Freshwater Key Biodiversity Areas in the Mediterranean Basin Hotspot

Informing species conservation and development planning in freshwater ecosystems

Darwall W., Carrizo S., Numa C., Barrios V., Freyhof J. and Smith K.

Occasional Paper for the IUCN Species Survival Commission No. 52

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Published by: IUCN, Gland, Switzerland, Cambridge, UK, and Malaga, Spain.

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Citation: Darwall, W., Carrizo, S., Numa, C., Barrios, V., Freyhof, J. and Smith, K. (2014). *Freshwater Key Biodiversity Areas in the Mediterranean Basin Hotspot: Informing species conservation and development planning in freshwater ecosystems.* Cambridge, UK and Malaga, Spain: IUCN. x + 86pp.

ISBN 978-2-8317-1698-5
DOI 10.2305/IUCN.CH.2014.SSC-OP.52.en

Cover photo: Inlet on Lake Skadar, Albania and Montenegro. This large Mediterranean lake and its associated catchment is a freshwater Key Biodiversity Area (KBA) supporting at least 24 species of threatened or restricted range freshwater species. © Geert De Knijf.

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Design and layout by: NatureBureau
Printed by: Solprint, Mijas (Malaga), Spain

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www.iucn.org/publications

This publication was funded by Critical Ecosystem Partnership fund (CEPF) and MAVA Foundation.

The Critical Ecosystem Partnership Fund (CEPF) is a joint initiative of l'Agence Française de Développement, Conservation International, the European Union, the Global Environment Facility, the Government of Japan, the MacArthur Foundation and the World Bank. A fundamental goal is to ensure civil society is engaged in biodiversity conservation.

If you have any questions regarding the data and outputs presented in this report, please contact the IUCN Freshwater Biodiversity Unit (Freshwater.Biodiversity@iucn.org).

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Acknowledgements

Identifying Key Biodiversity Areas in the Mediterranean region relies on the willingness of dedicated experts to contribute and pool their collective knowledge. Without their enthusiastic commitment to biodiversity conservation, this work would not be possible. We would therefore like to thank all of the Mediterranean experts who participated in the workshops held in Bosnia and Herzegovina, Morocco and Jordan, including Aljoša Duplić, Dejan Kulijer, Drazen Kotrosan, Geert De Knijf, Ioannis Bazos, Jörg Freyhof, Kanella Radea, Krešimir Žganec, Marko Ćaleta, Panagiota Maragou, Stamatis Zogaris, Ulrich Eichelman, Zoran Marčić, Zoran Mateljak, Güler Ekmekci, Nashat Hamidan, Ümit Kebapçi, Manuel Lopes Lima, Dirk van Damme, Zuhair Amr, Süreyya İsfendiyaroğlu, Haiffa Abdulhalim, Cagri Gocek, Laith El Moghrabi, Imtinen Ben Hadj Jilani, Miguel Clavero, Mohamed Dakki, Mohamed Ghamizi, Mohammed Melhaoui, Mohamed Noaman, Laila Rhazi, Boudjéma Samraoui and Jamel Tahri.

Special thanks go to Arantxa Cendoya who provided support organizing logistics for the workshops and identifying champions and to the Royal Society for the Conservation of Nature who helped organizing the workshop in Jordan. We would also like to thank Maher Mahjoub, Güler Ekmekci, Panagiota Maragou, Krešimir Žganec, Zoran Marčić, Alain Jeudy, Alexa Dubreuil-Storer and Süreyya İsfendiyaroğlu for translating the key terms and the Executive Summary into the other languages of the region. Finally, we would like to thank Ian Harrison for his significant help in the conception and design of this project.

This project was funded by the Critical Ecosystem Partnership Fund (Project 61452), the MAVA Foundation (Project 11-013) and the Spanish Agency for International Development Cooperation (AECID), with contributions from the European Commission funded project Biofresh (Project 226874) and the National Parks Autonomous Agency (OAPN) of the Spanish Ministry of Agriculture, Food and the Environment.

Key terms in regional languages

	French	Arabic	Turkish	Greek
Biodiversity	Biodiversité	التنوع البيولوجي	Biyolojik çeşitlilik (Biyoçeşitlilik)	Βιοποικιλότητα
Aquatic plants	Plantes aquatiques	النباتات المائية	Sucul bitkiler	Υδρόβια φυτά
Freshwater fish	Poisson d'eau douce	أسماك المياه العذبة	Tatlısu balıkları	Ψάρια των εσωτερικών υδάτων
Molluscs	Mollusques	الرخويات	Yumuşakcalar	Μαλάκια
Odonata (dragonflies and damselflies)	Odonates (libellules et demoiselles)	اليعسوب	Yusufcuklar- Helikopter böcekleri	Οδοντόγναθα (Ανισόπτερα και Ζυγόπτερα)
Shrimps	Crevettes	الجمبري	Karidesler	Γαρίδες
Crabs	Crabes	السرطانات	Yengeçler	Καβούρια
IUCN Red List of Threatened Species	Liste rouge des espèces menacées de l'UICN	القائمة الحمراء للأصناف المهددة للإتحاد الدولي لصون الطبيعة	IUCN Tehdit altındaki türler Kırmızı listesi	Κόκκινος κατάλογος απειλούμενων ειδών της IUCN
Critically Endangered (IUCN Red List Category)	En danger critique (catégorie de la Liste rouge de l'UICN)	المهدد بالإنقراض (تصنيف القائمة الحمراء للإتحاد الدولي لصون الطبيعة)	Kritik düzeyde tehlikede (IUCN Kırmızı Liste Kategorisi)	Κρισίμως Κινδυνεύοντα (κατηγορία κινδύνου της IUCN)
Endangered (IUCN Red List Category)	En danger (catégorie de la Liste rouge de l'UICN)	مهددة (تصنيف القائمة الحمراء للإتحاد الدولي لصون الطبيعة)	Tehlike altında (IUCN Kırmızı Liste Kategorisi)	Κινδυνεύοντα (κατηγορία κινδύνου της IUCN)
Vulnerable (IUCN Red List Category)	Vulnérable (catégorie de la Liste rouge de l'UICN)	حساسة (تصنيف القائمة الحمراء للإتحاد الدولي لصون الطبيعة)	Duyarlı (IUCN Kırmızı Liste Kategorisi)	Τρωτά (κατηγορία κινδύνου της IUCN)
Data Deficient (IUCN Red List Category)	Données insuffisantes (catégorie de la Liste rouge de l'UICN)	بيانات ناقصة (تصنيف القائمة الحمراء للإتحاد الدولي لصون الطبيعة)	Yetersiz Veri (IUCN Kırmızı Liste Kategorisi)	Ανεπαρκώς Γνωστά (κατηγορία κινδύνου της IUCN)
Freshwater Key Biodiversity Areas (KBA)	Zones clés pour la biodiversité (ZCB) d'eau douce	المواقع الهامة للتنوع البيولوجي للمياه العذبة	Önemli Tatlısu Alanı (ÖTA)	Κρίσιμες Περιοχές για τη Βιοποικιλότητα των Εσωτερικών Υδάτων (ΚΠΒ)
KBA Criteria	Critères ZCB	معايير المواقع الهامة للتنوع البيولوجي	ÖTA Kriterleri	Κριτήρια επιλογής ΚΠΒ
KBA Criteria Criterion 1: A site is known or thought to hold a significant number of one or more globally threatened species or other species of conservation concern.	Critères ZCB Critère 1: Le site abrite (à priori ou effectivement) un nombre significatif d'individus d'une ou plusieurs espèces menacées ou d'autres espèces d'intérêt pour la conservation	**معايير المواقع الهامة للتنوع البيولوجي** المعيار 1: الموقع معروف أو يعتقد أنه يحتوي عددا كبيرا من واحد أو أكثر الأنواع المهددة عالميا أو أنواع أخرى تستوجب الحماية	ÖTA Kriterleri Kriter 1: Küresel ölçekte tehdit altında olan bir veya birkaç türün ve korumada öncelikli diğer tür vey a türlerin önemli sayıda bireyinin barındığı bilinen ya da düşünülen alan	Κριτήρια επιλογής ΚΠΒ Κριτήριο 1: μια περιοχή που φιλοξενεί ή θεωρείται ότι φιλοξενεί σημαντικό αριθμό ενός ή περισσότερων παγκοσμίως απειλούμενων ή άλλων σημαντικών ειδών.
KBA Criteria Criterion 2: A site is known or thought to hold non-trivial numbers of one or more species (or infraspecific taxa as appropriate) of restricted range.	Critères ZCB Critère 2: Le site abrite (à priori ou effectivement) un nombre non négligeable d'une espèce ou plus (ou de taxons intraspécifiques) don't l'aire de répartition est restreinte	**معايير المواقع الهامة للتنوع البيولوجي** المعيار 2: الموقع معروف أو يعتقد أنه يحتوي أعداد من نوع واحد أو أكثر (أو أصناف دنيا حسب مقتضى الحال) ذات نطاق تواجد محدد.	ÖTA Kriterleri Kriter 2: Dar yayılışlı bir veya birkaç türün (ya da infraspesifik taksonun) önemsiz sayılamayacak sayıda bireyini barındırdığı bilinen ya da düşünülen alan	Κριτήρια επιλογής ΚΠΒ Κριτήριο 2: μια περιοχή που φιλοξενεί ή θεωρείται ότι φιλοξενεί μόνιμους αριθμούς ενός ή περισσότερων ειδών (ή κατώτερων ταξινομικών βαθμίδων) περιορισμένης εξάπλωσης.
KBA Criteria Criterion 3: A site is known or thought to hold a significant component of the group of species that are confined to an appropriate biogeographic unit or units.	Critères ZCB Critère 3: Le site abrite (à priori ou effectivement) une composante significative d'un groupe d'espèces limité à une unite(s) biogéographique(s) appropriée(s)	**معايير المواقع الهامة للتنوع البيولوجي** المعيار 3: الموقع معروف أو يعتقد أنه يحتوي عنصرا هاما من مجموعة أنواع تقتصر على وحدة أو وحدات بيوجغرافية مناسبة	ÖTA Kriterleri Kriter 3: Belirli bir biyocoğrafik birim veya birimlerde yaşayabilen tür gruplarının önemli bir bölümünü barındırdığı bilinen ya da düşünülen alan	Κριτήρια επιλογής ΚΠΒ Κριτήριο 3: μια περιοχή που φιλοξενεί ή θεωρείται ότι φιλοξενεί μια σημαντική συνιστώσα της ομάδας των ειδών που περιορίζονται στην αντίστοιχη βιογεωγραφική ενότητα ή ενότητες.
KBA Focal Areas	Domaine principal d'une ZCB	مجالات التركيز للمواقع الهامة للتنوع البيولوجي	ÖTA Odak Alanları	Περιοχές εστίασης στις ΚΠΒ
KBA Trigger species		الأنواع التي تستجيب لمعايير إحداث المواقع الهامة للتنوع البيولوجي	ÖTA türleri	Είδη χαρακτηρισμού των ΚΠΒ
Conservation actions	Actions de conservation	تدخلات المحافظة		
Threats	Menaces	التهديدات	Tehditler	Απειλές
Stakeholders	Parties prenantes	الأطراف المعنية	Paydaşlar	Εμπλεκόμενοι φορείς

Executive summary

The Mediterranean Basin Biodiversity Hotspot is well known for its globally important biodiversity. The freshwater biodiversity in the Hotspot, not previously widely recognized for its importance, is confirmed here to be unusually diverse and highly threatened, with many species endemic to individual rivers, streams, springs, wetlands and lakes across the region.

Key Biodiversity Areas (KBAs) are *areas contributing significantly to the global persistence of biodiversity.* Based on published information on species conservation status and distributions (source IUCN Red List of Threatened Species), 90% of the 3,894 river/lake sub-catchments considered were found likely to meet the criteria qualifying them as Freshwater KBAs.

The primary threats to freshwater species across the hotspot are increasing severity of droughts, hydrological alterations following construction of dams, over-abstraction of surface and ground waters, water pollution and invasive species. The impacts of these types of threat tend to spread rapidly throughout catchments such that localized conservation actions restricted to limited parts of a catchment will often fail to address these threats. For this reason the appropriate management unit for most freshwater KBAs is a sub-catchment, or a group of connected sub-catchments. The main criteria employed for a sub-catchment to qualify as a 'proposed KBA' were the presence of threatened or restricted range species, or an ecoregion-restricted community of species.

Subsequent evaluation of these proposed KBAs for the three sub-regions of the Hotspot eligible for CEPF funding was conducted through three workshops involving 39 stakeholders in the Balkans (Jahorina, Bosnia and Herzegovina), Turkey and Levant (Azraq, Jordan), and northern Africa (Marrakesh, Morocco). One hundred and sixty-seven freshwater KBAs, covering a total area of 302,557 km^2 were confirmed as valid freshwater KBAs. Of these, 40 KBAs also meet the criteria qualifying them as Alliance for Zero Extinction (AZE) sites where immediate conservation actions are required if a species present in the KBA is not to become globally extinct in the near future. All proposed and validated KBAs are now publicly available for viewing on the World Biodiversity DataBase website (www.birdlife.org/datazone/freshwater).

The current level of inclusion of validated freshwater KBAs within existing protected areas or other KBAs was found to be extremely low. Seventy-five per cent of the total area of these KBAs was found to lie outside the boundaries of any pre-existing protected areas or other KBAs, including 15 freshwater KBAs for which there is no overlap at all.

Through this project freshwater KBAs have now been identified, mapped and validated throughout much of the Mediterranean Hotspot. It is now important to raise awareness of their status as validated freshwater KBAs and to develop plans for appropriate conservation actions at these sites.

One hundred and eighty-eight potential *Site Champions* have been identified by stakeholders as individuals/organizations best placed to raise awareness of the existence of the KBAs and the issues faced with respect to threats to biodiversity, and to help implement the required actions to safeguard these globally important sites.

Specific recommendations for conservation actions are mainly focused on improving management of the hydrology of these KBAs, many of which are currently or potentially impacted by over-abstraction and diversion of water, construction of dams, and drought. KBAs need to be managed to ensure Environmental Flows are sufficient to support these fragile freshwater ecosystems and they should be implemented as part of catchment-wide Integrated River Basin Management planning which takes account of the wide range of uses of water across all sectors. There are also important knowledge gaps in site and basin-specific species distributions of many threatened species, and many countries do not yet have baseline inventories of their inland water ecosystems and species assemblages. It is very possible that many new KBAs will be discovered if these biodiversity inventories progress.

In conclusion, the Mediterranean Basin Hotspot is found to be globally important for its freshwater biodiversity. This biodiversity is highly threatened largely due to the conflicting demands upon a diminishing supply of fresh water which is further exacerbated by the increased severity of drought across the region. Unless the recommendations given above are followed and Site Champions are mobilized to raise awareness of these globally important freshwater KBAs, species will almost certainly be lost in the very near future. Solutions are available but the willingness to adopt them has to be encouraged. Freshwater species are most often out of sight and out of mind so raising awareness of their presence, the threats they face, and the necessary conservation actions are fundamental to the persistence of freshwater biodiversity in the Mediterranean Hotspot.

Résumé

Le « Hotspot » (point chaud) de la biodiversité du bassin méditerranéen est bien connu pour l'importance que sa biodiversité revêt à l'échelle mondiale. Il est aujourd'hui confirmé que la biodiversité d'eau douce existant dans ce hotspot présente une diversité inhabituelle, abrite de nombreuses espèces endémiques aux fleuves, rivières, ruisseaux, sources, zones humides et lacs de la région, et est fortement menacée, alors que l'importance de cette biodiversité n'était pas reconnue précédemment.

Les Zones clés pour la biodiversité (ZCB) sont des *sites qui contribuent de manière significative à la persistance globale de la biodiversité.* À partir des informations publiées concernant le statut de conservation et la répartition géographique des espèces (source : Liste rouge des espèces menacées de

l'UICN), il a été identifié que 90 % des 3 894 sous-bassins versants fluviaux/lacustres étudiés étaient susceptibles de remplir les critères d'admission en tant que ZCB d'eau douce.

Les principales menaces pesant sur les espèces d'eau douce au sein du hotspot sont la pollution de l'eau, la gravité accrue des sécheresses, les altérations hydrologiques suite à la construction de barrages, le captage excessif des eaux souterraines et de surface, et les espèces envahissantes. Les effets de ce type de menaces ont tendance à se propager rapidement au sein des bassins versants, à tel point que les actions de conservation localisées se limitant à des parties restreintes d'un bassin versant ne parviennent généralement pas à faire face à ces menaces. Pour cette raison, l'unité de gestion adaptée pour la plupart des ZCB d'eau douce est un sous-bassin ou un groupe de sous-bassins reliés. Les principaux critères utilisés pour qu'un sous-bassin soit admis en tant que « ZCB proposée » ont été la présence d'espèces menacées ou ayant une aire de répartition limitée, ou bien d'une communauté d'espèces limitée à une écorégion.

L'évaluation ultérieure de ces ZCB proposées, concernant les trois sous-régions (Balkans, Turquie & Levant et Afrique du Nord) du hotspot éligible pour bénéficier d'un financement du CEPF, a été réalisée dans le cadre de trois ateliers réunissant 39 parties prenantes et organisés à Jahorina (Bosnie-Herzégovine) pour les Balkans, à Azraq (Jordanie) pour la Turquie et le Levant, et à Marrakech (Maroc) pour l'Afrique du Nord. Cent soixante-sept ZCB d'eau douce, couvrant une superficie totale de 302 557 km^2, ont été validées en tant que ZCB d'eau douce officielles. Sur ces 167 ZCB, 40 ont également rempli les critères d'admission en tant que sites « Alliance for Zero Extinction » (Alliance pour une extinction zéro ou AZE), dans lesquels des actions de conservation immédiates sont requises pour qu'une espèce présente dans la ZCB ne s'éteigne pas à l'échelle mondiale dans un avenir proche. Toutes les ZCB proposées et validées peuvent à présent être visualisées par le public, en consultant le site Web de la base de données pour la biodiversité mondiale (World Biodiversity DataBase) (www.birdlife.org/datazone/freshwater).

Il a été constaté que le niveau actuel d'inclusion de ZCB d'eau douce validées au sein d'aires protégées existantes ou d'autres ZCB était extrêmement bas. Ainsi, il a été observé que 75 % de la superficie totale de ces ZCB se situait en dehors des limites géographiques d'aires protégées existantes ou d'autres ZCB, y compris 15 ZCB d'eau douce pour lesquelles il n'existe aucun chevauchement.

Dans le cadre de ce projet, les ZCB d'eau douce ont maintenant été identifiées, cartographiées et validées dans la majeure partie du hotspot méditerranéen. À présent, il est important de faire prendre conscience de leur statut en tant que ZCB d'eau douce validées, et de mettre en place des programmes d'actions de conservation adaptées sur ces sites. Les parties prenantes ont identifié 188 « *Ambassadeurs locaux* » potentiels parmi les personnes/organizations les mieux placées pour sensibiliser à l'existence des ZCB et aux difficultés rencontrées en raison des menaces pesant sur la biodiversité, et pour aider à mettre en œuvre les actions requises en vue de préserver ces sites dont l'importance est de portée mondiale.

Les recommandations spécifiques en matière d'actions de conservation sont principalement axées sur l'amélioration de la gestion hydrologique de ces ZCB dont beaucoup sont actuellement ou potentiellement affectées par le captage excessif et le détournement de l'eau, la construction de barrages et les sécheresses. Les ZCB doivent être gérées de manière à veiller à ce que les flux environnementaux soient suffisants pour soutenir ces écosystèmes d'eau douce si fragiles, et elles doivent être établies dans le cadre d'une planification de la Gestion intégrée des bassins hydrographiques (GIBH) à l'échelle des bassins versants, en tenant compte de la diversité des utilisations de l'eau selon les différents secteurs. Il existe également des lacunes importantes en termes de connaissances sur la répartition de nombreuses espèces menacées figurant parmi les espèces spécifiques aux bassins et aux sites, et de nombreux pays n'ont pas encore d'inventaires de base concernant les écosystèmes de leurs eaux intérieures et les assemblages d'espèces. Beaucoup de nouvelles ZCB seront très probablement identifiées au fur et à mesure de l'avancement de ces inventaires de la biodiversité.

En conclusion, il est clair que le hotspot du bassin méditerranéen revêt une importance mondiale pour sa biodiversité d'eau douce. Cette biodiversité est fortement menacée, en grande partie à cause de la concurrence de la demande dans un contexte de diminution de l'offre en eau douce, et cette menace est exacerbée encore davantage par la gravité accrue des sécheresses survenant dans la région. Des espèces seront presque certainement perdues dans un avenir très proche si les recommandations formulées plus haut ne sont pas suivies et si des Ambassadeurs locaux ne se mobilisent pas pour sensibiliser à l'importance mondiale de ces ZCB d'eau douce. Des solutions existent mais la volonté de les faire adopter doit être encouragée. La plupart du temps, la situation des espèces d'eau douce confirme l'adage « loin des yeux, loin du cœur », c'est pourquoi il est fondamental de sensibiliser à leur présence, aux menaces pesant sur ces espèces et aux actions de conservation nécessaires, ceci afin de garantir la persistance de la biodiversité d'eau douce dans le Hotspot méditerranéen.

Sažetak

Područje Mediterana dobro je poznata „vruća točka" bioraznolikosti od globalne važnosti. Bioraznolikost slatkovodnih ekosustava Mediterana, čija važnost još uvijek nije široko prepoznata, u ovom istraživanju je potvrđena kao izuzetno velika, ali i jako ugrožena, s mnogim endemičnim vrstama koje nastanjuju pojedine rijeke, potoke, izvore, močvare i jezera ovog područja.

Na temelju objavljenih informacija o statusu ugroženosti vrsta i njihovoj rasprostranjenosti (izvor: Crvena lista IUCN-a), za

3513 od ukupno 3894 analiziranih riječnih/jezerskih podslivova, ustanovljeno je da najvjerojatnije sadrže vrste zbog kojih zadovoljavaju kriterije da ih možemo kvalificirati kao **ključna područja slatkovodne bioraznolikosti** (engl. Freshwater Key Biodiversity Areas - KBAs), koja se definiraju kao *područja koja značajno pridonose globalnom očuvanju bioraznolikosti*.

Primarne prijetnje slatkovodnim vrstama u području Mediterana, „vruće točke" bioraznolikosti, su onečišćenje voda, porast jačine suša, hidrološke promjene zbog izgradnje brana, pretjerano crpljenje površinskih i podzemnih voda te invazivne vrste. Učinci ovakvih tipova prijetnji imaju tendenciju brzog širenja slivom tako da lokalizirane mjere zaštite koje su ograničene na pojedine dijelove sliva najčešće ne mogu ukloniti ove prijetnje. Iz tog je razloga za većinu slatkovodnih KBA-ova odgovarajuća jedinica upravljanja podsliv ili grupa povezanih podslivova. Glavni kriterij da se podsliv kvalificira kao predloženi KBA bio je prisutnost ugroženih vrsta ili onih s ograničenim područjem rasprostranjenosti, ili vrsta koje predstavljaju reprezentativan skup vrsta pojedine slatkovodne ekoregije.

