Information Sheet on Ramsar Wetlands

Categories approved by Recommendation 4.7 of the Conference of the Contracting Parties.

NOTE: It is important that you read the accompanying *Explanatory Note and Guidelines* document before completing this form.

1. Date this sheet was completed/updated:

25 June 1998

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□□□ SSK0001
Designation Date Site Reference Number

02/07/90

2. Country: Slovak Republic

3. Name of wetland: Šúr

4. Geographical coordinates: 48° 14' N, 17° 13' E
48° 12' 20" - 48° 15' N, 17° 12' 10" - 17° 15' 30" E

5. Altitude: (average and/or max. & min.) 130 m a.s.l. **6. Area:** (in hectares) 1136.6 ha 1137

7. Overview: (general summary, in two or three sentences, of the wetland's principal characteristics)
Fen alder (*Alnus glutinosa*) forest, the largest and best-preserved virgin alder forest in Slovakia and Central Europe, surrounded by wet meadows, open water bodies and thermophilous oak forests in a depression of Danube Lowland along E slopes of Malé Karpaty Mts in SW Slovakia. Valuable habitats of indigenous, rare and endangered species and communities, considerable hydrological values.

8. Wetland Type (please circle the applicable codes for wetland types as listed in Annex I of the *Explanatory Note and Guidelines*)

marine-coastal: A . B . C . D . E . F . G . H . I . J . K

inland: L . (M) . (N) . O . P . Q . R . Sp . Ss . (Tp) . (Ts)
. (U) . Va . Vt . (W) . (Xf) . Xp . Y . Zg . Zk

man-made: 1 . (2) . 3 . (4) . 5 . 6 . (7) . (8) . (9)

Please now rank these wetland types by listing them from the most to the least dominant: Xf, Ts, W, 2, 7

9. Ramsar Criteria: (please circle the applicable criteria; see point 12, next page)

(1a) . 1b . 1c . (1d) | (2a) . (2b) . (2c) . (2d) | 3a . 3b . 3c | 4a . 4b

Please specify the most significant criterion applicable to the site: 1a

10. Map of the site included ? Please tick *yes* ☑ **-or-** *no* ☐

(Please refer to the *Explanatory Note and Guidelines* document for information regarding desirable map traits).

11. Name and address of the compiler of this form:

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Please provide additional information on each of the following categories by attaching extra pages **(please limit extra pages to no more than 10):**

12. Justification of the criteria selected under point 9, on previous page. (Please refer to Annex II in the *Explanatory Note and Guidelines* document).

1 a, 1 d - it is a particularly good representative example of a relict virgin fen alder forest of a type formerly widespread in Central Europe but now rare and unusual in this region

2 a, 2 b - it supports more than 120 „red list" species of plants (about 50 of them are considered as rare, vulnerable or endangered in Slovakia and/or Europe) and approximately 330 noteworthy animal species (roughly 100 of them being threatened or protected)

2 c - it is important breeding site of many threatened animal species and resting site of migratory birds

2 d - it is of special value for endemic species of plants (*Cirsium brachycephalum*) and newly described animal species (*Batrachobdella slovaca* KOŠEL, 1972; *Hirudinea*); some subboreal species of *Ephemeroptera* (*Arthroplea congener, Paraleptophlebia werneri*) reach their S geographical limit there.

13. General location: (include the nearest large town and its administrative region)

The site is located in W part of Podunajská Rovina Lowland (Danubian Lowland) along E slopes of the Malé Karpaty Mts in SW Slovakia, about 13 km NE of the capital Bratislava (population 452,000) and 7 km S of the district town Pezinok (30,000 inhabitants).

