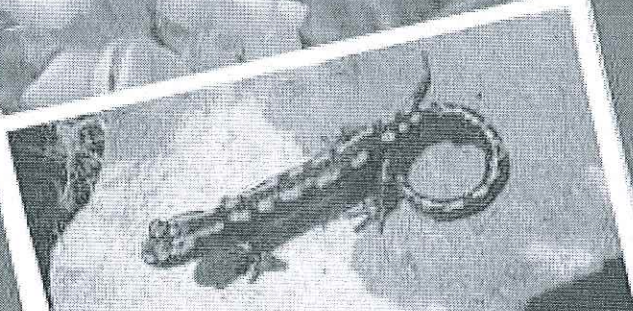


# STATUS AND PROTECTION OF GLOBALLY THREATENED SPECIES IN THE CAUCASUS



CRITICAL ECOSYSTEM  
PARTNERSHIP FUND





**STATUS AND PROTECTION OF  
GLOBALLY THREATENED SPECIES  
IN THE CAUCASUS**

CEPF Biodiversity Investments in the Caucasus Hotspot 2004-2009

Edited by Nugzar Zazanashvili and David Mallon

Tbilisi 2009

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## Executive Summary

The occurrence of 48 local endemic species belonging to 40 genera of 25 families was verified in the Georgian-Turkish transboundary zone within the West Lesser Caucasus Corridor. For each species, the main forms of habitat loss/degradation were determined and threats were determined according to extinction risk category and degree of responsibility of each country for global conservation. Out of these 48 species, 14 are considered to be Critically Endangered (CR), 17 Endangered (EN) and 17 VU (VU) (Table 1).

*Ex situ* and *in situ* conservation of species should envisage the following measures to reduce human impact and allow recovery of species:

- Developing a transboundary protected area network
- Giving protected areas status to selected habitats
- Reducing the impact caused by human activities, as well as toughening control measurements
- Planting gardens and green areas in populated areas
- Creating seed-stocks in botanic gardens, as well as regenerating and reintroducing species in their natural habitats
- Increasing local residents and visitors' awareness about biodiversity
- Setting-up information billboards on habitat approach roads

## Scope of the Work

Within the Caucasus, the Colchic and Hyrcanian regions are distinguished by unique diversity of relic and endemic plant species, as a result of their status as refugia for meso- and thermophilous plant species during the Ice Age. The study area consists of two ethnographically associated parts of the south Colchic region of Georgia and Turkey, the bordering areas of the Autonomous Republic of Adjara, Georgia, and Artvin Vilayet (province), Turkey. The unique Colchic forests of Adjara are listed among 100 unprotected forests covered by WWF's European Forest Hotspots Campaign.

The governments of Georgia and Turkey and NGOs are taking steps to cooperate and improve coordination of nature conservation activities in the transboundary zone. These efforts are based on two documents: the Framework Agreement between the Republic of Georgia and Republic of Turkey on Friendship and Good Neighbourly Relations (07.30.92), and the Agreement between the Governments of Georgia and the Republic of Turkey on Cooperation in the Field of Environment Protection (07.14.97). These documents have laid a solid foundation for new transboundary environmental initiatives to develop recommendations for *in situ* and *ex situ* conservation.

## Methods

Plant specimens were photographed and collected for herbarium processing on field excursions. Taxonomy is specified according to the nomenclature (Ketskhoveli et al. 1971-2005; Ketskhoveli 1964,



1969; Dmitrieva 1990a, b; Czerepanov 1995; Gagnidze 2005; Davis 1965-1982). Herbarium samples and digital pictures are kept at Batumi Botanical Garden (BAT). For indexing habitat types we followed Svanidze (2003). (See explanations for Table 1).

Red list category was assessed using the IUCN guidelines (IUCN 2006). Rarity was determined by estimating distribution and extent of subpopulations based on the number of 10x10 km UTM grid cells reflecting occupied habitat: 1-2 cells – **CR** (Critically Endangered); 3-9 – **EN** (Endangered); 10-49 – **VU** (Vulnerable). Degrees of responsibility of Georgia and Turkey for conservation of threatened subpopulations are **vh** – very high, **h** – high, **m** – medium, and **l** – low.

