bioeconomy—for instance, in the production of textiles or other biobased materials. A relevant model in this context is the food waste hierarchy. It outlines a series of utilisation solutions for food waste, ranked from the most to the least preferable options: prevention, re-use for human consumption (food), re-use as animal feed, re-use of by-products or recycling of the waste, recycling (nutrient recovery), energy recovery (burning), and disposal (European Commission, 2024). This hierarchy provides a framework for maximising value derived from food and organic waste, suggesting that even materials currently considered waste, such as those from invasive species, could be better managed and utilised if approached systematically.

**Centralised and decentralised supply chains**

Centralised and decentralised supply chains are a core topic in supply chain management, with each one of them bringing advantages and disadvantages to business operations (Giannoccaro, 2018; Epanchin-Niell, 2017). Invasive species intended for use as raw materials typically involve wild-harvested plants or animals that must be captured or hunted in their habitats. This results in procurement routes and supply chains that are markedly different from those of conventional products, which are cultivated, bred, or kept in controlled environments (Shackleton, et al., 2019).

**Market-shaping**

Market-shaping theory (Nenonen & Storbacka, 2021) emphasises the active creation and influence of markets by companies and other stakeholders. Markets are not static (Bentsen, 2021) and do not merely respond to supply and demand; they can be deliberately shaped (Jaworski, Kohli & Sahay, 2000). Firms and other actors influence markets through innovations, new business models, or by shaping customer behaviour (Jaworski, Kohli & Sahay, 2000). This process requires collaboration between companies, governments, and customers. Competition remains but is complemented by cooperation and the joint development of market standards (Möller & Rajala, 2007).

Active market shaping creates new value opportunities, for example through products, services, or business models that did not exist before (Kindström & Kowalkowski, 2014). It often triggers systemic changes with long-term effects on market structures, rules of engagement, and actor behaviour (Gawer & Cusumano, 2014). Technological innovations are central, as they can disrupt existing structures and create entirely new markets (Adner & Kapoor, 2010). Market-shaping companies can also take on social and environmental responsibility, for example by promoting sustainable products and practices (Porter & Kramer, 2007). In short, the theory enables stakeholders to shape markets actively rather than merely react to them, unlocking new value and driving long-term, positive change (Jaworski, Kohli & Sahay, 2000). Therefore, market shaping can bring great opportunities to companies that try to create new markets with new respectively under-used resources.

Typical steps in market shaping are: OBSERVING the market (Affordability, Availability, Assured Quality, Appropriate Design, Awareness), DIAGNOSING root causes, ASSESSING options, IMPLEMENTING tailored interventions, and MEASURING results (Savage et al., 2021). Flaig et al. (2021) distinguish four types: Market Reduction,

Market Maintenance, Market Disruption, and Market Widening. For offensive market expansion, "Market Disruption" and "Market Widening" are particularly relevant.

Key activities in market widening include standardisation, building market infrastructure, lowering prices, cognitive reframing of exchange objects, creating value for customers and stakeholders, and pursuing deregulation (Flaig, Kindström & Ottosson, 2021). Disruptive strategies, by contrast, involve network reconfiguration, radical market-creating innovations, new value propositions, lobbying for new rules and standards, triggering institutional change, and innovating the business model (Flaig, Kindström & Ottosson, 2021).

## 3. Research methodology

A qualitative approach using in-depth interviews was used to examine the various factors that contribute to the success of companies using invasive species. This approach enabled us to perform an in-depth analysis of this real-world problem and hence fundamentally examine the issues that companies using invasive species are currently facing. Due to the lack of information on invasive species and related business practices (both on the supply and the demand side), the interviews were valuable in broadening our understanding beyond mere business theory and to collect primary data to broaden knowledge.

| No. | Company/Association/Person | Company size | Country | No. of organisations interviewed |
|---|---|---|---|---|
| **1** | Trading company for herbs and teas | Small, family-owned business | Germany | 2 |
| **2** | (Tannery), furrier & fur trade | Small & medium-sized family-owned businesses | Germany | 8 |
| **3** | Import, wholesale & retail wool | Small, family-owned business (2 employees) | Germany/New Zealand | 1 |
| **4** | Swiss & German Hunting Federations | Federation, 280.000 members in total | Switzerland | 2 |
| 5 | Production and trade of cosmetics & consumer goods (mainly soaps) | Small, family-owned business; long family tradition | Germany | 1 |
| 6 | Hunter & butcher | Small, family-owned business | Germany | 3 |
| 7 | Farm, herbal education & farm shop | Small, family-owned business | Germany | 2 |
| 8 | Processing & trading company for seafood | Small, family-owned business | Germany | 1 |
| 9 | NGO for awareness & education against a specific invasive species | Small association | USA | 1 |
| 10 | Producer, trading company for cosmetics and consumer goods | Small, family-owned business; Partner business in Croatia | Austria/Croatia | 1 |
| 11 | Production and distribution of leather goods | Small company | USA | 1 |
| 12 | Trading company for cosmetics & consumer goods | Small company | Germany | 1 |
| 13 | Restaurant | Small restaurant, now inactive | Germany | 1 |

Table 1: Overview of companies and organisations interviewed. More details in Table 4 (appendix).

We conducted an extensive investigation across various media to identify companies in Europe involved in hunting, collecting, trading and/or manufacturing products from the 88 invasive species listed by the European Union. Subsequently 584 companies were identified. Companies located outside the DACH region (Germany, Austria, and Switzerland) were then excluded from further analysis except for two companies (one in the USA and one in New Zealand) since they represented very interesting cases, leaving 176 companies, all of which were contacted via email with a request for an interview. Ultimately, 26 companies and associations agreed to participate, and interviews via online meetings and telephone were subsequently carried out. The participating companies and organisations are listed in Table 1. Out of these interviewees, 23 are operating in Germany, Austria and Switzerland, but some of them are even located in the USA and one of the German companies is sourcing in New Zealand. The reason for including these companies is that we got the unique chance to interview them and because their cases reflect the basic tenor of what has been said by the other companies very well. In addition to the companies, one US American researcher (marine biologist) was interviewed. In future research, we want to investigate whether the same results found also apply in other regions and continents.