14. Physical features: (e.g. geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth; water permanence; fluctuations in water level; tidal variations; catchment area; downstream area; climate)

Origin: Natural, partly artificial. Geology: The site is located in the contact zone between the two basic structural units - Malé Karpaty Mts in NW part and Podunajská Rovina Lowland in SE part. The crystalline core of Malé Karpaty Mts consists of Proterozoic igneous (biotitic granites and granodiorites, diorites, pegmatites) and metamorphic rocks (phyllites) that weathered during the Quarternary into various clastic sediments (rudaceous, arenaceous and argillaceous eluvial and colluvial deposits). Podunajská Rovina Lowland as a part of the Pannonian Basin had evolved in the Tertiary through successive cycles of marine, brackish and limnic (in the Upper Pliocene even fluvio-limnic or fluvial) sedimentation that yielded thick layers of clays, marls, sands, gravels and other sedimentary rocks. In the late Pleistocene and Holocene a marginal part of the Danube Lowland adjacent to the Malé Karpaty Mts was filled with extensive alluvial fans; the mid-late Holocene fluvial sediments include both gravel/sand (more elevated landforms) and finer deposits (depressions). The centre of the site is formed by tectonic depression with a specific type of Holocene sedimentation - accumulation of organic matter under hydromorphic conditions and fen peat formation. The fen peat layer, 1 - 2 m thick, emerged during the Atlantic period, when the area was a swamp. In Sub-Boreal period it was occupied by willow and alder forest. Soil types: Histosols (pH about 5.8) dominate in central part. Gleysols additionally occur, fluvi-gleyic phaeozems (pH 5 - 6), and eutric fluvisols also occur. Geomorphology: Primarily, tectonic sinks and accumulation processes are responsible for the relatively uniform wetland piedmont depression characteristics of the site. Hydrology: The area belongs to the Danube River catchment. Some streams in the NE part of the site are in the Čierna Voda catchment, others are in the Šúrsky Kanál catchment, but the two main streams flow to the Malý Dunaj River. Peak discharges occur in March, while minimum discharges occur in November. High discharges happen also in February - April and during the end of autumn/beginning of winter there is a conspicuous secondary maximum in discharges. The current water regime of the site operates mainly by adjustments to the outlet conditions within the system of watercourses: Rakový Potok Brook (catchment area P = 4 km^2, mean annual discharge Q = 15 $l.s^{-1}$); Fanglovský Potok Brook (P = 4.2 km^2, Q = 18 $l.s^{-1}$), Fofovský Potok Brook (P = 2.6 km^2, Q = 25 $l.s^{-1}$), Blahutov Kanál, Hájsky Potok Brook, Rímsky Potok Brook, Jurský Potok Brook (P = 7.43 km^2, Q = 96 $l.s^{-1}$), Staromlynský Potok Brook, Novomlynský Potok Brook, Novohorský Potok Brook, Myslenický (Račí) Potok Brook (P = 34.67 km^2, Q = 230 $l.s^{-1}$), Šúrsky Kanál (Blatina) (P = 76.7 km^2, Q = 383 $l.s^{-1}$), Čierna Voda Brook, Šúrsky Potok Brook, Chlebnický Kanál and other small streams. Standing water is represented by a gravel pit, a fishpond (10.9 ha) and small ponds in the area of the Biological Station. Groundwater levels fluctuate between 0 - 2.7 m below the surface. Depth of the

surface water in the forest can reach more than 0.7 m, in artificial lakes, 2 m. The dryest period is from late August to mid November. Water quality: According to the surface water quality index, based on concentrations of Ca, Mg, K, S and N ($N\text{-}NH_4$), the water quality in Šúr is classifed as high or very high; in some streams, higher NO_3 concentrations were recorded and those streams were classified as polluted. The lowest quality was recorded in Čierna Voda Brook (higher concentrations of SO_4, NO_3 ions, soluble matter, Ca). Acidity measured in 7 streams varied from pH 6.89 to 7.56 (7.51 - 8.30 in ground water from 8 probes). Conductivity measured between 227.9 - 966 $\mu S.cm^{-1}$. Climate: The site belongs to the warm, moderately wet district with mild winters. The average air temperature in January is over -3 °C, in July, 20.1 °C, annual rainfall ranges from 530 to 650 mm.

15. Hydrological values: (groundwater recharge, flood control, sediment trapping, shoreline stabilisation, etc.)
The site is important, particularly in recharge of groundwater and in maintenance of water quality.