Procjena predloženih KBA-ova za tri podregije „vruće točke" pogodnih za financiranje iz fonda CEPF-a provedena je kroz tri radionice uključujući 39 dionike na području Balkana (Jahorina, Bosna i Hercegovina), Turska i Levant (Azrak, Jordan), i sjeverna Afrika (Marakeš, Moroko). Ukupno je 167 slatkovodnih KBA-ova, koji pokrivaju ukupno 302.557 km^2, potvrđeno da zadovoljavaju kriterije koji ih kvalificiraju za slatkovodne KBA-ove. Od toga, 40 KBA-ova također ispunjava kriterije koji ih kvalificiraju kao područja „Saveza za nultu stopu izumiranja" (engl. Alliance for Zero Extinction - AZE) u kojima su potrebne žurne konzervacijske akcije kako vrste prisutne u KBA-u ne bi globalno izumrle u bliskoj budućnosti. Svi predloženi i vrednovani KBA-ovi su sada javno dostupni za pregled na internetskim stranicama svjetske baze bioraznolikosti, World Biodiversity DataBase (www.birdlife.org/datazone/freshwater).

Trenutna razina uključivanja potvrđenih slatkovodnih KBA-ova uključenih u postojeća zaštićena područja i druge (kopnene) KBA-ove je izrazito niska. 75% slatkovodnih KBA-ova leži izvan granica postojećih zaštićenih područja i drugih KBA-ova, uključujući i 15 slatkovodnih KBA-ova s kojima uopće nije bilo preklapanja s zaštićenim područjima ili drugim KBA-ovima.

Kroz ovaj projekt slatkovodni KBA-ovi su identificirani, kartirani i potvrđeni za većinu „vruće točke" Mediterana. Sada je potrebno podići svijest o njihovom statusu kao potvrđenim slatkovodnim KBA-ovima i razviti planove za odgovarajuće konzervacijske akcije na ovim područjima. 188 Dionici su identificirali potencijalne *Pobornike područja* kao pojedince ili organizacije koji mogu podići svijest o postojanju KBA-ova i problemima koji im prijete s aspekta bioraznolikosti te koji mogu pomoći provesti potrebne mjere kojima bi se očuvala ova globalno važna područja.

Naročite preporuke za konzervacijske akcije pretežno su usmjerene na unaprjeđenje upravljanjem hidrologijom ovih KBA-ova od kojih su mnogi trenutno ili potencijalno pogođeni gradnjom brana, pretjeranim korištenjem vode, skretanjem vodotokova i sušama. KBA-ovima treba upravljati tako da se osiguraju ekološki prihvatljivi protoci koji su dovoljni za održavanje ovih krhkih slatkovodnih ekosistema i trebali bi biti ostvareni kao dio plana upravljanja čitavog sliva (Integrated River Basin Management) koji uzima u obzir ukupno korištenje vode u svim sektorima.

Zaključno, Mediteranska „vruća točka" prepoznata je kao globalno važna zbog svoje slatkovodne bioraznolikosti. Ova bioraznolikost je izrazito ugrožena zbog potreba za korištenjem slatke vode čija količina se smanjuje, a koja je dodatno pojačana sve jačim sušama diljem regije. Ako se preporuke iznesene ranije ne provedu u djelo i ako se ne aktiviraju *Pobornici područja* koji će podići stanje svijesti o ovim globalno važnim slatkovodnim KBA-ovima, ugrožene vrste koje u njima dolaze će sigurno izumrijeti u vrlo bliskoj budućnosti. Postoje rješenja, ali spremnost da ih se usvoji treba poticati. Slatkovodne su vrste često zaboravljene jer su nedostupne i nevidljive većini pa su podizanje razine svijesti o njihovom postojanju, o prijetnjama koje ih ugrožavaju i potrebnim konzervacijskim akcijama vrlo važan prvi korak.

ملخص تنفيذي

النقطة الساخنة للتنوع البيولوجي بحوض البحر الأبيض المتوسط معروفة جيدا باعتبارها تحتضن تنوعا بيولوجيا ذو أهمية عالمية. التنوع البيولوجي للمياه العذبة بالنقطة الساخنة، والذي لم يسبق الاعتراف بأهميته على نطاق واسع، يؤكد لنا بأنه تنوعا غير مألوف ومهددا للغاية نظرا لتواجد عديد الأنواع المستوطنة في الأنهار الفردية والجداول والينابيع والأراضي الرطبة والبحيرات في جميع أنحاء المنطقة.

وبناء على المعلومات المنشورة بخصوص وضعية المحافظة على الأنواع وتوزيعها (المصدر : القائمة الحمراء للإتحاد الدولي لصون الطبيعة)، تم العثور على أن 3513 من بين 3894 نهر وبحيرة ومستجمعات مياه فرعية تحتوي على الأنواع التي تفي بمعايير تأهيلها كمناطق هامة للتنوع البيولوجي بالمياه العذبة، حيث تتميز هذه المواقع بمساهمتها الكبيرة في الإستمرار الكوني للتنوع البيولوجي.

إن التهديدات الرئيسية للأنواع المتواجدة بالمياه العذبة في جميع أنحاء النقطة الساخنة تتمثل بالأساس في تلوث المياه وزيادة حدة الجفاف والتغيرات الهيدرولوجية التالية لبناء السدود عبر تجريد المياه السطحية والجوفية إلى جانب التهديدات المتأتية من الأنواع الغازية. وتعرف تأثيرات هذه التهديدات انتشارا سريعا في جميع أنحاء مستجمعات المياه ومن بينها التأثيرات على إجراءات المحافظة المقتصرة على أجزاء محدودة من المستجمعات والتي لا تتوفق في كثير من الأحيان لمواجهة هذه التهديدات. لهذا السبب فإن الإدارة المناسبة لمعظم المناطق الهامة للتنوع البيولوجي بالمياه العذبة هي المستجمعات الفرعية أو مجموعة الأحواض الفرعية المتصلة. إن المعايير الرئيسية المستخدمة لمستجمعات المياه الفرعية لتأهيل اقتراحها كمنطقة هامة للتنوع

العذبة. ويعرف هذا التنوع البيولوجي تهديدا كبيرا بسبب المطالب المتضاربة على المياه العذبة الذي ازدادت حدتها في ضل تفاقم ظاهرة الجفاف في جميع أنحاء المنطقة. كما تجدر الإشارة أنه إذا لم يتم توفير الضمانات اللازمة لمتابعة تنفيذ التوصيات المشار إليها سلفا وتحديد مواقع رئيسية تساهم في حشد الوعي تجاه الأنواع المتواجدة بالمناطق الهامة للتنوع البيولوجي بالمياه العذبة الهامة عالميا، فإنه من شبه المؤكد أن تتلاشى في المستقبل القريب جدا. إن الحلول متاحة لكن الرغبة في تنفيذها يستوجب المزيد من التشجيع. إن الأنواع المتواجدة بالمياه العذبة هي في أغلب الأحيان بعيدة عن الأنظار وخارج مجالات التفكير، وبالتالي فإن رفع درجة الوعي بوجودها وبالتهديدات التي تواجهها وتدابير الحماية الضرورية ستكون من أول الخطوات الواجب اتخاذها في هذا المجال.

Genişletilmiş Özet

Akdeniz Havzası Biyoçeşitlilik sıcak noktası küresel öneme sahip biyoçeşitliliğiyle tanınır. Sıcak noktanın daha önce önemi geniş kitlelerce bilinmeyen, bölgede yer alan bir çok nehre, akarsuya, kaynağa, sulak alana ve göle endemik türlere sahip tatlısu biyoçeşitliliğinin olağanüstü çeşitli, son derece tehlike altında olduğu burada teyid edilmiştir.

Önemli Doğa Alanları (ÖDA'lar) biyolojikçeşitliliğin küresel devamlılığına hatrı sayılır destek sağlayan alanlardır. Tür durum ve dağılımlarına dair basılı kaynaklara (kaynak IUCN Nesli Tehlike Altında Türler Kırmızı Listesi) değerlendirilen 3,894 nehir/göl althavzasından %90'ının kriteleri sağlayarak Önemli Tatlısu Alanı olduğu tespit edilmiştir.

Sıcak noktada tatlısu türlerini tehdit eden başlıca tehditler, su kirliliği, kurakllığın gittikçe daha sertleşmesi, Baraj inşaatları, yeraltı ve yüzey su kaynaklarının aşırı kullanımı gibi şekillerde suyun akışına müdahale edilmesi ve istilacı türlerdir. Bu tip tehditlerin etkileri havzalar boyunca hızlıca yayılma eğilimindedir, öyle ki, havzaların belli kısımlarıyla sınırlandırılan bölgesel koruma eylemleri çoğu zaman bu tehditleri ele almakta yetersiz kalmaktır. Bu nedenle, birçok tatlısu ÖTA'sı için uygun yönetim birimi bir alt-havza veya birbirine bağlı bir alt-havzalar grubudur. Bir alt-havzanın "aday ÖTA" olarak sınıflandırılması için gereken başlıca kriter, tehdit altında veya daryayılışlı bir türün veya bir tatlısu ekolojik bölgesine özgü tür topluluğunu temsil eden türlerin varlığıdır.

Sıcak noktanın üç alt-bölgesi için önerilen ÖTA'ların aşağıda yer alan değerlendirmeleri, CEPF fonu ile destelenerek, Balkanlardaki (Saraybosna, Bosna Hersek), Türkiye ve Doğu Akdeniz'deki (Azrak, Ürdün) ve Kuzey Afrika'daki (Marakeş ve Fas) 39 paydaşın katılımıyla gerçekleştirilen üç çalıştay ile yürütülmüştür. Toplam 302.557 km^2 alan kapsayan 167 tatlısu ÖTA'sı, onaylanmış ÖTA'lar olarak gerçelilik kazanmıştır. Bu alanlardan 40 tanesi kriteleri karşılayarak Sıfır Yok Oluş Alanı (Alliance for Zero Extinction-AZE) sınıflandırılmıştır. Sıfır Yok Oluş Alanları, Önemli Doğa Alanında bulunan bir türün yakın

البيولوجي هي بالأساس وجود طائفة أنواع مهددة أو مقيدة، أو أنواع ممثلة لمجموع المياه العذبة بالمنطقة الإيكولوجية.

وقد تم إجراء تقييم للمناطق الهامة للتنوع البيولوجي المقترحة للمناطق الفرعية الثلاث بالنقطة الساخنة المؤهلة للحصول على تمويل من صندوق الشراكة للمنظومات الهامة من خلال تنظيمثلاث ورشات عمل بإشراك 39 جهة مختصة بكل من البلقان (سراييفو، البوسنة والهرسك) وتركيا وبلاد الشام (الازرق والأردن)، وشمال أفريقيا (مراكش بالمغرب). وقد تم تأكيد صلوحية 167 منطقة هامة للتنوع البيولوجي بالمياه العذبة، والتي تغطي مساحة إجمالية تبلغ 302557 كم مربع. من بينها 40 منطقة هامة للتنوع البيولوجي تستجيب كذلك لمعايير تأهيلها لـ" التحالف من أجل مواقع بدون انقراض" مما يتطلب إجراءات فورية للمحافظة على الأنواع الموجودة بالمنطقة الهامة للتنوع البيولوجي لكي لا تنقرض على مستوى العالم في المستقبل القريب. إن جميع المناطق الهامة للتنوع البيولوجي المقترحة والمصادق عليها هي الآن منشورة ومتاحة ويمكن الإطلاع عليها بموقع قاعدة بيانات التنوع البيولوجي العالمية.(www.birdlife.org/datazone/freshwater)

إن المستوى الحالي لإدراج المناطق الهامة للتنوع البيولوجي بالمياه العذبة المصادق عليها ضمن المناطق المحمية القائمة أو غيرها من المناطق الهامة للتنوع البيولوجي يعتبر منخفض للغاية. حيث أن خمسة وسبعين في المئة من المساحة الإجمالية للمناطق الهامة للتنوع البيولوجي توجد خارج حدود المناطق المحمية المعلنة أو غيرها من المناطق الهامة، بما في ذلك 15 منطقة هامة للتنوع البيولوجي بالمياه العذبة لا يوجد بها أي تداخل على الإطلاق.

وقد تم عبر هذا المشروع تحديد المناطق الهامة للتنوع البيولوجي بالمياه العذبة، والتحقق من دقة تعيينها على خرائط وذلك في مواقع متعددة بالنقطة الساخنة للمتوسط. ويبدو من المهم الآن رفع مستوى الوعي بخصوص وضعهم الحالي إبان المصادقة على المناطق الهامة للتنوع البيولوجي بالمياه العذبة إلى جانب وضع خطط لإجراءات محافظة ملائمة في هذه المواقع. وقد تم تحديد 188 موقع رئيسي محتمل من قبل الجهات المعنية كأفراد وكمؤسسات الأقدر على رفع الوعي بوجود المناطق الهامة للتنوع البيولوجي والقضايا التي تواجهها فيما يتعلق بالتهديدات على التنوع البيولوجي والمساعدة في تنفيذ الإجراءات اللازمة لحماية هذه المواقع الهامة عالميا.

وتتركز التوصيات الخصوصية لإجراءات المحافظة أساسا على تحسين الإدارة الهيدرولوجية للمناطق الهامة للتنوع البيولوجي، والتي تأثرت كثير نتيجة بناء السدود، عبر تجريد وتحويل المياه، وكذلك الجفاف. وتحتاج المناطق الهامة للتنوع البيولوجي إلى إدارة محكمة تساهم في تأمين التدفقات البيئية اللازمة لدعم النظم الإيكولوجية الحساسة للمياه العذبة، وينبغي تنفيذها باعتبارها جزء من التخطيط الإداري المندمج لمستجمعات أحواض الأنهار والتي تأخذ بعين الإعتبار تعدد مجالات استخدامات المياه في جميع القطاعات.

في الختام، تم التوصل إلى أن النقطة الساخنة لحوض البحر الأبيض المتوسط تعتبر ذات أهمية عالمية من حيث التنوع البيولوجي بالمياه

gelecekte küresel ölçekte yok olmaması için acil koruma çalışmalarına ihtiyaç duyulan alanlardır. Günümüzde tüm önerilen ve geçerli. Bütün aday ve onaylanmış ÖDA'lar Dünya Biyoçeşitlilik Veri Tabanı (World Biodiversity DataBase) (www.birdlife.org/datazone/freshwater) web sitesinde halkın kullanımına sunulmuş ve yayınlanmaktadır.

Onaylanmış ÖTA'ların hal,hazırda var olan korunan alanlarla veya diğer ÖDA'larla örtüşme seviyesinin son derece sınırlı olduğu görülmektedir. Hiçbir şekilde bir alanla örtüşmeyen 15 ÖTA da dahil olmak üzere bu ÖTA'ların toplam alanının %75'inin hali hazırda yer alan herhangi bir korunan alan veya ÖDA sınırının dışında yer aldığı görülmektedir.

Bu proje ile Akdeniz Sıcak Noktasında yer alan ÖTA'lar, tanımlanmış haritalanmış ve onaylanmıştır. Artık, bu alanların uzmanlarca onaylanmış ÖTAlar olarak tanıtılması ve bu alanlarda ihtiyaç duyulan koruma çalışmaları için gerekli planların geliştirilmesi önem arz etmektedir. 188 potansiyel Alan Şampiyonu (Site Champions) paydaşlar tarafından ÖDA'ların varlığına yönelik farkındalığın arttırılmasında en iyi konumda olan ve biyolojikçeşitliliğe karşı tehditlerle mücadele eden ve bu küresel öneme sahip alanların korunması için gerekli faaliyetleri yürüten kişiler/kuruluşlar olarak belirlenmiştir.

Koruma çalışmalarına yönelik spesifik tavsiyeler çoğunlukla alandaki su yönetiminin iyileştirilmesine odaklanmaktadır, ÖDA'ların birçoğu yeraltı suyunun aşırı kullanımı ve barajlarla suyun akış yönünün değiştirilmesi ve kuraklık gibi tehditlerden hali hazırda ya da potasiyel olarak etkilenmektedir. ÖDA'lar can suyunun güvence altına alındığı bu hassas ekosistemleri destekleyecek şekilde yönetilmeli ve bunlar havza ölçeğinde her sektörün geniş yelpazedeki su kullanımı ihtiyacını gözönünde bulunduran bütünleşik dere havzası yönetimi planlamasıyla uygulanmalıdır. Aynı zamanda bir çok nesli tehlike altında türün alan ve havzadaki dağılımlarına dair bilgi açıkları da mevcuttur ve bölgede bir çok ülkede içsu ekosistemlerinin temel tür envanteri ve tür toplulukları belirlenmiş değildir. Bu tip envanterler gerçekleştirildikçe yeni ÖDA'ların keifedilmesi de mümkündür.

Son olarak, Akdeniz sıcak noktasının içsulardaki çeşitlilik açısından küresel öneme sahip olduğu bulunmuştur. Bu biyoçeşitlilik büyük oranda bölgede şiddeti sürekli artan kuraklıktan da zarar gören ve her geçen gün azalan tatlısu kaynaklarının temini konusunda ortaya çıkan yönetsel taleplerin yolaçtığı çıkan çıkar çatışmalarından dolayı yüksek tehdit altındadır. Yukarıda dile getirilen tavsiyeler gözönünde bulundurulmaz ve Alan Şampiyonları bu küresel ÖTA'larla ilgili farkındalığı arttırmak üzere harekete geçirilmezse, gelecekte hiç süphesizki türler kaybolacaktır. Hali hazırda çözüm ortadadır ve bunların hayata geçirilmesi özendirilmelidir. Tatlısu türleri çoğunlukla kişinin gözü önünde veya aklında bulunmayan türlerdir dolayısıyla Akdeniz Sıcak Noktasında bu türlerin varlığı, karşı karşıya kaldıkları tehditler konusunda farkındalık oluşturulması ve içsu biyolojik çeşitliliğin dayanma gücünü arıtaracak koruma uygulamalarının hayata geçirilmesi elzemdir.

Background

The state of freshwater biodiversity in the Mediterranean Basin

Freshwater ecosystems cover less than 1% of the planet yet are among the most diverse and threatened ecosystems in the world (Strayer & Dudgeon 2010). People have been draining, in-filling and converting inland wetlands for hundreds of years such that their estimated loss was 69–75% for the 20th century (Davidson 2014). There is little information on ephemeral or intermittently flooded wetlands, such as water meadows and arid and semiarid zone shallow depressions. There is also no global assessment of the health of those wetlands that do remain (Davidson 2014), many of which are likely to now be heavily degraded. Given that a tenth of all animal species (Poff *et al.* 2012) including almost half the world's known fish species (Carrizo *et al.* 2013) live in freshwater this extensive loss of habitat is of major concern for meeting targets to halt the ongoing extinction of species. More than 29% of the 25,007 freshwater species assessed on The IUCN Red List of Threatened Species™ ('IUCN Red List') (www.iucnredlist.org) are globally threatened with extinction (IUCN 2013). With a high number of Data Deficient freshwater species (n=5,761) on the Red List (IUCN 2013) and many species remaining to be assessed (Poff *et al.* 2012), this proportion may increase.

One of the greatest threats to freshwater species is therefore the loss or degradation of habitats (Collen *et al.* 2014; Garcia-Moreno *et al.* 2014) and the Mediterranean Basin is no exception. The Mediterranean situation for freshwater ecosystems is of particular concern on account of the high diversity of endemic species under increasing pressure largely due to over-abstraction of water, spread of invasive species and pollution. Past assessments have found more than half of the regions' endemic freshwater fishes, more than a third of all crabs and crayfish, and almost a third of amphibians are threatened (Cuttelod *et al.* 2008). One fifth of all Mediterranean dragonflies (Riservato *et al.* 2009; Samraoui *et al.* 2010) are also threatened and the outlook for Mediterranean freshwater molluscs is poor with almost half of all species in Europe threatened (Cuttelod *et al.* 2011). It therefore follows that protection of habitats through site based conservation actions, such as protected areas, can provide a powerful tool to help prevent species loss.

Key Biodiversity Areas (KBAs), globally significant areas for the persistence of biodiversity (Eken *et al.* 2004; Langhammer *et al.* 2007), can guide the selection of new protected areas or the expansion of existing site networks. Science tells us that protected areas have not always been placed strategically and may not therefore provide the best protection for the biodiversity they are intended to safeguard; this is particularly the case for freshwater biodiversity (e.g. Darwall *et al.* 2011). Initially developed for birds (Important Bird Areas (Grimmett & Jones 1989)) and plants (Important Plant Areas (Anderson 2002)) a set of standardized criteria and thresholds were developed to identify KBAs in a justifiable and transparent way.

The criteria used to identify KBAs are based on vulnerability and irreplaceability. In this context vulnerability refers to the likelihood that species within a site will be lost over time, and irreplaceability refers to the spatial options available for conservation of a particular species (Langhammer *et al.* 2007). The IUCN Red List provides the species information required to determine species vulnerability and irreplacability and so identify KBAs. The rationale and criteria for identification of KBAs (Eken *et al* 2004; Langhammer *et al.* 2007) are extensions of the original concepts of Important Bird Areas (e.g. Grimmett & Jones 1989). However, the methods being employed to identify KBAs for a wide range of taxonomic groups are not always consistent in terms of selection criteria such that IUCN was asked by its members to lead a globally represented process to streamline the KBA procedures (IUCN 2014). This consultation, which is due for completion in 2014, has already greatly raised the profile of this important tool.

Freshwater KBAs are yet to be identified for most parts of the world leaving few current opportunities for conservation and development managers to take account of freshwater biodiversity within the planning process (Darwall *et al.* 2011). Furthermore Alliance for Zero Extinction (AZE) sites (Ricketts *et al.* 2005), which are an important subset of KBAs containing the last or only populations of globally threatened species, are in urgent need of identification for freshwaters. In Europe, only one freshwater AZE has been identified to date; an amphibian site for *Calotriton arnoldi* (Critically Endangered) in El Montseny Natural Park in Spain (Carranza & Amat 2005).

KBAs as a conservation tool

Identification of KBAs provides fundamental information to inform a wide range of decision-making contexts and end-users by, for example:

- **Informing the selection of sites for protection** under national and international legislation.
- **Implementing and monitoring global biodiversity targets** in multi-lateral environmental agreements (e.g. Aichi Target 11 of the Convention on Biological Diversity).
- **Supporting private and financial sectors to manage their environmental risks** related to biodiversity impact.
- **Guiding conservation investments** by donors (e.g. Critical Ecosystem Partnership Fund, Global Environment Facility).
- **Strengthening conservation action on the ground** by local or international Non-Governmental Organizations.