According to the research questions, suitable companies for interviews were identified and contacted. Subsequently, semi-structured interviews were conducted. Most of the interviewees were interviewed for about an hour and the interviews were analysed and coded qualitatively according to Mayring and Fenzl (2019). The collected data were analysed using predefined codes and paraphrasing. Through this coding process, the material was examined to identify similarities and differences in respondents' statements, which were then compared against the research questions.

The companies interviewed varied in age from long-established firms with up to 86 years of history to newly founded start-ups, allowing for the inclusion of a broad spectrum of organisational backgrounds and experiences. The period in which the interviews took place was from June to August 2024. Theoretical saturation was reached due to very similar answers over time (Grounded Theory).

Furthermore, a comprehensive analysis of both scientific literature and grey literature was conducted as a baseline for the topic, to obtain a basic understanding of theoretical and practical topic-related aspects and to develop related keywords.

## 4. Findings

This section summarises the main results of the survey by category. The content is based on interviews conducted with the participating companies. The categories were developed inductively by identifying recurring patterns within the codes, derived through qualitative content analysis following Mayring and Fenzl's approach to qualitative data analysis (Mayring & Fenzl, 2019). The analysis reveals that companies working with invasive species are predominantly small or family-run craft businesses and manufactories. They operate under challenging conditions due to the decentralised and unpredictable availability of raw materials, which are neither cultivated nor optimised for human use and often occur only seasonally. This seasonality affects both procurement and sales, creating additional logistical and planning difficulties. Supply chains, production, and distribution processes are therefore highly individualised and small-scale.

In terms of perception, there is a marked disconnect between producers and consumers: while producers view invasive species as valuable raw materials, consumers often associate them with ethical or ecological concerns. Culturally, invasive species remain poorly anchored as usable resources, and many business customers lack knowledge about their processing and potential applications. Consequently, these products often occupy niche markets with high prices but limited profit margins.

Scaling and growth are constrained by market size, regulations, and certification requirements. Sales strategies tend to emphasise the unique properties of the products rather than their role in invasive species control. Although there is potential for expansion into other markets, companies face obstacles related to policy frameworks, regulatory barriers, and a lack of institutional support. Environmental and animal welfare organisations also play an ambivalent role—sometimes as partners, sometimes as

opponents—in shaping the market for invasive species-based products.

## 4.1 Predominance of small and family-owned businesses

The interview results indicate that most companies working with invasive species as raw materials are small, often family-run businesses, frequently operating as artisanal workshops or small-scale manufactories. Some collaborate with small family enterprises abroad to source species not locally available. A few are long-standing, generational establishments specialised in crafts such as furriery, producing unique products.

These artisans take great pride in their work, which, though labour-intensive, provides a strong sense of purpose. Hunting and processing animals are considered meaningful both for conservation and in compliance with legal regulations. However, some businesses face declining customer interest and a lack of successors, particularly in sectors such as tanning and furriery, putting traditional knowledge—like preparing raw hides from martens or weasels—at risk.

Many companies integrate multiple professions along a single supply chain. It is common for butchers to also be certified hunters or for fur and leather workers to manage hunting, processing, and distribution themselves. Other professions, such as foresters, farmers, and silviculturists, are also represented. Ethical concerns regarding the killing of animals solely for disposal further shape practices. For example, nutria farms for pelts have largely disappeared due to changing public attitudes.

Several entrepreneurs intentionally maintain small-scale, workshop-style operations to avoid overexploitation. They oppose industrial harvesting methods that could harm other species, preferring manual collection of plants and animals, with machinery used only for specific processing steps. One company even cultivates invasive plants like Himalayan balsam for ecological benefits, such as supporting pollinators.

Because these species are commonly neither cultivated nor farmed, acquisition relies on hunting, fishing, or wild harvesting, resulting in low levels of automation. In luxury leather goods, capturing invasive species like pythons requires significant manual effort. Despite these challenges, the work engages a dedicated number of people, sometimes supported by government funding, and the market for these products is well-established, occasionally leading to competition among producers.

## 4.2 Limited and decentralised raw material supply

Invasive species differ from conventional goods in that they generally may not be cultivated, bred, or transported alive, preventing any optimisation for human use. As a result, they are collected in their natural state, which presents both opportunities and challenges. Locating these species in the wild requires active searching, often without guarantee of success, and yields are usually smaller than those of farmed species, affecting product quality. Consequently, specialising solely in invasive species is rarely economically viable; they are often processed as bycatch or co-products.

Their decentralised distribution complicates collection and quality control, as environmental factors such as soil composition, climate, and seasonality affect yields. Businesses emphasise that the focus should remain on ecosystem health and biodiversity rather than purely on resource extraction. Sustainable practices, including permaculture and agroforestry, are preferred over large-scale, monocultural exploitation.

Processing invasive species is labour-intensive, with wild animals often requiring the same effort as conventional livestock but yielding less meat or usable material. Manual collection is time-consuming and limits scalability, while inspections and testing further increase costs. The irregular availability and variability in quality, combined with dispersed sources, complicate logistics, traceability, and standardisation. Legal, ethical, and sustainability considerations further shape the supply chains, which are typically direct, short, and managed by small-scale operators. These factors collectively define the distinct challenges of sourcing and processing invasive species compared to conventional products.