16. Ecological features: (main habitats and vegetation types)
Extensive wetlands, which were widespread in the past along the S edge of the Malé Karpaty Mts, have been gradually fragmented and altered by agriculture and urbanization. The exception is Šúr wetland in the lowest part of the former complex. The site consists of four main habitats:
- „šúr" - fen alder forest - an isolated patch of seasonally flooded forest of the association *Carici elongatae - Alnetum* on fen peat in the middle of swamp meadows; the patch is highly valuable as a unique example of native fen forest community (carr);
- swamp meadows and pastures that surround the alder forest, with considerable heterogeneity dependent on groundwater regime, duration of floods and way of management/use; particularly associations of the alliances *Phragmition, Sparganio-Glycerion fluviatilis* and *Magnocaricion elatae* that are involved in this habitat type which merges into wet meadows and pastures; some endangered plant species occur there;
- standing water (of artificial origin) represented by a fishpond (10.9 ha), small ponds near the Biological Station and a gravel pit, an important habitat for many amphibians and waterbirds;
- „Pannonian grove" - a complex of valuable remnants of thermophilous oak woodland dominated by *Quercus robur* and *Q. cerris* with fragments of edge and meadow steppe communities, an important habitat of rare and endangered species of plants (including e.g. halophilic), invertebrates, birds and game contrasting with mostly wetland area.
Landscape structure in the reserve (approximately): forests 65 %, meadows 25 %, freshwater lakes 3 %, others 7 %; in buffer zone: arable land 82 %, meadows and pastures 14 %, gardens 1 %, others 3 %.

17. Noteworthy flora: (indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc.)
Based on the results of more than 100 years of research at the site, many species have been considered as threatened: 49 species of lower plants (*Mycophyta* - 13 spp., *Lichenes* - 22 spp., *Bryophyta* - 14 spp.) and 110 species of vascular plants (*Tracheophyta*) (see also enclosed brochure). The most valuable communities inhabit the alder forest and other wetlands with such endangered species as *Althaea officinalis*, *Dactylorhiza incarnata* subsp. *incarnata*, *Gentiana pneumonanthe*, *Heleochloa schoenoides*, *Lathyrus palustris*, *L. pannonicus* subsp. *pannonicus*, *Leucanthemella serotina*, *Leucojum aestivum*, *Lythrum hyssopifolia*, *Oenanthe silaifolia* subsp. *silaifolia*, *Orchis laxiflora* subsp. *palustris*, *Ranunculus lingua*, *Scirpoides holoschoenus*; vulnerable species as *Allium angulosum*, *Berula erecta*, *Bromus racemosus*, *Butomus umbellatus*, *Carex disticha*, *C. paniculata*, *C. strigosa*, *Cirsium brachycephalum* (an endemic species), *Dichodon viscidum*, *Dryopteris cristata*, *Gratiola officinalis*, *Heleochloa alopecuroides*, *Hottonia palustris*, *Juncus atratus*, *Leersia oryzoides*, *Lychnis coronaria*, *Molinia coerulea*, *Myosotis caespitosa*, *M. palustris* subsp. *palustris*, *Myosurus minimus*, *Myriophyllum verticillatum*, *Najas marina*, *N. minor*, *Plantago altissima*, *Scilla vindobonensis*, *Senecio paludosus*, *Teucrium scordium* subsp. *scordium*, *Thalictrum flavum*, *T. simplex*, *Utricularia vulgaris*, *Viola stagnina* etc.

18. Noteworthy fauna: (indicating, e.g., which species are unique, rare, endangered, abundant or biogeographically important; include count data, etc.)

