Journal homepage: www.fishtaxa.com

Diversity and Distribution of Endemic Freshwater Fish Species in the River Systems of Northern Cyprus

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Abstract

This analysis provides an overview of the diversity and geographic dispersion of endemic freshwater fish in the river systems of Northern Cyprus highlighting their ecological value, enduring problems, and conservation measures. Northern Cyprus is a rare habitat for the development of endemic species of fish that have specialized to survive in specific freshwater environments, as a result of its unique Mediterranean climate and isolated river systems. Morpho and Karpaz basins in the river systems host rich endemics, such as the Cypriot rainbow trout (Oncorhynchus mykiss), Cypriot carp (Cyprinus carpio), and several representatives of the family Cyprinidae. These fish are essential for maintaining healthy aquatic through nutrient cycling as well as forming key components of the local food webs. But these endemic species are becoming increasingly susceptible to anthropogenic pressures, including habitat disruption, water contamination-induced pollution, introduction of invasive species, and changes to water flow when dams are built. Moreover, there is also need for frequent monitoring and scientific studies to assess the health of the freshwater habitats and the present situation with the endemic species. The results highlight the urgent need to protect the dying freshwater fish species in Northern Cyprus, acknowledging its ecological value, and its cultural and economic relevance. Local participation, public funding, and involvement of environmental social groups must converge to ensure the survival of such exotic species and the future vitality of the river ecosystems of Northern Cyprus. Through the new information that this study provides, in terms of regional aquatic biodiversity, it strengthens the argument, in favor of robust conservation processes being adopted in order to sustain these ecosystems.

Keywords: Diversity and Distribution (D&D), Endemic Freshwater (EF), Fish Species (FS), River Systems (RS), Northern Cyprus (NC)

Citation: Ayşegül, D, Sevgi, Y. 2025. Diversity and Distribution of Endemic Freshwater Fish Species in the River Systems of Northern Cyprus. FishTaxa 35: 44-54.

Introduction

The word Endemic Freshwater Fish Species means those important species which are specific to a particular geographical region or any particular ecosystem. In this way, these Species are having such characteristics that make them adapted to that local environment. These endemic Freshwater Fish Species are important for the biodiversity of that particular ecosystem. These endemic Freshwater Fish Species are also prerequisites for ecological balance in that local environment. Alongside it, there is also a need to take some important conservative measures to protect these endemic Freshwater Fish Species. We are going to understand the water system of Northern Cyprus, so we have to discuss about key features of this water system. The first most important feature is that there are limited water resources in Northern Cyprus. In other words, we can say that water is scarce because of climate and the location of this region on Earth. Secondly, we have seen that there are some important river systems in Northern Cyprus along dams and reservoirs on these rivers, which make it possible to store and manage such water resources in Northern Cyprus (Papastergiadou et al., 2016). As we have mentioned that there are some important river systems in Northern Cyprus, which are named as Pedieos River