Project objectives

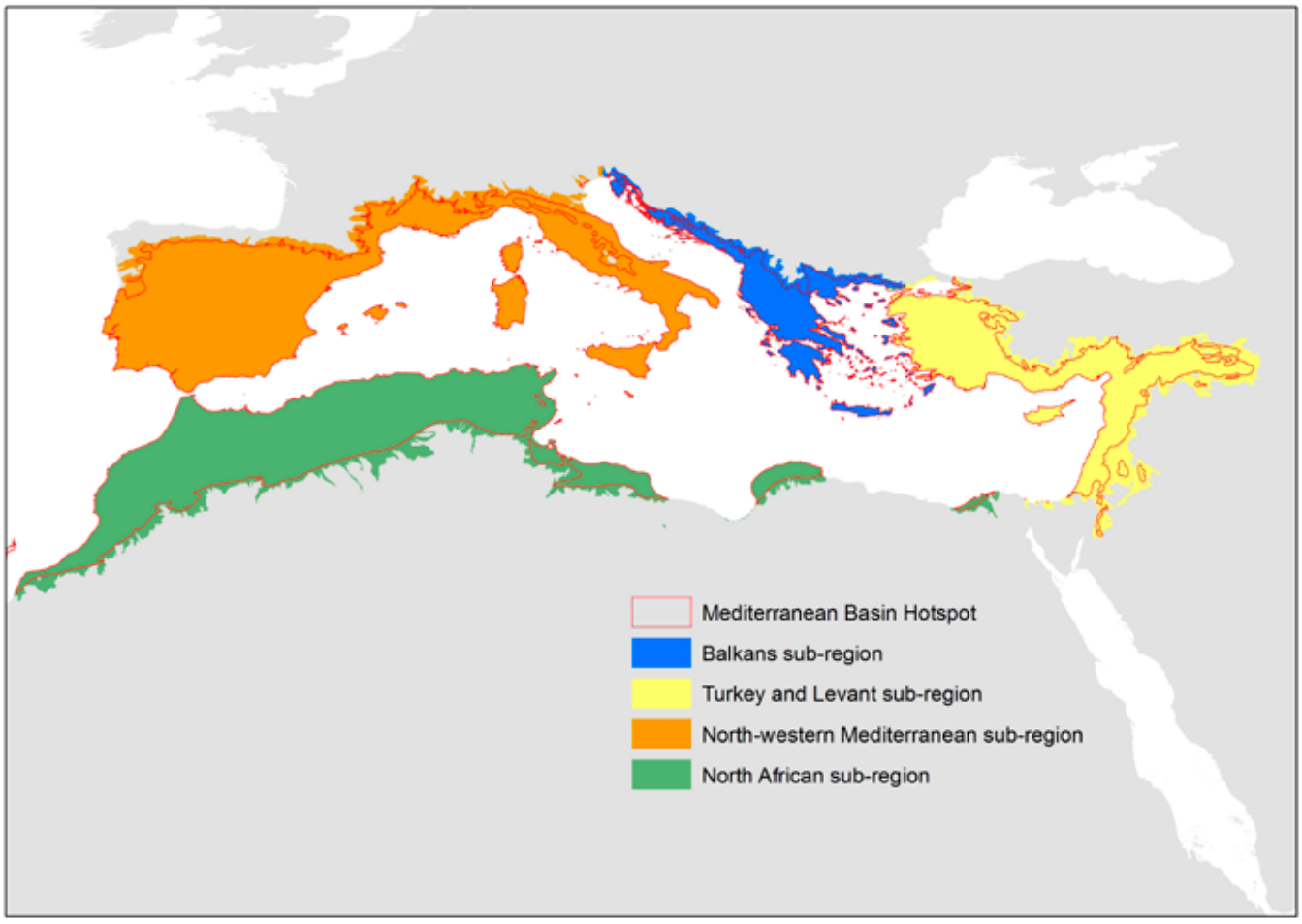
In light of the situation described above, in 2012, CEPF and the MAVA Foundation funded IUCN to fill the remaining gaps in the Red List assessments of freshwater species in the

Mediterranean Basin Hotspot (Figure 1) and work with the relevant stakeholders to identify and validate Key Biodiversity Areas for the southern and eastern Mediterranean (see Figure 1 for the project region). The aim of the project is to provide resources that are essential for guiding decisions on the conservation and sustainable management of freshwater biodiversity in the Mediterranean Basin Biodiversity Hotspot.

The project aimed to first fill the remaining gaps in information on freshwater biodiversity in the eastern parts of the basin and to then use this information, combined with the results of previous biodiversity assessments, to identify KBAs throughout much of the basin. This was to be achieved by: (i) collating data on the distribution, abundance, ecology, and utilization by humans, for several groups of species that are reliable indicators of the biological structure and functioning of freshwater ecosystems in the eastern Mediterranean region; (ii) evaluating the risk of extinction for these species according to the IUCN Red List Criteria; (iii) mapping geographic patterns of species richness, endemism, and existing or impending threats to the species (Smith *et al*. in prep.); (iv) identifying those river/lake sub-catchments holding species that appear to meet the KBA criteria for the entire Mediterranean Basin Biodiversity Hotspot region; (v) validating (through stakeholder consultations) those sub-catchments that do meet the KBA criteria as KBAs in those regions covered by CEPF funding, and (vi) making the collated data and results of the analyses widely and freely available to conservation practitioners and developers alike.

The importance and urgency of this work is, as outlined above, evident from the high concentration of species found in the freshwaters of the Mediterranean Basin, the ecosystem services that are supplied to human communities by these freshwaters and their biodiversity, and the increasing threats to these ecosystems.

Figure 1. The project sub-region boundaries within the Mediterranean Basin Hotspot.



Methodology

Criteria for identification of Freshwater Key Biodiversity Areas (KBAs)

As outlined above, there is an ongoing consultation, led by IUCN, to streamline the many existing sets of criteria and thresholds used to identify KBAs for different taxonomic groups. In this project we employed the only published methodology for identification and delineation of Freshwater KBAs (Holland *et al.* 2012) which has been developed in line with the general KBA methodology. The criteria and thresholds employed are summarized in Table 1. For more detail on the criteria, thresholds and methods used see Holland *et al.* (2012). An important advantage of these criteria is that they also allow for the identification of small or even temporary water bodies that remain largely neglected by policy makers, yet are still important for freshwater biodiversity.

The identification and validation of KBAs followed a two-step process:

Step 1. Identification of Proposed KBAs: defined as all river/lake sub-catchments holding species that meet the KBA criteria.

Information for the following taxonomic groups was collated to identify all those river/lake sub-catchments across the Mediterranean Hotspot holding species that meet the thresholds for KBA Criteria 1, 2, or 3 (see Table 1): i) freshwater fishes; ii) freshwater molluscs; iii) dragonflies and damselflies (odonata); and iv) aquatic plants. Species meeting the KBA criteria are defined as KBA *trigger species*. Presences of additional species from other freshwater dependent taxa were also noted on occasions where the information was made available.

Table 1. Current Criteria used to identify a freshwater KBA (adapted from Holland *et al.* 2012).

Criterion 1: A site is known or thought to hold a significant number of one or more globally threatened species or other species of conservation concern.
Threshold: The presence of one or more CR, EN or VU species will trigger the site as a potential freshwater KBA.
Criterion 2: A site is known or thought to hold non-trivial numbers of one or more species (or infraspecific taxa as appropriate) of restricted range.
Threshold: A threshold value of 20,000 km^2 was applied to fishes, plants and molluscs and a threshold value of 50,000 km^2 was applied to odonates.
Criterion 3: A site is known or thought to hold a significant component of the group of species that are confined to an appropriate biogeographic unit or units.
Threshold: To trigger qualification at least 25% of the total species from a specific taxonomic group must be restricted to the freshwater ecoregion in which the catchment is located.

River/lake sub-catchments were delineated according to the recently developed spatial data layer called HydroBASINS (Lehner & Gill 2013) (http://hydrosheds.org/page/hydrobasins) (Figure 2). This global catchment delineation was customized for IUCN as a modification of the existing HydroSHEDS data (Leyner *et al.* 2008) (http://hydrosheds.org/) to now include lakes polygons from the Global Lakes and Wetlands Database (GLWD; Lehner & Doll 2004). HydroBASINS is a global standardized hydrological framework that delineates catchments at 12 resolutions and includes information on network connectivity. For KBA delineation we started with catchments delineated at the HydroBASIN Level 8 resolution. Level 8 HydroBASINS in Europe have an average surface area of 600 km^2.

This first step of the process was primarily a desktop analysis of data collated for the series of published reports of IUCN Red List assessments for the region. These data sets include the required information on species distributions (digital shape files) and their IUCN Red List Categories of extinction risk as published on the IUCN Red List. The main information sources include:

- The IUCN Red List of Threatened Species online database (www.iucnredlist.org)
- Bilz, M., Kell, S.P., Maxted, N. and Lansdown, R.V. (2011). *European Red List of Vascular Plants*. Luxembourg: Publications Office of the European Union.
- Cuttelod, A., Seddon, M. and Neubert, E. (2011). *European Red List of Non-marine Molluscs*. Luxembourg: Publications Office of the European Union.
- Freyhof, J. and Brooks, E. (2011). *European Red List of Freshwater Fishes.* Luxembourg: Publications Office of the European Union.
- García, N., Cuttelod, A. and Abdul Malak, D. (eds.) (2010). *The Status and Distribution of Freshwater Biodiversity in Northern Africa*. Gland, Switzerland, Cambridge, UK, and Malaga, Spain: IUCN. xiii + 141 pp.
- Riservato, E. *et al.* (2009). *The Status and Distribution of Dragonflies of the Mediterranean Basin*. Gland, Switzerland and Malaga, Spain: IUCN. vii + 33 pp
- Smith, Kevin G. and Darwall, William R.T. (Compilers) (2006). *The Status and Distribution of Freshwater Fish Endemic to the Mediterranean Basin*. IUCN, Gland, Switzerland and Cambridge, UK. v + 34 pp.
- Smith, K.G., Barrios, V., Darwall, W.R.T. and Numa, C. (Compilers) (in prep.). *Status and distribution of freshwater biodiversity in the eastern Mediterranean*. IUCN, Cambridge, UK, Malaga, Spain and Gland, Switzerland: * + ** pp.

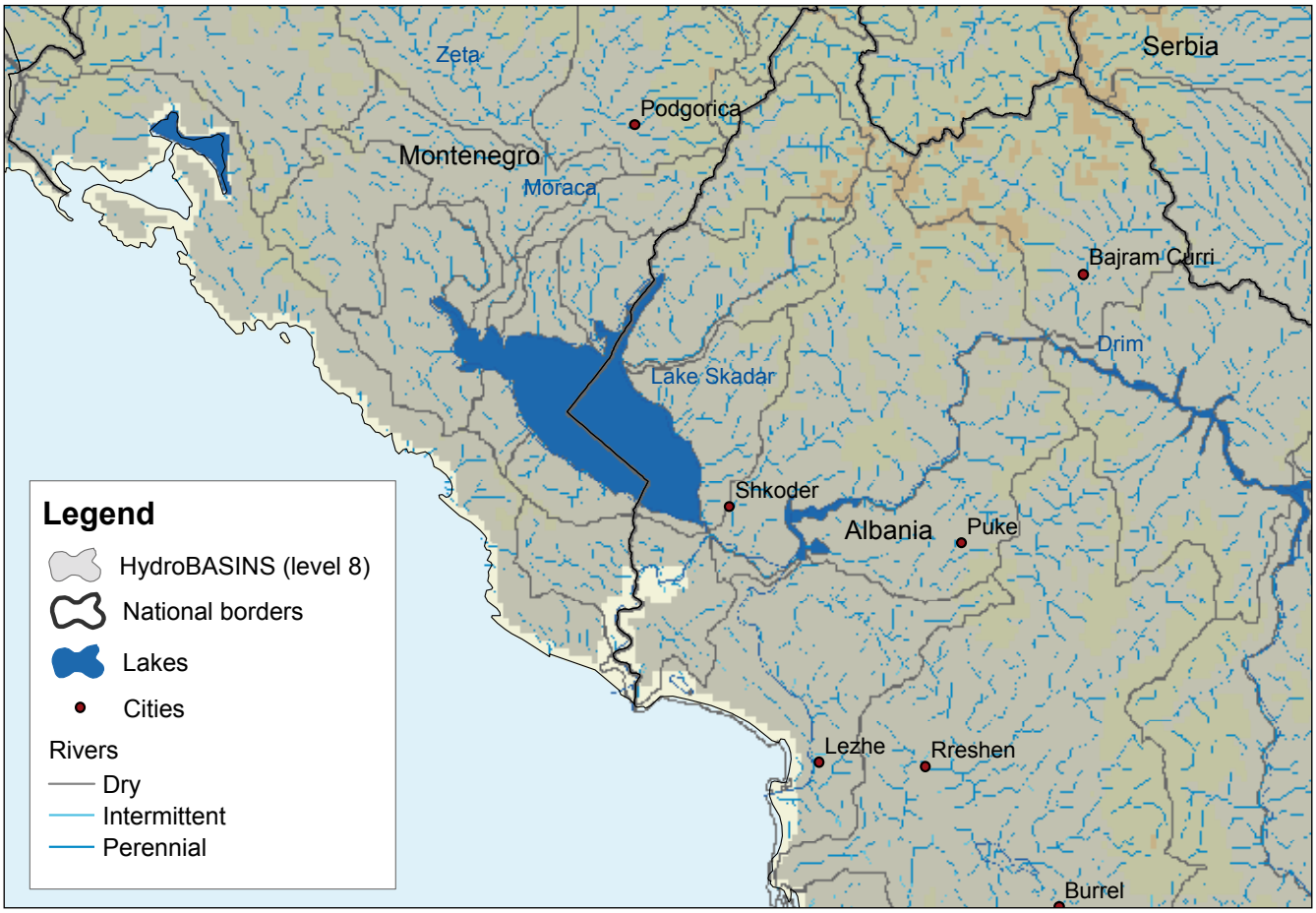
Delineation of Freshwater KBAs using river or lake sub-catchment boundaries is an approach that differs somewhat from the delineation of other KBAs so warrants explanation. Threats to freshwater species, particularly in this region of the world, are primarily due to alterations in hydrology (dams and water abstraction), invasive alien species, and

water pollution. The impacts of these types of threat tend to spread rapidly throughout catchments such that localized conservation actions limited to parts of a catchment will often fail. For this reason the appropriate management unit for most freshwater KBAs will be a sub-catchment or a grouping of connected sub-catchments (e.g. Bruno *et al.* 2014). By basing KBA delineation on combinations of HydroBASIN level 8 sub-catchments, with an average size of 600 km^2, realistic management units are identified. As an example in support of this approach, consider a small spring holding a number of endemic snails. In this case the major threat is coming from over-abstraction of water for irrigation leading to a lowering of the water table and reduced water supply to the spring. Protection of the spring itself through fencing it off and preventing access might appear to be a useful approach but the water levels would continue to decline, threatening the snails. The important issue of hydrological management of the wider catchment remains unaddressed. Through delineating freshwater KBAs as catchment units we are aiming to send a strong message that freshwater ecosystems need to be managed at the catchment scale and not just as localized sites within a hydrologically connected larger unit.

Step 2. Stakeholder consultation on Proposed KBAs (identified in Step 1) and delineation as prioritised Validated KBAs.

The database of Proposed KBAs identified in Step 1 was presented to stakeholders at a number of workshops in order to identify and delineate those catchments, or groups of catchments, which meet the overall KBA criteria. For the stakeholder validation we first prioritized catchments according to the numbers of trigger species meeting the KBA criteria in each. We also prioritized those sites that potentially qualified as Alliance for Zero Extinction (AZE) sites (Ricketts *et al.* 2005). AZEs are places where Critically Endangered or Endangered species are restricted to single remaining sites. Stakeholders worked down the list of catchments evaluating as many as possible in the time available. Time was then allowed for stakeholders to revisit the full list of proposed KBAs and consult with additional stakeholders to ensure that all of the most important catchments had been evaluated. Any catchments not yet evaluated, but which the stakeholders felt might be important, were also then evaluated against the KBA criteria.

Figure 2. Example map of HydroBASINS boundary delineation at Level 8.



Stakeholders were identified as those people/organizations with scientific knowledge, involvement in protected areas or conservation management, and private sector interests in the region. During each workshop the following was discussed and recorded for the data presented on each of the proposed KBAs to determine if each should be confirmed as a validated KBA:

- **Presence of KBA trigger species** – confirm presence of trigger species in the catchment, where a trigger species is defined as a species that meets one or more of the KBA criteria thereby triggering the catchment/s to potentially qualify as a KBA.
- **Site boundary delineation** – determine if the catchment should be delineated as the single sub-catchment or merged with adjacent catchments to form a more logical KBA management unit.
- **KBA site name** – assign a name based on major rivers, lakes or wetlands in the catchment.
- **General site text description** – summarize the key ecological features of the KBA.
- **Focal Areas** (where appropriate) – identify and delineate Focal Areas within KBAs, where a Focal Area is defined as an area (e.g. a particular river reach, lake, headwater stream, spring or wetland) within a freshwater KBA that is of particular importance for one or more of the KBA trigger species. For example it may contain all or the majority of one or more trigger species populations, or is the only known spawning area or migration route. Recommended management actions may take special note of Focal Areas within the management and/or monitoring of the wider KBA.
- **KBA spatial overlap with Protected Areas or other conservation areas** – confirm the extent of spatial overlap between the KBA and any existing Protected Areas or other conservation areas, noting the extent of likely protection for freshwater biodiversity in these areas of overlap.
- **Threats** – identify the main threats to freshwater biodiversity in the KBA.
- **Habitats** – identify the main freshwater habitats in the KBA.
- **Conservation actions** – identify conservation actions in place, and propose new actions.
- **KBA stakeholders** – propose organizations or individuals to be considered as potential 'Site Champions' for each KBA (i.e. those who can undertake conservation actions or raise the KBA profile) or those who have an interest in, or are impacting, the KBA.

Examples of the KBA data sheets are given in Annex I.

Gap analysis for current levels of protection

For the gap analysis of freshwater KBA inclusion within existing protected areas and other KBAs we used the World Database of Protected Areas (WDPA) dataset (IUCN & UNEP-WCMC 2014). This is the data layer used to compute protected area coverage statistics for the Protected Planet report 2014. This layer was pre-processed to remove all points and polygons with STATUS = "not reported" and STATUS = "proposed" and to remove all UNESCO MAB Biosphere reserves because they may include large areas that do not meet the definition of protected areas (Juffe-Bignoli *et al.* 2014). In addition we incorporated the KBA spatial layer for Turkey and the terrestrial KBA spatial layers as supplied by CEPF.

Results

Identification of qualifying river/lake sub-catchments as proposed KBAs

Across the Mediterranean hotspot we considered 3,894 sub-catchments (level 8 HydroBASIN resolution) covering an area of 2,505,560 km^2. Of these, 3,513 sub-catchments met the KBA criteria and hereafter are termed 'proposed KBAs' (Figure 3). This desk based analysis finds the majority of freshwater catchments to contain threatened or restricted range species, or representative assemblages of endemic species, confirming the importance, and urgency, for developing and implementing effective conservation actions for freshwater biodiversity throughout the hotspot. Presence of these species in individual catchments is confirmed through the stakeholder consultations.

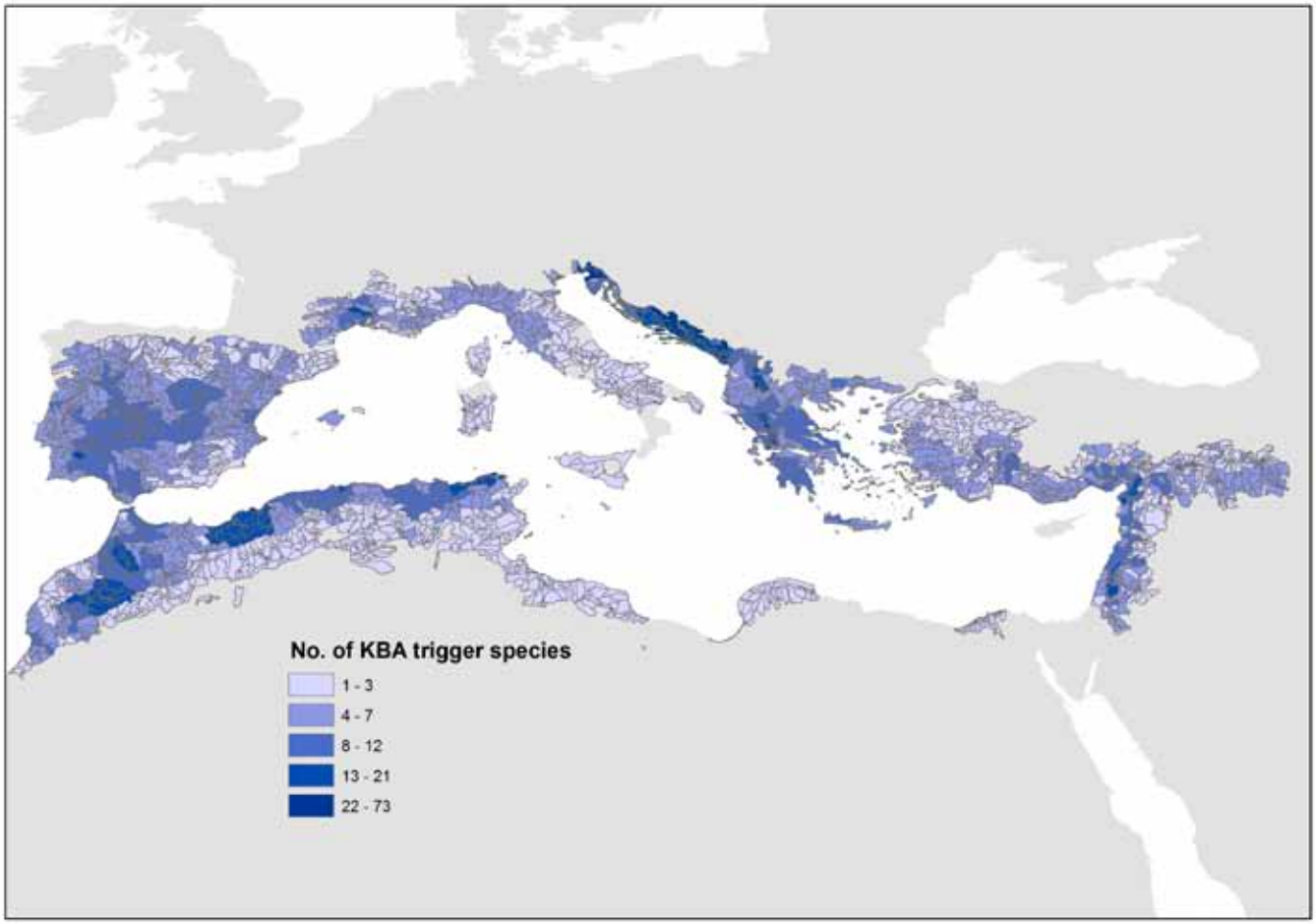
Stakeholder consultation and delineation of validated KBAs

Three workshops were held between December 2012 and December 2013 in Bosnia and Herzegovina, Morocco, and Jordan (details below in Table 2), to engage with relevant stakeholders and biodiversity experts (Annex II). The workshops focused on validating proposed KBAs through: i) confirming the presence of trigger species; ii) identifying and documenting threats to the sub-catchments/s; iii) identifying and documenting conservation needs; iii) delineating appropriate KBA boundaries, and; iv) identification of 'Site Champions' for each KBA.

Table 2. Freshwater KBA validation workshops for southern and eastern Mediterranean.

Mediterranean sub-region	Venue	Dates	Duration
Balkans	Jahorina, Bosnia and Herzegovina	11–13 December 2012	3 days
Northern Africa	Marrakesh, Morocco	03–06 September 2013	3 days
Turkey and Levant	Azraq, Jordan	02–06 December 2013	5 days

Figure 3. All proposed KBAs showing the number of KBA trigger species in each sub-catchment in the Mediterranean Hotspot region.



Participants discuss potential sites for freshwater KBAs in the stakeholder KBA delineation and validation workshop for the northern Africa sub-region. © Violeta Barrios

Validated freshwater KBAs

One hundred and sixty seven freshwater KBAs, covering a total area of 302,557 km², were validated and delineated for the eastern and southern Mediterranean during the three workshops (see Table 3 and Figure 4). The factsheets for each KBA are available for viewing from the World Biodiversity Database managed by Birdlife International (http://www.birdlife.org/datazone/freshwater). The 1,368 proposed KBAs for the Iberian Peninsula, France and Italy still remain to be prioritized, refined and validated as KBAs. Moreover, an additional assessment has been conducted to cover an area outside of the Mediterranean Basin Biodiversity Hotspot boundary as a number of species have distributions extending into hydrologically connected catchments in this broader region. An account of the freshwater KBAs of the eastern Mediterranen broader region, incorporating the full extent of connected catchments beyond Hotspot boundaries, such as the Tigris and Euphrates, is presented in Annex III.

