RANA	Sonderheft 4	5 - 22	Rangsdorf 2001

Current State of *Triturus cristatus* Populations in the former Soviet Union

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Summary

Review of data on the state of *Triturus cristatus* populations in the former Soviet Union is presented. In large areas the newt is a common amphibian. These are the regions of leafed and mixed forests in the south-western part of the area of occupancy in the former USSR. The overall abundance decreases in the zones of forest steppe and steppe as well as the taiga in the north. The areas, from where declines were documented, comprise less than a half of the total area of the species occupancy. Majority of the declines and extinctions concern the landscapes disturbed by anthropogenic activity: destruction, pollution, the shallowing and eutrophication of the ponds, drainage and pollution of water bodies, melioration of meadows, destruction of forests, construction of dams on large rivers and the introduction of the exotic fish *Perccottus glehni*. In general, *T. cristatus* in the former Soviet Union deserves conservation in many regions where it is rare and/or threatened species. The measures for protection should include, first of all, conservation of the habitats from destruction, pollution and introductions of exotic fish. However, the general situation with this newt on the territory seems not to be alarming and the species seems not to be threatened there in general. This part of the range composes about a half of the total range of the species. Thus, *T. cristatus* at present does not meet the requirements for the inclusion in the IUCN Red List and should be protected only at various regional levels.

Key words: *Triturus cristatus*, distribution, threats, protection.

Zusammenfassung

Es wird Überblick der Verbreitung von *Triturus cristatus* in der ehemaligen Sowjetunion gegeben. In den Laubwald- und Mischwaldgebieten im südwestlichen Verbreitungsgebiet in der ehemaligen Sowjetunion gehört der Kammolch zu den gemeinen Arten. Die Abundanz sinkt in den Waldsteppen- und Steppengebieten als auch in der Taiga im Norden. Die Gebiete aus denen Rückgänge dokumentiert sind, umfassen weniger als die Hälfte des Verbreitungsgebietes. Die Rückgänge und das Aussterben der Art betrifft hauptsächlich anthropogen veränderte Gebiete. Als Ursachen sind zu nennen: Zerstörung, Verschmutzung, Austrocknung und Eutrophierung von Gewässern, Melioration von Wiesen, Waldzerstörung, Bau von Dämmen an großen Flüssen und das Einsetzen der Armurgrundel (*Perccottus glehni).* Der Kammolch benötigt in vielen Regionen, wo er selten und/oder bedroht ist, Schutzmaßnahmen. Schutzmaßnahmen sollten sich zunächst auf den Schutz der Habitate vor Zerstörung, Verschmutzung und Fischbesatz konzentrie-

ren. Die allgemeine Sitution des Kammolches im Gebiet scheint dennoch nicht beunruhigend und die Art scheint allgemein nicht gefährdet zu sein. Dieser Teil des Verbreitungsgebietes umfasst etwa die Hälfte des Gesamtverbreitungsgebietes der Art. Der Kammolch erfüllt deshalb derzeit nicht die Anforderungen der IUCN zur Aufnahme in die Rote Liste und sollte nur auf der regionalen Ebene geschützt werden.

Schlagwörter: *Triturus cristatus*, Verbreitung, Gefährdung, Schutz.

Preface

Crested newts (*Triturus cristatus* superspecies) and especially the great crested newt *Triturus cristatus* (Laurenti 1768) are widespread in the former Soviet Union. Increased number of indications on local and regional declines has led to conclusion on the threatened status of this species, which was included in the IUCN Red List (Hilton-Taylor 2000). However, estimation of the global status of a species is impossible without the knowledge of its status over wide distribution areas. Former Soviet Union, where about a half of the *T. cristatus* global range is positioned (Griffiths 1996), represents one of such areas where the state of the populations was not yet estimated.

Methods

There are about 600 publications containing data on the ecology, distribution and systematics of the Great Crested Newt in the former Soviet Union (Database "Amphibians of the USSR", ®0229803415, State Register of Databases of the Russian Federation). After the exception of some dubious records, all these data indicate that the species inhabits a large area in the European part of the former USSR and the western part of West Siberia (see Kuzmin 1999 for review). Many works contain also estimates of the species abundance, habitat distribution and main threats. These data, as well as my multiyear results for Moscow Province (from 1970 to 2000) and some narrative informations provided the basis for general estimation of the current state of populations of *T. cristatus* on the territory under consideration. At first, I identified the geographical coordinates of available localities from where *T. cristatus* was recorded. The coordinates of 632 localities were identified and 17 other localities were not found on maps. These 632 localities provided the grounds for the map of the species distribution in the former Soviet Union. The map was constructed using the ARC VIEW GIS (Version 3.0). Then, all available data on the abundance in different regions were also put on the map. A large majority of publications contain data on the abundances in terms "singular records", "rare", "abundant" etc. Meaning of these terms probably varies among authors and many data concern particular localities instead of a region as a whole. However, the commonalty is designation of the species' place in an amphibian multispecies assemblage in the terms of relative abundance. The use of such measure is the only reasonable way in our case, because it is impossible to obtain precise data on the newt abundance in each region as a whole. I used the IUCN categories of the conservation status, adopted earlier (Kuzmin 1999), because the currently used, quantitative categories seem to be poorly applicable to amphibians (see Kuzmin et al. 1998 for details).