Accepted: 29 August 2024; Published: 30 October 2024

and the Serdarli River. These two river systems are important because they mostly contribute to major water resources in Northern Cyprus. Along these river systems are also important because they support a diversity of freshwater fish species. Actually, we are having very less information about diversity and Distribution of Endemic Freshwater Fish Species in Northern Cyprus but we can say that Turkey is nearby to this Northern Cyprus, so diversity of freshwater fish species in Turkey will be similar to Northern Cyprus diversity of freshwater fish species. So, we are going to discuss some important Endemic Freshwater Fish Species of Turkey. Leucocidin is one of the important families of freshwater fish species, which we will try to understand here. This particular family of fishes is also known as Eurasian minnows, and these fishes have having variety of habitats such as rivers, lakes, streams, ponds, and others. If we discuss diversity in this group of fish, we may come to know that this family has much diversity in terms of characteristics and adaptations in fish. The size of these species of fish is usually variable and ranges from small to medium-sized(Demartini, Tziortzis, Dörflinger, & Buffagni, 2016). If we discuss nutritional mode in these fishes, we can say that they are having an omnivorous mode of nutrition, so these fishes feed on small invertebrates, algae, and other fishes. These fishes have having variety of habitats ranging from slow-moving rivers to streams as well. These species of fish are important because of their ecological role. These fish are important in the food chain because they serve both as prey and predator as well. The most important aspect of importance of these fishes is that they can serve as natural indicators that can indicate the quality of water along the health of the ecosystem in that particular region (Smith & Darwall, 2006). The other important family of endemic Freshwater Fish Species in Northern Cyprus is Aphaniidae, which is considered a family of small fishes. These types of fish are mostly found in freshwater along brackish environments as well. These fish show diversity in their characters and habitats as well. These fishes are mostly known as killifish of tooth carps, which are found in shallow and mostly slow-moving water. These fish mostly have small size ranges of about 10 to 15 cm in length (Zogaris & Economou, 2018). The most important characteristic of this family of fishes is that they have bright colors on their bodies, which have attractive and alluring patterns on them. These fishes are having such adaptations that enable them can survive not only in freshwater but also in hyper saline water. These fish are also omnivores mode of fire so they also feed on animal-based food in the form of small fishes or invertebrates. Like other families of fishes in Northern Cyprus, these fishes are also important for their ecological role because of their role in the food chain as prey and predator as well (Economidis & Banarescu, 1991). These fish are highly sensitive to environmental changes, so they can serve as useful indicators of temperature, pressure, and humidity in a water ecosystem. The next most important freshwater fish species in Northern Cyprus is Cobitidae. This family is also known as loaches. These fish have an elongated body so that they have a cylindrical body shape. These fish are mostly bottom dwellers, so they feed on detritus. Because of this characteristic, they are mostly found in muddy and sandy substrates. These fishes have small mouths, but this mouth is specialized for feeding on small invertebrates and detritus (Oikonomou, Leprieur, & Leonardos, 2014). These fish have nocturnal behavior, so they hide during the day but usually search for prey at night. These have characteristics that help them to search for prey at night. These fishes have having ecological role because they help to control the population of invertebrates. Alongside it, they can also serve as food for many other animals. These fishes are known for their diversity because they have almost 200 species, which are varied in color and behavior as well. These fishes are found in not only slow-moving rivers but also in fast-flowing streams as well. The other most important characteristic of these fishes is that they are useful for the aquarium trade (ÇIÇEK, FRICKE, Sungur, & EAGDERI, 2018). Humanized features such as urbanization, agriculture and industrial water use have altered the natural environments of these river systems significantly with the risk to the continued presence of these species. Also, alterations in climate influence water conditions and natural flow, thereby enhancing the stresses applied to these very sensitive freshwater environments. From this study, it is clear that there is an imminent need to come up with elaborate conservation plans in order to guarantee survival of these endemic freshwater fish. To regulate the ecological

balance efforts should be targeted at re-formation of habitats, establishing protected areas, proper water guardianship and the reduction of invasive species' spread. They have such interesting behavior and attractive appearance that they are usually traded for aquariums. These fish need specialized care because they are mostly sensitive to many important environmental factors. They need hiding places and a balanced diet for better growth and survival. The other most important freshwater fish species in Northern Cyprus is Nematicide, which is also known as stone loaches. These fish have elongated and cylindrical bodies. These fish are mostly dwellers, so they help in the recycling of nutrients as well. These fishes have much similarity with Cobitidae. Both of these families have had same habitat and the same ecological role as well. Like Cobitidae, these fishes also have nocturnal behavior, so they search for prey at night. If we talk about the distribution of these fishes, we may come to know that these fishes are not only common in Northern Cyprus but also found in other important freshwater ecosystems all over the world (Zogaris et al., 2012). The ranges and dispersions for the native freshwater fish in the rivers of Northern Cyprus reflect an ecological profile defined by the natural environment of the region, including its climate and water dynamics. The unique Mediterranean climate in Northern Cyprus facilitates resident and migratory fish interactions thereby continuing the adaptability and diversification nature of freshwater ecosystems in the region. River systems such as Morphou, Karpaz and other minor watercourses provide unique habitats that enable endemic species mass out which are endemic here. These species have developed to flourish in such unique environmental conditions, in the waters with the change in flow, temperature, and water quality over time. Many endemic fish species have been recorded in years, like the Cypriot rainbow trout the presence of these endemic species is essential due to their ecological role in recycling nutrients in the system as well as being important food resource to other species in the system. However, they are often limited to certain locations due to interference like blocking of rivers, pollution of water and spread in invasive species. There are steps to take to protect these rare fish populations, such as habitat restoration, increased water management rules and conservation research for sustainable practices that will be able to ensure their survival under escalating environmental threats. The conservation of such unique species is critical not only for the preservation of the biodiversity in the region but also for the maintenance of the cultural and economic impact enjoyed by the local communities.