The resulting network of 167 validated freshwater KBAs incorporates the ranges for ***491 KBA trigger species*** (377 of which are threatened with extinction, 411 are restricted range and 107 are biome restricted) (Table 3, Figure 4 and Annex IV).

Figure 4. All validated KBAs showing the number of KBA trigger species in each site across the Mediterranean Hotspot region.

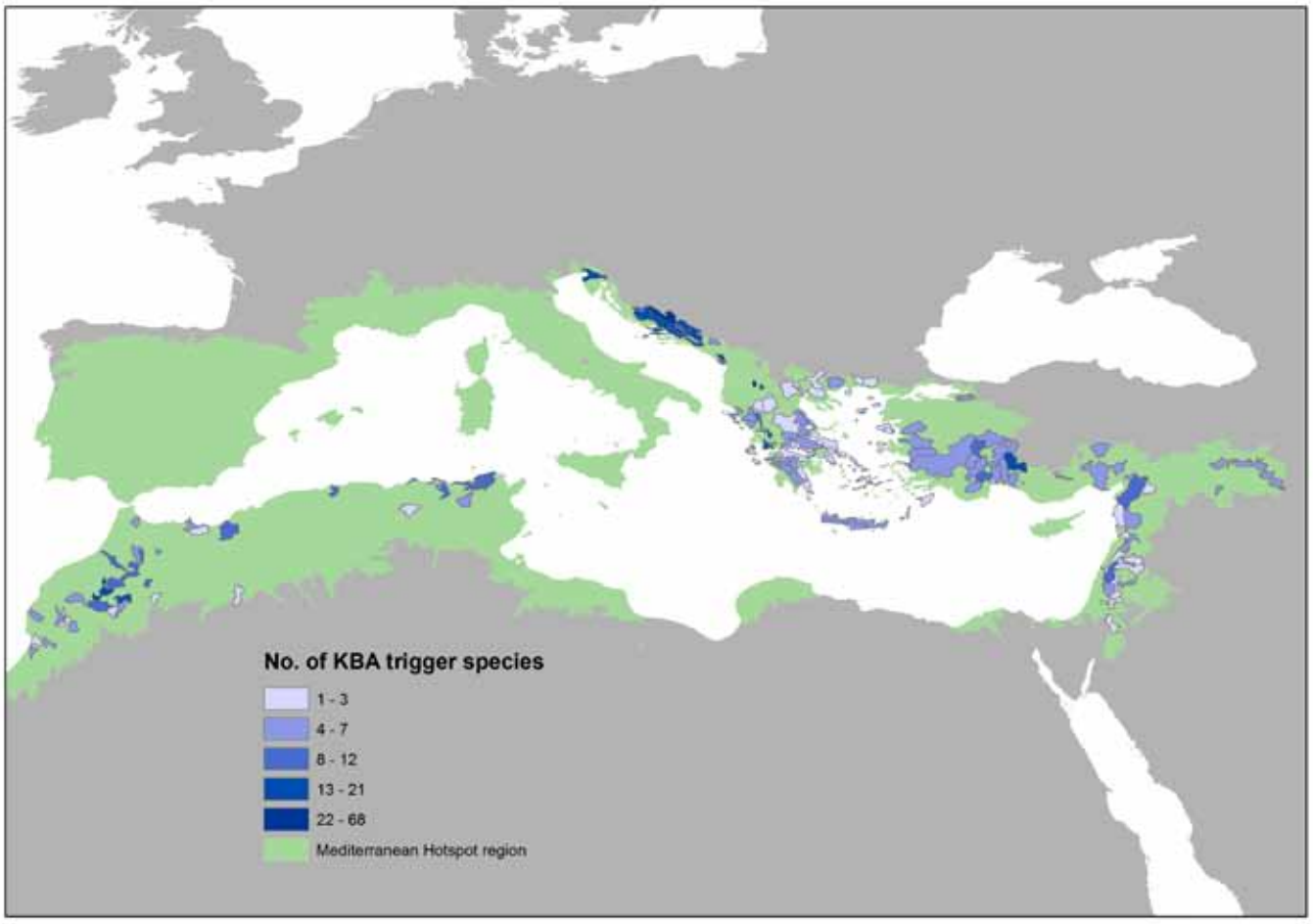


Table 3. Number of validated freshwater KBAs, Alliance for Zero Extinction (AZE) sites and threatened, restricted range and biome restricted species in the Mediterranean sub-regions. * Total accounts for duplication of species in more than one region and thus is not the sum of the rows.

	Balkans	Turkey and Levant	Northern Africa	Total
Number of threatened species	206	105	70	**377***
Number of restricted range species	265	97	50	**411***
Number of biome restricted species	67	9	31	**107***
Number of trigger species	281	123	92	**491**
Number of validated freshwater KBAs	77	47	43	**167**
Number of AZE sites	20	18	2	**40**

The KBA with the highest number of trigger species is the Lake Ohrid catchment in Albania and FYR Macedonia (68 trigger species), followed by Lake Busko (27 trigger species), and the western Poljes in Bosnia and Herzegovina (27 trigger species). Forty freshwater AZE sites were validated across the hotspot (Figure 5).

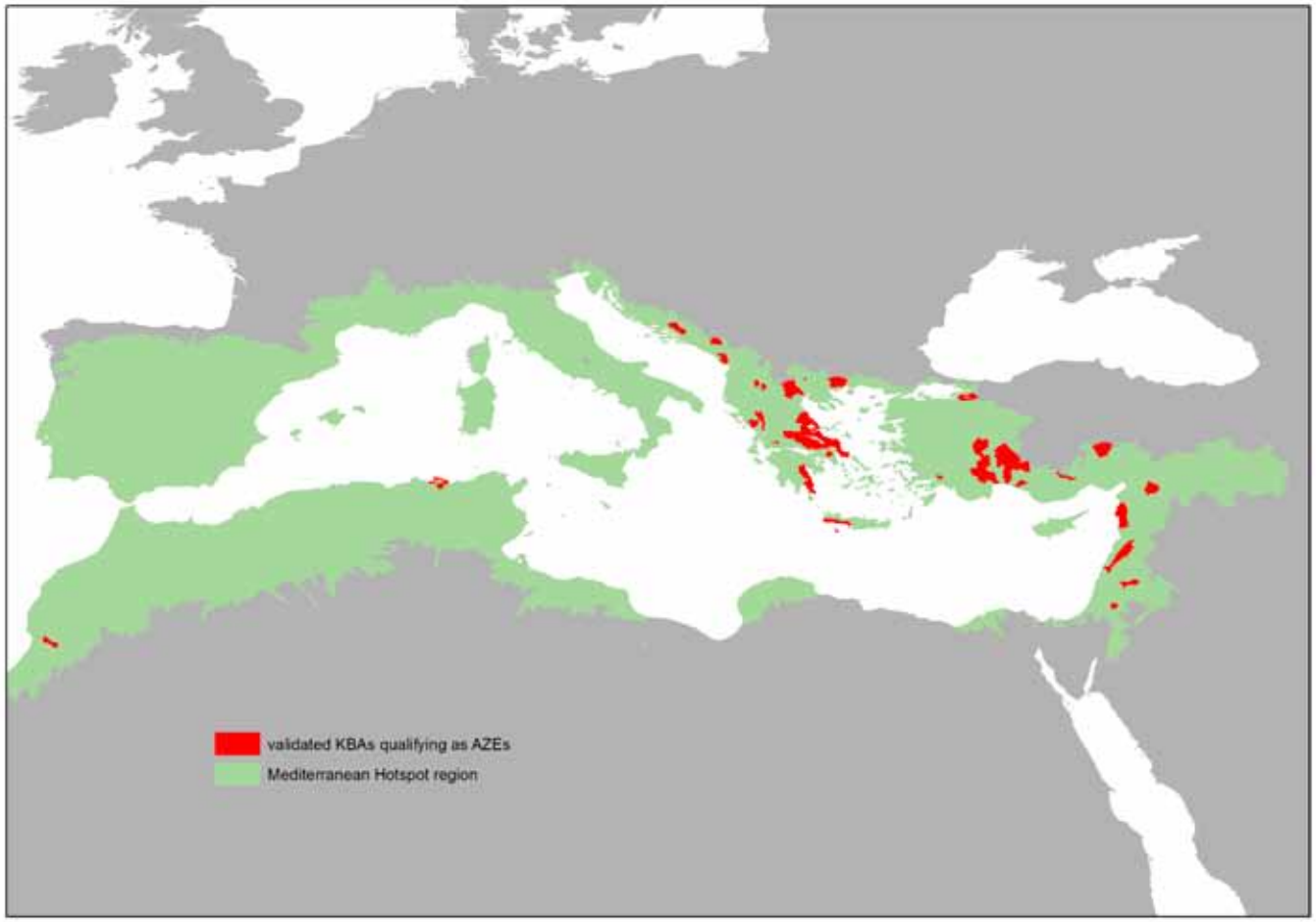
Main threats

The main threats to biodiversity were identified for each validated freshwater KBA. In general they include increasing severity of droughts, hydrological alterations following construction of dams, over-abstraction of surface and ground waters, water pollution, and invasive species. The following sections contain an overview for each sub-region with specific reference to a number of KBAs in each case.

Current levels of protection for freshwater KBAs across the Mediterranean hotspot

The spatial overlap between Protected Areas (PAs) and other KBAs and the validated freshwater KBAs covers a total area of 76,462.06 km^2 (25% of the total area of the validated freshwater KBAs) (Figure 6). This means that 75% of the

Figure 5. Validated KBAs that also qualify as AZE sites across the Mediterranean Hotspot region.



Construction and management of dams such as the Ouirgane Dam on the N'Fiss River in Morocco rarely address the impact on freshwater biodiversity. Policies for management of water resources across the Mediterranean Basin, such as for exploitation of hydropower, must incorporate new measures to maintain the ecological functioning of freshwater ecosystems. © William Darwall

Popovo Polje and Trebišnjica KBA is one of the largest poljes (karstic plains) in Bosnia and Herzegovina, famous for the Trebišnjica River which flows through the polje recharging the underground waters, as well as the Vjetrenica cave system with its very rich cave fauna. Poljes such as this one are heavily impacted by ongoing alterations to the associated hydrology for purposes such as hydropower development. © Biciklima za odrzivu energiju 2011. Online image/Flickr (CC BY-NC-ND 2.0)

area of validated freshwater KBAs remains outside of the boundaries of any existing PA or KBA.

Across the region the following validated freshwater KBAs fall outside the boundaries of any other existing KBAs or PAs:

1. Amman (Jordan)
2. Assif El Mal east (Morocco)
3. Beni Belaid (Algeria)
4. Catchment surrounding Niksic (Montenegro)
5. Lake Bilecko (Bosnia and Herzegovina)
6. Lake Kastrakiou (Greece)
7. Listica River and Mostarsko blato (Bosnia and Herzegovina)
8. M'Goun river basin (Morocco)
9. Nevesinjsko polje, Gatacko polje, Cernicko polje, Fatnicko polje and Dabarsko polje (Bosnia and Herzegovina, and Montenegro)
10. Oued Zhour (Algeria)
11. Part of the Neretva upper catchment (Bosnia and Herzegovina)
12. Part of the Neretva upper catchment – eastern mid catchment (Bosnia and Herzegovina)
13. Popovo polje and Trebišnjica (Bosnia and Herzegovina, and Montenegro and Croatia)
14. Tributaries of lower and middle Neretva including Hutovo Blato (Bosnia and Herzegovina)
15. Upper Medjarda River (Algeria and Tunisia)

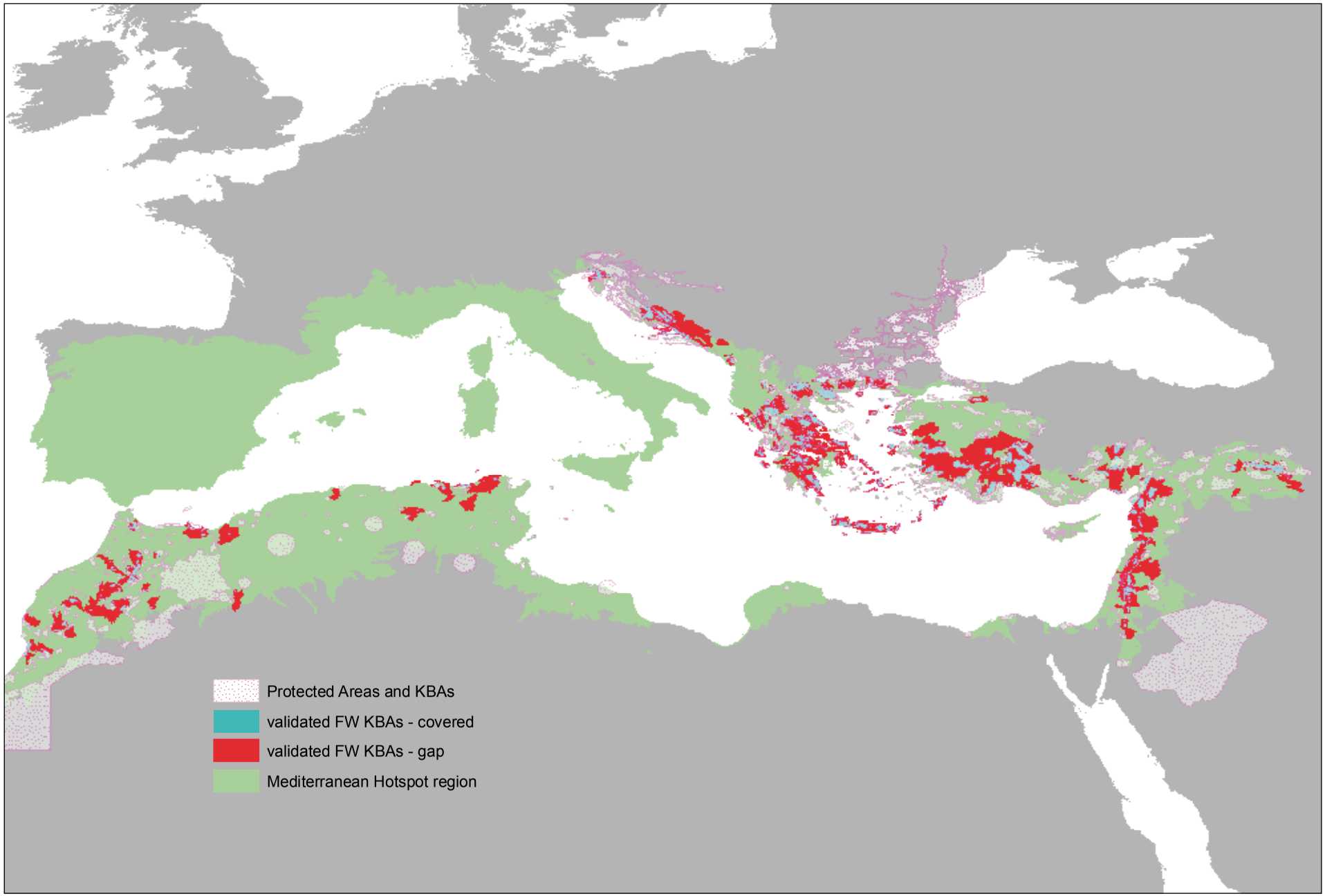
No gap analysis of the north-western Mediterranean sub-region was conducted as these sites are yet to be validated as KBAs.

Site Champions

Freshwater KBAs have now been identified, mapped and validated throughout much of the Mediterranean Hotspot and the information on each site is publicly available through the World Biodiversity Database (WBDB) and the Integrated Biodiversity Assessment Tool (IBAT). We now need people/organizations to take the lead and turn the recommended actions for safeguarding KBAs into action on the ground. Site Champions have been identified during the stakeholder workshops as individuals/organizations best placed to raise awareness of the KBAs existence and the issues faced with respect to threats to biodiversity, and to help implement the required actions to safeguard these globally important sites.

A total of ***188 potential Site Champions and stakeholders*** were recommended for the various KBAs (see Annex V).

Figure 6. Spatial overlap between validated freshwater KBAs and other PAs and KBAs in the Mediterranean Hotspot region.



Regional overviews

Freshwater KBAs in the Balkans sub-region

This region (Figure 7) incorporates the two priority CEPF corridors, the eastern Adriatic and south-west Balkans. The eastern Adriatic corridor runs through Bosnia and Herzegovinia, Croatia and Montenegro and the area is notable for the many karstic streams, springs and cave systems, and the associated polje's (depressions typical in karstic regions – often containing marshes or small lakes) important to a number of freshwater species, many of which are endemic. The major threats to freshwater ecosystems come from hydropower developments, diversion of water for agro-industry, land development in upper catchments, and coastal tourism. Invasive species also present a potential threat in many areas. The south-west Balkans corridor covers parts of Albania, FYR Macedonia, Greece, Montenegro and Serbia. This corridor was primarily identified for the unique freshwater biodiversity it holds. There are three principal lake systems: the Prespa and Ohrid Lake systems shared between Greece, FYR Macedonia and Albania; the Lake Skadar system shared between Albania and Montenegro; and the Dojran Lake area between FYR Macedonia and Greece.

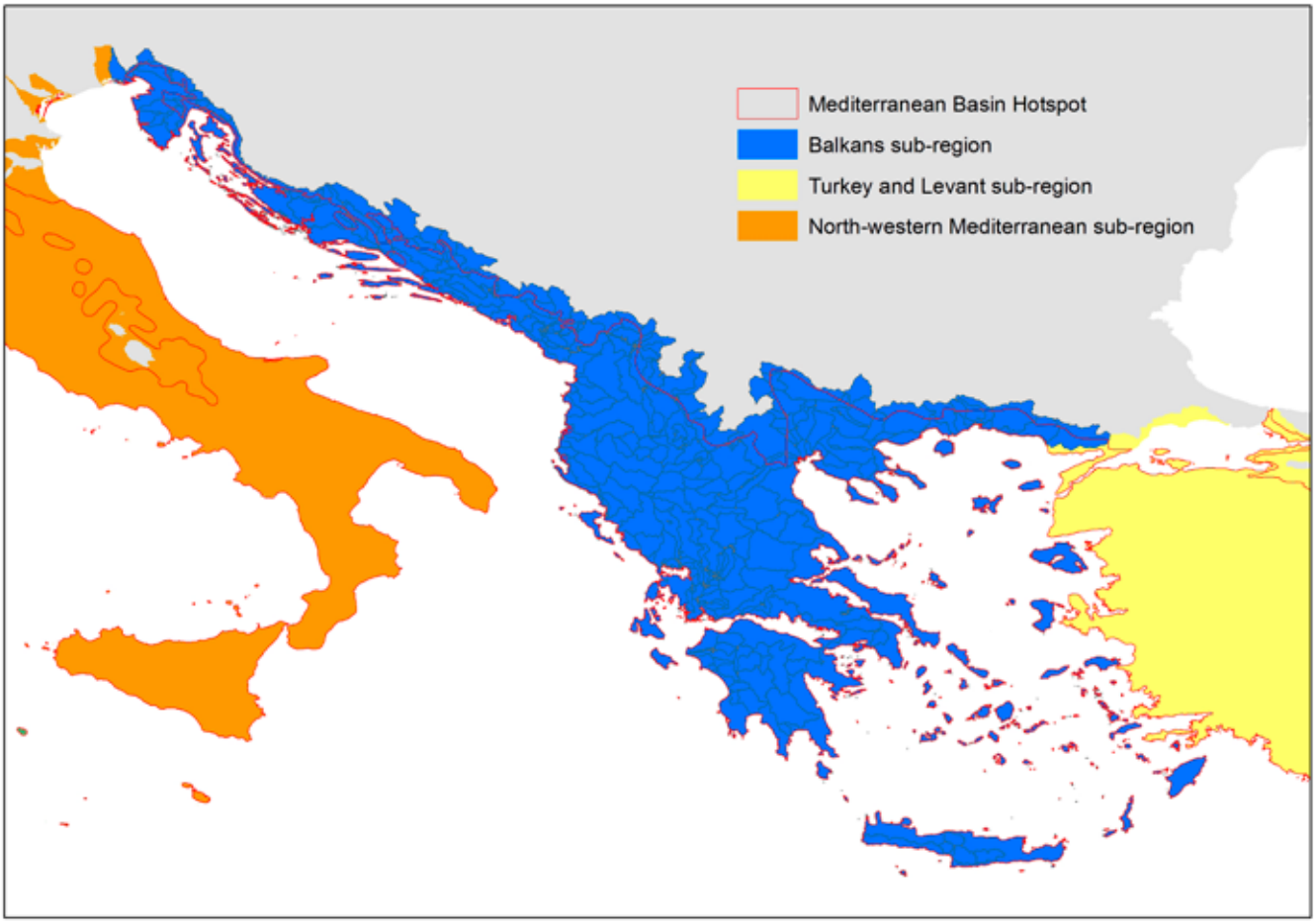
KBA overview

For the Balkans sub-region we considered 528 sub-catchments (level 8 HydroBASINS) covering an area of 216,492 km^2. Within these sub-catchments **253 proposed KBAs** were identified as meeting the KBA criteria for the freshwater taxonomic groups evaluated here (Figure 8, Table 4). Three hundred and six species were identified as KBA trigger species. Subsequent stakeholder consultation of these proposed KBAs led to the designation and delineation

Table 4. Proposed KBA summary. Number of sub-catchments proposed as KBAs through the presence of threatened species (C1), restricted range species (C2), and ecoregion restricted communities (C3) for each taxon group. Note that numbers under the heading 'All Criteria' represent the total number of distinct catchments triggered and are thus not the sum of the rows.

	Number of Triggered sub-catchments			
	All Criteria	C1	C2	C3
Fishes	211	156	201	3
Molluscs	197	139	191	1
Odonata	26	26	23	0
Plants	81	78	4	0
Total	**253**	**231**	**245**	**3**

Figure 7. The Balkans sub-region.



of **77 validated KBAs** (Figure 9, Table 5 and Table 6). This set of KBAs is home to the highest number of threatened, restricted range and restricted biome species of the sub-regions assessed. Two hundred and eighty-one species meet at least one of the KBA criteria (Annex IV Table A).