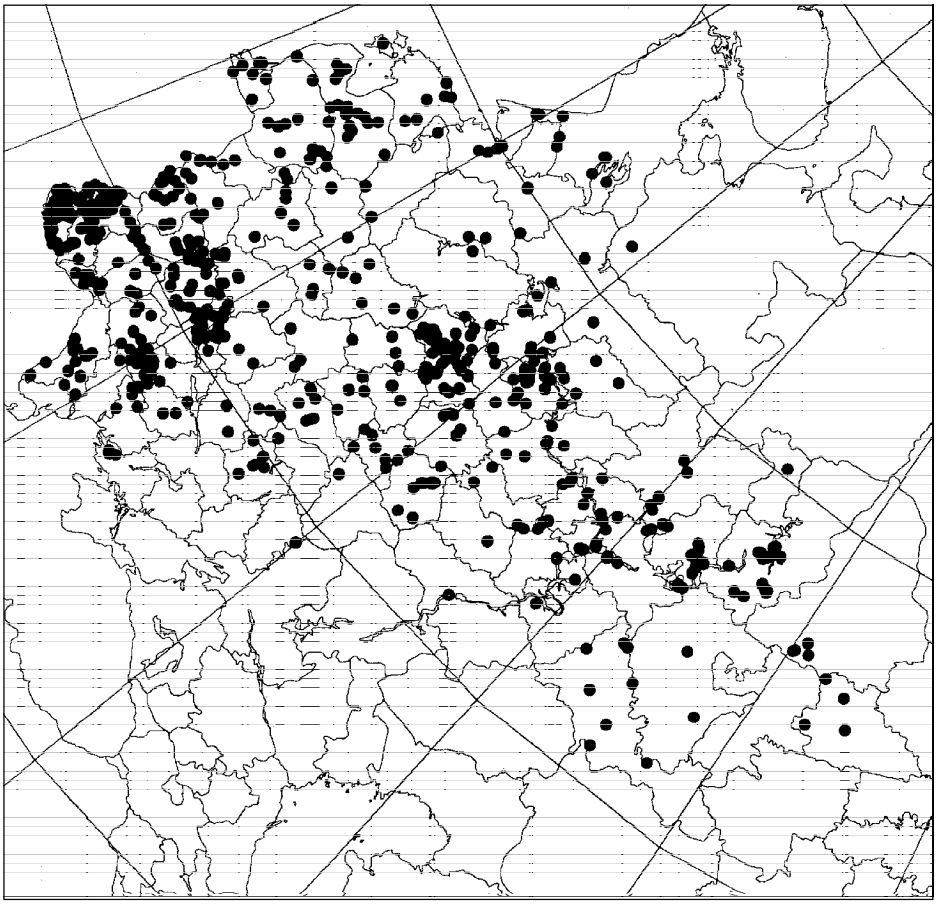

Fig. 1: Distribution of *Triturus cristatus* in former Soviet Union, by provinces.
Verbreitung von *Triturus cristatus* in der ehemaligen Sowjetunion, auf Basis der Provinzen.

Distribution

According to the verified published evidences of different years from the 19th Century to the present days (KUZMIN 1999) *T. cristatus* occurs in Kaliningrad Province of the extreme west of Russia and in Lithuania. Then the northern margin of the range runs north-eastwards from Latvia and Estonia to Russia. Published data indicate following distributional limits in *T. cristatus* (see the list of references below). The northern margin runs approximately along the line Leningradskaya Province - Republic of Karelia (the northernmost locality is Sopokha Village in Kondopozhskii District: ca. 62°12'N, 34°E), then turns to the south-east and runs by the line Arkhangelskaya Province (Kuzino