Local fauna is relatively well-known and species-rich (see also enclosed brochure): *Porifera* - 1 sp., *Rotatoria* - 63 spp. (*Testudilla coeca, Ptygura socialis* - the first finding in former Czechoslovakia; 7 spp. first found in Slovakia), *Mollusca* - 28 spp. [endangered and vulnerable species include *Anisus spirorbis, Bathyomphalus cornotus, Gyraulus albus, Valvata pulchella* (*Gastropoda*), *Pisidium obtusale, Unio pictorum* (*Bivalvia*)], *Annelida: Oligochaeta* - 30 spp. (7 threatened spp., *Bratislavia palmeni* - in Central Europe occurs only there), *Hirudinea* - 12 spp. [including new species described from the site *Batrachobdella slovaca* (KOŠEL, 1972) and vulnerable species *Erpobdella lineata*], *Crustacea* - 52 spp. [including endangered species *Siphonophanes grubyi* (*Anostraca*), *Triops cancriformis* (*Notostraca*); *Scapholeberis erinaceus* (*Cladocera*) found only there in Slovakia], *Insecta: Ephemeroptera* - 21 spp. (including vulnerable species *Paraleptophlebia werneri*), *Odonata* - 30 spp. (including endangered species *Epitheca bimaculata, Sympetrum fonscolombei*), *Plecoptera* - 12 spp. (including endangered species *Isogenus nubecula*), *Megaloptera* - 1 sp., *Trichoptera* - 21 spp., *Coleoptera* - 1339 spp. of 70 families (including endangered species *Agathidium plagiatum, Cerophytum elateroides, Dreposcia umbrina, Dromaeolus barnabita, Eustrophus dermestoides, Hydaticus modestus, Leistus terminatus, Lignyodes bischoffi, Nemadus colonoides, Odacantha melanura, Saulcyella schmidti, Tapinotus sellatus*, etc.), *Diptera* - 454 spp. of 38 families, *Homoptera* (*Aphidoidea*) - 89 spp. (new species described from the site *Stomaphis bratislavensis*, new species for Slovak fauna *Gotiella alba*), *Heteroptera* (*Myridae*) - 77 species (*Psallus flavellus, P. wagneri* - first findings in Slovakia), *Hymenoptera* - 305 spp. [including vulnerable species *Boucekiella depressa, Mahencyrtus comara* (*Encyrtidae*), *Polemochartus liparae, P. melas* (*Braconidae*), etc.), *Orthoptera* - 24 spp., *Mantodea* - 1 sp., *Lepidoptera* - 707 spp. of 44 families (e.g. endangered and vulnerable species *Lycaena dispar, Apatura ilia, Limenitis populi, Nymphalis antiopa, Zygaena viciae*, etc.); *Amphibia* - 11 spp. (including endangered and vulnerable species *Triturus vulgaris, T. dobrogicus, Bombina bombina, Pelobates fuscus, Rana arvalis, R. ridibunda*), *Reptilia* - 5 spp. (including *Natrix tesselata, Coronella austriaca, Elaphe longissima*), *Aves* - 212 spp. (123 breeding species, including *Tachybaptus ruficollis, Podiceps cristatus, P. nigricollis, Ixobrychus minutus, C. nigra, Cygnus olor, Anas crecca, A. querquedula, A. clypeata, Aythya ferina, A. fuligula, Circus aeruginosus, Accipiter gentilis, Falco cherrug, Falco subbuteo, Coturnix coturnix, Rallus aquaticus, Porzana porzana, Gallinula chloropus, Vanellus vanellus, Gallinago gallinago, Strix aluco, Athene noctua, Asio flammeus, Asio otus, Jynx torquilla, Picus viridis, Dendrocopos minor, Dryocopus martius, Riparia riparia, Anthus trivialis, Motacilla flava, M. alba, Luscinia megarhynchos, Saxicola torquata, Locustella naevia, L. fluviatilis, L. luscinioides, Acrocephalus schoenobaenus, A. palustris, A. scirpaceus, A. arundinaceus, Panurus biarmicus, Aegithalos caudatus, Remiz pendulinus, Oriolus oriolus*, etc. and many migrating waterbirds), *Mammalia* - 27 spp. (including *Neomys anomalus, Micromys minutus, Castor fiber*).

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19. Social and cultural values: (e.g. fisheries production, forestry, religious importance, archaeological site, etc.)

The site is traditionally used for tourism and outdoor recreation as well as for scientific research and education because of its proximity to the capital Bratislava, its schools, universities, and other scientific institutions. The fishpond in the site is used for fish production (mainly carp), and marginal parts of the site are used for agricultural production. These activities are not consistent with the maintenance of natural wetland processes.