Current levels of protection

The area of validated freshwater KBAs falling within the boundaries of existing protected areas (PAs) and other KBAs is 36,948 km^2 (36% of the area of all validated freshwater KBAs in the Balkans sub-region), leaving 64% of the area of freshwater KBAs outside of any formally protected areas or other sites recognized for their biological importance as KBAs (Figure 10). Furthermore, the following validated freshwater KBAs fall completely outside the boundaries of any other KBAs or PAs:

1. Catchment surrounding Niksic (Montenegro)
2. Lake Bilecko (Bosnia and Herzegovina)
3. Lake Kastrakiou (Greece)
4. Listica river and Mostarsko blato (Bosnia and Herzegovina)
5. Nevesinjsko polje, Gatacko polje, Cernicko polje, Fatnicko polje and Dabarsko polje (Bosnia and Herzegovina, Montenegro)
6. Part of the Neretva upper catchment (Bosnia and Herzegovina)
7. Part of the Neretva upper catchment – eastern mid catchment (Bosnia and Herzegovina)
8. Popovo polje and Trebišnjica (Bosnia and Herzegovina, Montenegro, Croatia)
9. Tributaries of lower and middle Neretva including Hutovo Blato (Bosnia and Herzegovina)

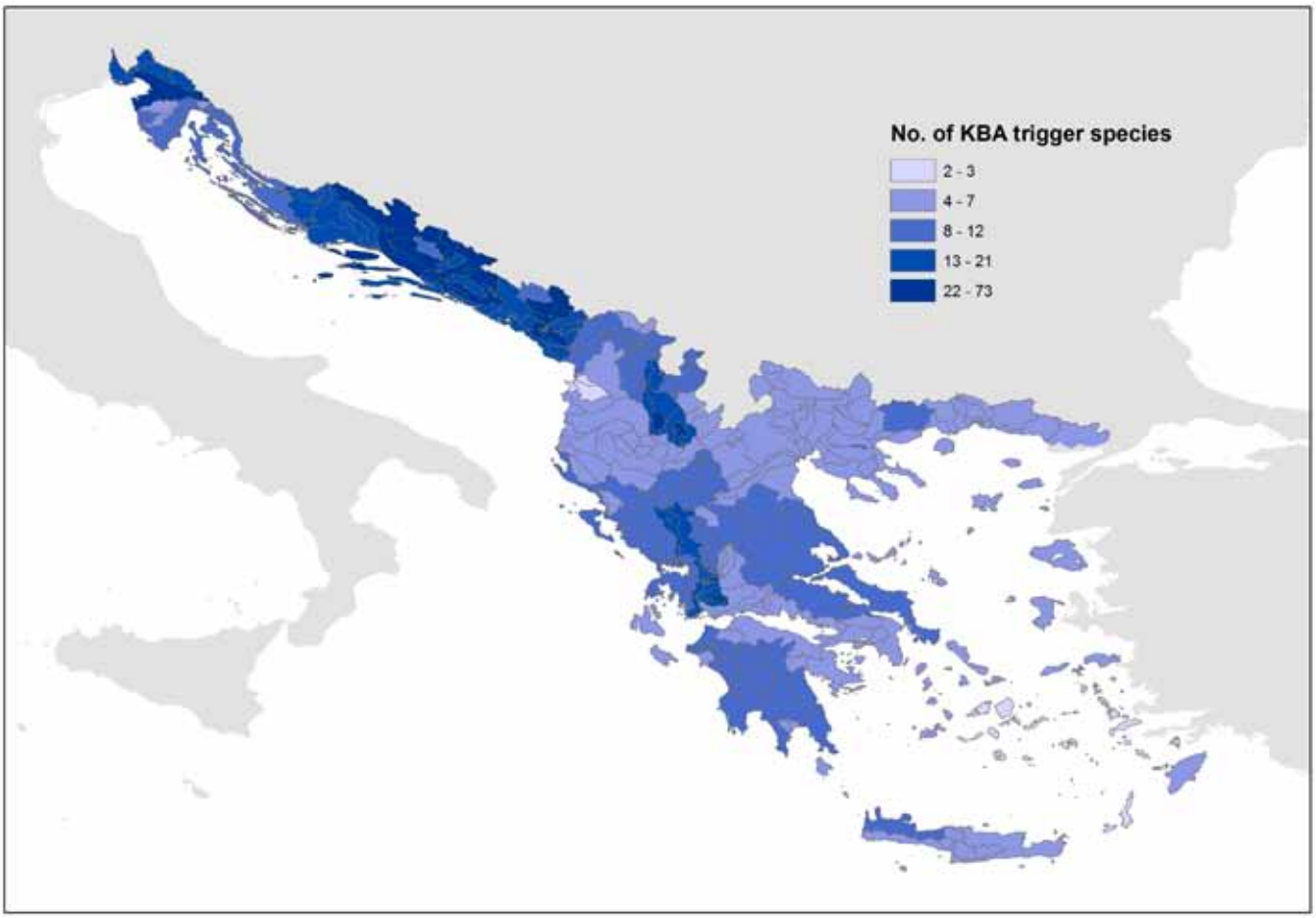
Table 5. Validated KBA summary. Number of sub-catchments validated through the presence of threatened species (C1), restricted range species (C2), and ecoregion restricted communities (C3) for each taxon group. Note that numbers under the heading 'All Criteria' represent the total number of distinct catchments triggered and are thus not the sum of the rows.

	Number of Triggered sub-catchments			
	All Criteria	C1	C2	C3
Fishes	63	54	59	2
Molluscs	62	44	60	1
Odonata	13	13	11	0
Plants	14	11	4	0
Total	**77**	**70**	**74**	**2**

Discussion

The Balkans sub-region supports a number of important river and lake systems validated as freshwater KBAs, a significant number of which also qualify as AZE sites (Figure 5 and Table 6). The issues facing these critical sites are highlighted below through discussion of a few of these sites.

Figure 8. All proposed KBAs showing the number of KBA trigger species in the Balkans sub-region.



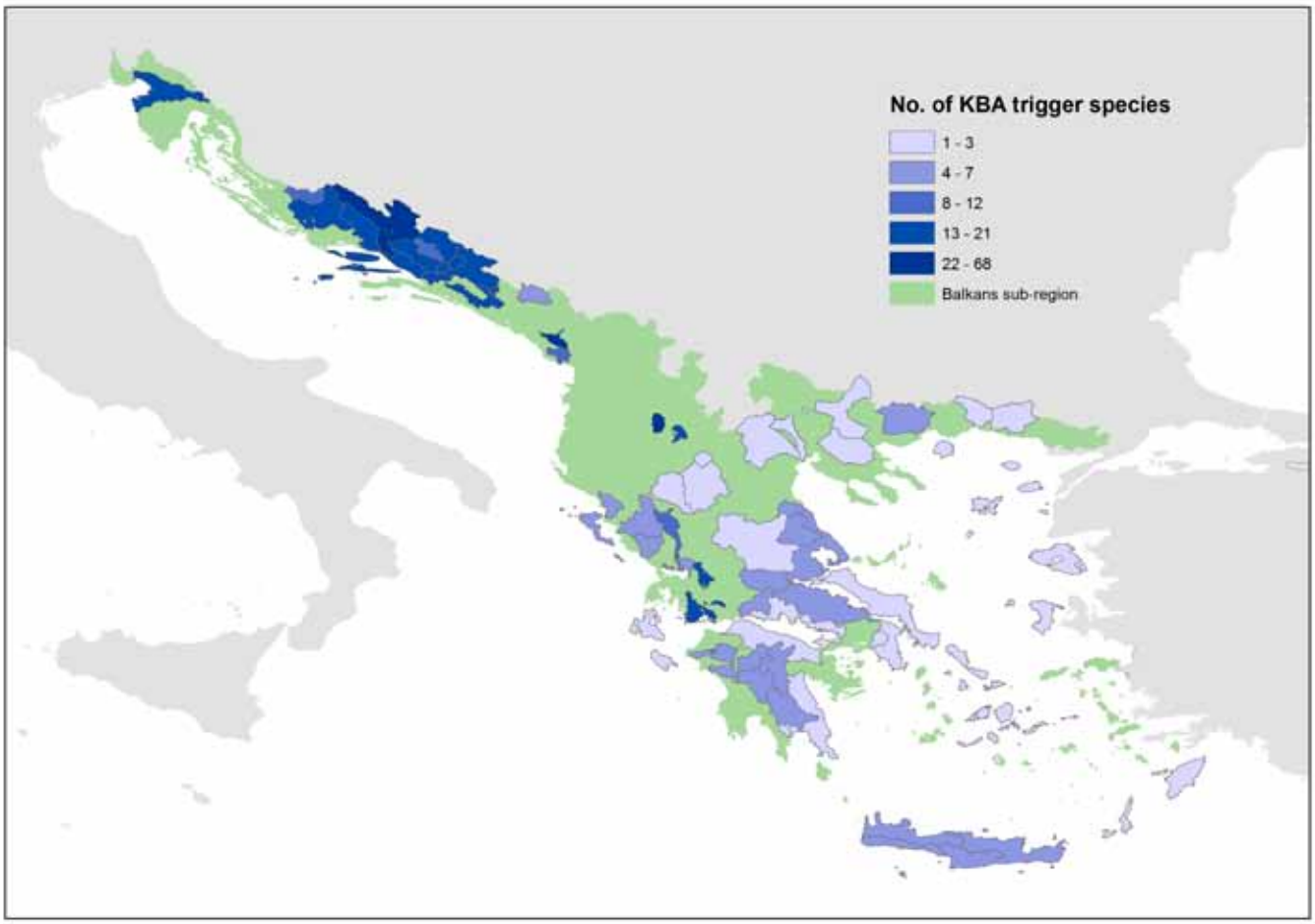


Figure 9. All validated KBAs showing the number of KBA trigger species in the Balkans sub-region.

Table 6. Validated freshwater KBAs for sub-catchments of the Balkans sub-region, showing the number of KBA trigger species, AZE sites (*) and, where identified, Focal Areas for each KBA. Transboundary KBAs are listed at the end of the table.

Country	KBA Name	Number of trigger species	Focal Areas[i]
Albania	Butrint	4	
Bosnia and Herzegovina	Lake Bilecko	21	
Bosnia and Herzegovina	Lake Busko	27	
Bosnia and Herzegovina	Listica River and Mostarsko blato	8	
Bosnia and Herzegovina	Nevesinjsko polje, Gatacko polje, Cernicko polje, Fatnicko polje and Dabarsko polje	19	Fatnicko polje and Dabarsko polje
Bosnia and Herzegovina	Part of the Neretva upper catchment	21	
Bosnia and Herzegovina	Part of the Neretva upper catchment - eastern mid catchment	18	
Bosnia and Herzegovina	Popovo polje and Trebišnjica	21	Vjetrenica cave, Doljasnica cave, Ponikva cave, Lisac cave and Crnulja cave
Bosnia and Herzegovina	Tributaries of lower and middle Neretva	18	Neretva river south of Mostar, Bregava and Buna rivers including Hutovo Blato
Bosnia and Herzegovina	West Karst poljes	27	
Croatia	Cetina River	15	
Croatia	Matica River and Bacina lakes	19	
Croatia	Zrmanja River	10	
Greece	Acheron*	4	
Greece	Aggitis*	5	
Greece	Aliakmon Naoussa*	1	
Greece	Andros Tinos	1	
Greece	Arachthos	5	

Table 6 cont'd. Validated freshwater KBAs for sub-catchments of the Balkans sub-region.

Country	KBA Name	Number of trigger species	Focal Areas[i]
Greece	Arkadia Plateau	5	
Greece	Chios	1	
Greece	Corfu Island (Kerkyra)	6	
Greece	Crete central south	5	
Greece	Crete eastern	5	
Greece	Crete north-west	6	
Greece	Crete south-west*	6	
Greece	Eastern Attica	1	
Greece	Euboea Manikiatis*	3	
Greece	Evrotas	4	
Greece	Evrotas-Arniotikos	1	
Greece	Evrotas-Gytheio	3	
Greece	Ismaris-Vosvozis-Filiouris	3	
Greece	Kalamas	5	
Greece	Karla*	4	
Greece	Karpathos	1	
Greece	Kastoria	2	
Greece	Kastraki	15	
Greece	Kephalonia and Ithaki	1	
Greece	Kerkini	1	
Greece	Krka drainage	14	
Greece	Ladon	4	
Greece	Lake Kastrakiou	16	
Greece	Lakes Limnothalassa Rodias, Limnothalassa Tsoukaliou, Limnothalassa Lagarou	7	
Greece	Lakes Trichonis and Lisimachia*	18	
Greece	Lesvos	2	
Greece	Lower Acheloos	16	
Greece	Lower Alfeios	4	
Greece	Lower Axios	1	
Greece	Magnisia*	5	
Greece	Mornos	5	
Greece	Naxos	1	
Greece	Northern Korinthiakos	1	
Greece	Pamvotis Lake*	10	
Greece	Peloponnese Maleas*	1	
Greece	Pineios Peloponnisou	4	
Greece	Pinios Thessalias	3	
Greece	Rhodes Island	1	
Greece	Spercheios*	4	
Greece	Tempi	5	
Greece	Thassos	2	
Greece	Tragos	4	
Greece	Upper Alfeios	5	
Greece	Upper Aliakmon	2	
Greece	Upper Aoos	3	
Greece	Upper Kifissos*	1	
Greece	Vistonis	2	
Greece	Volvi-Koronia	3	
Greece	Yliki-Paralimni-Kifissos*	5	

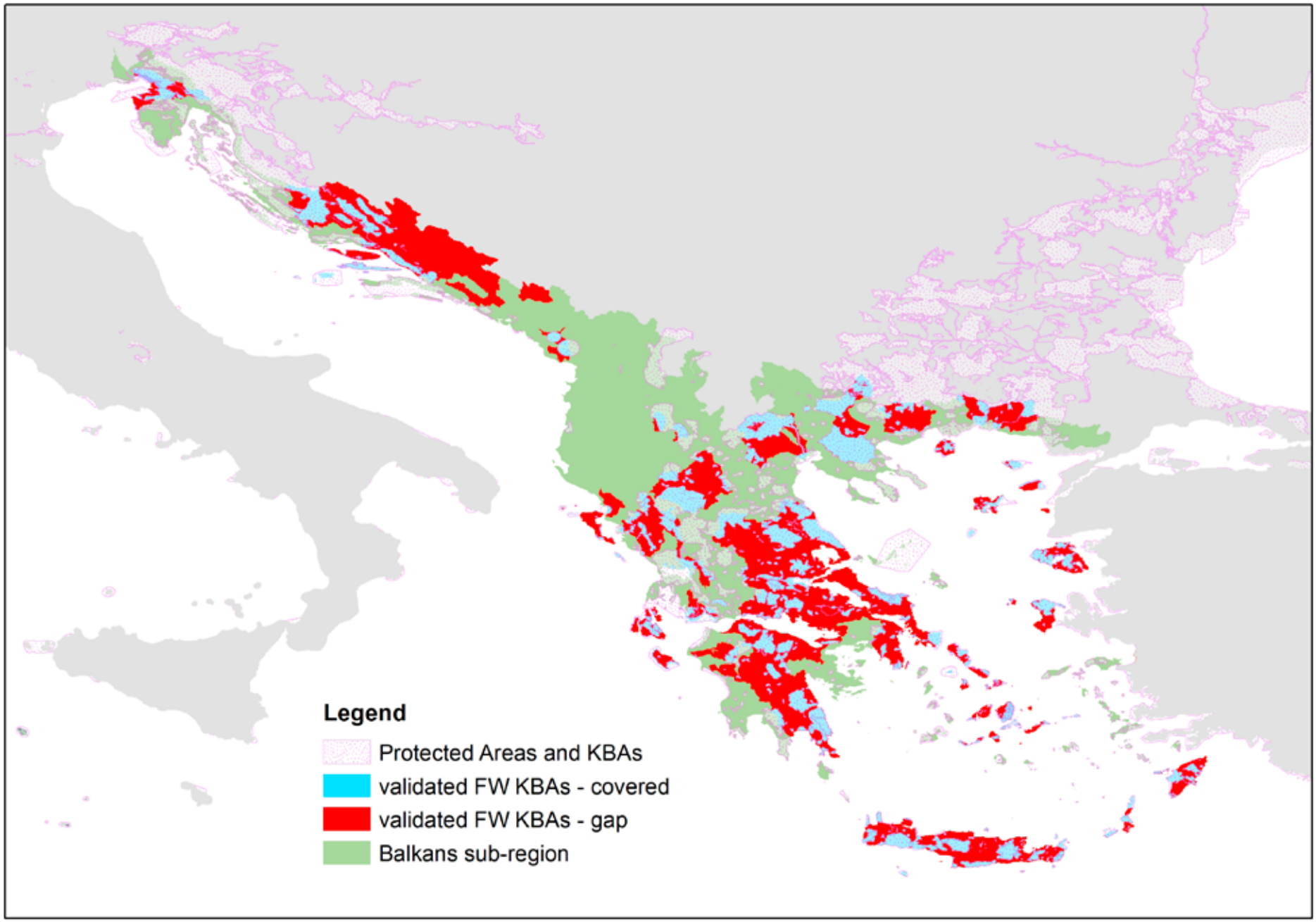
Table 6 cont'd. Validated freshwater KBAs for sub-catchments of the Balkans sub-region.

Country	KBA Name	Number of trigger species	Focal Areas[i]
Greece	Zakynthos	3	
Montenegro	Catchment surrounding Niksic*	5	
Albania, FYR Macedonia	Lake Ohrid*	68	
Albania, Greece, FYR Macedonia	Transboundary Prespa Park*	21	
Albania, Montenegro	Lake Skadar*	24	The lake itself, selected springs and large to medium sized lake tributaries
Albania, Montenegro	Lower Bojana river basin*	12	
Croatia, Bosnia and Herzegovina	Neretva Delta and associated springs/lakes including Hutovo Blato	19	
Croatia, Bosnia and Herzegovina	Trebizat drainage including Imotsko polje*	20	
Greece, FYR Macedonia	Doirani*	2	
Slovenia, Croatia	Dragonija drainage in Slovenia and Croatia, Reka River in Slovenia and Timavo spring, north of Trieste in Italy	19	Reka River and Timavo Spring

[i] We do not yet have a comprehensive list of Focal Areas for this first sub-region as the information was not collected systematically at that time. Further Focal Areas could be defined by reviewing factsheets and contacting us at: freshwater.biodiversity@iucn.org

A waterfall within the Krka drainage KBA which includes a wide range of freshwater habitats including Karstic rivers, springs, lakes, waterfalls, tufa areas and underground waters. This KBA includes 14 species of threatened or restricted range freshwater species. © Geert De Knijf

Figure 10. Spatial overlap between validated freshwater KBAs and other PAs and KBAs in the Balkans sub-region.



In the eastern Adriatic corridor the issues at the **Trebizat drainage including Imotsko polje KBA**, also identified as a freshwater AZE site, typify those for many of the freshwater KBAs in the sub-region. This site includes karstic rivers, springs and lakes, many waterfalls, tufa areas rich in wetland plants, underground aquifers, as well as seasonally flooded areas (poljes). The site supports 20 trigger species of fishes and molluscs. *Cobitis illyrica*, a Critically Endangered species of spined loach, is thought to be unique to the Imotsko polje (Freyhof & Stelbrink 2007) – it is this species that qualifies the site as an AZE. This KBA is primarily threatened by hydrological disruption due to two large hydroelectric dams, Pec Mlini in Bosnia and Herzogovina, and Ricice in Croatia, and a planned cascade of small dams. Invasive species also threaten species at the site with at least ten alien fish species and an unknown number of alien plants and invertebrates already recorded. The priority for this KBA is to implement management at the catchment scale with a primary focus on minimizing disruption to the hydrology of the site and to control the spread of invasive alien species. Management of the site is particularly important in the part of the catchment in Bosnia and Herzegovina where protection is entirely lacking. The Croatian part of the site is protected but enforcement of the legislation is weak and largely ineffective. Management of *Salmo obtusirostris* (Adriatic Salmon) which is restricted to just four locations, one of which is the Imotski polje, is also a priority as the species is currently threatened by overfishing and hybridization with introduced trout species.

Further south in the south-west Balkans corridor Lakes Skadar, Ohrid and Prespa are all freshwater AZE sites. **Lake Skadar KBA** is a large Mediterranean lake basin including karstic streams, rivers, springs and seasonally flooded marshes. The lake itself is a National Park, Ramsar site, and Important Bird Area (IBA). However, the associated springs, streams and rivers fall outside of all these protected areas leaving them, and therefore the lake itself, vulnerable to widespread external impacts. For this reason the KBA boundary extends beyond the lake boundary itself to include all streams, springs and rivers which drain into the lake up to upper Moraca and Zeta river drainages. This site supports 24 KBA trigger species including seven endemic and highly threatened mollusc species which qualify the site as an AZE. The major threats to the lake and its catchment include potentially unsustainable fisheries, locally important impacts of deforestation, gravel mining (especially in the lower Moraca River), over-abstraction of water (a widespread concern), and invasive alien species. The hydrological impacts of a number of planned large dams, if realized, are predicted to heavily impact the biodiversity of this unique KBA. Management recommendations include effective implementation of action plans for native salmonids, some of which appear to be on the brink of local extinction, including *Salmo obtrusirostris*, general improvements to fisheries management as illegal fishing is reported to be widespread, and a large scale campaign to raise awareness for the unique biodiversity of this site.

Lake Skadar, Albania and Montenegro © Geert De Knijf**. This large Mediterranean lake and its associated catchment is a freshwater Key Biodiversity Area (KBA) including at least 24 threatened or restricted range freshwater species, such as *Ninnigobius montenegrensis*.** © Jörg Freyhof

Lake Ohrid KBA has 68 KBA trigger species of fishes and molluscs making it one of the most important sites of freshwater biodiversity in Europe. Of these species, 25 are unique to the lake and are also highly threatened making it an important AZE site. Lake Ohrid is a Ramsar site and the KBA boundary is taken as the lake shore in order to match that of the Ramsar site itself. Threats and management actions proposed for the lake have not yet been defined through this project so remain a priority.

The two **Prespa Lakes (Lesser and Great Prespa)** have 21 KBA trigger species. The KBA boundary coincides with that of the Transboundary Prespa Park, an example of transboundary cooperation that was established in 2000 under a joint Declaration by the Prime Ministers of the three countries, followed by signing of an international Agreement for the Protection and Sustainable Development of the Prespa Park Area in 2010 (Albania, FYR of Macedonia, Greece and the European Commission). The park aims to protect the ecological values of the area through collaboration between the three states, and also to promote the economic prosperity of the local communities in the three countries. This is the first transboundary protected area in the Balkans and is also now validated as a freshwater KBA covering an area shared by Greece, Albania and the FYR of Macedonia. It includes two lakes, Lesser and Greater Prespa, as well as their associated catchments which extend to the adjacent mountain tops. Prespa's most important characteristic, however, is the high concentration of species in such a small geographical area. The extent of this diversity is demonstrated by nine out of the 23 species of fish living in its lakes and rivers being endemic to the KBA and a very high level of endemism with more than 30 endemic forms of lacustrine organisms, mainly gastropods, diatoms, oligochaeta, leeches, poriferans, tricladids and ostracods.

Greece also includes many freshwater KBAs of which 15 qualify as AZE sites. Many of Greece's river basins and aquatic habitats are poorly inventoried for their freshwater biota so species distributions are often out of date or unavailable. However, there are many very small sites that are known to be important for freshwater species, and these aquatic micro-habitats are important conservation targets. For example, the **Euboea Manikiatis KBA**, an isolated stream catchment on Euboea Island in Greece, is also designated as an AZE site on account of two endemic fish species (*Barbus euboicus* and *Squalius* sp. "Evia") and one endemic mollusc (*Pseudobithynia euboeensis*). *B. eubiocus* is restricted to a single stream where it is protected by Greek law which is helping to maintain water levels. *P. euboeensis* is also only known from a few small streams running from a spring near Marmari, near Karystos. Over-abstraction of water presents a major threat to the survival of these species so management of water resources in the associated catchments is once again a priority.