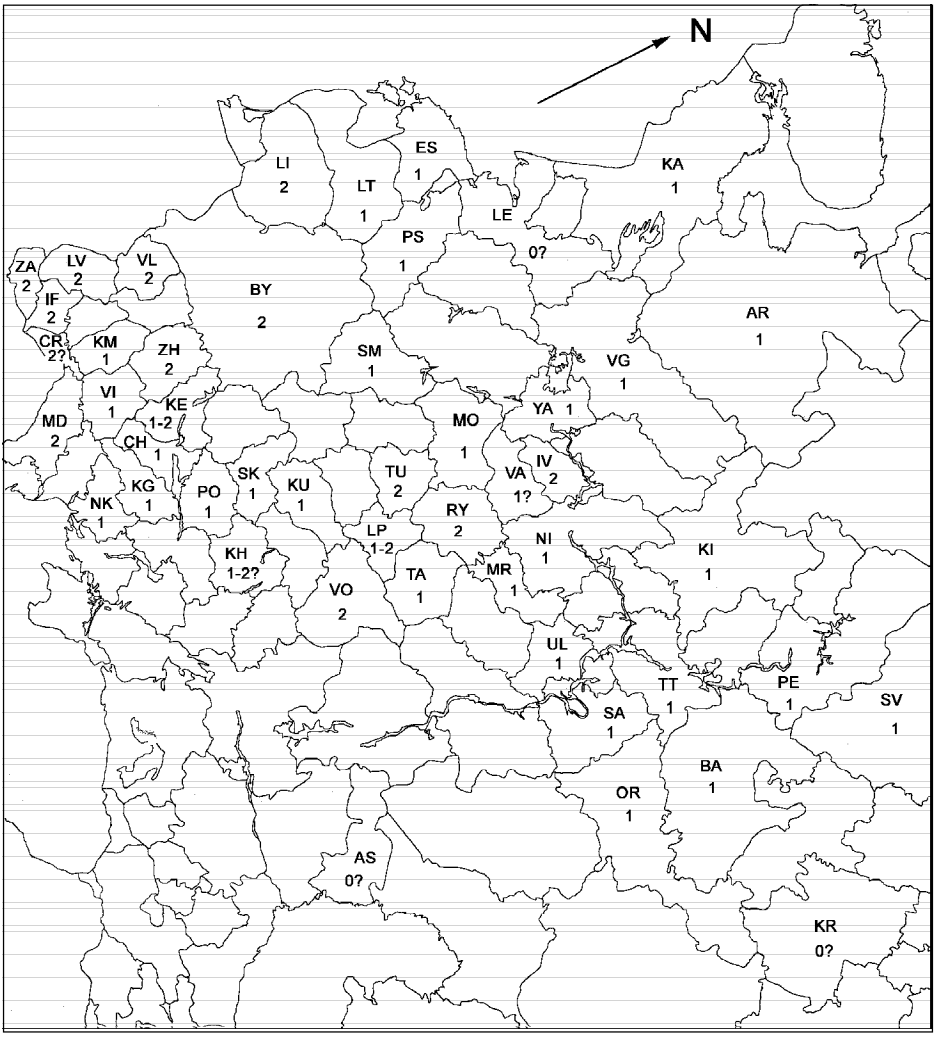

Fig. 2: The abundance of *Triturus cristatus* in different regions of the former Soviet Union.
Abundanz von *Triturus cristatus* in der ehemaligen Sowjetunion.

Regions: AR - Arkhangelskaya Province; AS - Astrakhanskaya Province; BA - Bashkiria; BY - Byelorussia; CH - Cherkasskaya Province; CR - Chernovitskaya Province; ES - Estonia; IF - Ivano-Frankovskaya Province; IV - Ivanovskaya Province; KA - Karelia; KE - Kievskaya Province; KG - Kirovogradskaya Province; KH - Kharkovskaya Province; KI - Kirovskaya Province; KM - Khmelnitskaya Province; KR: Kurganskaya Province; KU - Kurskaya Province; LE - Leningradskaya Province; LI - Lithuania; LP - Lipetskaya Province; LT - Latvia; LV - Lvovskaya Province; MD - Moldavia; MO - Moskovskaya Province; MR - Mordovia; NI - Nizhegorodskaya Province; NK - Nikolaevskaya Province; OR - Orenburgskaya Province; PE - Permskaya Province; PO - Poltavskaya Province; PS - Pskovskaya Province; RY - Ryazanskaya Province; SA - Samarskaya Province; SK - Sumskya Province; SM - Smolenskaya Province; SV: Sverdlovskaya Province; TA - Tambovskaya

Province; TT - Tataria; TU - Tulskaya Province; UL - Ulyanovskaya Province; VA - Vladimirskaya Province; VG - Vologodskaya Province; VI - Vinnitskaya Province; VL - Volynskaya Province; VO - Voronezhskaya Province; YA - Yaroslavskaya Province; ZA - Zakarpatskaya Province; ZH - Zhitomirskaya Province.

Levels of abundance: 0 - Extinct; 1 - Rare; 2 - Common; 3 - Numerous.