## Results

### Species Diversity

The first work on Adjara's flora, containing a list of 1,048 species and information on their status was by Grossgeim (1936). Further research increased the number to over 1,800 in 1990 (Dmitrieva 1956, 1959, 1990a, b). The flora of Turkey includes 2,991 endemic species, 35 of them endemic to Artvin administrative district (Davis 1965-1982; Güner et al. 2000; Anşin 1983; Eminağaoğlu & Anşin 2003, 2004; Özhatay et al. 2005, Eminağaoğlu et al. 2006, 2008). The flora of Adjara includes up to 180 endemic species (Ketskhoveli et al. 1971-2005; Gagnidze 2005; Manvelidze et al. 2008). Results verify the occurrence of 48 local endemic species belonging to 40 genera of 25 families in the Georgian-Turkish transboundary zone, including 22 species common to both regions (Table 1).

Table 1. Threatened endemic species in the Georgian-Turkish transboundary zone<sup>1</sup>

| Species                                                  | Family         | IUCN<br>(Vers. 6.2,<br>2006) | Habitat      |                                                  |
|----------------------------------------------------------|----------------|------------------------------|--------------|--------------------------------------------------|
|                                                          |                |                              | Altitude (m) | Biotope                                          |
| 1. <i>Allium pseudostrictum</i> ( <i>A. adzharicum</i> ) | ALLIACEAE      | CR                           | 2450-2500    | m; bs/B <sub>1</sub>                             |
| 2. <i>Alyssum artvinense</i>                             | CRUCIFERAE     | CR                           | 250-750      | fr ;bs; r; ; rsh/ A <sub>1</sub>                 |
| 3. <i>Amaracus rotundifolius</i>                         | LABIATAE       | VU                           | 600-700      | fr; r; bs/ A <sub>1</sub> ; B <sub>1</sub>       |
| 4. <i>Angelica adzharica</i>                             | UMBELLIFERAE   | CR                           | 2000-2050    | m; fr;bs/ A <sub>1</sub> ; B <sub>3</sub>        |
| 5. <i>Astragalus adzharicus</i>                          | FABACEAE       | EN                           | 270-750      | fr;bs/ A <sub>1</sub>                            |
| 6. <i>Astragalus doluchanovii</i>                        | FABACEAE       | CR                           | 2450         | m; bs/ B <sub>1</sub>                            |
| 7. <i>Astragalus sommieri</i>                            | FABACEAE       | VU                           | 650-1560     | fsh ;bs/ A <sub>1</sub> ; B <sub>1</sub>         |
| 8. <i>Betula medwediewii</i>                             | BETULACEAE     | VU                           | 1200-2400    | Fsh/ B <sub>1</sub>                              |
| 9. <i>Campanula betulifolia</i>                          | CAMPANULACEAE  | VU                           | 800-900      | fsh; fr; r/ A <sub>1</sub> , B <sub>1</sub>      |
| 10. <i>Campanula troegerae</i>                           | CAMPANULACEAE  | CR                           | 600-650      | r/ A <sub>1</sub>                                |
| 11. <i>Centaurea dmitriewiae</i>                         | ASTERACEAE     | CR                           | 700-800      | bs; r/ A <sub>1</sub>                            |
| 12. <i>Centaurea appendicigera</i>                       | ASTERACEAE     | EN                           | 2600-2800    | r;bs/ A <sub>1</sub>                             |
| 13. <i>Chesneya elegans</i>                              | FABACEAE       | CR                           | 650          | fr;bs; fsh/ A <sub>1</sub>                       |
| 14. <i>Convolvulus pseudoscammonia</i>                   | CONVOLVULACEAE | CR                           | 550          | fr;bs;r/ A <sub>1</sub>                          |
| 15. <i>Cyclamen adzharicum</i>                           | PRIMULACEAE    | VU                           | 70-700       | fm ;fsh ;fr;r/ A <sub>1,2</sub> ; B <sub>1</sub> |
| 16. <i>Dactylorhiza osmanica</i> var. <i>osmanica</i>    | ORCHIDACEAE    | VU                           | 2450         | fsh, sh/ A <sub>2</sub>                          |
| 17. <i>Delphinium iris</i>                               | HELEBORACEAE   | EN                           | 2450         | fsh; sh; bs/ B <sub>2</sub>                      |
| 18. <i>Draba bruniifolia</i> ssp. <i>armeniaca</i>       | CRUCIFERAE     | VU                           | 2700         | m; bs/ B <sub>1</sub>                            |