Research Objective

The main objective of this research is to understand diversity and Distribution of Endemic Freshwater Fish Species in the River Systems of Northern Cyprus. These studies have effectively explained about various fish species along important characteristics of them (Figure 1).

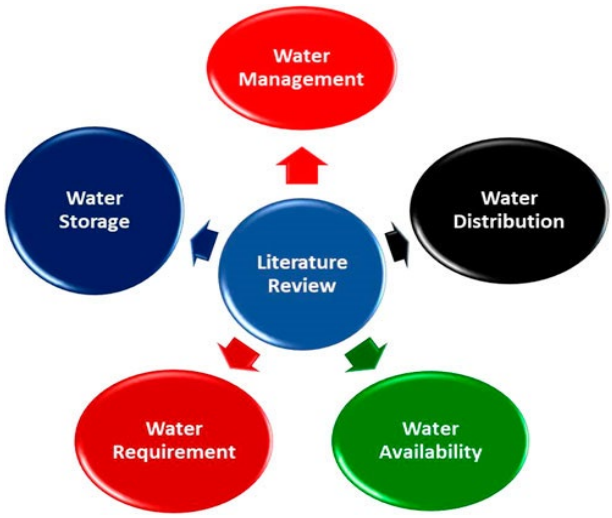

Figure 1: Research Objective

Literature Review

In the past few years, medical studies have convinced us that there is a Great role of every type of fish species in balancing the water ecosystem. So, there were ongoing studies about the habitat and morphological characteristics of various types of species of fish. We also came to know that when the habitat of fishes varies, their characteristics also change because characteristics help in adapting to the local environment. There was much attention towards the river systems of Northern Cyprus because studies have shown that water is scarce there(Lodge, Taylor, Holdich, & Skurdal, 2000). So, it is important to understand how a variety of species of fish survive there. For this purpose, there was ongoing research on river systems of Northern Cyprus, along diversity and Distribution of Endemic Freshwater Fish Species there. As it is new research so presently there is less data related to the diversity and Distribution of Endemic Freshwater Fish Species in Northern Cyprus. But scientists have concluded that as Turkey and Northern Cyprus have similar characteristics of water ecosystems so if we study diversity and Distribution of Endemic Freshwater Fish Species in Turkey, it will help study diversity and Distribution of Endemic Freshwater Fish Species in Northern Cyprus as well(Wagner et al., 2021). Because studying diversity and Distribution of Endemic Freshwater Fish Species in Northern Cyprus, we have to understand some important characteristics of the river systems of Northern Cyprus. Usually, there is a cool and rainy climate in Northern Cyprus, where the annual rainfall occurs during December and February. After that, the whole year is mostly hot and dry in terms of summer. Some important factors affect the diversity of Endemic Freshwater Fish Species in Northern Cyprus. One of these important factors is climate, which mostly affects the population of fish in rivers (Cantonati et al., 2020). Secondly, water is scarce in this region of the Earth, so only those types of fish survive there that have adaptations that will help them to live in dry water resources. It has also been seen that there is habitat diversity in river systems. There are pools, riffles, river mouth, and others, so such diversification of habitat will help in diversification of fish species as well. Recent studies have shown that most of the Species which are found in Northern Cyprus are found nowhere else in the world except Turkey (Edo, Nwosu, & Samuel, 2023). Leuciscidae is one of the important fish families which is found in Northern Cyprus. This group of fish is mostly diverse because they have a variety of body shapes and sizes as well. These fish are mostly found in freshwater reservoirs. The other important genus of Leuciscidae is Pseudophoxinus, which are commonly known as minnows (Zarei, Masoumi, Al Jufaili, & Esmaeili, 2023). These fish are mostly small in size compared to other genera. These fish are mostly found in Northern Cyprus and Turkey. The most important characteristic of this genus is that these fishes can be used as indicators, so that they can indicate environmental health and water quality as well. It is because they are sensitive to many environmental parameters such as temperature, pressure, and others. The other important family of Endemic Freshwater Fish Species in Northern Cyprus is Aphaniidae, which has many important group of genus(Carpio, De Miguel, Oteros, Hillström, & Tortosa, 2019). The most important genera of this family are Aphanius and Anatolichtys. If we discuss Aphanius, we may come to know that these are commonly known as killifish. Along freshwater habitats, these fishes can also survive in brackish environments. Not only this, but these fishes are also found in hyper saline environments, which shows that they have a variety of characteristics that help them adapt to the local environment. As another genus of this family, these fishes can also be used as environmental indicators, thus useful for the environment. If we discuss important threats to Endemic Freshwater Fish Species in Northern Cyprus, we may conclude that climate change is the most important threat to these species (Englezou, Gücel, & Zogaris, 2018). As we know that because of urbanization and other such factors, there is an increase in the level of greenhouse gas, and this greenhouse effect is responsible for global warming. The average increase in temperature of the Earth, which is called global warming, can cause changes in weather patterns called climate change. Because of this reason, we are having a prolonged summer season and a short but intense winter season all over the world(Tierno de Figueroa, López-Rodríguez, Fenoglio, Sánchez-Castillo,