Regions, localities, years and levels of abundance by sources of information: AR: 1 - Marvin et al. 1971; AS: 0? - Garanin 1999; BA: Bahskirskii Nature Reserve: 1 - Pozdnyakova et al. 1989; surroundings of Ufa City: 1 - Bayanov 1995; BY: "everywhere" - Fedorowicz 1918; 2 - Voronin 1967; Pikulik 1985a; Belovezhskaya Pushcha Nature Reserve: 3 - Balyuk et al. 1989; ibid. 1952-1955: 2 - Bannikov & Belova 1956; ibid.: 1 - Bakharev 1986; CH: 1 - Goncharenko 1979; CR: Marcu 1934; ES: Saaremaa Island: 1 - Grosse & Transehe 1929; IF: 1 - Kolyushev 1959; 1950-1975: 2 - Polushina 1977; Szczerbak & Szczerban 1980; Zabroda 1993; IV: 2 - Guseva & Okulova 1998; KA: Ivanter 1975, 1988; south: 1 - Mela 1882; Kondopoga: 1 - Terhivuo et al. 1998; Kivach Nature Reserve: 1 - Zimin & Ivanter 1969; 1980-1999, Kutenkov 1988, 2000; Ivanter & Tikhomirov 1998; KE: Dneprovsko-Teterevskoe Forestry: 2 - Kanevskii Nature Reserve: 1 - Darevsky & Krever 1987; surroundings of Boyarka Settlement: 1978-1980: 1 - Kuzmin 1993; KG: 1 - Goncharenko 1979; KH: 1949-1849: 2 - Czernay 1851; 1? - Krivitskii et al. 1986; KI: 1 - Krulikovsky 1901; KM: 1 - Goncharenko 1979; KR: 0? - 1971-1973: Ponomarev 1976, 1977, cf. 1979-1993: Starikov 1995; KU: Tsentralno-Chernozemnyi Nature Reserve, Streletskii Area: 1963-1965: 1 - Eliseeva 1966; LE: Leningradskaya Province: 0? - Bianki 1909; LI: "everywhere" - Fedorowicz 1918; LP: 1 - Klimov & Aleksandrov 1987; "somewhere absent, somewhere rare, somewhere common" - Klimov et al. 1999; LT: 1 - Latvijas 1988; LV: 2 - Bayger 1909; 1950-1975: Polushina 1977; Rostochie Nature Reserve: 2 - Darevsky & Krever 1987; MD: Kodry and Redenskii Les Nature Reserves: 2 - Darevsky & Krever 1987; MO: "not rare" - Kulagin 1892; 1 - Orlova 1988; Dunaev 1999; 1970s-1999 - Kuzmin 1994, Kuzmin et al. 1996, my data; 2 - Losinyi Ostrov: Kuznetsov 1928; Prioksko-Terrasnyi Nature Reserve, 1980s: 2 - Leontyeva & Pereshkolnik in Zablotskaya & Zablotskaya 1991; Saltykovka Village: since 1969: 0 - Goncharova & Semenov 1997; Glubokoe Ozero Wildlife Sanctuary: 1970s-1996 - Reshetnikov & Manteifel 1997; Sharapova Okhota Settlement: 1995-2000: 2 - B.I. Timofeev, pers. comm.; Moscow City: 1 - Bannikov & Isakov 1967; Orlova 1988; Kuzmin et al. 1996; my data; since 1990: 0 - Leontyeva & Semenov 1998; MR: Simkinskii Wildlife Sanctuary: Astradamov & Alysheva 1979; NI: 2 - Varpakhovsky 1888; Puzanov et al., 1942; Nizhny Novgorod City: 2 - Sharygin 1979; 1940s-1960s - 2, 1980: 1 - Lebedinsky 1981; NK: 1 - Goncharenko 1979; OR: basin of the Dema River: 1960-1994: Chibilev 1995; PE: Ishchenko et al. 1996; Pechmen Settlement: "in significant number" - Voronov et al. 1971; PO: Poltava City: 1 - Gavrilenko 1970; PS: 1 - Meshkov 1958; Toropetskii and Kholmskii Counties: "not very often" - Esaulov 1878; RY: Okskii Nature Reserve: 1971-1990: Panchenko 1979, 1992; SA: 1 - Garanin 2000; SK: Ukrainskii Stepnoi Nature Reserve: Mikhailovskaya Tselina Area: 1 - Darevsky & Krever 1987; SM: 1 - Bazanova & Diakov 1975; SV: Toporkova 1973; my data; TA: Kersha River valley, 1967-1986: 1 - Sokolov & Lada 1997; TT: Varpakhovsky 1885; Garanin & Ushakov 1969; Volzhsko-Kamskii Nature Reserve: Raifskii Area: 4,4-12,3% of total amphibian numbers - Garanin 1983; TU: 2 - Ammon 1928, Aralov et al. 1987; UL: 1 - Osipova 1988; Melekesskii District: 1 - Abrakhina et al. 1993; VA: Litvinchuk 1998; VG: Litvinchuk 1998; VI: 1 - Goncharenko 1979; VL: Shatskii National Park: Darevsky and Krever 1987; VO: Voronezhskii Nature Reserve: 1984-1998: 2 - Lada 1999; YA: Darvinskii Nature Reserve: 1947-1985 - Kaletskaya 1953; Kaletskaya & Tupitsyna 1988; Kaletskaya et al. 1988; ZA: 1 - Kolyushev 1959; 1950-1975: 2 - Polushina 1977; Szczerbak & Szczerban 1980; Zabroda 1993; my data; ZH: Polesskii Nature Reserve: Darevsky & Krever 1987.