| Species                                                                             | Family           | IUCN<br>(Vers. 6.2,<br>2006) | Habitat      |                                            |
|-------------------------------------------------------------------------------------|------------------|------------------------------|--------------|--------------------------------------------|
|                                                                                     |                  |                              | Altitude (m) | Biotope                                    |
| 19. <i>Epigaea gaultherioides</i>                                                   | ERICACEAE        | VU                           | 1200-1800    | Fsh/ B <sub>3</sub>                        |
| 20. <i>Erysimum contractum</i>                                                      | CRUCIFERAE       | EN                           | 150-200      | fr; bs/ A <sub>1</sub> ; B <sub>1</sub>    |
| 21. <i>Ficaria grandiflora</i> (F. <i>popovii</i> )                                 | RANUNCULACEAE    | VU                           | 50-300       | fm; m/ A <sub>1</sub> ; B <sub>1</sub>     |
| 22. <i>Fritillaria armena</i>                                                       | LILIACEAE        | EN                           | 2450         | fsh; sh/ B <sub>1</sub>                    |
| 23. <i>Galanthus rizechensis</i>                                                    | AMARYLLIDACEAE   | CR                           | 2450         | fsh; sh/ B <sub>1</sub>                    |
| 24. <i>Galanthus krasnovii</i>                                                      | AMARYLLIDACEAE   | CR                           | 900-1200     | f; fsh/ B <sub>1</sub> ; B <sub>2</sub>    |
| 25. <i>Galium subuliferum</i>                                                       | RUBIACEAE        | EN                           | 200-250      | r;bs/ A <sub>1</sub> ; B <sub>1</sub>      |
| 26. <i>Hypericum adzhagicum</i>                                                     | HYPERICACEAE     | EN                           | 1100-1200    | fr;fsh/ A <sub>1</sub> ; B <sub>1</sub>    |
| 27. <i>Genista suanica</i> (G. <i>adzhagica</i> )                                   | FABACEAE         | CR                           | 650-700      | fr;bs/ A <sub>1</sub> ; B <sub>1</sub>     |
| 28. <i>Lilium ponticum</i>                                                          | LILIACEAE        | VU                           | 1000-1800    | f; fsh/ B <sub>1</sub> ; B <sub>2</sub>    |
| 29. <i>Linaria adzhagica</i> (L. <i>sypsiensis</i> )                                | SCROPHULARIACEAE | EN                           | 200-300      | bs; r; fr/ A <sub>1</sub> ; B <sub>1</sub> |
| 30. <i>Melampyrum albofianum</i>                                                    | SCROPHULARIACEAE | CR                           | 2350-2400    | Bs/ B <sub>1</sub>                         |
| 31. <i>Melampyrum arvense</i> var. <i>elatius</i>                                   | SCROPHULARIACEAE | VU                           | 1800         | m;bs/ B <sub>1</sub>                       |
| 32. <i>Muscari alexandrae</i>                                                       | HYACINTHACEAE    | CR                           | 50-100       | fr;bs/ B <sub>2</sub> ; B <sub>3</sub>     |
| 33. <i>Nonea pulla</i> subsp. <i>monticola</i>                                      | BORAGINACEAE     | EN                           | 2000         | m/ B <sub>1</sub>                          |
| 34. <i>Orobancha armena</i>                                                         | OROBANCHACEAE    | EN                           | 2450         | sh;bs/ B <sub>1</sub>                      |
| 35. <i>Osmanthus decorus</i>                                                        | OLEACEAE         | VU                           | 300-1100     | f; fr; bs/ B <sub>1</sub>                  |
| 36. <i>Papaver lateritium</i>                                                       | PAPAVERACEAE     | VU                           | 2450         | sh;bs/ B <sub>2</sub>                      |
| 37. <i>Primula megasaeolia</i>                                                      | PRIMULACEAE      | EN                           | 100-1200     | f;fm/ B <sub>1</sub>                       |
| 38. <i>Psoralea acanthis</i> var. <i>adzhagica</i>                                  | FABACEAE         | CR                           | 600-700      | fr;bs/ A <sub>1</sub> ; B <sub>1</sub>     |
| 39. <i>Quercus dschorochensis</i>                                                   | FAGACEAE         | VU                           | 300-800      | f/ A <sub>1</sub> ; B <sub>1</sub>         |
| 40. <i>Rhododendron smirnowii</i>                                                   | ERICACEAE        | EN                           | 1100-2000    | fr;r/ B <sub>1</sub>                       |
| 41. <i>Rhododendron ungerii</i>                                                     | ERICACEAE        | VU                           | 1100-2000    | f; fsh/ B <sub>1</sub> ; B <sub>2</sub>    |
| 42. <i>Rhododendron sessilifolius</i>                                               | ERICACEAE        | VU                           | 2150         | fr;bs/ B <sub>1</sub>                      |
| 43. <i>Rhynchospora caucasica</i>                                                   | CYPERACEAE       | EN                           | 10           | s/ C <sub>3</sub>                          |
| 44. <i>Rubus adzhagicus</i>                                                         | ROSACEAE         | EN                           | 25           | fr; fsh/ B <sub>1</sub>                    |
| 45. <i>Scutellaria pontica</i>                                                      | LABIATAE         | VU                           | 2400-2700    | sh; bs/ B <sub>1</sub>                     |
| 46. <i>Senecio integrifolius</i> ssp. <i>karsianus</i>                              | ASTERACEAE       | EN                           | 2450         | m; bs/ B <sub>1</sub>                      |
| 47. <i>Seseli foliosum</i>                                                          | APIACEAE         | EN                           | 400-500      | r; bs/ B <sub>1</sub>                      |
| 48. <i>Teucrium trapezunticum</i> (T. <i>chamaedrys</i> ssp. <i>trapezunticum</i> ) | LABIATAE         | EN                           | 200-250      | bs;r/ B <sub>1</sub>                       |