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20. Land tenure/ownership of:

(a) site - The largest part of the nature reserve itself (685.8 ha) is owned by municipalities (318.3 ha: forest 315.4 ha, water 0.2 ha, other 2.7 ha) and the state (268.3 ha: forest 50.5 ha, water 22.1 ha, meadows 12.9 ha, other 182.9 ha). Private owners own only 0.07 ha (meadows and other), and ownership of 99.01 ha is not clear (forest 45.4 ha, meadows 16.9 ha, arable land 5.5 ha, water 3 ha, other 28.3 ha). The fishpond is managed by the State Fishery at Trnava. In the buffer zone of the reserve (307.2 ha), the largest area is managed by a cooperative farm at Svätý Jur and Comenius University at Bratislava and the owners are: the state 10.6 ha, municipalities 0.2 ha, private land 0.2 ha, unknown 296.2 ha (mostly arable land and meadows).

(b) surrounding area - similar structure of ownership.

21. Current land use:

(a) site - Land use is excluded from the reserve except for small-scale fish production in the fishpond and regulated hunting for some ungulates. Under permission of the Ministry of Environment (up to 2006), the buffer zone is agriculturally used as meadows and crop fields (corn, grain, clover) and a small part is used for recreation (gardens and cottages). These activities have an adverse effect on the habitats and status of the site. The Biological Research Station (Faculty of Natural Sciences of Comenius University at Bratislava) is located in W part of the site (6.5 ha).

(b) surroundings/catchment - Agriculture with large drained land tracts (grain crops), improved meadows (dominant land use type) which are made using heavy machinery and agricultural chemicals even in contact with the reserve; vineyards and managed forests on the slopes of the Malé Karpaty Mts. W of the site, orchards and gardens, a nursery for decorative trees/shrubs, small pool used for recreation, urbanized areas and infrastructure [villages/towns Svätý Jur (Jur pri Bratislave), Chorvátsky Grob (Čierna voda), Vajnory (a part of Bratislava), a sewage treatment plant, a poultry farm, cattle and horse breeding, small industry, a small airport, roads, a highway, a railway (source of pollutants, weeds) and power lines] surround the site.

22. Factors (past, present or potential) adversely affecting the site´s ecological character, including changes in land use and development projects:

(a) at the site - The site has been under human influence since the Middle Ages. During the 18th and 19th centuries, there were attempts to enlarge the area for vineyards and agricultural land. A large part of the fen forest was cut down in 1864. During the end of the 1890s, drainage of the site was planned and carried out and the area of the wetland was diminished. A plan for complete drainage of Šúr was developed in 1929. In 1941 - 1943, an additional canal was built and consequently fires and peat extraction took place. Establishment of a cooperative farm in 1950 and continued drainage of the area in the 1960s and 1970s, led to a fall in groundwater levels and faster discharge of spring floods from the site. The few water-retention facilities are now mostly destroyed or silted up and out of function. Grasslands of the site were mowed until 1948 (partly in 1956 as well) and natural succession began. Increasing recreation use, building of cottages in the center of the site and activities connected with it (planting of allochthonous species, keeping of domestic animals, waste disposal, car traffic, horse-riding and invasions of synanthropic plants and animals) also show adverse effects. Pollution of waters limits the survival of biota, and sluice gates prevent fish migration in most of the streams; mainly in Čierna Voda Brook, Šúrsky Kanál, Jurský Potok Brook. During the last few years, illegal collection of invertebrates (mainly insects) for commercial purposes, picking up of rare plants, and poaching game species has occured.

(b) around the site - Changes in the water regime of the streams of the Malé Karpaty Mts as sources of water for the site have been made; water pollution in almost all streams; land drainage; enlargement of arable land at the expense of grasslands; enlargement of land tracts; use of heavy machinery and chemicals in agriculture; building of railway, highway and roads around the site; waste disposal; air pollution from Bratislava industrial center sources.

23. Conservation measures taken: (national category and legal status of protected areas - including any boundary changes which have been made; management practices; whether an officially approved management plan exists and whether it has been implemented)