Note: all data for CH, KG, KM, NK and VI belong only to the basin of the Yuzhnyi Bug River; regions with no data on the abundance of *T. cristatus* are not indicated.

Settlement: 61°30'N, 39°08'E) - Vologodskaya Province (Shuiskoe Settlement: 59°22'N, 41°02'E) - north of Kostromskaya Province (Kologrivskii District: ca. 58°19'N, 44°19'E) - surroundings of Kirov City (58°37'N, 49°43'E) - Permskaya Province (Gainy Town: 60°19'N, 54°19'E - Palniki Village: 58°19'N, 56°54'E) - Sverdlovskaya Province (Sysertskii District: ca. 56°35'N, 60°56'E).

The southern margin of the range in the Ukrainian Carpathians runs a little north-eastwards from the northern margin of the another crested newt *Triturus dobrogicus* and generally corresponds to the hilly and mountain areas of Transcarpathia. In Moldavia, *T. cristatus* again lives north-eastwards from *T. dobrogicus*. There the southern margin of its range runs from central Moldavia from Nisporenskii District (Chutesty Village: ca. 45°45'N, 28°22'E) to the area of Bendery Town (46°34'N, 29°53'E). Then the margin runs through Ukraine south-eastwards and crossing the lower reaches of large rivers flowing into the Black Sea, approximately along the line Odesskaya Province (the Savranka River: 48°06'N, 29°41'E) - Nikolaevskaya Province (the Chichikleya River: 47°22'N, 31°10'E) - Khersonskaya Province (Krasnaya Khatka, mouth of the Dnieper River: 46°35'N, 32°26'E) - northwards through Nikolaevskaya Province - north-eastwards in Kirovogradskaya Province (Znamenka Town: 48°41'N, 32°40'E) - through Poltavskaya Province - Kharkovskaya Province (surroundings of Izyum Town: 49°11'N, 36°13'E) - Luganskaya Province (Streltsovka Settlement: 49°17'N, 39°58'E). Then the margin runs northwards into Russia through Voronezhskaya Province - Tambovskaya Province (Volkhonshchino Village: 52°00'N, 41°44'E) - Penzenskaya Province (former Gorodishchi County) - Saratovskaya Province (?Saratov City: 51°31'N, 45°58'E) - Samarskaya Province (Zhigulevskii Nature Reserve: 53°02'N, 49°04'E) - Orenburgskaya Province (Samara and lower Sakmara rivers: ca. 51°04'N, 55°03'E) - Chelyabinskaya Province on the southern Urals - south of Kurganskaya Province (south-easternmost localities in Yurgamyshskii District: ca. 55°20'N, 64o20'E) in West Siberia. Then the margin turns north-westwards through Shadrinskii District of Kurganskaya Province (ca. 56°06'N, 63°35'E), then north-westwards to Sverdlovskaya Province.

Thus, the great crested newt is distributed in the forest and forest steppe zones. Isolated populations live in "insular" forests within the European steppes. The hot and dry conditions of the steppes with deficiency of ponds and cold conditions of the northern taiga seem to be the main natural factors limiting the range. The species lives mainly on plains at an altitude near sea level. The maximum altitude (1.450 m above sea level) has been recorded in the Ukrainian Carpathians.

The recent range limits of the species need further examination. The records from St. Petersburg and Saratov cities, dated by the 19th Century, as well as Astrakhanskaya and Rostovskaya provinces were not confirmed later (Guskov et al. 1983; Garanin 1999; Kuzmin 1999). No new data are known from Sverdlovskaya Province since 1970s (Sabaneev 1872; Deksbakh et al. 1958; Toporkova 1973). Although at least some of these records may be related to misidentified or imported specimens, the past existence of extinct populations can not be excluded. It is supposed that the amphibians of the forest complex have been distributed far southerly, until the forests were not destroyed by people in the past (Garanin 1989).

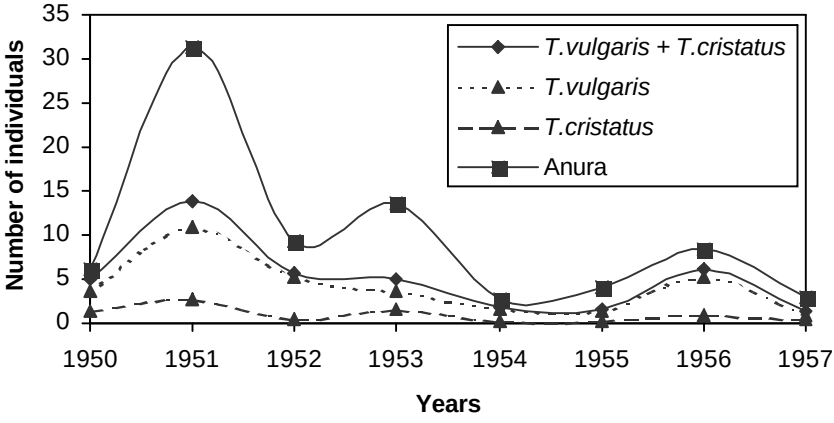

Fig. 3: Number of amphibians caught in standard ditches, per 10 days, in the Raifskii Forest, Volzhsko-Kamskii Nature Reserve, Tataria, east of European Russia (GARANIN & POPOV 1958, changed).