& Fochetti, 2013). When there is an aspect of climate change, there will be more risk of floods, and such floods will disturb water levels in freshwater reservoirs. In this way, the population in these freshwater reservoirs will be badly affected. Climate change will not only result in floods but will also result in droughts that will also affect the population of these fish. The other most important threat to these endemic Freshwater Fish Species in Northern Cyprus is anthropogenic activities, for example, agricultural activities. As we know that there is an increasing demand for food all over the world because of the increasing population. To meet such demand for food, there is extensive use of fertilizers and pesticides in agriculture. When such polluted water reaches water reservoirs, there will be harm to the fish species there. Many chemicals in fertilizers and pesticides may cause suffocation in the water ecosystem. Water pollution is also another important threat to endemic Freshwater Fish Species in Northern Cyprus (Spairani et al., 2025). Many factors pollute water, such as industrial pollutants, detergents from houses, and others. When water quality deteriorates, there will be a definite decline in the fish population there. Overfishing is also considered one of the important threats to endemic Freshwater Fish Species in Northern Cyprus (Vardakas et al., 2015). As we know that overfishing is responsible for many species becoming extinct or endangered. Urbanization is also an important leading cause of habitat destruction of these endemic Freshwater Fish Species in Northern Cyprus, which will result in a smaller population of these important fish species (Delipetrou, Makhzoumi, Dimopoulos, & Georghiou, 2008). For this purpose, there is a need for the adoption of some important Strategies to cope with these challenges for endemic Freshwater Fish Species in Northern Cyprus (Langeneck et al., 2022; Zotos et al., 2021). We need to make conservation efforts, such as the protection of habitats, along restoration of habitats. Moreover, we need to improve water quality in various ways because when water quality is improved, the diversity and Distribution of Endemic Freshwater Fish Species in Northern Cyprus will become better (Zogaris et al., 2023).

Applications of Diversity and Distribution of Endemic Freshwater Fish Species in the River Systems of Northern Cyprus

An analysis of the various endemic freshwater fish species that is contained in the river-systems of Northern Cyprus provides benefits across a variety of disciplines, not only contributing to environmental conservation but to the sustainability of resources. Such applications play an important role in the protection of biodiversity and livelihoods of local communities as well as the sustainable use of freshwater resources. Below are some key applications:

Figure 2: Conservation and Biodiversity

Conservation and Biodiversity Protection

Effectiveness of conservations largely relies on the knowledge of distribution and diversity of endemic