In conclusion, the Balkans sub-region supports some of the most biodiverse and heavily threatened freshwater ecosystems in the Mediterranean hotspot. A study of threatened species of freshwater fishes and molluscs of the region (Freyhof 2012) concluded that "…the Balkan is the most important 'hotspot' for threatened freshwater biodiversity in Europe and also within the Mediterranean Biodiversity hotspot." Freyhof went on to say that "About 75% of all the threatened fishes and 70% of all threatened molluscs in the Balkan are highly vulnerable to the construction of dams, irrigation systems, and hydrological works, and the habitat alterations which accompany their construction. They are also vulnerable to alien species invasions, an unavoidable side effect of reservoir construction." Many of these freshwater species are endemic to the region so the risk of global extinctions is high. The vulnerability of molluscs to hydrological disruptions is particularly high as most threatened species are restricted to caves and springs in karstic systems. The draining and regulation of Karst Poljes, water transfer from ground water to artificial tunnels, and changes to water quality and quantity all impact these sensitive species. In particular, all spring and underground water systems are threatened by extensive water regulation projects, such as in the Neretva-Trebišnjica and Cetina catchments. A large proportion of threatened molluscs belong to the family Hydrobiidae, small snails which occur almost exclusively in springs and underground water systems. The freshwater molluscs of Lakes Skadar, Prespa, and Ohrid are particularly notable as most are endemic and are also threatened. The water quality and quantity in these lakes needs to be safeguarded and monitored if these sensitive species are to be conserved. With regard to freshwater fishes, the migratory species are at particular risk, given their need for long stretches of unimpeded rivers with sufficient quantity and timing of water flows. Fish passes, if well constructed, may alleviate the problems but in reality many rivers are dammed and few have been equipped with effective passes. The potential impacts of invasive alien species are of concern given the highly restricted ranges of many of these species. For example, it is suspected that the transformation of the Lake Bushko KBA into a recreational angling resort, along with the introduction of several popular angling species, may have already extirpated several native species from the lake (Freyhof, pers. comm.).

The connection between the Moraca catchment and the Danube, once planned in order to increase water supply to hydropower generators, would be likely to heavily impact many native fish species. Similar inter-basin water transfers in many other parts of the region will likely also impact other native species as alien species enter the area.

Although it is mainly fishes and molluscs that are under threat or show high levels of endemism there are also a few species of odonate (dragonflies and damselflies) and aquatic plant that can also benefit from protection within KBAs. Most of the odonata trigger species are in the Greek islands such as Crete and Corfu. The Critically Endangered *Pyrrhosoma elisabethae* (Greek Red Damselfly) is one such species confined to the Greek island of Kérkira, Peloponnese and north-west Greece, and southern Albania. This species is highly dependent upon small brooks which are often destroyed as part of irrigation works and is found within a number of validated freshwater KBAs. The few trigger species of plants are also mainly found in the Greek islands.

Callitriche pulchra (Critically Endangered) is one species of plant that can clearly benefit from site based protection being only known to occur for certain within a single pond on the Island of Gavdos, off Crete, where it is at risk through heavy use of the pool by stock and also from tourism impacts. This species falls within the **Crete South-west KBA**.

Finally, it is important to reiterate that some areas in the Balkan sub-region are very poorly inventoried in terms of their aquatic biota; Albania which has few designated sites compared to the Ionian coast further south is a case in point. Many development projects (such as dams) threaten to impact wetland and river flow regimes in Albania where the aquatic biota is not well inventoried. Lack of information on species in wetlands represents a serious shortcoming in many parts of the region leaving many potentially important sites of biodiversity open to the impacts of development.

Although the threats to freshwater biodiversity in this region are high the catchments of the Balkans are still relatively intact when compared with other parts of Europe where very few rivers can be considered to be of good status. It is therefore all the more important to maintain and improve the rivers and lakes of this region – restoration of degraded systems is extremely costly and is often too late for the species that formerly inhabited them.

The Hutovo Blato Nature Park that includes a lake and marshlands is part of the Lower and Middle Neretva KBA. This site which is also recognized as an Important Bird Area supports many threatened and restricted range freshwater molluscs and fishes. © Geert De Knijf

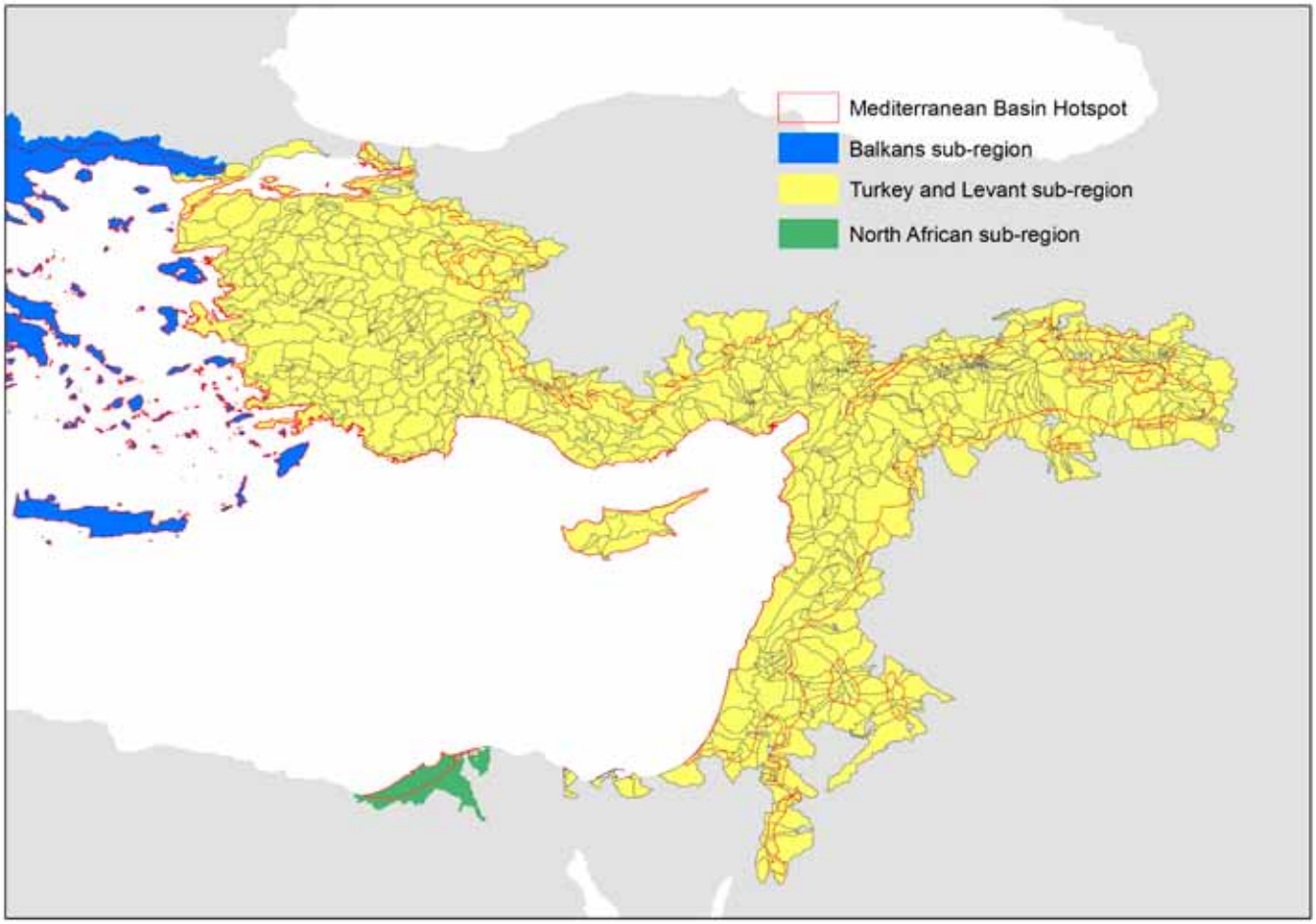
Freshwater KBAs in the Turkey and Levant sub-region

The Turkey and Levant sub-region includes southern and western Turkey, a large part of Syria, Lebanon, the northern part of Iraq, Jordan, Palestinian Occupied Territories and Israel (Figure 11). The region is characterized by a number of freshwater ecoregions including: Thrace, western Anatolia; southern Anatolia; central Anatolia; upper Tigris and Euphrates; Orontes; coastal Levant, and the Jordan River (Abell *et al.* 2008). CEPF priority corridors cover most of the Hotspot within this sub-region, and include: Marmara Sea Basin; Taurus Mountains; northern Mesopotamia; Orontes Valley and Lebanon Mountains; south Syria and northern Jordan. The following summary is largely based on information obtained from the online Freshwater Ecoregions of the World (www.feow.org).

Western Anatolia includes the Dalaman River which flows through a deeply incised gorge, in contrast to the meandering rivers typical of the Aegean coast (e.g. the Büyük Menderes and the Gediz). The part of central Anatolia within the Hotspot includes a multitude of endorheic basins on the Anatolia Plateau, including lakes Eğirdir, Burdur and Aci. The rivers of southern Anatolia mostly originate in the Taurus Mountains and empty into the Mediterranean Sea. The Göksu (or Gök) Delta, and Akyatan lagoon near Adana are Ramsar Sites. The upper Tigris and Euphrates ecoregion is essentially the upper sections of these two great rivers where there are occasional smaller lakes, but no extensive marsh or natural lake habitats like those found in the lower Tigris and Euphrates ecoregion. The Orontes ecoregion includes the Orontes River, the Afrin and Karasu rivers flowing from the north, and the former Amik Lake. Amik Lake was once an important freshwater habitat, especially for migratory water birds, relatively unusual in south-west Asia, but it was drained in the 1940s–1970s to free up land for growing cotton, to eliminate malaria and to construct an airport.

The coastal Levant ecoregion includes the coastal strip of the Levant from the western slopes of the Jabal an Nusayriyah Mountains in Syria, the Lebanon Mountains in Lebanon and the Judean Hills in Israel, to the Sinai. It covers a narrow coastal plain backed by mountain ranges. Coastal rivers descending from Mount Lebanon to the Mediterranean Sea are short and steep, some drying up in the summer. The heavily polluted Litani River parallels the coast before it turns abruptly west and crosses the coastal mountain range to enter the sea. The swampy area known as Aamiq (not Lake

Figure 11. The Turkey and Levant sub-region.



A typical river of the Taurus mountain range in southern Anatolia. © Jean-Pierre Boudot

Amiq of the Orontes) on the Litani River has been reclaimed for farming, and large parts of the remaining swamp dry out in summer. The main river of the Jordan ecoregion is the Jordan which originates in the Anti-Lebanon Mountains in Syria. It connects the Sea of Galilee (Lake Kinneret or Tiberias) to the Dead Sea, but now due to the diversion of its flow is little more than a stream. *Wadis* – valleys with intermittent watercourses – that flow into the Jordan include Wadi Mujib, Wadi Mousa, Wadi Hassa, and Wadi Zarqa. The ecoregion contains Tethyan relicts, including blind prawns, subterranean molluscs, and endemic sponges.

KBA overview

For the Turkey and Levant sub-region we considered 872 sub-catchments (level 8 HydroBASINS) covering an area of 508,351 km^2. Within these sub-catchments **608 proposed KBAs** were identified as sub-catchments meeting the KBA criteria for the freshwater taxonomic groups evaluated here (Figure 12 and Table 7). One hundred and sixty-five species were identified as KBA trigger species. Subsequent stakeholder consultation of these sub-catchments led to the designation and delineation of **47 validated KBAs** (Figure 13, Table 8)**.** There were 122 species that met at least one of the KBA criteria (Annex IV Table C). KBA names and the numbers of trigger species are given in Table 9.

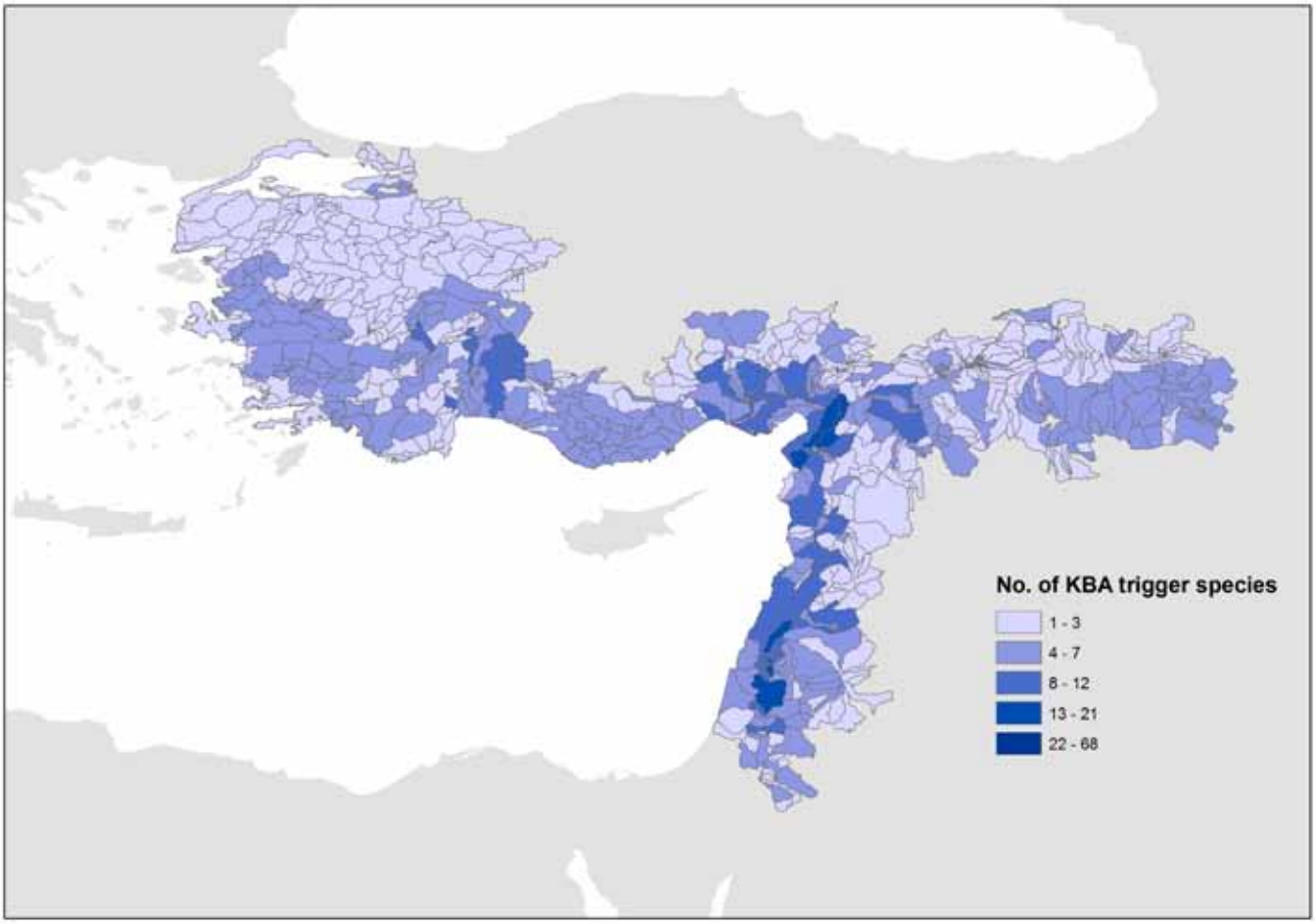
Table 7. Proposed KBA summary. Number of sub-catchments proposed as KBAs through the presence of threatened species (C1), restricted range species (C2), and ecoregion restricted communities (C3) for each taxon group. Note that numbers under the heading 'All Criteria' represent the total number of distinct catchments triggered and are thus not the sum of the rows.

	Number of Triggered sub-catchments			
	All Criteria	C1	C2	C3
Fishes	413	320	205	16
Molluscs	583	580	42	3
Odonata	160	130	98	0
Plants	25	24	20	4
Total	**608**	**607**	**296**	**23**

Current levels of protection

The area of validated freshwater KBAs within the boundaries of existing PAs and other KBAs is 32,172 km^2 (24% of the area of the validated freshwater KBAs in the Turkey and Levant sub-region), leaving 76% of the area of freshwater KBAs outside of any formally protected areas or other sites recognized for their biological importance as KBAs (Figure 14). The only

Figure 12. All proposed freshwater KBAs showing the number of KBA trigger species in the Turkey and Levant sub-region.



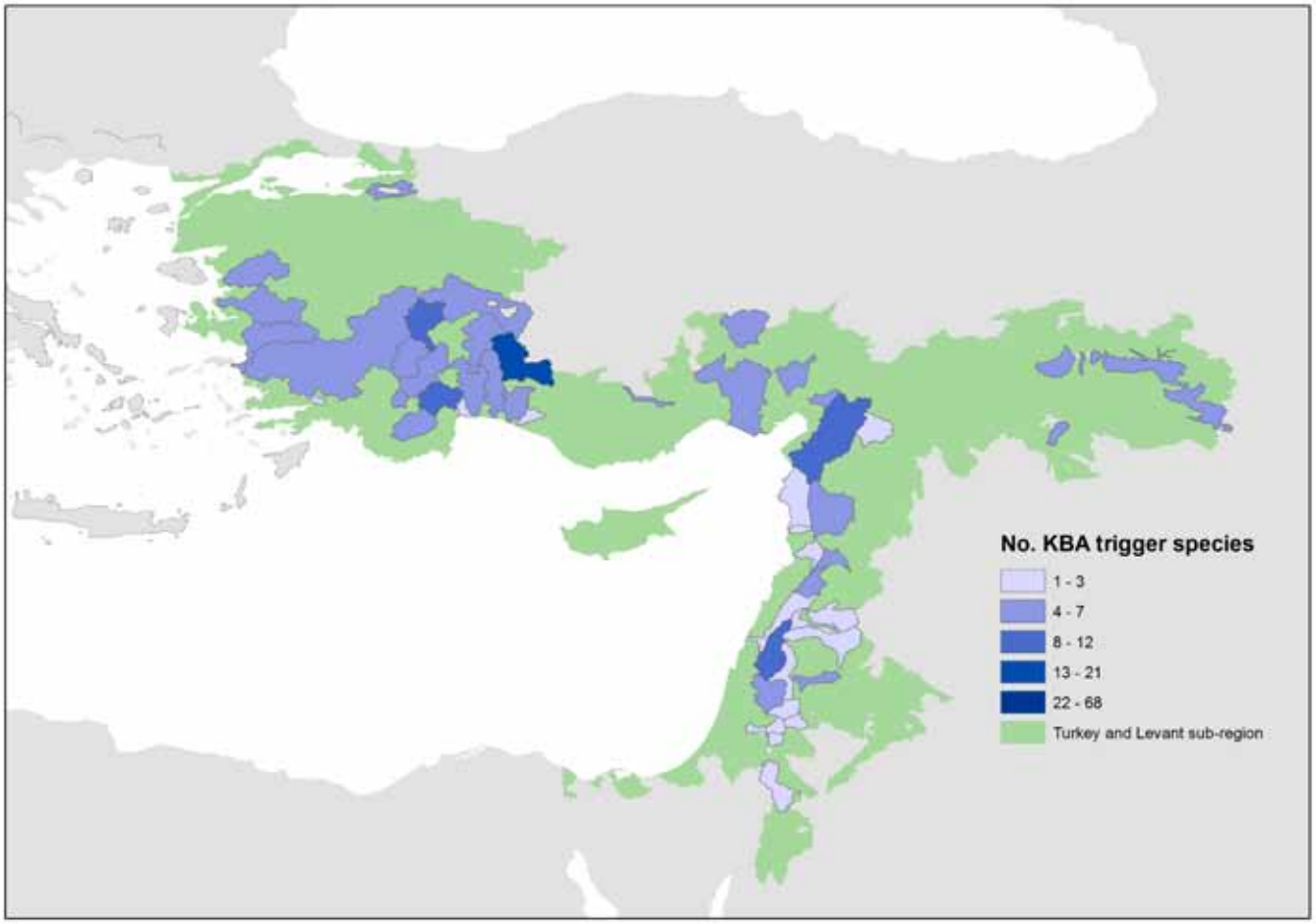


Figure 13. All validated KBAs showing the number of KBA trigger species in the Turkey and Levant sub-region.

The Barada Spring KBA, Syria. This spring was almost completely drained in 2008 to meet the growing needs for water. As a consequence the endemic fish species, *Pseudophoxinus syriacus* (CR) (inset), is now possibly Extinct. © Jörg Freyhof

Figure 14. Spatial overlap between validated freshwater KBAs and other PAs and KBAs in the Turkey and Levant sub-region.

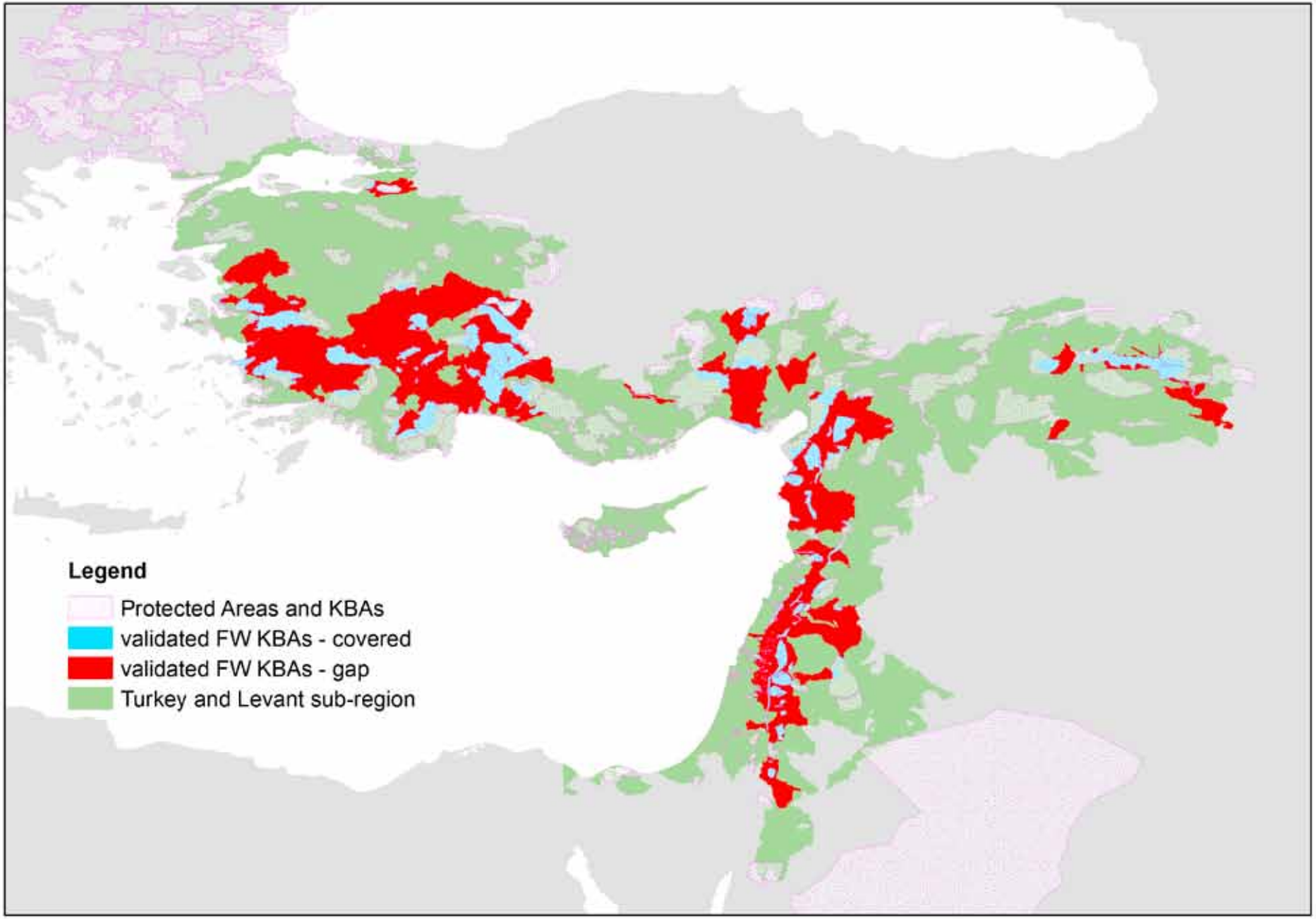


Table 8. Validated KBA summary. Number of sub-catchments validated through the presence of threatened species (C1), restricted range species (C2), and ecoregion restricted communities (C3) for each taxon group. Note that numbers under the heading 'All Criteria' represent the total number of distinct catchments triggered and are thus not the sum of the rows. For this sub-region sites for aquatic and wetland plants and odonates (of which there are very few in comparison to fishes and molluscs) could not be included in the stakeholder workshop. Proposed KBAs for these two taxonomic groupings are presented in Annex VI and await stakeholder validation.