Anzahl von Amphibienfängen in Standardfallen an 10 Tagen im Raifskii-Wald, Volzhsko-Kamskii Naturpark, Tatarien, osteuropäisches Russland (GARANIN & POPOV 1958, verändert).

Many other populations of *T. cristatus* have extinct due to anthropogenic pressure, but they lived usually within the newt recent range margins.

Abundance

In majority of the studied regions, this newt is a rare species but never numerous (fig. 2). Nevertheless, it is a common amphibian over a considerable part of its range: in Byelorussia, Western Ukraine and central European Russia. All these regions are positioned in the zone of leafed and mixed forests in the south-western part of the area of occupancy. From this area the species abundance is decreased northwards, eastwards and southwards to the zones of the taiga and the forest steppe.

Nevertheless, the great crested newt is not the most abundant amphibian even in the regions where it is estimated as "common". It is almost everywhere rarer than the another sympatric newt, *Triturus vulgaris* (Lithuania: GAIZUSKIENE 1964; Byelorussia: PETROVA 1959; SAPOZHENKOV 1961; PIKULIK 1985a, b; Karelia: KUTENKOV 2000; Udmurtia: PRIEZZHEV et al. 1983; Tataria: KUZNETSOV 1921; the provinces Pskovskaya: ESAULOV 1878; Tverskaya: SHAPOSHNIKOV et al. 1959; Ivanovskaya: OKULOVA & GUSEVA 1998; Moskovskaya: my data; Tulskaya: AMMON 1928; MILLER et al. 1985; Orlovskaya: OGNEV 1908; Nizhegorodskaya: LEBEDINSKY et al. 1999; Kostromskaya: KRYLOV 1987; Ivanovskaya: KUZMIN et al. 1996; Permskaya: VORONOV & ZHUKOVA 1976; YUSHKOV & VORONOV 1994; and Sverdlovskaya: TOPORKOVA 1973). Moreover, even in Byelorussia, where it is a generally common species, its abundance is 5-10 times less than that in *T. vulgaris* (PIKULIK 1985a). The difference becomes much higher at the northern limit of the range: e.g. in Karelia its

abundance seems to be a few hundred times lower than that in the smooth newt, and in the Kivach Nature Reserve during 19 years singular individuals were found only in 4 ponds from more than 300 ponds studied, but even in these ponds the abundance is about 5 times less than that in *T. vulgaris* (KUTENKOV 2000).

Near the eastern margin of the species range, in Tataria (Volzhsko-Kamskii Nature Reserve: Raifskii Forest) in 1950-1957 the newt averaged 20,7% in amphibian samples with the maximum abundance in 1951 (13.8 spec./10 standard ditch-days) and the minimal abundance in 1957 (1.3 spec.) (GARANIN & POPOV 1958). Thus, there are 10-fold fluctuations in the species abundance by years (fig. 3).

However, in few areas it was indicated as "not rare", similarly to *T. vulgaris* (KULAGIN 1892), or even more numerous (Nizhegorodskaya Province: VARPAKHOVSKY 1888; PUZANOV et al. 1942; Marii El: EFREMOV et al. 1984; ZABIYAKIN 1998; Orenburgskaya Province: ZARUDNOI 1896). In the Okskii Nature Reserve, Ryazanskaya Province, *T. cristatus* in 1971-1990 was even more common in meadows and forests (67 spec./ha) than the grass frog (*Rana temporaria*), the most common amphibian of the Central Russia (PANCHENKO 1992). In majority of these areas, however, this situation does not exist now due to population declines in *T. cristatus* (see below).

The great crested newt seems to obtain its maximum abundance at the south-western part of its distribution in the former Soviet Union: Byelorussia (PIKULIK 1985a), the Carpathian Mountains (from 1 to 20 individuals per 100 m of pond shore, in some places to 1 individual per 0,2 - 50 m^2: SZCZERBAK & SZCZERBAN 1980) and Moldavia (to 41 - 53 ind./100 m: DAREVSKY & KREVER 1987). However, the local abundance is high in some sites even within some regions where the species is generally rare, in particular in Permskaya (KHAZIEVA & BOLOTNIKOV 1976; YUSHKOV & SHAROV 1997) and Moskovskaya provinces (B. I. TIMOFEEV, pers. comm.).