## 4.3 Seasonal markets

For companies working with products derived from wild collection and hunting, seasonal availability of raw materials plays a critical role. Certain animals, for example, develop denser winter fur, making their pelts more desirable at specific times of the year. Similarly, the availability of plant-based materials depends on blooming or ripening seasons, while hunting seasons dictate when species can be harvested. While some species are less affected by seasonality, this factor significantly influences many of the companies interviewed. To mitigate these limitations, some businesses strategically stockpile raw materials during peak seasons to maintain a steady supply throughout the year.

Supply chain disruptions can result not only from seasonal factors but also from processing challenges and variations in consumer preferences, such as seasonal colour trends in fashion. Poor harvest or hunting years may lead to temporary stockouts, yet many businesses accept this risk to remain aligned with natural cycles. These fluctuations often cause price volatility, which some companies manage by building reserves during high-yield periods. Environmental factors, such as droughts, can also reduce yields for specific species in certain years. In some industries, bottlenecks are unrelated to raw material availability. For instance, in the fur processing sector, the critical constraint lies in tanning, as only a few companies can meet stringent environmental regulations.

Seasonal effects extend to sales as well. Demand for knitted yarns, furs, roast meat from invasive animals, and wild-harvested herbal teas increases during colder months, with peaks around the Christmas season. Companies respond by producing custom orders in advance and maintaining stock of standard products throughout the year to ensure consistent supply. External events, such as the COVID-19 pandemic and geopolitical conflicts, have further impacted sales, occasionally leading to severe market disruptions. Businesses thus balance natural variability, consumer demand, and operational constraints to manage seasonal markets effectively.

## 4.4 Procurement, production, and distribution processes

For companies utilising invasive species in Europe, vertical integration in supply chains is common. Many of the supply chains considered directly engage in manual harvesting or hunting, using limited tools such as traps, sensors, or firearms, resulting in more complex processes than conventional supply chains for cultivated products.

When not managing the entire process internally, firms rely on short, regional supply chains, sourcing from local collectors and hunters. In Germany, fur traders specialise in pelt processing, sorting, and bulk auctioning, sourcing from wildlife-rich regions like Scandinavia and North America. However, geopolitical events, such as the Russian-Ukrainian conflict and related sanctions, have disrupted the luxury fur trade.

Finished products are typically produced in-house with minimal outsourcing. Transport and supply operations are shaped by regulations, including the EU Invasive Alien Species Regulation, and hunting laws mandate humane trapping and immediate processing of animals such as nutria. For invasive plants, logistics focus on short processing times and direct delivery to preserve ripeness, though limited production can lead to stockouts. Environmental considerations and regional quotas further influence harvesting and storage practices.

Supply chains for invasive seafood follow similar patterns. Local fishermen deliver catches like American crayfish to processors, who produce value-added products. The decentralised nature of wild harvesting complicates maintaining consistent supply volumes. Companies such as Teton Leather (USA) balance supply and demand while ensuring sustainability and regulatory compliance.

Overall, firms working with invasive species navigate distinct logistical, regulatory, and environmental constraints, creating supply chains that differ markedly from those for conventional resources.

## 4.5 Perception of invasive species as resources

The perception of invasive species as raw

materials highlights a disconnect between industries and consumers, particularly around ethical concerns. Interviews reveal that consumers often misunderstand invasive species and their products, a view supported by research (Martin et al., 2016). In the fur industry, for example, consumers focus on animal killing while overlooking the sustainability claims of materials sourced from necessary conservation efforts. Fur, a natural and durable fibre, contrasts with synthetic materials derived from fossil fuels and fast fashion. The industry adapts by upcycling older furs, which decompose naturally, unlike synthetic alternatives.

A major challenge is the public's unfamiliarity with invasive species and the persistence of misinformation—such as the belief that certain harmless plants are poisonous. Despite niche "invasivore" movements promoting the consumption of invasive species, many consumers remain unaware of their uses. In some regions, however, strong aversion to invasive species has led to a more open mindset regarding their potential as resources. Consumer attitudes are inconsistent: many accept leather and meat but reject fur. As interviewee 2 remarked, "Everyone wants to eat meat, but no one wants to see the slaughterhouse." Today, most pelts are byproducts of environmental conservation or the food industry, but this remains largely unknown. Animal conservation organisations also shape perceptions, often stigmatising fur.

Fur producers argue that the debate is overdue, especially in urban areas where connections to nature are limited. Rural populations, more familiar with wildlife management, tend to be more accepting. Changing perceptions is particularly challenging for "cute" species like raccoons, with social media reinforcing these biases and complicating discussions about the need for control. Consumer education is widely regarded as key to shifting these views.

## 4.6 Limited cultural integration of invasive species as raw materials

Most invasive species and their by-products are currently not used in high-value applications according to the (food) waste hierarchy, such as human or animal consumption. Instead, culled or cut invasive species are often buried in soil, incinerated, or disposed of, even though these resources hold considerable potential for more efficient and sustainable use. This underutilisation reflects both practical and cultural limitations.

In many regions, invasive species lack cultural integration as products. Knowledge of how to prepare or use them is often missing, or traditional uses have disappeared over time as societies have modernised, and affluence has increased. Practices once based on necessity—such as "nose-to-tail" consumption—are nowadays seen as ethically or gastronomically commendable but are far less common in everyday life.

Interestingly, species that are considered invasive in one part of the world may be native and highly valued in another. In those regions, they are often well integrated into local cuisines and markets. This has led to cross-border trade, where species are hunted or processed in one country and exported to another where demand is higher. A long-standing example is the export of fur from Western to Eastern Europe, where it has traditionally been in high demand. However, the COVID-19 pandemic, war, and economic sanctions have sharply reduced these export flows and changed market dynamics.

In parallel, certain invasive species are being rediscovered and marketed as exclusive, even luxurious products. In high-end gastronomy, they are reintroduced as exotic and desirable ingredients, reflecting a global trend toward re-evaluating and redefining the value of overlooked natural resources. This movement illustrates both ecological awareness and a growing openness to alternative food sources.