freshwater species (Figure 2). It is possible to implement targeted conservation measures (establishment of protected areas, rehabilitation and protection of habitats, water quality protection) once key habitats are identified, understanding the species' exact environmental needs. Preservation of endemic fish species in freshwater is within the bigger picture of biodiversity and makes sure that freshwater ecosystems are stable and able to withstand any shock. Promoting biodiversity and conservation work a primary function in protecting ecological balance and assuring continued salutary of earth. The wide spectrum of life from the genetic, specie and ecosystem levels; collectively known as biodiversity is critical in providing some of the most important services that the ecosystem offers; such as pollination, purification of water as well as mitigation of carbon absorption. While engaging in activities such as deforestation, pollution, climate change, and overuse, the major declines of biodiversity has endangered ecosystems and their vital services (Zogaris et al., 2012). To both save the species and their habitats conservation strategies include creating protected Zones, sustainable practices and wildlife corridors. Biodiversity protection involves the restoration of damaged ecosystems, use of effective conservation mechanisms, and involving societies in conservation. Biodiversity conservation efforts made by the world are reflected by treaties such as the Convention on Biological Diversity. Conservation of biodiversity brings substantial benefits to human health and well-being in addition to ecological gains. Remains of many medicines, food sources, and cultural practices are directly related to global biodiversity. Conservation of biodiversity is necessary both to support the survival of endangered species and to increase the resilience of ecosystems to accommodate environmental change.

Sustainable Water Resource Management:

Freshwater environments are essential to Northern Cyprus society particularly, for agriculture, increasing the tourism and conveying drinking water. Studies of the native fish species locations may help develop better ways to manage water resources. For example, sustainable water management measures can be taken to reconcile human needs with freshwater system maintenance. Furthermore, for projects of this kind (such as dams or irrigation schemes), evaluation and control of influence becomes more precise (Figure 3).

Figure 3: Freshwater System

Tourism and Ecotourism Development

Northern Cyprus's unique fish populations mean that there is huge potential for ecotourism, contributing to the economic growth of local communities whilst helping to stimulate ecologically protective work. Awareness sensitization of the public on these endemic species and their habitats enables the region to attract travelers who want to have a nature experience such as fishing, observing birds and venturing into the rivers. The respective

initiatives promote sustainable tourism that increases economic status of the community without compromising the environment. Ecotourism is an important complementary aspect to economic growth in maintaining a balance between the protection of the environment and the appreciation of culture of the people in a world that is advancing globally in terms of trends in its sector. The possible loss experienced in terms of the potential customers due to the diminishing tourism industry can be countered by introducing the ecotourism as an attractive alternative for the Northern Cyprus in the wake of its unique natural legacy and abundant biodiversity. Introducing eco-tourism, by attracting aware travelers can at the same time promote conservation and drive economic improvement in local surroundings while not undermining natural resources. The presence of unique freshwater fish and various river ecosystems fuels up an ideal environment for the development of ecotourism in Northern Cyprus. Through such activities as guided river explorations, bird watching and nonpolluting fishing, the community can benefit financially while protecting the sensitive biodiversity of the area. Ecotourism encourages the sustainable practices, such as waste reduction, carbon emission reduction and support of local businesses (Spairani et al., 2025). Ecotourism offers the local population a sustainable alternative to the resource-intensive sectors such as agriculture, or mass tourism. With ecotourism, many jobs are provided for tour ambassadors, hotels, and environmental educators but at the same time, they are meant to increase awareness about the importance of conservation. Besides, the proceeds derived from ecotourism can be strategically used towards conservation activities ranging from the protection of riverine ecosystems, recovery of ecosystems in the neared states of collapse as well as the research of local species. Further, ecotourism might encourage the development of facilities that add to the pleasure of guests and to the standard of living of the residents as well. For instance, the investments may be directed towards upgrading roadways, installation of informative signs, improved waste disposal network and creation of educational facilities to sensitize people about environment.