Long-term changes in the population numbers

Relative rarity of *T. cristatus* is often considered as the result of its population declines, which was probably reflected in its inclusion in the 2000 IUCN Red List. This suggestion is true only in part. As I noted above, in many regions the species is not rare. Then, in majority of the regions under consideration *T. cristatus* was estimated as rare not only in the last decades (when the overall decline is usually supposed), but even in the 19th Century and the beginning of the 20th Century (see legend to the fig. 2).

However, the declines and extinctions really exist and they embrace a significant number of localities. I already noted dubious old records of crested newts from the regions where they do not live now (see above). In Moskovskaya Province in the 19th- beginning of the 20th centuries, *T. cristatus* was common or at least not rare (KULAGIN 1892; KUZNETSOV 1928) but now is generally rare. Numerous declines and extinctions of the local populations have been recorded in 1970s-1990s in Moscow City and in the province (ORLOV 1988; KUZMIN et al. 1996). The newt was not recorded in 1990s in Moscow City (LEONTYEVA & SEMENOV 1998), so it has extinct there from the 25 localities where it was recorded earlier (Database "Amphibians of the USSR", ®0229803415). Although it has extinct also from few localities in Moskovskaya Province (ORLOVA 1988; KUZMIN et al. 1996; GONCHAROVA &

Regions	RU	BY	LT	LI	ES	MD	UA	AR	AS	BA	KA	KI	KR	KU	LE	LP
Status	N	N	R	D	I	N	N	R	EX?	R	R	R	EX?	R	EX?	I
Presence/absence in Red Data Books	-	-	+	+	-	-	-	-	-	+	+	-	-	+	+	+
Number of nature reserves inhabited	13	3	2	1	1?	2	7	-	-	1	1	-	-	1	-	1

Regions	MO	NI	OR	PE	PS	SA	SV	TA	TT	UL
Status	R	LR	R	R	R	R	EN	R	R	R
Presence/absence in Red Data Books	+	+	+	+	-	-	+	+	+	-
Number of nature reserves inhabited	1	1	-	-	-	1	-	-	1	-

Table 1: Conservation status of *Triturus cristatus* in different regions of the former Soviet Union. Schutzstatus von *T. cristatus* in verschiedenen Regionen der ehemaligen Sowjetunion.

Note: Regions of the former USSR: RU - Russia in general; BY - Byelorussia; LT - Latvia; LI - Lithuania; ES - Estonia; MD - Moldavia; UA - Ukraine in general; see Fig. 2 for other abbreviations. **Status categories:** D - Data Deficient; E - Endangered; I - Indeterminate; N - Not Threatened; R - Rare. The conservation status in all other regions marked with the sign „1" in the Fig. 2 seems to be DD. In NI the newt included in the Attachment to the Red Data Book as a species needed special attention (GARANIN 2000). In KU and TA the inclusions in the Red Data Books are planned (LADA 2000).

SEMENOV 1997), in two other sites it remains a common (B.I. TIMOFEEV, pers. comm.) or even increasing species (ZABLOTSKAYA & ZABLOTSKAYA 1991). However, general trend there is overall decline (e.g. MANTEIFEL et al. 1991; KUZMIN et al. 1996).

The declines occur also in some other regions: Byelorussia (KUZMIN et al. 1995), Tataria (GARANIN & USHAKOV 1969, 1970), Nizhegorodskaya (SHARYGIN & USHAKOV 1979; LEBEDINSKY 1981), Kharkovskaya (SHIDLOVSKY & KOTOV 1916; KRIVITSKII et al. 1986), Lvovskaya (TATARINOV 1977), Kurskaya, Belgorodskaya, Lipetskaya and Tambovskaya provinces (LADA 2000).

Thus, the declines were documented only in ca. 16% of the regions of the former USSR inhabited by *T. cristatus* (i.e. the provinces of Russia and Ukraine, as well as some republics). This comprises less than a half of total area of the species range there. In some of these regions *T. cristatus* is not a rare animal. In addition, some other amphibian species are declining in the same regions (KUZMIN 1994; KUZMIN et al. 1995).

Majority of the declines and extinctions in *T. cristatus* concern the landscapes disturbed by anthropogenic activities. The newt is absent from settlements and landscapes transformed by human activity (Byelorussia: PIKULIK 1985a; Lipetsk City: KLIMOV 1999; Nizhegorodskaya Province: LEBEDINSKY et al. 1999). Elsewhere, in Moscow (my data) and Nizhny Novgorod cities (SHARYGIN & USHAKOV 1979; LEBEDINSKY 1981), the species occurred in many sites even in 1960s but became rare in the1980s and probably extinct in the 1990s. This was caused mainly by the destruction and pollution of ponds used for reproduction,

their shallowing and eutrophication and the introduction of the exotic fish, *Perccottus glehni* (see below for details). In these conditions *T. cristatus* is declined more rapidly than *T. vulgaris* (BOBROV et al. 1995) because it requires generally deeper ponds, cleaner water and its larvae are more vulnerable from fishes because they lead a pelagic life, in contrast to *T. vulgaris*.