Despite these developments, the market for wild game meat remains relatively narrow in the DACH region (Germany, Austria, Switzerland). Compared with France—where a more diverse and well-established market for wild poultry and other game exists—consumers in the DACH region still have limited access to comparable variety and quality. This highlights both a cultural gap and an untapped opportunity for expanding the culinary use of invasive species.

## 4.7 Knowledge gaps among business customers in processing and utilisation

Not only private and end consumers, but also corporate clients face major challenges in using

invasive species as raw materials. These issues often start with hunters and gatherers, who generally have little knowledge of invasive species. Within hunting circles, such species are often perceived as low-value or waste products. As one interviewee noted about nutria, "I wouldn't touch a rat," illustrating the deep-seated prejudice against these animals.

To counter this, some professionals now promote the culinary use of invasive species—such as nutria—through specialised training programs for meat sommeliers and similar audiences. Participants tend to be open to these ideas, and once they taste the meat, they often respond with enthusiasm.

The same undervaluation applies to fur from invasive species, which is frequently discarded despite its potential usefulness. This lack of appreciation is not only a societal issue but also rooted within the industry itself. Considerable educational work is needed to shift perceptions and build awareness of the broader potential of these materials.

One non-profit organisation has taken a leading role by creating recipes and training chefs on how to cook with invasive green crabs. Although the crabs provide relatively little meat, their exceptional flavour and prized roe have impressed chefs and inspired creative dishes such as pasta. This initiative demonstrates how education and hands-on experience can transform perception and practice.

In Germany, a hunting association attempted to promote local fur products to business clients, but the project failed due to insufficient engagement with clients, logistical challenges, and other practical issues. This highlights the need for market research, communication, and a clear understanding of client needs when introducing new products.

A further barrier lies in the lack of available product information. For many invasive species and their derivatives, few ingredients or physical/ chemical properties are documented, and technical data sheets are rare. This lack of transparency and standardisation makes such products less attractive to the industry and hinders their commercial potential.

## 4.8 Sales driven by product attributes rather than invasive species control

Discussions with companies reveal that combatting invasive species is rarely the main selling point of related products. Instead, marketing and consumer appeal focus on intrinsic product qualities such as taste, appearance, or technical features. The fur of the common brushtail possum, for instance, is prized for its high quality, while meat from the invasive king crab—now common in Norway—is sought after primarily for its flavour, especially in Asian markets, and is gaining popularity elsewhere through social media. Similarly, jams made from Himalayan balsam flowers or seeds are produced mainly for their taste, and invasive herbs are used as teas or spices for their flavour or health benefits rather than for ecological reasons.

Price and convenience remain decisive factors in consumer choices. As one furrier remarked, "Germans prefer cheap goods from China, ideally delivered by drone through the living room window." Local processing, though a potential marketing advantage, is rarely emphasised. Larger companies, such as supermarket chains, tend to communicate regional origins more effectively—an approach smaller firms could adopt to enhance their appeal.

An exception is the company Holy Crab!, which pursues impact-driven goals. Its main mission is to combat invasive species, achieved through the sale of attractive culinary products. Customers are also drawn by the high quality of the meat, which is antibiotic-free, naturally raised, and thoroughly inspected. The company emphasises sustainability, animal welfare, and the necessity of using hunted species responsibly.

Some companies seek to highlight sustainability through social media, videos, websites, or direct customer engagement. However, many of these products require detailed explanation—particularly regarding the rationale behind hunting or culling—to gain broader acceptance.

## 4.9 Niche products, premium pricing, and constrained margins

Many of the species discussed are niche products due to limited automation, scalability,

and consumer awareness. Compared with conventional, mass-produced goods, these products are often more expensive and yield lower profit margins, making them less attractive to both end consumers and corporate clients. Consequently, they are typically sold in high-end or specialty stores.

Producers of invasive species-based products rarely rely solely on these niche offerings. For most companies, such products represent only a small segment of their overall assortment; only one interviewed company offered a range entirely composed of invasive-species products. Unusual items serve primarily to attract curious customers and differentiate companies from competitors. Sustaining the business generally requires the sale of more mainstream products alongside these niche offerings. Companies note that while niche products generate attention and initial interest, customers frequently purchase additional items as well.

This pattern is consistent across producers dealing in python leather, nutria or raccoon meat, jams from invasive plants, and similar products. While niche offerings can spark interest and provide market differentiation, business viability depends on maintaining a broader product range.

## 4.10 Limitations to scaling and growth

Many companies do not plan to scale their products, either due to limited interest in growth or because they perceive it as highly challenging. Key obstacles include the decentralised sourcing of raw materials, low yield per animal or plant, and the extensive manual labour required. Consequently, production quantities are often not scalable, and the products are typically seen as non-competitive compared with conventional alternatives, largely because of their niche market status and higher prices. Moreover, the invasive nature or specific characteristics of these species often prevent cultivation, further limiting economic utilization. Much of the sourcing and processing work remains manual, with minimal technological support.

Only a few companies are experiencing notable growth. For example, businesses dealing with invasive king crabs in Norway benefit from favourable pricing, strong demand, an established market, large crab size, and sufficient quantities that allow industrial-scale processing. Similarly, a US-based leather manufacturer attributes rapid growth to extensive marketing and public relations efforts. In Austria, WeLoveFurs has achieved relative success in its niche. This online fur retailer, founded by marketing professionals, leveraged strong branding, sustainability-focused strategies, and product designs appealing to younger consumers compared with competitors.

## 4.11 Sales and distribution channels

Due to customers' unfamiliarity with the raw materials, products from these companies often require detailed explanation. In the fur industry, for example, complex processes are involved in repurposing and modifying materials. Consequently, many companies sell directly through physical stores as well as online shops and websites. The most successful firms communicate the unique properties of their products effectively through marketing and public relations, including social media campaigns and collaborations with film crews.