**Note:** <sup>1</sup>The species occurring in the transboundary section of Georgia and Turkey of Adjara-Şavşat floristic region are shown in bold type.

<sup>2</sup>**Explanations:** f – forest; sh – shrubs; wm – wet meadow; fm – forest meadow; r – rock; m – meadow; fsh – forest shrubbery; sc – scree; hv – high herbaceous vegetation; s – swamp; p – still water; sr – moist rocks; fr – forest-covered rocks; ss – seashore; sn – sands; al – agricultural lands; rd – ruderal. **A-xerophilous (dry) biotope:** A<sub>1</sub> – steep slopes (21-35°) with primitive, shallow (≤15 cm), dry soil; A<sub>2</sub> – slanting slopes (11-20°) with thin (16-30 cm) and medium-thick (31-60 cm) dryish soils; and A<sub>3</sub> – flat slopes (≤10°) with medium-thick (31-60 cm) and thick (≥ 61 cm) dryish soils. **B-mesophilous (moderately wet) biotope:** B<sub>1</sub> – steep slopes (21-35°) medium-thick (31-60 cm) moderately wet soils; B<sub>2</sub> – slanting slopes (11-20°) with medium-thick (31-60 cm) and thick (≥ 61 cm) moderately wet soils; and B<sub>3</sub> – flat slopes (≤ 10°) with medium-thick (31-60 cm) and thick (≥ 61 cm) moderately wet soils. **C-meso-hygrophilous (wet) biotope:** C<sub>1</sub> – steep slopes (21-35°) with thin wet soil; C<sub>2</sub> – gentle slopes (11-20°) with medium-thick (31-60 cm) and thick (≥ 61 cm) wet soils; and C<sub>3</sub> – flat slopes (≤ 10°) with thick (≥ 61 cm) wet soils.



The IUCN criteria B2 (area of occupancy) and C (population size) and assessment of habitat stability were used to determine the conservation status and degree of responsibility of each country for global conservation of species endemic to the Georgian-Turkish transboundary zone (Adjara-Şavşat floristic region) (Table 1).

The local endemics *Galanthus krasnovii* and *Cyclamen adzharicum* (Fig. 1 and 2, respectively) are listed in CITES. Ten species are included in the Red Book of Georgia (1982): *Betula medwedewii*, *Epigaea gaultherioides*, *Rhododendron ungeronii*, *Rh. smirnovii*, *Quercus dschorochensis*, *Astragalus sommieri*, *Genista suamica*, *Osmanthus decorus*, *Primula megasaefolia*, and *Angelica adzharica*.