Similar limiting factors are acting in the coutryside. These are drainage and pollution of water bodies, melioration of meadows, destruction of forests and the dispersal of *Perccottus glehni* (KUZMIN et al. 1996; LADA 2000; my unpubl. data). The construction of dams and large reservoirs leads to flooding of the river valley habitats, which results in sharp declines in newt abundances (GARANIN & USHAKOV 1969, 1970).

The rapid declines of *T. cristatus* in Moskovskaya Province during the last two decades may be largely explained by the colonization of water bodies by the fish *Perccottus glehni*, which was introduced from the Amur River basin in 1950s. This fish is highly resistant to low oxygen levels and it is gradually dispersed in small water bodies. As revealed from observations in the Glubokoe Ozero Wildlife Sanctuary, the dispersal of this fish has led to extinction of *T. cristatus* from the majority of ponds (MANTEIFEL 1989; MANTEIFEL et al. 1991; RESHETNIKOV & MANTEIFEL 1997). Total number of *T. cristatus* has fallen by 10 times only from 1973 to 1990. There is a significant ($p < 0.01$) negative correlation between the existence of *T. cristatus* and *P. glehni* in ponds. At the same time, the newt coexists with the autochthonous *Carassius carassius*. I recorded the extinction of *T. cristatus* during 1980s from two monitored localities, one in Moscow City and another in Moskovskaya Province, where this exotic fish has appeared in the 1970s (fig. 4). Continuing dispersal of this fish in the centre of the European part of the former Soviet Union may result in acceleration of the decline rates in *T. cristatus*.

Status and conservation

The abundance of *T. cristatus* in a large part of the regions under estimation is lower than that of other amphibians, so it is considered as a rare species. However, there are no indications that it is at risk of extinction in the wild in the majority of these regions. Therefore, it can not be considered as a "Rare" species from the standpoint of its conservation status, even if we apply the non-quantified categories used in this work, which are not so rigid as the categories currently used by the IUCN (cf.: HILTON-TAYLOR 2000; KUZMIN 1999). In general, it seems to be "Not Threatened" in the former Soviet Union, although its status varies by regions (table 1). According to this table, *T. cristatus* is fairly well provided by the legislative protection at regional levels. It was included in Red Data Books of many regions where it was found to be threatened at any extent. There, as well as in some other regions, it lives in many nature reserves (see fig. 1 and table 1): Russia: Bryanskii Les, Darvinskii, Kerzhenskii, Kivach, Lesna Vorskle, Mordovskii, Okskii, Polistovskii, Prioksko-Terrasnyi, Prisurskii, Tsentralno-Chernozemnyi, Volzhsko-Kamskii and Zhigulevskii; Byelorussia: Belovezhskaya Pushcha, Berezinskii and Propyatskii; Latvia: Krustkalny and Teichi; Lithuania: Kamanos; Estonia: ?Endla; Moldavia: Kodry and Redenskii Les; Ukraine: Dneprovsko-Teterevskoe, Kanevskii, Karpatskii; Polesskii, Rostochie, Ukrainskii Stepnoi and Zalesskii.

Fig. 4: A pond near the Levoberezhnaya Railway station near Moscow City, where *Triturus cristatus* was not rare in 1973 (A) but has became extinct in 1980s due to introduction of the exotic fish *Perccottus glehni*, overgrowth and eutrophication of water (B: in 1994).

Ein Kleingewässer an der Eisenbahnstation von Levoberezna in der Nähe von Moskau in dem *Triturus cristatus* 1973 (A) nicht selten war, 1980 jedoch wegen Fischbesatz mit *Perccottus glehni*, Verlandung und Eutrophierung ausgestorben ist (B:1994).

The great crested newt in the former Soviet Union deserves conservation in many regions where it is rare and/or threatened species. The measures for conservation should include first of all protection of its habitats from destruction, pollution and introductions of exotic fish, because this newt is more vulnerable to these factors than majority of other sympatric amphibian species. However, the general situation with *T. cristatus* on this territory seems not to be alarming and the species seems not to be generally threatened there. This part of the range composes about a half of the total range of the species. Thus, the latter at present does not meet the requirements for the inclusion in the IUCN Red List and should be protected only at various regional levels.

Acknowledgements

The work was partly supported by the INTAS (project no.97-11909), the Russian Foundation for Basic Research (project 98-04-48254), the Naturschutzbund Deutschland and the Deutsche Gesellschaft fur Herpetologie und Terrarienkunde. V.I. GARANIN, A.P. KUTENKOV, B.I. TIMOFEEV, G.A. LADA and S.E. MARGOLIS kindly provided information on *Triturus cristatus*.

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