	Number of Triggered sub-catchments			
	All Criteria	C1	C2	C3
Fishes	45	43	35	4
Molluscs	39	36	26	3
Odonata	n/a	n/a	n/a	n/a
Plants	n/a	n/a	n/a	n/a
Total	**47**	**47**	**41**	**7**

validated freshwater KBA with no coverage by any other PA or KBA is Amman.

Discussion

The Turkey and Levant sub-region supports a number of important river, lake, karst and wetland systems validated as freshwater KBAs, 18 of which are also AZE sites (two of these potentially so) (Table 9). The main threats to freshwater KBAs across the region include: i) the hydrological impacts of dam construction and over-abstraction of ground and surface water; ii) land degradation and loss when converted to agriculture; iii) invasive alien species; iv) overfishing, and; v) water pollution. Unlike parts of the western Mediterranean, many aquatic habitats in the east are poorly surveyed by scientists; because of this some species that may be of particular interest are poorly documented, and in some cases even confirmation of their survival is lacking, a case in point

Table 9. List of validated freshwater KBAs for the catchments of the Turkey and Levant sub-region showing the number of KBA trigger species, AZEs (*) and, where identified, Focal Areas for each KBA. Transboundary KBAs are listed at the end of the table.

Country	KBA Name	Number of trigger species	Focal Areas
Jordan	Amman	2	
Jordan	Upper Mujib*	2	Springs near Swaymeh town – Beer Al Azraq
Jordan	Wadi Shuaib	2	The western part of catchment
Jordan	Zarqa River	3	Rumeimin spring
Syria	Middle Orontes	4	Two focal areas for *M. dircaena* in the catchment and Syrofontana which is endemic to Gab in catchment
Syria	Nahr al Aouaj	3	Upper part (western)
Syria	Nahr al Marqiya*	1	
Syria	Upper Khabour	7	Springs of Ras Al Ain (for the molluscs)
Turkey	Aksu River	5	Lower reaches of the river
Turkey	Akyaka springs*	2	Springs in headwaters
Turkey	Bakirçay	6	Two streams in the Bakir
Turkey	Burdur lake and catchments*	6	Burdur Lake, Karatas Lake, Duger stream
Turkey	Büyük Menderes river	7	Kamis stream
Turkey	Düden River*	2	
Turkey	Eğirdir Lake catchment*	7	Çaykoy stream
Turkey	Gökdere (Yeşildere) stream*	4	
Turkey	Işıklı/Çivril lake and catchment*	8	Springs in the tributaries of Büyük Menderes River
Turkey	Karpuzçay stream*	3	Murtici spring
Turkey	Kopru Çay*	5	
Turkey	Korkuteli and Elmali plains	4	Avlan Lake with remnants of Sogut Lake and Karagol
Turkey	Küçük Menderes	5	Freshwater coastal delta (37°57'24'' 27°17'30.81'')
Turkey	Lake Beyşehir and catchments*	13	Lower and middle parts of the northern
Turkey	Lake Iznik and catchment*	5	Cakirca spring focal area for the fish and Pinarbasi spring
Turkey	Lakes Acıgöl and Salda	5	Freshwater spring fields around the shore of Lake Acıgöl and lake Yarishli and Lake Saldagol itself
Turkey	Lakes Akşehir – Eber system	5	Tributaries to the lakes, especially to eastern Lake Aksehir
Turkey	Lower Gediz river	6	Lake Marmara (hosts good populations of the fish species in the area)
Turkey	Manavgat River	5	

Table 9 cont'd. List of validated freshwater KBAs for the catchments of the Turkey and Levant sub-region.

Country	KBA Name	Number of trigger species	Focal Areas
Turkey	Middle and lower Seyhan river	6	
Turkey	Savrun catchment (Ceyhan drainage)	6	
Turkey	Sultan Sazlığı Marshes*	5	Marshes/springs and wider seasonal wetlands
Turkey	Upper Dalman	4	Springs at Tefenni
Turkey	Yarpuz and Hammus catchment (in Ceyhan basin)	6	
Jordan, Israel	Wadi Karak Basin	2	Wadi Karak Ibnhamad Hadditha
Jordan, Israel, Palestinian Occupied Territories	Central Jordan River	5	
Lebanon, Syria	Upper Asi Lebanon*	6	
Lebanon, Syria, Israel	Upper Jordan Valley	9	Sea of Galilee (also known as Tiberias Lake or Kinneret) and surrounding springs and Hula marshes (restored)
Palestinian Occupied Territories	Jerico catchment	3	
Syria, Jordan	Yarmuk basin*	6	Muzayrib Lake
Syria, Jordan, Israel	Lower Yarmouk	2	The area extending from Maqarin to Wadi Shaq Al-barid
Syria, Lebanon	Lake Homs (Qatinah)	7	Orontes river and Homs Lake
Syria, Lebanon	Litani River*	2	Aamiq marshes
Syria, Lebanon	Nahr al Kabir	3	
Syria, Lebanon	Spring of Barada (En Fidje)	2	Outflow of the spring
Turkey, Syria	Lower Asi drainage	10	Tahta Köprü dam lake and its influence streams, Golbasi Lake. Büyük KaraÇay and Küçük KaraÇay
Turkey, Syria	Northern Coastal Streams of Syria*	2	The lower part of the streams and two small streams between Baniyas and Jableh
Turkey, Syria	Qweik*	3	Turkish headwaters (where water remains)
Turkey, Syria, Iraq	Main stem of the Tigris River	5	

is Cyprus's freshwater blenny (*Salaria fluviatilis*) (Zogaris *et al.* 2014). Habitat and species inventories as well as further taxonomic work to clarify taxa validity are critically important for aquatic conservation in this area.

For additional information on the status of freshwater biodiversity and wetland habitats in the eastern Mediterranean see the companion report *Status and Distribution of Freshwater Biodiversity in the Eastern Mediterranean* (Smith *et al.* in prep.) which highlights the findings of the IUCN Red List assessments. The issues and management recommendations for these KBAs are further highlighted below through discussion of a few selected sites.

Akyaka Springs KBA in south-western Turkey is an AZE site encompassing the springs and the two short permanent streams of Akçapınar and Kadın Azmağı. The KBA also qualifies as an AZE site due to the presence of the Endangered mollusc, *Bithynia pesicii*, which is restricted to the KBA. *Unio crassus*, the Endangered river mussel is also thought to be present at the site. The main threats are nutrient enrichment from agricultural runoff, and sewage from a nearby expanding coastal tourism development at Akyaka. As these species are both sensitive to changes in water quality, the current issue of poor water quality needs to be addressed. Also in Turkey, the **Eğirdir Lake catchment KBA** in central Anatolia includes the karstic lake itself and its catchment, including a number of springs. The site qualifies as an AZE site on account of the two endemic species of mollusc, *Bythinella turca* (CR) and *Falsipyrgula pfeiferi* (EN), and possibly a third, *Graecoanatolica lacustristurca* (EN), which may have been lost from two of its three locations; and two endemic fish species the Yag Baligi (*Pseudophoxinus egridiri* EN), and the Eğirdir Longsnout Scraper (*Capoeta pestai* CR). The main threats to the site are typical of the region, including eutrophication of the lake, over-abstraction and pollution of water, invasive species and, in the case of Kayaagzi Spring, road construction. *B. turca* is only known from a single spring (Cire) in the middle of a village where it is at risk from the impacts of habitat modification for recreation such as concreting the floor of the main spring and bank clearance. *F. pfeiferi* and *G. lacustristurca* are both endemic to Lake Eğirdir where the impacts of eutrophication (the lake is naturally oligotrophic) and invasive alien species potentially threaten the species. The fish species are also impacted by the introduced Pikeperch (*Sander lucioperca*), and *Capoeta pestai* by overharvesting. In south Anatolia, the **Düden River KBA** also qualifies as an AZE site on account of the

presence of one Critically Endangered mollusc, *Hydrobia anatolica*, only known from the Upper Düden waterfall. The Vulnerable fish species *Pseudophoxinus antalyae* (Antalya Spring Minnow) is also endemic to the KBA. The major current threat to this KBA is the over-abstraction of water for irrigation and domestic use by Antalya city which has an impact on the karstic groundwater system supplying these springs and the river itself. Further to the east the **Sultan Sazlığı Marshes KBA** in the Develi depression combines a complex of freshwater marshes and saline/brackish pools and seasonally flooded mud flats and halophytic vegetation. This KBA also qualifies as an AZE site due to the presence of two Critically Endangered fish species, *Aphanius danfordii* (Sultan Sazlığı Toothcarp) and *Pseudophoxinus elizavetae* (Sultan Sazlığı Minnow). Once again this site is at great risk due to the abstraction of groundwater for irrigation. The Sultan Sazlığı marshes once formed a very important wetland area which has been drained and finally dried out in the early 21st century. These two species of fish now survive in just a few small springs and a few canals. The KBA extends to include the wider catchment as all the water bodies are fed from a single aquifer. The continued draining of the area needs to be stopped if these species are to survive.

The **Nahr al Marqīyah KBA** in Syria is a coastal karstic system. It is also an AZE site on account of the presence of *Pseudophoxinus hasani* (Marqīyah Spring Minnow) which is endemic to the currently unprotect Nahr Marqīyah coastal stream. The main threat is once again water abstraction and water retention by dams. Rapid economic development in the area is likely to lead to an increase in water demands so environmental flows in the river must be determined and maintained if this species is to survive in the wild. The **Litani River KBA** in Lebanon combines the river system with hydrologically connected spring fed marshes, including Aamiq marsh, which is the largest remaining freshwater wetland in Lebanon, a remnant of much more extensive marshes and lakes. The KBA also qualifies as a freshwater AZE site due to the presence of the fish, *Tylognathus festai*, in the Aamiq marsh. Other trigger species include *Oxynoemacheilus leontinae* (Lebanese Loach) which is Least Concern but restricted to the Litani and northern Jordan drainages, and the Endangered *Potomida littoralis,* a unionid mussel that is widespread in southern Europe, northern Africa and the Middle East, but is declining across its highly fragmented range at an alarming rate. Water abstraction and drought are considered a major threat to the local hydrology, in particular to the marsh areas. *Ex situ* conservation is recommended for *T. festai* until the hydrology of its natural habitat can be stabilized and restored through better management of water use and agricultural practices. The final example is the **Yarmuk Basin KBA** which includes the headwaters of the Yarmuk River and Muzayrib Lake (the KBA focal area) in Syria. This KBA also qualifies as an AZE site on account of the presence of the Critically Endangered mollusc, *Melanopsis pachya* and the Critically Endangered

Düden Waterfall within the Düden River KBA, in south Anatolia. This is also an AZE site as the Critically Endangered mollusc, *Hydrobia anatolica*, is only known to occur here. © Zolakoma. Online image/Flickr (CC BY 2.0)

The Asi-Orontes River as it passes through Al Ghab in Syria. Intensive abstraction of ground water for agriculture has led to a considerable reduction in water flow such that, at times, the river barely flows. © Jörg Freyhof

fish species *Oxynoemacheilus galilaeus* (Galilean Loach). *M. pachya* is only known from its type locality the small karstic Mezerib Spring, and *O. galilaeus* is now only known from Muzayrib Lake, as it was extirpated from its other known locality (Lake Hula) when it was drained. As for all water bodies in this region increasing severity of droughts and over-abstraction of water are major causes for concern.

In conclusion, the main issues include water pollution, drought, hydrological alterations following construction of dams, over-abstraction of surface and ground waters, and invasive species. In order to gain the support needed to address these significant threats to freshwater species general awareness first needs to be raised. Most people are currently unaware of the existence of critical sites for freshwater biodiversity, such as KBAs, and few will understand the impacts we are having on these sites and their species.

Conservation actions such as those by A Rocha in the Aamiq marsh (see http://www.arocha.org/lb-en/index.html) need to be rolled out rapidly across the region if many freshwater species are to be prevented from extinction. In the Aamiq marsh A Rocha's actions have helped to improve management techniques, such as the reduced pumping of water for irrigation of nearby farmland, and changes to less "thirsty" crops, so helping the marsh to remain wet throughout the year.

The severity of the situation regarding increasing drought and over-abstraction of water in this region is effectively encapsulated in the recent e-journal article entitled 'Climate change and the Syrian uprising' (Mohtadi 2012) as follows: '*... From 1900 until 2005, there were six droughts of significance in Syria; the average monthly level of winter precipitation during these dry periods was approximately one-third of normal. All but one of these droughts lasted only one season; the exception lasted two. Farming communities were thus able to withstand dry periods by falling back on government subsidies and secondary water resources. This most recent, the seventh drought, however, lasted from 2006 to 2010, an astounding four seasons – a true anomaly in the past century. Furthermore, the average level of precipitation in these four years was the lowest of any drought-ridden period in the last century... The Intergovernmental Panel on Climate Change predicts that global warming will induce droughts even more severe in this region in the coming decades... It is estimated that the Syrian drought has displaced more than 1.5 million people; entire families of agricultural workers and small-scale farmers moved from the country's breadbasket region in the north-east to urban peripheries of the south. The drought tipped the scale of an unbalanced agricultural system that was already feeling the weight of policy mismanagement and unsustainable environmental practices. Further, lack of contingency planning contributed to the inability of the system to cope with the aftermath of the drought*.'

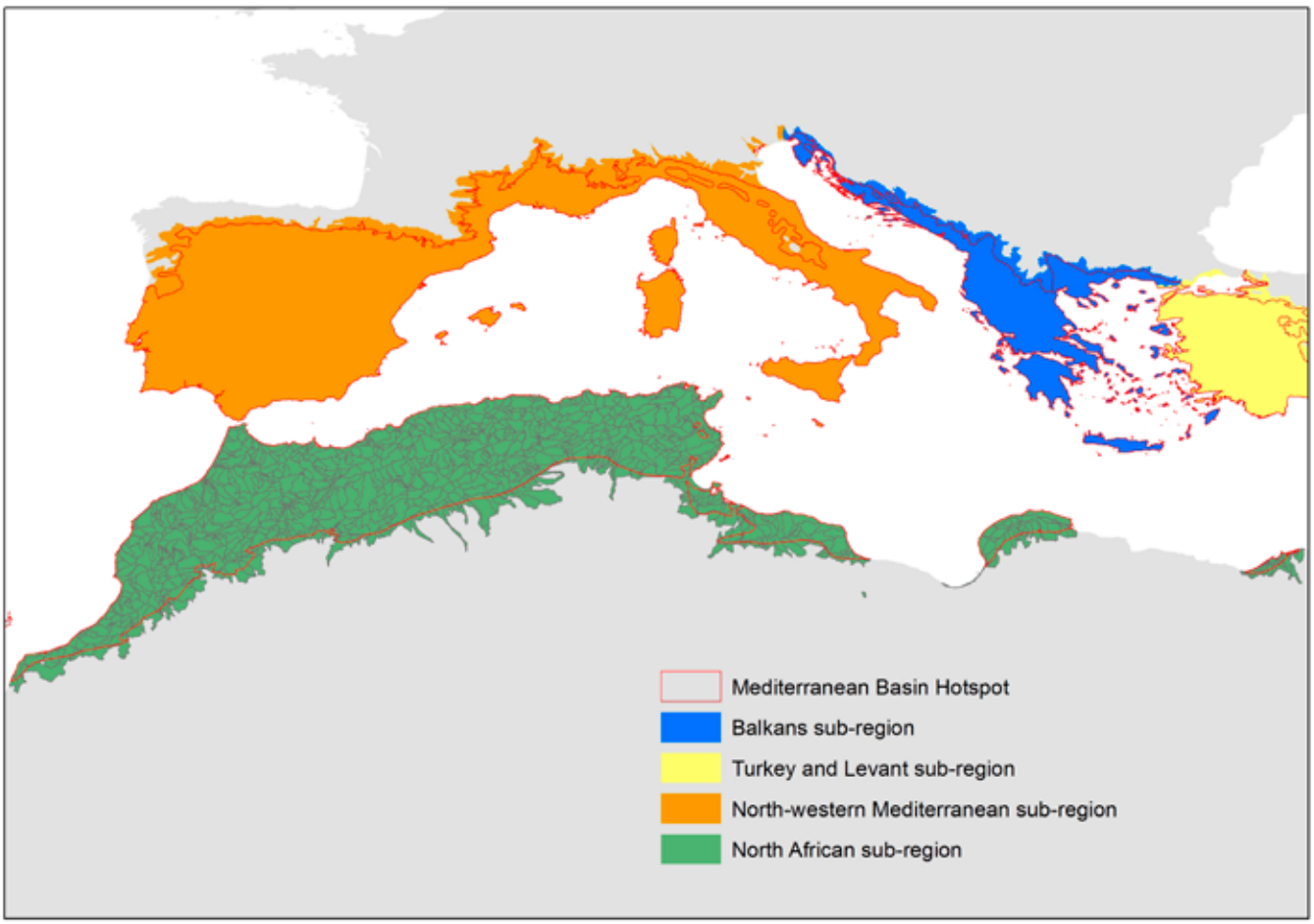
Freshwater KBAs in the northern Africa sub-region

The northern Africa region of the Hotspot includes the Mediterranean coasts of Morocco, Algeria, Tunisia, Libyan Arab Jamahiriya and Egypt and includes nine CEPF priority corridors. Except for the Nile River Delta, permanent rivers are only found in the northern parts of Morocco, Algeria and Tunisia – the region fed by rain and snow melt in the Atlas Mountains range (Figure 15). The region is characterized by the Permanent Maghreb, Temporary Maghreb and Nile Delta Freshwater Ecoregions (Thieme *et al.* 2005). The Permanent Maghreb, which extends along the northern parts of Morocco, Algeria and Tunisia, contains a freshwater fauna with many European elements (Jacquemin & Boudot 1999; Samraoui & Menai 1999; Jödicke *et al.* 2000; Annani *et al.* 2012), Afrotropical relicts (Samraoui *et al.* 1993) and relatively high endemism (Samraoui *et al.* 2012). The following descriptions are largely based on those given in Thieme *et al.* (2005) and in García *et al.* (2010).

Morocco possesses the most extensive river system in northern Africa. The precipitation that falls in the high mountain ranges of the Rif, Middle Atlas, high Atlas and Anti-

Lake Fetzara, part of the Western Numidia KBA, holds a number of globally threatened fishes and aquatic plants. The Endangered Edough Ribbed Newt (*Pluerodeles poireti*) is also known from this KBA. Lake Fetzara is also a designated Ramsar site on account of the large numbers of visiting waterbirds. © Samraoui Boudjéma

Figure 15. The northern Africa sub-region.



Atlas feeds rivers generally flowing north-westward to the Atlantic or south-eastward towards the Sahara. The Oued Moulouya is the main exception, flowing *ca* 500 km north-east from the Middle Atlas to the Mediterranean Sea. Morocco also possesses a number of mountain lakes situated above the 1,800 m level, with vast hydroelectric reservoirs and coastal brackish marshes mainly along the Atlantic coast.

Most Algerian rivers originate in the Tell Atlas and flow north to the Mediterranean, namely the Oued Chellif system (around 550 km in length) and the Oued Seybouse system (around 180 km in length). Algeria also holds numerous small rivers confined to the Mediterranean mountainous coast of the Tell Atlas. Remnants of formerly extensive lakes and marshlands still occur, namely Lake Fetzara (Annaba), La Macta, La Grande Sebkha (near Oran) and a complex of marshes and small lakes near El Kala (Samraoui & Samraoui 2008). The caverns of Ghar Boumaaza, discovered in 1931, form the largest African subterranean hydrological system.

In Tunisia the main and only perennial river is the Oued Medjerda system (450 km in length) that originates in Algeria and ends in the Gulf of Tunis (where it flows into the Mediterranean Sea). The largest lakes, Lac de Tunis and Lac Ichkeul, are brackish so some freshwater species occur in the surrounding marshes as well as in the oasis Nouail, near Chott El Jerid. Some mountain streams in Kroumiria are of tremendous faunistic and floristic interest and are probably a hotspot of endemicity (Korbaa *et al.* 2014; Samraoui & Al Farhan 2015).

In Libya there are no permanent rivers but many springs, seguias (irrigation canals), pools, artificial wells and oases as well as salt marshes. The main regions with oases are those of Ghat, Sabha and Kufrah. The Great Man-made River is a gigantic complex of pipelines that carries water from the deep Nubian Sandstone aquifer in southern Libyan to the main cities in the north. The crater lakes of Tibesti, e.g., the Trou au Natron, are either saline or alkaline.

The Nile Delta in Egypt is a fertile area wedged in the midst of one of the world's driest deserts. It extends about 175 km from its apex at Cairo to the Mediterranean Sea and is about 260 km wide at the coast. Since construction of the Aswan High Dam (completed in 1970) water flow through the delta has decreased and it is no longer subject to annual floods. As a result the Nile River now occupies only two main channels. The main wetlands in the delta are the coastal lakes of Manzala, Burullus, Idku, and Maryut. The Nile Delta is part of one of the world's most important sites for migratory birds. The freshwater fauna is typical of the Nilo-Sudan ichthyofaunal province. Human settlements and agriculture cover almost the entire delta, except for a few areas in the extreme north of the delta. Remaining wetlands are being rapidly converted to agricultural use with more than 50 per cent of their original area lost over the last century through land reclamation, sedimentation and erosion. The delta has eroded by up to 2 km since the 1960s due to the loss of sediment deposition following the construction of the Aswan High Dam and is subject to increasing saltwater intrusion. Pollutants are accumulating in the delta as agriculture and human settlement both increase – the previous annual flooding from upstream is no longer present to remove them. Alien invasive species, such as the water hyacinth (*Eichhornia crassipes*) and American crayfish (*Procambarus clarkii*), threaten native biodiversity.

KBA overview

For the northern Africa sub-region we considered 1,223 sub-catchments (level 8 HydroBASINS resolution) covering an area of 921,006 km^2. Of these sub-catchments **1025 proposed KBAs** were identified as meeting the KBA criteria for the freshwater taxonomic groups evaluated here (Figure 16). One hundred and nine species were identified as KBA trigger species (Table 10). The relatively high number of species appearing to meet Criterion 3 results from the presence of many species restricted to single freshwater ecoregions, the entire northern Africa region being delineated into just two large freshwater ecoregions. Subsequent stakeholder consultation of these proposed KBAs led to the designation and delineation of **43 validated KBAs** which include the ranges of 92 species meeting at least one of the KBA criteria (Table 11, Figure 17 and Annex IV Table B). KBA names and the numbers of trigger species are given in Table 12.

Table 10. Proposed KBA summary. Number of sub-catchments proposed as KBAs through the presence of threatened species (C1), restricted range species (C2), and ecoregion restricted communities (C3) for each taxon group. Note that numbers under the heading 'All Criteria' represent the total number of distinct catchments triggered and are thus not the sum of the rows.