Currently, five species are included in the Red List of Georgia: *Betula medwedewii*, *Epigaea gaultherioides*, *Rhododendron ungeronii*, *Rhododendron smirnovii* (Vulnerable VU) and *Osmanthus decorus* (Endangered



Fig. 1. Artvin gorge of Çoruh River / © Z. Manvelidze and Ö. Eminağaoğlu

EN). Twenty-seven species are included in the Red Book of Turkey: *Galanthus krasnovii* (Critically Endangered - CR); *Campanula troegerae*; *Orobancha armena*; *Delphinium iris* (Endangered - EN); *Astragalus adzharicus*; *Astragalus sommieri*; *Chesneya elegans*; *Galanthus rizechensis*; *Epigaea gaultherioides*; *Lilium ponticum*; *Osmanthus decorus*; *Papaver lateritium*; *Primula megasaefolia*; *Rhododendron smirnovii*; *Rh. ungeronii*; *Rhodothamnus sessilifolius*; *Senecio integrifolius* subsp. *karsianus* (Vulnerable - VU); *Alyssum artvinense* (LR (cd)); *Campanula betulifolia*; *Convolvulus pseudoscammonia*; *Dactylorhiza osmanica* var. *osmanica*; *Draba bruniifolia* subsp. *armeniaca*; *Fritillaria armena*; *Nonea pulla* subsp. *monticola* (Least Concern - LC); *Centaurea appendicigera*;

*Melampyrum arvense* var. *elatius* (Near Threatened - NT); *Seseli foliosum* (Data Deficient- DD) (Ekim et al. 2000).

All 22 endemic species occurring in the transboundary section of Georgia and Turkey of Adjara floristic region (Table 1) should be included in the national Red Lists of Georgia and Turkey. Conservation of rare species - *Betula medwedewii*, *Rhododendron ungeronii*, *Astragalus doluchanovii*, *Melampyrum alboffianum* - will be considered in the Caucasus Red List.

### Threats

The following main forms of habitat loss/degradation and threats were distinguished in the Adjara-Savsat floristic region:

- Clear cutting/logging including secondary forest material (brushwood, branches).
- Overgrazing.
- Ploughing and sowing on steep slopes.
- Over-collection of flowers, bulbs and parts of plants.
- Utilization of non-woody resources (berries, mushrooms, etc.).
- Hay making.
- Recreational pressure.
- Dam construction.



- Construction/widening of forest roads and highways.

#### Conservation

*Ex situ* and *in situ* conservation of species should envisage the following measures to reduce human impact and allow recovery of species:

- Develop a network of transboundary protected areas;
- Give the status of protected areas to selected habitats;
- Reduce human impact and toughen controls;
- Plant gardens and greenery in populated areas;
- Create seed-stocks in botanic gardens, regenerate and reintroduce species in their natural habitats;
- Increase awareness of local residents and visitors;
- Set up information boards on habitat approach roads;

There are many protected areas within the administrative borders of Artvin Vilayet coinciding or bordering with Adjara-Şavşat floristic region's boundaries, namely, Camili Biosphere Reserve, National Parks of Hatila Valley and Karagöl-Sahara, Strict Nature Reserve of Camili-Gorgit, Camili-Efeler and Çamburnu. Kintrishi reserve, Kintrishi protected area, Kobuleti reserve and Mtirala National park are located in Adjara Autonomous Republic occupying a total area of 30,137 ha or 15.7% of the area of Adjara's forests (19,3608 ha), and managed according to the Law of Georgia 'On the System of Protected areas' (1996) and *in situ* conservation requirements of species and habitats. There are also two protected areas underway: the support/buffer zone of the Mtirala National Park (multi-use area of 10,202 ha) and Machakhela (12,700 ha) (Fig. 3). Conservation of endemic species of the Adjara-Şavşat floristic region first requires Georgian-Turkish transboundary cooperation to protect and manage effectively those ecosystems of high conservation value.