Most companies operate in the B2C (business-to-consumer) market, with some also engaging in B2B (business-to-business) transactions. Many sell at farmers' markets, city festivals, food trucks, or farm shops, where direct customer advice is possible. When distributing through retail partners, such as supermarkets, companies typically supply only conventional products, believing that specialty items—like those derived from invasive species—are too niche to attract consumers without targeted consultation.

Companies are also aware of challenges in the declining fashion market, characterised by shrinking retail spaces and city centre vacancies. To remain appealing, businesses often offer a diverse product range, combining invasive and conventional products to create a balanced portfolio.

## 4.12 Additional market opportunities in other markets

Many companies perceive greater sales potential for their products outside Europe, particularly beyond the DACH region. Fur, pelt, and yarn manufacturers, for example, consider Eastern

Europe a promising market due to climate and consumer preferences, although this potential has largely been lost due to the Russia–Ukraine war. Scandinavia, the United Kingdom, and other northern countries are also regarded as attractive export markets. Some manufacturers view the United States as an interesting opportunity, although distribution there is often handled through separate contractual distributors.

## 4.13 Regulatory frameworks and certifications

Companies in this sector face numerous regulatory challenges, often imposed by government authorities, which vary by species but share common issues. For wild collection and organic-certified products, firms must provide detailed documentation of collection sites, often requiring mapped areas certified as both wild and organic. All companies, regardless of size, are subject to regular inspections, with even small firms reviewed at least annually. Wild collections are also monitored by food control authorities.

Invasive species introduce additional complexity under the EU Novel Food Regulation, which mandates approval for any food not widely consumed in Europe before 1997. Many invasive species now require lengthy approval processes. Health claim regulations further challenge companies, as natural variability in active compounds in wild plants makes it difficult to meet strict requirements, placing small processors at a disadvantage compared to the pharmaceutical industry. As a result, even recognized organic wild products are increasingly rare in EU retail and must often be sold as generic “plant raw materials” without usage guidance, despite strong demand driven by international medical recommendations.

Other regulatory constraints include the prohibition of certain products, such as teas, under Novel Food rules, and complications with organic certification of natural aromas. Some producers report excessive focus on certification, which may not always be beneficial. Specific cases illustrate these hurdles: in New Zealand, government programs for controlling fox kusu (an invasive species) are supported by organizations like WWF, whereas in the EU, businesses in sectors like cosmetics or soap may face additional labelling requirements and pressure from environmental organisations.

Hunting regulations are particularly complex. Special permits may be required, and jurisdiction varies by region and species, often involving local water management or conservation authorities. In areas like North Rhine-Westphalia and the Netherlands, invasive species threaten dikes, creating regulatory pressure and sometimes incentivised hunting through bounties. EU regulations require member states to manage or eradicate invasive species, and hunters must obtain specialised training.

Despite these pressures, commercialisation of invasive-species products faces resistance, as authorities prioritise eradication over market development to avoid creating perverse economic incentives. Social challenges also arise: hunters and butchers often respond to residents’ complaints, yet receive little official support.

Smaller companies face additional burdens, including frequent health inspections, strict licensed kitchen requirements, and complex documentation for organic certification. Products once permitted can suddenly be banned, creating uncertainty. International trade adds further challenges, such as compliance with CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) regulations, which vary by region and species.

Overall, the regulatory landscape for wild and invasive species is highly complex, particularly for small businesses. Companies call for reduced bureaucracy, clearer guidance, and greater support from authorities to navigate overlapping regulations while maintaining necessary consumer protections.

## 4.14 Environmental and animal welfare organisations

Companies using products derived from invasive species are acutely aware of ethical concerns surrounding animal culling. They emphasise that they generally use byproducts rather than targeting animals solely for production. Nevertheless, they face challenges from organisations like PETA (People for the Ethical Treatment of Animals), which oppose all animal use and killing, regardless of ecological necessity (PETA-Team, 2022).

Many companies describe interactions with such organisations as irrational and emotionally driven. They note these groups often operate without transparency or democratic accountability, supported by substantial financial and legal resources, extensive media networks, and high-budget campaigns aimed at awareness rather than practical support for animal shelters or conservation.

These campaigns influence public perception, creating paradoxes: for example, people who consume meat may still view the use of fur as morally unacceptable. Companies argue that this undermines both the appreciation and image of their work, especially since animals culled for conservation purposes often have their fur discarded in favour of synthetic alternatives.

The fur industry highlights that humane treatment is essential for high-quality pelts and emphasises partnerships with indigenous communities, such as Native American trappers, who sustainably harvest only what they need. The decline of the fur industry has contributed to social issues, including rising unemployment and associated challenges in these native communities. Legal frameworks exacerbate this, as failure to hunt on indigenous lands can result in state control and environmentally destructive activities like oil fracking.

Companies also note misinformation spread by some environmental organisations, including claims that certain species are protected when they are not. In some cases, activists have released non-native species, such as farmed mink, into the wild, causing ecological damage. These animals are often culled and buried, rather than used.

Despite these challenges, some companies collaborate with conservation groups—for example, hunters leasing land to manage species harmful to forest ecosystems. However, widespread caution and mistrust persist due to potential public backlash. Veganism promoted by advocacy groups is often viewed as an extreme stance, adding to tensions, as exemplified by debates in Berlin over orphaned raccoon cubs that are later euthanised despite causing property damage.

In summary, companies using invasive-species products navigate a complex mix of ethical, social, and regulatory challenges. They must manage public opinion shaped by powerful advocacy organizations while addressing the practicalities and ethics of invasive species management to maintain their businesses in a hostile public environment.