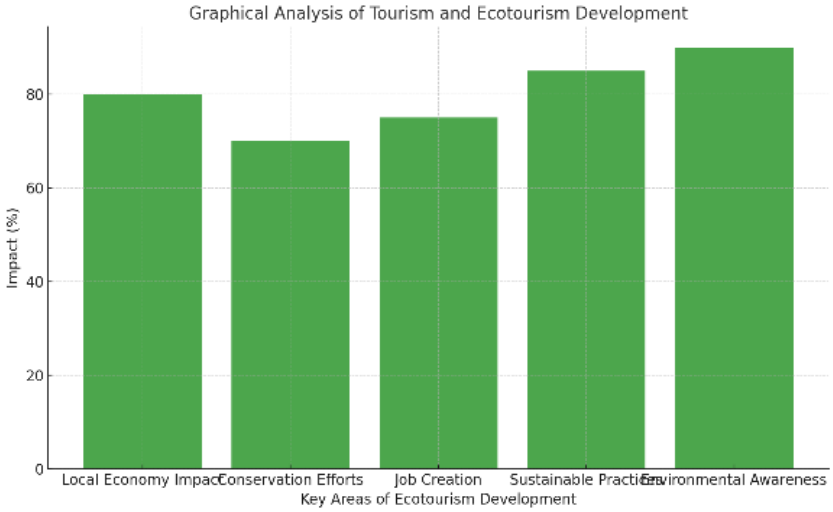

Figure 4: Tourism and Ecotourism Development

As shown above in Figure 4, a bar chart shows how tourism and ecotourism are projected to impact on critical areas. Based on the data, it is evident that ecotourism results in real advances in local economic growth, conservation, employment, sustainability, and environmental awareness. For example, from the graph, the environmental awareness gets to 90%, which is one of the highest impact areas, only second to sustainable practices, at 85%. The chart shows the transition of ecotourism (from the balance, if maintained, to an unavoidable mean to inform tourists and locals about the importance of environmental protection). The 80% reflection of local economy impact indicates that ecotourism stimulates the growth of the economy while saving the environment. The data shows that ecotourism is a key factor in the economic development and environmental

sustainability, as well as synchronizes the local communities (Figure 5).

Figure 5: Local Communities.

Limate Change Adaptation

With the threat of climate change to the river ecosystems, location and adaptive strength of endemic fish is critical in estimating the effects of changed conditions on freshwater diversity. Attaining this understanding enables the development of climate adaptation strategies that involve preserving habitats, water resource management improvement, and assisted species movements all aiming at strengthening the resilience of aquatic ecosystems against the face of<|/system|>Mastery of this knowledge permits climate adaptation strategies that include the conservation of habitats, improved water resource management Climate change adaptation entails preparedness for as well as managing the impact of the current and future climate changes which particularly affect the ecosystem, societies and economies. The rising of global temperatures, increased appearances of extreme weather events, and high sea level necessitate immediate adaptation practices for sustainability and resilience development. Climate change adaptation aims to decrease risks and increase benefits through system arrangements that help to cope with changes in environmental conditions. At the heart of climate change adaptation lies the understanding that change will happen irrespective of adaptation efforts. These strategies aim to counter the result of climate impact such as changed temperature condition, changes in rainfall pattern, and an increased probability of severe weather events such as flood and heat waves. When adapted technical, ecological, and socio-economic factors intersect to create solutions unique to specific communities or ecosystems, adaptive solutions are the most effective. As regards natural ecosystems, adaptation activities generally tend to focus on biodiversity conservation and ecosystem protection that provide critical services. Importantly, the deployment of early warning systems and strong risk assessment is critical in minimizing the effects of flooding, storms and other climatic disasters. Another strategy for adaptation is that communities shift their sources of income, for example, they adapt to more resilient agricultural practices or they use new technologies in order to reduce reliance on precarious sources. Governments and international organizations are tasked with policies that contribute to enhanced promotion of sustainable land use, efficient management of water resources, and promoting the development of climate resiliency infrastructure. Climate adaptation efforts would have to be aimed at vulnerable groups in particular those affected by rising sea level or prolonged shortage of water and have to include local stakeholders and traditional knowledge in the planning processes.

Educational and Scientific Research

The study of endemic freshwater fish specialists can enrich the data base for research and educational purposes. An analysis of these fish in the light of the evolutionary history of species, species forming, and relations among

species in autonomous river systems is of great importance to researchers. The findings of this research have the potential to be used by educators, and environmental organizations in order to inform about biodiversity, conservation of animals, and the role of freshwater ecosystems. Finally, it is not difficult to see that understanding the diversity and the distribution of endemic freshwater fish species in Northern Cyprus provides much more than a set of basic ecological insights. Their significance is that they support conservation objectives, facilitate sustainable management of natural resources, help influence response strategies to climate change and substitute sustainable ecotourism. As we adopt these applications, we can secure the future of freshwater ecosystems and the good health of not only the communities nearby but also the whole ecosystem of the globe.