Fig. 2. Adjaristskali River gorge / © Z. Manvelidze and Ö. Eminağaoğlu

Cultivation of endemic species in botanic gardens and their reintroduction into natural habitats is the best way to conserve them. The Botanic Gardens Conservation International (BGCI) has certain commitments to the International Biodiversity Management Programme, reflected in the BGCI Strategy (International Agenda for Botanic gardens in Conservation 2002). It is logical to assume that the problem of *ex situ* conservation of endemic species of Adjara-Şavşat can be resolved through creation of collections of live plants and seed banks in botanic gardens, in conservation areas and in training and research centers in Georgia and Turkey.

The unique biological diversity and tourist and recreational opportunities in the transboundary area, nature protection-related tourism development should be considered as one of the main priorities. Machakhela gorge as well as Mtirala National Park and their support/buffer zones would act as ecological corridors and key protected areas in the south Colchic region, offering opportunities for transboundary cooperation.

The present conservation status of endemic species of the Adjara-Şavşat floristic region is unsatisfactory both in Georgia and Turkey. Actual conservation of habitats involves addressing a number of socio-



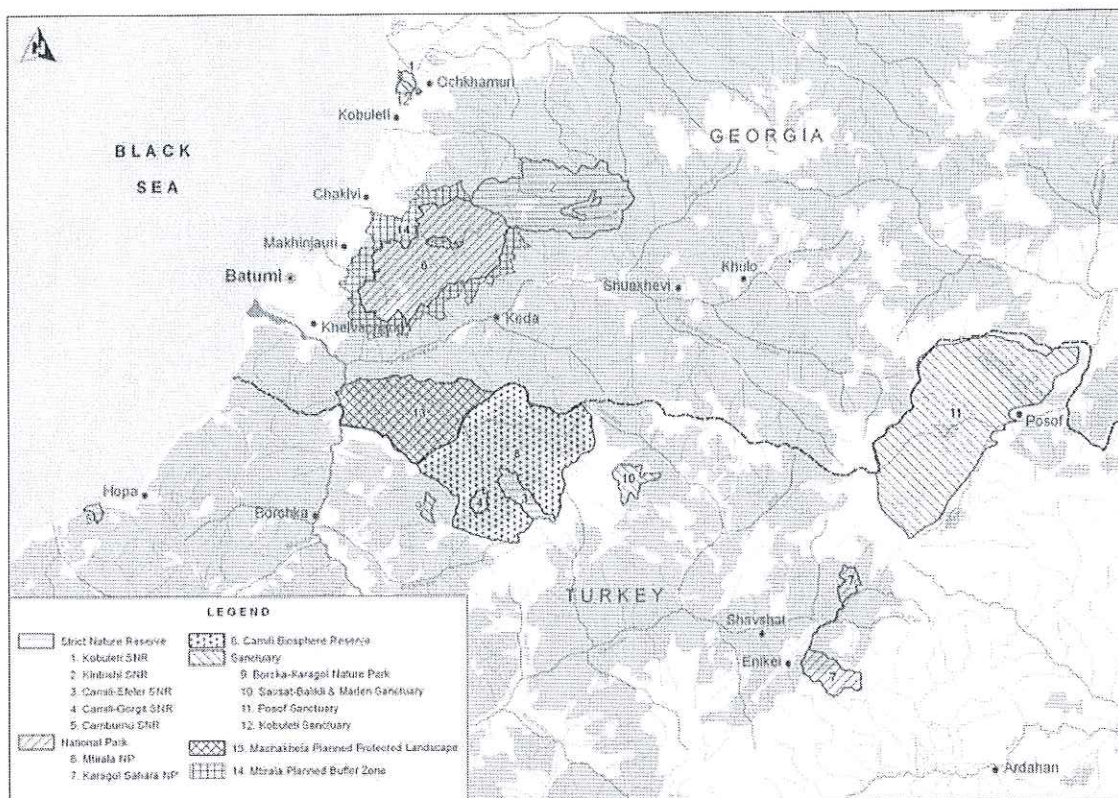


Fig. 3. Current and planned conservation territories of Adjara-Şavşat florist region / © WWF, G. Beruchashvili

economic problems. Nevertheless, urgent measures should be taken to conserve many endemic species. Government agencies should be more actively involved in the process to enable solution of at least some problems in the near future. The assessments of rarity status of local endemic species of the Adjara-Şavşat floristic region and recommendations on endemic species protection and global conservation would be useful for Georgian-Turkish transboundary cooperation and coordination of efforts for protection and conservation of endemic species within the Lesser Caucasus Corridor.

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