## 4.15 Market-shaping attempts

Interviews with companies working with invasive-species products reveal that many actively seek to shape the market, either by introducing new products or enhancing public awareness. These efforts are often fragmented and unsystematic but reflect key aspects of market shaping, including observing the market (factors such as affordability, availability, quality, design, and awareness), diagnosing market challenges, assessing shaping options, implementing tailored interventions, and measuring outcomes (Savage et al., 2021).

For example, women producing and selling invasive-plant products often hold certifications as herbal educators. Through their courses, they teach the public about culinary and medicinal uses of invasive species, expand knowledge, dispel misconceptions (e.g., that certain plants are poisonous), and reframe these species as valuable resources, sometimes branding them as "local superfoods".

Other companies pursue alternative strategies to enhance market acceptance, such as forming brand alliances to jointly market products and communicate their benefits. Examples include initiatives like "WE PREFUR," WeLoveFurs' "GreenCollection," and the "Fellwechsel" initiative, each of which will be discussed in more detail.

| Company name | Business content | Country of origin |
|---|---|---|
| WE PREFUR | Marketing association of the German furrier trade | Germany |
| WeLoveFurs | Sales of fashion with real and faux furs (modern fashion) | Austria |
| Fellwechsel | Sale of fur products, initiative of the German Hunting Association | Germany |

Table 2: Successful actors in market shaping for invasive species.

WE PREFUR is a collective brand and association established by the central association of furriers in Germany. Collaborating with a marketing agency, the brand promotes local fur products as "natural and fair," emphasising sustainable hunting, ethical sourcing, and the distinction between natural and synthetic fibers. Only qualifying products carry the label, and around 30 businesses are currently certified.

The Fellwechsel initiative, launched by the German Hunters' Federation, aimed to better market local fur from sustainable hunting. While initial supply chain development and marketing efforts were extensive, the project achieved only limited success and continues at a smaller scale in Baden-Württemberg, one of Germany's Federal States.

In Austria, the WeLoveFurs GmbH markets fur under its GreenCollection brand, sourcing wild, non-farmed Finnraccoon fur directly from Finnish hunters. Founded by marketing professionals in collaboration with experienced furriers, the company combines ethical sourcing with a young, trendy design aesthetic, contributing to its popularity.

Other companies, including those producing luxury yarns from invasive species such as the Australian fox kusu, enhance product appeal through designs and knitting patterns that showcase practical uses, educating consumers and increasing desirability.

The German Hunters' Federation promotes culinary uses of game through its Wild auf Wild initiative, encouraging recipe submissions that feature invasive species like Nutria. Recipes, cooking tips, and marketing advice are shared online, increasing public interest and positioning game meat as a sustainable food source.

Fur industry companies also engage in public outreach through workshops, media collaborations, and social media campaigns to raise awareness and address public misconceptions, emphasising sustainability and ethical sourcing.

These examples demonstrate diverse strategies employed to shape markets for invasive-species-derived products. Through education, branding, alliances, and public engagement, companies create new market opportunities while promoting responsible and sustainable use of invasive species.

# 5. Discussion, limitations and conclusion

## 5.1 Discussion

This study provides a detailed view of how companies managing invasive species operate within their market environment. These firms face challenges in product scalability but also have opportunities to shape the market. Key areas for improvement include further research on the chemical and technical properties of invasive species to expand industrial applications, as well as enhancing collection and harvesting methods, including AI-driven technologies.

Strategic market shaping is essential. Companies need to modernise product designs and marketing strategies while navigating complex regulatory frameworks. Government support is critical for democratising research and providing smaller firms with access to valuable data and resources. Although invasive species are often seen as threats, they also present opportunities for new applications and substances.

Despite this potential, few businesses fully utilise invasive species. Innovation in research and technology is needed, but economic viability remains uncertain, and ethical concerns—particularly regarding pathogens and bycatch—must be addressed. Companies should aim to move beyond niche markets, as invasive species could strengthen regional supply chains and enhance food security. The distinction between pests and invasive species should be considered, and future developments, such as lab-grown meat, may further impact the industry.

Customer perceptions often conflict with industry practices. Misunderstandings about the sustainability of materials, such as fur versus synthetic alternatives, highlight the need for improved consumer education. Cultural integration remains challenging, as historically forgotten uses and recent geopolitical events limit acceptance. Some efforts aim to reintroduce these species as luxury items, but broader adoption is still limited.

Processing invasive species is labour-intensive and often considered low-value. Educational initiatives are required to improve adoption and profitability. Many companies use these products to attract attention but rely on a broader product range for financial stability. Scaling is constrained by low yields and high

labour costs, so successful companies combine market differentiation with diversified offerings. Distribution is primarily direct through stores and online platforms, emphasising consumer education and blending invasive and conventional products.

There is potential for market growth beyond Europe, though geopolitical issues may affect these opportunities. Companies also navigate complex regulations, including documentation for wild collection and EU Novel Food Regulations, which can be particularly burdensome for smaller firms. Conflicts with environmental and animal welfare organisations, such as PETA, are common, as these groups oppose the use of invasive species despite their conservation benefits, affecting public perception.