Numerical Analysis

The numerical analysis of conservation and biodiversity protection usually involves estimating biodiversity changes caused by conservation action, calculating ratios of cost to the benefits for conservation strategies, and quantifying the order of biodiversity decline.

Numerical analysis is set upon certain important dimensions of the task that include:

Biodiversity Loss Rate

Estimates are that human activity rates have raised the rate of extinction by a factor of 1,000 from the natural background rate. The IUCN reveals that about 27,000 species are currently at risk of extinction.

Economic Costs of Biodiversity Loss

According to a report by the World Economic Forum (WEF), the current trend given a scenario that does not change, would present a race towards a $10 trillion annually economic cost from biodiversity loss by 2050. This enormous economic impact is mostly contributed to by the degradation of ecosystems critical for processes such as providing clean water, food and climate control.

Cost of Conservation

The global estimate for the annual cost of the measures of protecting biodiversity through such protection areas and restoration measures is estimated at $200 billion. The investment costs of protecting ecosystem services are dwarfed by even more significant returns on that investment.

Graphical analysis of Conservation and Biodiversity Protection

Figure 6: Conservation and Biodiversity Protection

These species of fish peculiar to the rivers of Northern Cyprus are critical bioindicators of ecological well-being.

Investigating changes in the population and spread of these native fish species provides valuable information on the general health of freshwater that is important with respect to temperature, contaminates and human disturbances. Using this knowledge, environmental managers are able to respond immediately to unfavorable changes, like unnatural pollution, or destruction of habitat (Figure 6).

Conclusion

In summary, the diversity and their distribution in the endemic freshwater fish species in the river systems at Northern Cyprus reinforces their critical role in maintaining ecological equilibrium and regional diversity. This diversity of landscape and climatic conditions in Northern Cyprus has led to the presence of a variety of river systems each complete with unique attributes that support unique communities of life. Some isolated river basins by geographical barriers have helped the establishment of endemic species that live in their distinct water habitat. Species such as the Cypriot rainbow trout, Cypriot carp and others belonging to the Cyprinidae family are critical for the health of river systems on the northern side of Cyprus. In virtue of becoming prey to other animal species and the provision of nutrient recycling, such species are indispensable for the balance and function of aquatic food chain. In addition, the resurgence of these species is a very important indicator of the health of the aquatic environment because they are sensitive to changes in quality of water, temperature and destruction of habitats. However, different human activities threaten to choke these endemic species' habitats and ranges. Increasing urban growth, demands for water in agriculture and industry, and construction of dams and other infrastructures have interfered normal water flows, degraded habitats, and polluted river environment. The resultant disruptions have resulted in habitat fragmentation which has limited the movement of species, and hence increased the vulnerability of endemic species. Invasive species are a serious danger to preserving Northern Cyprus' rich freshwater diversity. Non-native species, sometimes introduced for business or pleasure, frequently have to fight the native fish for food and living conditions. If invasive species can outperform endemic ones, they can reduce their numbers to such a level that local extinction is a possibility for some species. Some of the major strategies of conservation of such species include restoring the spoiled habitats, constructing protected zones, and the use of environment-friendly mechanisms of water utilization. We have reviewed various important aspects to understand the diversity and Distribution of Endemic Freshwater Fish Species in Northern Cyprus while studying the river systems of Northern Cyprus. After an overview of these important studies, we may conclude that data related to the diversity and Distribution of Endemic Freshwater Fish Species in Northern Cyprus is inadequate. Scientific monitoring has to continue in order to monitor how freshwater ecosystems lie and trace trends with the movement of species. Furthermore, the effective conservation efforts require collaboration of state bodies, environmental organizations, and community members to achieve growth and harmony with environmental preservation. Finally, the indigenous freshwater fish of Northern Cyprus are key elements of the overall ecosystem and biodiversity of the region. Thriving the existence of endemic freshwater fish is very important both for the preservation of the ecological diversity of Northern Cyprus and the life and traditions of its residents. It is therefore important to act quickly to reduce risks on these species for their natural heritage to the region to remain for the future generations. Actions to address habitat destruction, invasive organisms, and environmental shifts will be the heart of any efforts needed to maintain the endangered species of freshwater fish of Northern Cyprus and their ecosystems.

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