The site has been protected as a nature reserve since 1952. In 1956, measures to restore the water regime of the site disturbed by drainage canal construction in 1940s were adopted, and retention facilities were constructed according to the management plan. The Regional Council issued a statute for the reserve in 1961 and established a management authority - an Advisory Board. Conservation measures were also stated. However, until the 1980s, the conservation of the site was problematic with many conflicts between various interests. Use of the buffer zone of the reserve has had adverse effects on the site. Protection of the site was revised and amended in 1971 and the 1990s, and the site was declared as a State Nature Reserve by Decree of the Ministry of Environment, No. 83 of 23 March 1993. In accordance with the Act on Nature and Landscape Protection No. 287/1994, the site has been categorized as a National Nature Reserve since 1 January 1995. The area of the reserve is 831.39 ha, with a buffer

zone of 305.23 ha. The borders of the Ramsar site are the same as the borders of the reserve with its buffer zone. The site is listed in the General Scheme of Supraregional Territorial System of Ecological Stability (TSES) as a biocenter of supraregional importance and a part of the supraregional biocorridor (approved by government on 27 April 1992), as well as in the regional (district) document of TSES and other landscape plans. The site was designated as an Important Bird Area in Europe (GRIMMET, JONES 1990). An inventory of natural values and management proposals was done in 1994. Draft management plans for the site were developed in 1994 - 1997. Some measures already have been implemented (management of wet meadows, research, publication of the Red List of flora and fauna of the reserve). Monitoring of the groundwater levels has been carried out since 1992, twice a month. The site has a special manager (ranger), who is a staff of Slovak Environment Agency.

24. Conservation measures proposed but not yet implemented: (e.g. management plan in preparation; officially proposed as a protected area, etc.)

The management plan for the site has not been officially approved because of other legislative priorities. The projects of water regime restoration in the reserve were developed in 1989, 1996 and 1997, but they have not been implemented for financial reasons. Plans for purchase of agricultural land by the state and elimination of recreation in the site also exist.

25. Current scientific research and facilities: (e.g. details of current projects; existence of field station, etc.)

The first floristic data from the site were published in 1791. The first detailed description of Šúr as an important botanical site is from KORNHUBER (1858). Continuing interest of botanists and zoologists has been expressed in many publications since the middle of the 20th century, and it has been the subject of a number of specialised excursions of Slovak and foreign naturalists. Its close position to the scientific and university centre in Bratislava stimulated many research projects and theses. A special Biological Research Station of Faculty of Natural Sciences of Comenius University at Bratislava was established in the SW part of the site in the 1950s with laboratories and other facilities (ponds, breeding facilities). Recent studies are aimed at groundwater levels (8 hydrological probes for monitoring in various parts of the site), soil structure and protection, forest communities, threatened species, inventories of fungi, mosses, lichens, vascular plants, invertebrates and vertebrates, ecological evaluation of abiotic landscape components, land use and other environmental studies. The facilities of the Biological Station are used for captive breeding of endangered species (*Umbra krameri, Emys orbicularis*).

26. Current conservation education: (e.g. visitors centre, hides, information booklet, facilities for school visits, etc.)

The site is used occasionally for the education of students from the surrounding areas and from Bratislava. The Red List of threatened flora and fauna of Šúr Reserve, with basic information on the site and the history of its protection and research, was published in 1996. The building of an educational trail in the site and an information (visitors) centre in the area of the Biological Station are planned.

27. Current recreation and tourism: (state if wetland is used for recreation/tourism; indicate type and frequency/intensity)

The site (mostly its dry and marginal parts) is intensively used for insufficiently managed recreation and tourism (walking, horseback-riding, recreation in cottages, angling, limited hunting) which have adverse effects on the site. Most visitors come from Bratislava; activities are mostly seasonal (spring and summer).

28. Jurisdiction: (territorial e.g. state/region and functional e.g. Dept. of Agriculture/Dept. of Environment, etc.)

Ministry of Environment, Department of Nature and Landscape Protection at Bratislava
Ministry of Agriculture, Forest and Water Management at Bratislava
Regional Office at Bratislava, Department of Environment and Department of Agriculture
District Office at Pezinok, Department of Environment and Department of Agriculture
Municipal authorities at Svätý Jur and Chorvátsky Grob

29. Management authority: (name and address of local body directly responsible for managing the wetland)

Slovak Environment Agency, Centre of Nature and Landscape Protection, Hanulova 5/d, SK-844 40 Bratislava; tel.: +421 7 64369946, fax: +421 7 64283982

Danube River Catchment Administration, Karloveská 2, SK - 842 17 Bratislava, tel.: +421 7 60292111

30. Bibliographical references: (scientific/technical only)

See enclosed list. Additional bibliography:

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