| Companies using invasive species | Companies using conventional species |
|---|---|
| Small and medium-sized enterprises (SMEs), family-run businesses, craftsmanship, manufactories, pride, personal connections, purpose, sustainable thinking | Big businesses, few family businesses, long-term growth, often emotionally more disconnected from companies |
| Small-scale (middle-scale) operations | Small-scale (middle-scale) operations |
| Decentralised availability of raw materials, no human optimisation, small quantities | Often centralised, planned crops, bred and optimised plants and animals, big quantities |
| Seasonal availability and poor predictability of raw materials | Often seasonal availability as well, but usually better predictability of raw materials |
| Seasonality of the sales market | Seasonality of the sales market |
| Regional, short supply chains, stockpiling in times of poor harvest | International, often global and long supply chains |
| Personal contacts, private links in business | International business relationships, more formal relationships |
| High vertical integration | High specialisation, low vertical integration |
| Customer ignorance, indifference or even bias, ethical concerns and inconsistency | Products well-known and accepted by the customers |
| Culturally poor anchoring of invasive species as raw material | Products well-known and accepted by the customers |
| Business customers' lack of knowledge about processing and use of invasive species | Well-established recipes and forms of use, both by B2C and B2B customers |
| Sales via different, typical product properties like taste, quality, price (control of invasive species is secondary) | Sales via typical product properties like taste, quality, price |
| Niche products, expensive prices, and sometimes low margins | Mainstream products, competitive prices, standard margins |
| Scaling and growth difficulties | Scaling and growth difficulties |
| Focus amongst others on availability of nature, protection of biodiversity and the ecosystem | Protection of nature, biodiversity and the ecosystem are rather secondary |
| Distribution channels: specialised stores, extensive explanation needed | Standard distribution channels, standardised shops |
| Further market potential in other markets sometimes limited due to current circumstances | Further market potential in other markets possible |
| Policy, regulations and laws, certifications sometimes limiting;. low influence on policy-making due to small size, low political power and influence, lower (marketing) funds | Policy, regulations and laws, certifications sometimes limiting; higher influence on policy-making due to medium and big size, bigger political power and influence, (marketing) funds |
| Environmental organisations and animal welfare organisations are influencing customer perceptions on certain product types like fur | Environmental organisations and animal welfare organisations have less influence on customer perception since they are well-established in the markets |
| Market-shaping attempts to change market perception (from negative to positive) | Market-shaping attempts to even promote more sales of already accepted products |

Table 3: Main contrasts between invasive species-based and conventional material companies.

Companies' market-shaping efforts include consumer education, brand alliances, and public outreach. Examples include:

- WE PREFUR: promoting natural and ethical fur products
- Fellwechsel: marketing local fur products
- GreenCollection by WeLoveFurs: highlighting ethical sourcing
- Wild auf Wild: promoting game meat recipes

These initiatives aim to enhance market acceptance and highlight the sustainability of products derived from invasive species.

The main differences between companies working with conventional species and those utilising invasive species can be summarised as follows. From these differences, key enablers and barriers for businesses working with invasive species can also be derived:
Using those kinds of information, we can answer the research question of this paper: Companies commercialising products from invasive species typically operate as small to medium-sized, often family-run or craft businesses, emphasising sustainability, biodiversity, and ethical sourcing. Their business models rely on niche markets, offering products such as meat, fur, yarn, and plant-based goods, often with higher prices and lower margins than conventional products.

In contrast to conventional companies, these firms face decentralised and unpredictable raw material supplies, labour-intensive processing, and cultural and consumer unfamiliarity, requiring extensive education, marketing, and market-shaping efforts to enhance acceptance. Regulatory challenges—including EU Novel Food rules, organic certifications, and animal welfare concerns—further complicate operations, while environmental and animal welfare organisations strongly influence public perception.

Opportunities for these companies lie in leveraging the intrinsic qualities of their products, promoting sustainable and ethical practices, expanding into new regional or international markets, and developing innovative applications for invasive species. Compared to conventional companies, which benefit from standardised production, well-known products, established supply chains, and scalable operations, firms using invasive species must combine creative branding, education, and alliances with diversified product offerings to achieve economic viability while contributing to ecosystem management.

## 5.2 Research limitations

The scope of this study was limited by the number of companies surveyed, although a larger sample could have provided more comprehensive insights. Nonetheless, the responses indicated a degree of theoretical saturation, as defined in Grounded Theory, suggesting that additional interviews might not substantially alter the overall findings.

Further research could explore practices in other countries and continents, as existing literature is predominantly grey, with limited peer-reviewed studies on the topic. This presents substantial potential for future investigation.

It should be noted that information on certain invasive species remains incomplete. Some species, including fungi, viruses, disease vectors, and insects, currently have limited economic applications. From a biological perspective, it is essential to assess whether their control or utilisation is a viable strategy, and management actions must be carefully evaluated to avoid counterproductive outcomes.

Ethical considerations are also significant. While species movement is a natural process, using invasive species as raw materials raises moral questions. For example, species like Indian balsam attract many insects, complicating their management.

This study focuses on the use of invasive species as raw materials when their control or minimisation is both biologically and ethically justified. While invasive species may offer potential benefits, this research specifically addresses cases where they are considered harmful and require management. Future research could explore broader implications and potential benefits of invasive species beyond immediate control.

## 5.3 Conclusion and outlook

This study addressed the research question: "What business models are being developed by companies to commercialise products from invasive species, and what opportunities

and challenges do they face in comparison to conventional companies in their business processes?" It provides valuable insights into the operations, supply chains, and market contexts of companies using invasive species, highlighting both their challenges and potential for market shaping.

Despite issues related to scalability, labour intensity, and cultural unfamiliarity, these companies demonstrate significant opportunities. Key areas for improvement include research into the chemical and technical properties of invasive species to enhance industrial applications, the development of AI-driven harvesting and automated processing technologies, and the creation of standardised product data and ingredients lists. Strategic market shaping—including modernised design, communication, and branding—remains crucial, as does navigating regulatory frameworks and engaging with consumers to improve acceptance. Government support for research and access to knowledge is particularly important for smaller businesses.

While the economic utilisation of invasive species can help control their populations, ethical and biological considerations—particularly regarding vertebrates, bycatch, and ecosystem impacts—must be addressed. Companies could also expand beyond niche markets to strengthen regional supply chains, enhance food security, and develop innovative product offerings. Current and emerging technologies, such as lab-grown meat and fur, may reshape the field, highlighting the need for adaptability and long-term strategic planning.

In conclusion, this paper demonstrates that invasive species, long viewed as ecological threats, can be transformed into valuable economic resources. By combining innovative supply chain management, technological advancements, and strategic market shaping, businesses can turn environmental challenges into opportunities, redefining invasive species from menace to market.

## Outlook

Future research should explore broader international practices, investigate additional industrial and pharmaceutical applications, and assess the long-term sustainability and ethical implications of utilising invasive species. Expanding the evidence base and technological capabilities could further enhance the viability of this emerging market and its contribution to both ecological management and economic development.

## Acknowledgements

A detailed overview over the companies is given in Table 4 in the Appendix. Furthermore, selected quotes that emphasise the basic tenor of the interviewees are presented in Table 5 in the Appendix. The interview questions all interviewed companies, associations and partners were asked, can be found in Table 6 in the Appendix.

## Disclaimer

Statements about animal welfare organisations such as PETA only reflect the statements of the companies surveyed and do not necessarily reflect the authors' opinions.

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# Appendix

| Company/ association/ person | Position of interviewee | Length of interview (minutes) each | Affected invasive species/similar processes | Company size | Country | Number of organisations interviewed |
|---|---|---|---|---|---|---|
| Trading company for herbs and teas | Owner | 60 | Wild harvest of herbs and teas | SME, family-owned business | Germany | 2 |
| (Tannery), furrier & fur trade | Owner, furrier | 60 | Invasive: Nutria, raccoon, etc. | SME, family-owned business | Germany | 8 |
| Import, wholesale & retail wool | Co-owner | 45 | Fox kusu (wool) | SME, family-owned business | Germany/ New Zealand | 1 |
| Swiss & German Hunting Federations | Employee, | 60 | Raccoon, Nutria | Association, 280.000 members in total | Switzerland | 2 |
| Production and trade of cosmetics & consumer goods (mainly soaps) | Owner | 60 | Myrtle heath (herbs) | SME, family-owned business, long family tradition | Germany | 1 |
| Hunter & butcher | Owner | 60 | Nutria, raccoon | SME, family-owned business | Germany | 3 |
| Farm, herbal education & farm shop | Owner | 35 | Indian balsam | ME, family-owned business | Germany | 2 |
| Researcher, marine biologist | Scientist | 40 | Green and blue crabs | SME | USA | 1 |
| Processing & trading company for seafood | Co-founder & Co-owner | 60 | American swamp crayfish, (raccoon), not invasive but sometimes also biological plague: swans | SME, family-owned business | Germany | 1 |
| NGO for awareness & education against a specific invasive species | Founder & leader | 30 | Green crab | Small Association | USA | 1 |
| Producer, trading company for cosmetics and consumer goods | Co-founder & Co-owner | 60 | Indian balsam | SME, family-owned business; partner business in Croatia | Austria/ Croatia | 1 |
| Production and distribution of leather goods | Owner & assistant | 60 | Invasive snakes, invasive carp, python, dragonfin | SME | USA | 1 |
| Trading company for cosmetics and consumer goods (essential oils) | Co-owner | 45 | Myrtle heath | SME | Germany | 1 |
| Restaurant | Owner, cook | 30 | Raccoon | Small restaurant, now inactive | Germany | 1 |

Table 4: Interview details and respondent characteristics.

| Source | Representative quote | First-order categories | Second-order themes |
|---|---|---|---|
| Processing & trading company for seafood | “The Bible knows 10 plagues. 4 of them can be eaten.<br><br>Since man has been acting like God, a few more have been added. Fortunately, some of them are also edible..." | Humans have influence on invasive species’ spread. Nevertheless, many of them can be used (economically)/ consumed. | Human impact, economic use (potential) |
| Furrier | "I am a furrier and craftsman with heart and soul." | Pride in the profession | Pride in profession, dissonance with customers |
| Furrier | "Germany is an extremely fur-rich country." | In some areas there are more than enough raw materials. | Abundance of raw materials |
| Hunter and butcher | “We are ‘hunters and carers’, but we no longer have much of a lobby". | Contradiction between own and external view | Pride in profession, dissonance with customers |
| Furrier | "We do what the industry already wants. Yet we are not the model industry of the green movement."<br><br>"Don't believe what people are saying." "There are no queues at the organic food shop." “Put your money where your mouth is – Germans don't. | Remodelling of clothes: upcycling, more durability; own green acting, customer dissonance | Pride in profession, sustainability, dissonance with customers’ behaviour |
| Hunter and butcher | In the hunting community, exotic is inferior, like a waste product. You might hear a statement like "I'm not going to touch a rat". | Lack of knowledge about invasive species and their potential use | Lack of knowledge about invasive species and their potential use |

Table 5: Representative quotes (translated mostly from German language).

| | |
|---|---|
| **1.** | **Introduction of the interview partners** |
| 2. | **<u>Questions about the company</u>**<br><br>• History of origin<br>• Original motivation<br>• How did you come across invasive species?<br>• How big is your company? |
| 3. | **<u>Products & supply chain/organisational matters</u>**<br><br>• Which animals or plants do you process? Which of them are invasive?<br>• What does the supply chain look like to you, who processes?<br>• How many suppliers do you have?<br>• If you collect or hunt yourself, how do you do it?<br>• What is made from the raw materials?<br>• What is the main difference between wild and conventional products?<br>• What quantities do you produce?<br>• Could you still scale? |
| 4. | **<u>Marketing and sale</u>**s<br><br>• If brands are used in the company: asking about the history of origin, success and use<br>• Perception of the population/potential customers<br>• Typical customers? Cultural or age differences?<br>• Sales arguments<br>• Question about competitors |
| 5. | **<u>Dealing/relationship with authorities, support from them</u>** |

Table 6: Interview questions (semi-structured interviews).