	Number of Triggered sub-catchments			
	All Criteria	C1	C2	C3
Fishes	815	731	58	357
Molluscs	476	316	200	247
Odonata	487	482	58	2
Plants	674	672	218	0
Total	**1025**	**968**	**356**	**449**

Table 11. Validated KBA summary. Number of sub-catchments validated through the presence of threatened species (C1), restricted range species (C2), and ecoregion restricted communities (C3) for each taxon group. Note that numbers under the heading 'All Criteria' represent the total number of distinct catchments triggered and are thus not the sum of the rows.

	Number of Triggered sub-catchments			
	All Criteria	C1	C2	C3
Fishes	33	32	11	19
Molluscs	28	24	19	9
Odonata	26	21	18	2
Plants	36	35	21	0
Amphibians (incidental)	4	4	0	1
Total	**43**	**42**	**40**	**22**

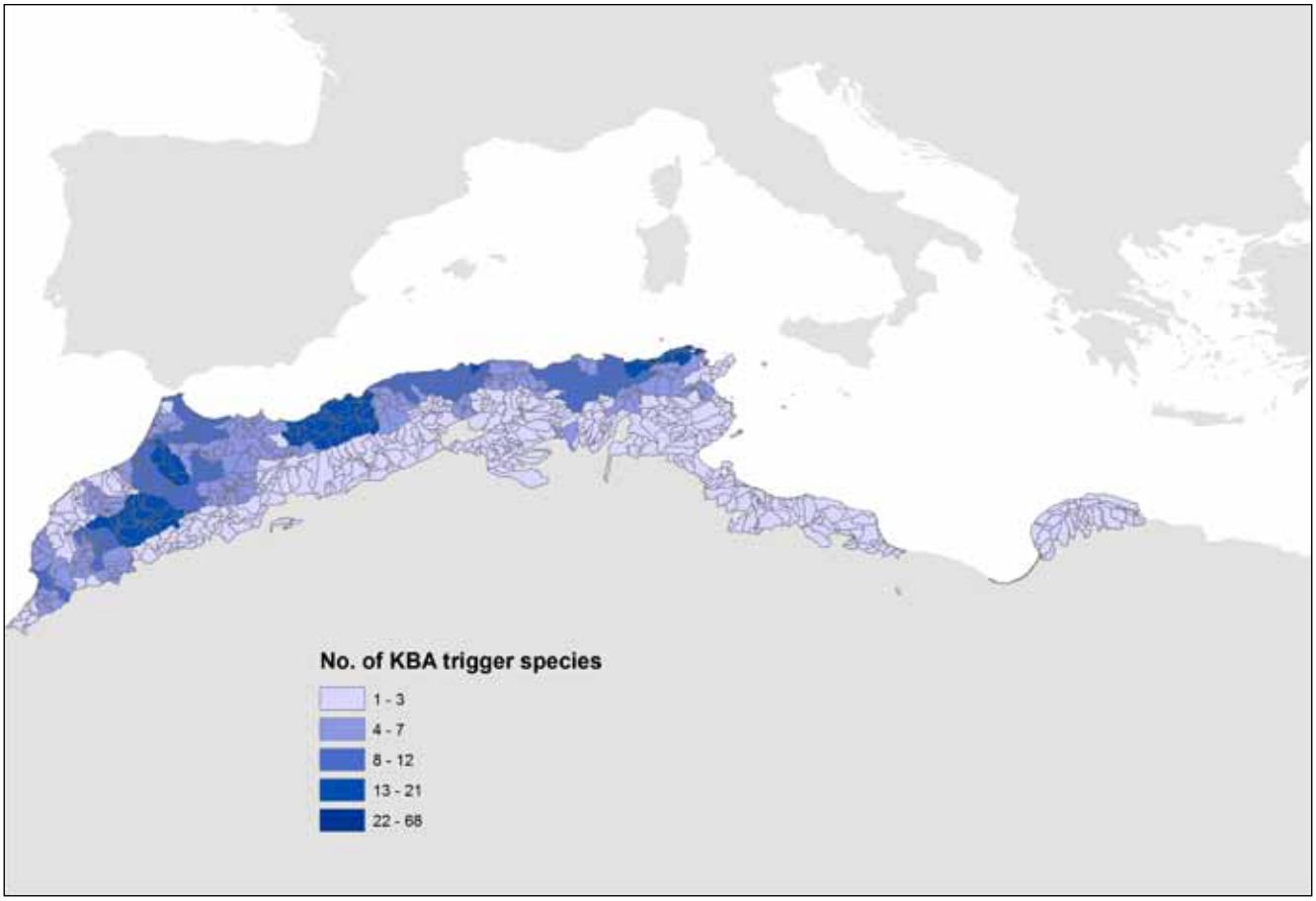


Figure 16. All <u>proposed</u> freshwater KBAs showing the number of KBA trigger species in the northern Africa sub-region.

Figure 17. All validated KBAs showing the number of KBA trigger species in the northern Africa sub-region.

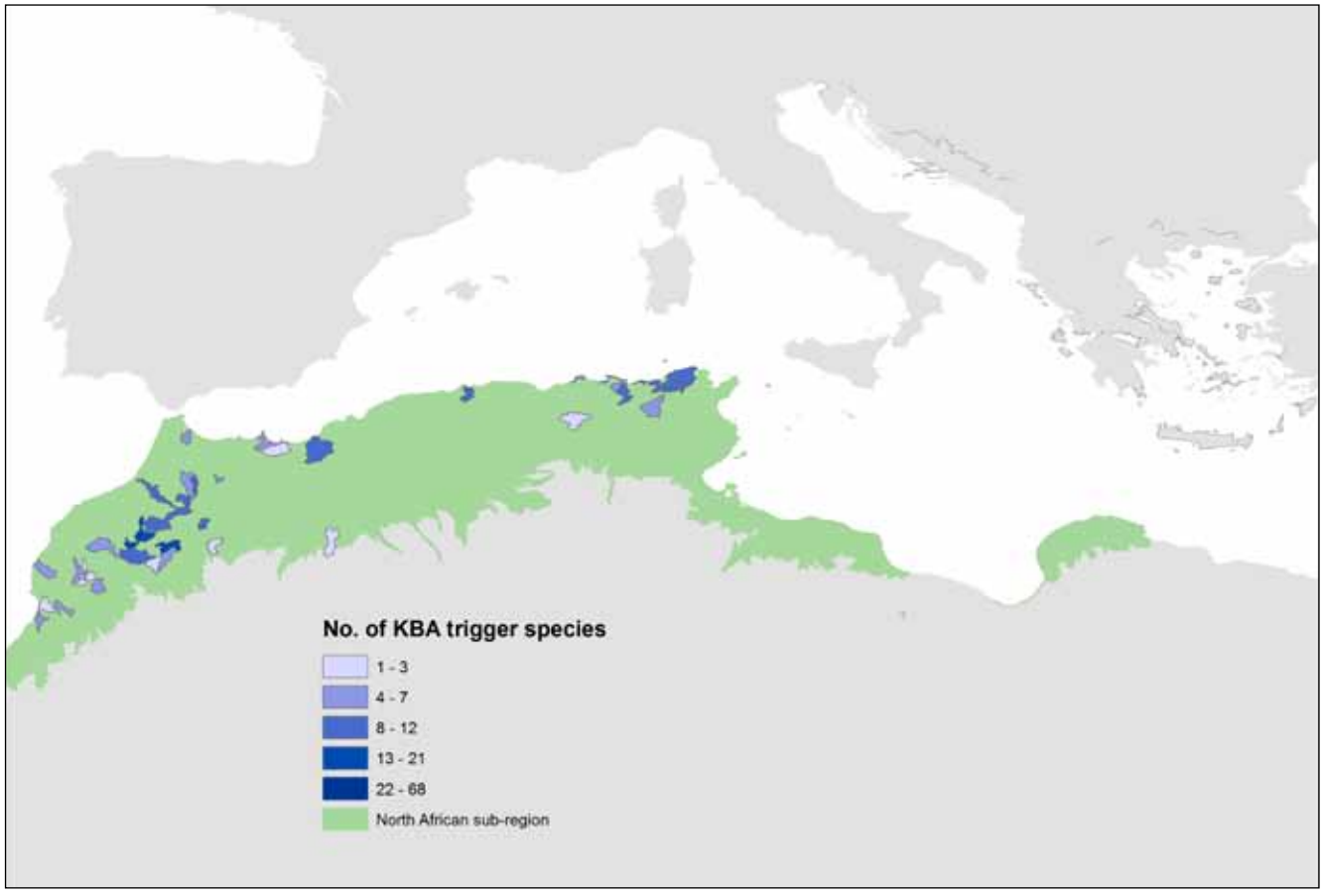


Table 12. List of validated freshwater KBAs for the catchments of the northern Africa sub-region showing the number of KBA trigger species, AZE (*) and, where identified, Focal Areas for each KBA. Transboundary KBAs are listed at the end of the table.

Country	KBA Name	Number of trigger species	Focal Areas
Algeria	Beni Belaid	9	
Algeria	Hauts Plateaux	3	Localities of the endmic *Aphanius apodus* which is close to extinction – between Aïn Mlila and Batna.
Algeria	Oued el Harrach	8	Melifi stream – a hill stream (important for *Barbus leptopogon*).
Algeria	Oued Zhour	4	
Algeria	Seybouse catchment	11	The Upper Seybouse for *Calopteryx exul* and *Gomphus lucasii*
Algeria	Tafna Catchment	10	
Algeria	Western Numidia*	7	Lake Fetzara (IBA, Ramsar Site and important for *Pleurodeles poireti*)
Morocco	Abid river downstream	14	
Morocco	Arhreme River*	5	The wells
Morocco	Assif El Mal	5	Upper catchment
Morocco	Assif El Mal east	2	Springs and streams in the upper catchment
Morocco	Assif Meloul river	13	The two mountain lakes (oligotrophic) and their sources
Morocco	Lower Moulouya	3	Spawning sites of the anadromous *Alosa algeriensis*
Morocco	Lower Souss and tributaries	1	
Morocco	M'Goun river basin	1	
Morocco	Middle N'Fiss river	1	Sites important for populations of *Luciobarbus magniatlantis*
Morocco	Middle Oum Er Rbia – Beni Mellal	14	Important populations of *Ptercapoeta maroccana* and *Carasobarbus harterti*
Morocco	Middlelt Upper Moulouya	8	
Morocco	Oued Amizmiz	4	Imintala Spring
Morocco	Oued Bouhlou	6	
Morocco	Oued Bouregreg	8	The plaine of Oulmes and estuary of Bouregreg
Morocco	Oued Imouzzer Kandar	8	Dayat Aoua (endorheic lake) and Dayat Hachlaf
Morocco	Oued Ksob – Igrounzar	5	Coastal parts of the river
Morocco	Oued Lakhdar	12	
Morocco	Oued Laou	5	The area west of Chefchaouen is important for aquatic plants
Morocco	Oued Massa	6	*Unio foucauldianus* locality in the upper catchment and other springs and wells important for snails
Morocco	Oued Tizguite and Oued Ouaslane	5	Upper reaches of these two rivers
Morocco	Oued Ziz Errachidia	3	
Morocco	Saidia Coastal Plain	6	
Morocco	Sehb El Majnoune	6	
Morocco	Tifnout basin	6	Lake Ifni with its endemic *Salmo* sp.
Morocco	Tigrigra stream	9	Aghbal spring
Morocco	Upper Dades	4	The uppermost part of the catchment above 2,000 m
Morocco	Upper Oued N'Fiss	2	Sites important for populations of *Luciobarbus magniatlantis*
Morocco	Upper Oum Er Rbia	8	Aguelmame Azigza mountain lake
Morocco	Upper Oum Er Rbia above Kasba Tadla	10	Important populations of *Ptercapoeta maroccana*
Tunisia	Cap Serrat – Cap Blanc – Parc national de l'Ichkeul	8	
Tunisia	Maden River	9	
Algeria, Morocco	Figuig Oasis and Oued Saoura	2	Subterranean waters in the city of Figuig with endemic *Luciobarbus figuigensis* and gueltas in Algeria where *Aphanius saouraensis* occurs
Algeria, Tunisia	Eastern Numidia	12	
Algeria, Tunisia	El Kala – Les Tourbières de Dar Fatma transboundary site	9	
Morocco, Spain (Melilla)	Le Grand Nador	5	Nador lagoon and Cap Trois Fourches
Tunisia, Algeria	Upper Medjarda River	6	

Over-abstraction of water from the Seybouse River (KBA), as shown here, has led to the drying out of many stream habitats threatening their freshwater biodiversity. The Endangered Glittering Demoiselle (*Calopteryx exul*) (inset) is one of eight threatened species of fishes, odonates, plants and molluscs living in this river system. © Samraoui Boudjéma

Current levels of protection

The area of validated freshwater KBAs within the boundaries of existing protected areas (PAs) and other KBAs is 7,341 km^2 (12% of the area of the validated freshwater KBAs in the northern Africa sub-region), leaving 88% of the area of freshwater KBAs outside of any formally protected areas or other sites recognized for their biological importance as KBAs (Figure 18). Those validated freshwater KBAs with no coverage by any other PA or KBA include:

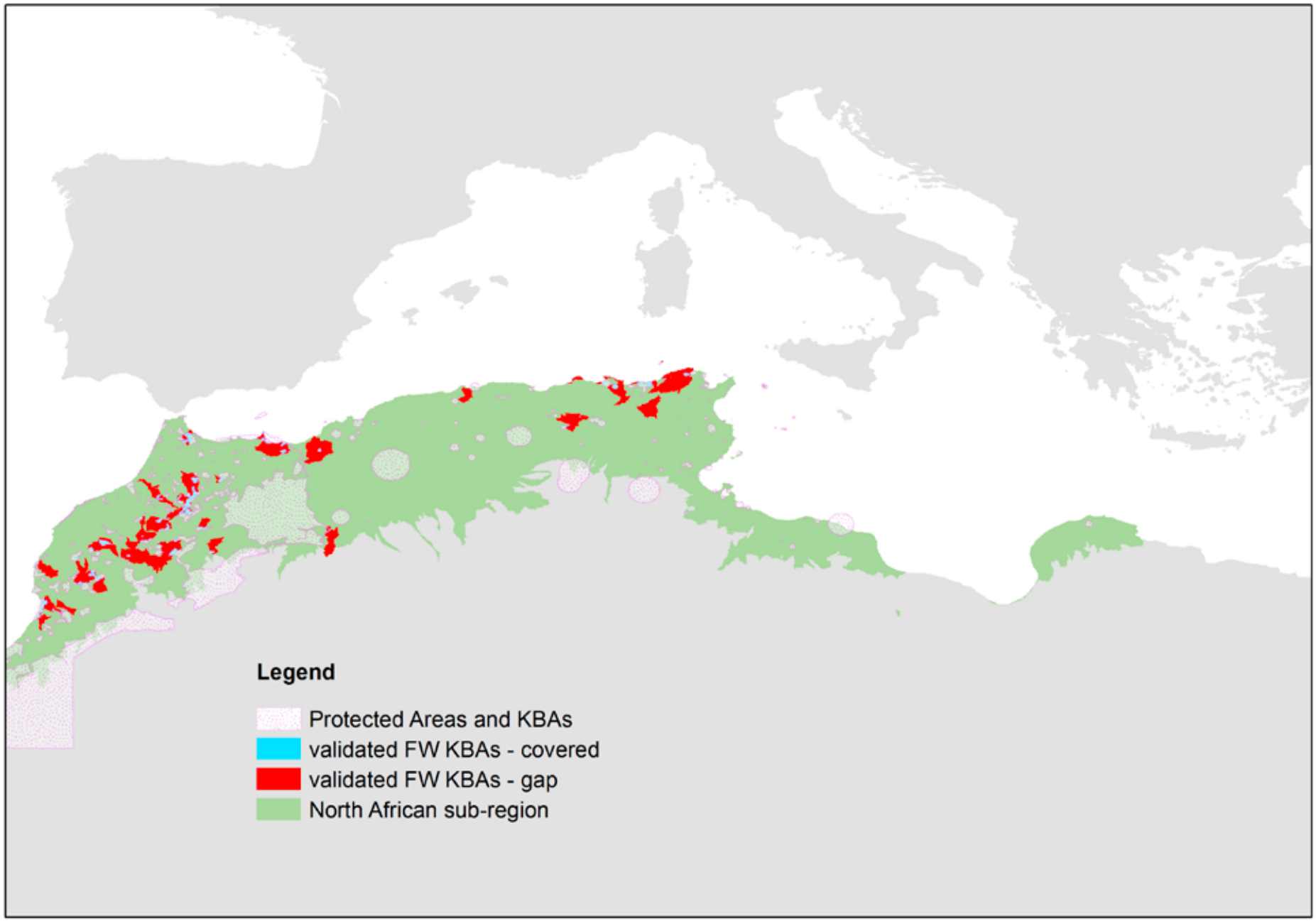
1. Assif El Mal east (Morocco)
2. Beni Belaid (Algeria)
3. M'Goun river basin (Morocco)
4. Oued Zhour (Algeria)
5. Upper Medjarda River (Tunisia, Algeria)

Discussion

The northern Africa sub-region supports a number of important river, lake and wetland systems validated as freshwater KBAs, two of which are also AZE sites (Table 12). All the validated KBAs are located in Morocco, Algeria and Tunisia. The main threats to the KBAs of this sub-region are hydrological disruption caused by dams, increasing periods of drought and over-abstraction of water, water pollution, erosion, salination of habitats, and invasive species. The issues and management recommendations for these KBAs are further highlighted below through discussion of a few selected sites.

The Arhreme River KBA in Morocco is a branch of the Souss River and is largely comprized of temporary waters and wells, with few refuge areas. This KBA has five species of fishes and molluscs that meet the KBA criteria including the Critically Endangered mollusc, *Iglica soussensis*, which is restricted to a single well at Tamait Izder and qualifies the KBA as an AZE site. Pollution and over-abstraction of groundwater pose major threats to species in this KBA. The other AZE site is the **Western Numidia KBA** in Algeria, the only place where the Endangered Edough Ribbed Newt (*Pleurodeles poireti*) is found (Samraoui *et al.* 2012), along with three freshwater fish species and three aquatic plants that also meet the KBA site selection criteria. In this KBA the main threats are urban expansion in the mountainous areas, sand mining in the Guerbes wetland (Samraoui & de Bélair 1997; Toubal *et al.* 2014), over-abstraction of groundwater which has led to many springs drying out, and introduction of carp into the dam reservoirs. Plans have also been discussed for additional introductions of carp (*Cyprinus* spp.) into the coastal freshwater lakes. Although a number of protected areas have been designated within the KBA they do not address the current hydrological concerns. A catchment management plan is therefore recommended to address the use of water across the entire KBA, which includes four linked sub-catchments extending from Skikda in the west to Annaba in the east, and extends inland to include the Guerbes-Senhadja wetlands, Lake Fetzara and the Edough Mountains. As for many freshwater KBAs where the threat is over-abstraction of water it is important to designate management areas that adequately reflect the underlying hydrology of the site. It is for this reason that many freshwater

Figure 18. Spatial overlap between validated freshwater KBAs and other PAs and KBAs in the northern Africa sub-region.



KBAs include surrounding catchments associated with the focal areas where KBA trigger species are found.

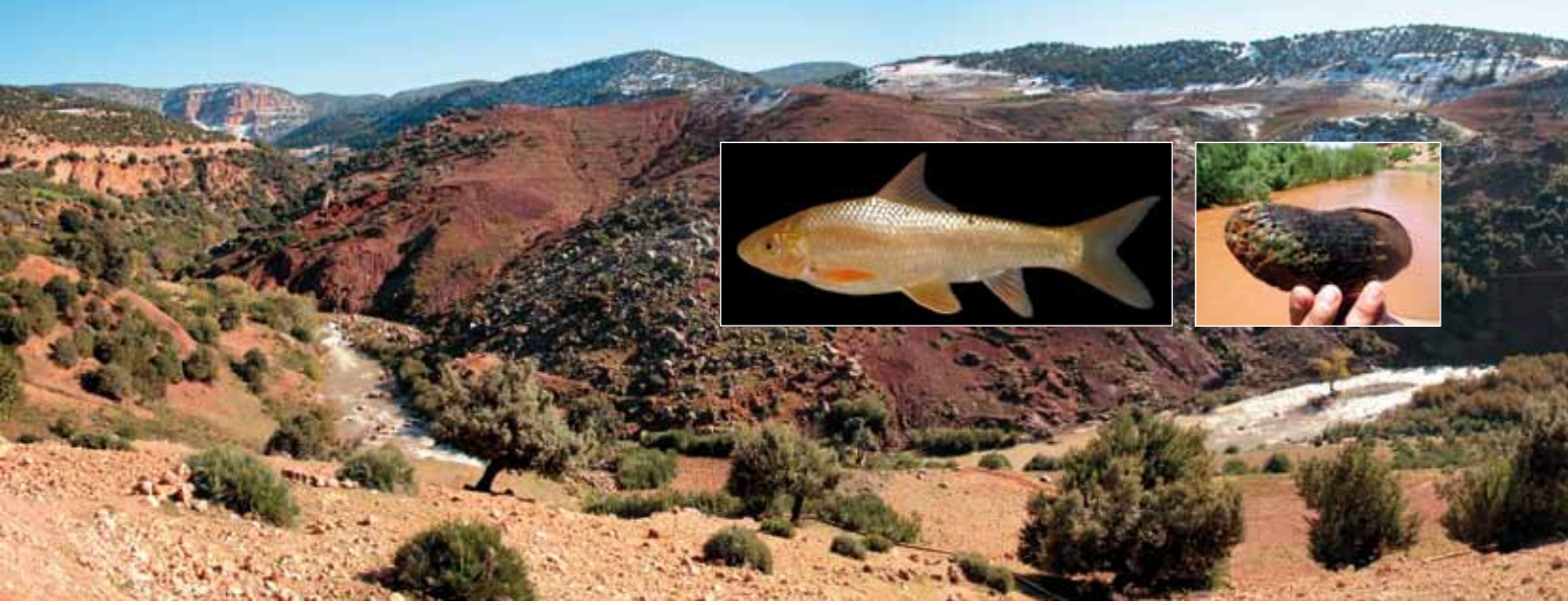
The Middle Oum Er Rbia – Beni Mellal KBA in Morocco is the part of the permanent large river upstream of the Al Massira reservoir. There are 14 trigger species qualifying the site as a KBA, including three freshwater fishes, eight molluscs, two plants and a dragonfly. Most of these species are globally threatened but two of the fishes, *Carasobarbus harteri* and *Ptercapoeta maroccana* are considered representative of a fish community in that freshwater ecoregion which seems to be close to extinction. One species, the large barbel *Barbus reinii*, might have even gone extinct recently. Of particular note is the Critically Endangered pearl mussel, *Margaritifera marocana*, which used to be wide spread in north-western Morocco but is now limited to only a few localities, including the Oum Rbia catchment which is part of this KBA. Water pollution, over-abstraction, and siltation are problems throughout the KBA heavily impacting species such as *M. marocana*. Obstructions to fish migrations by dams (there are six dams on the Oum Er Rbia) also present a threat not only to migratory fish species but also to *M. marocana* which relies on fish hosts to take its larvae upstream. Protective measures for *M. marocana* are recommended as it is a highly threatened species from the family Margaritiferidae which has very few representatives globally. Determination and implementation of environmental flows for this catchment are recommended in addition to reforestation of the upper catchment.

Tafna catchment KBA in Algeria combines a subterranean wetland network with mountain streams and coastal wetlands – all of which are hydrologically connected. The KBA has 10 trigger species including a community of freshwater molluscs considered to be representative of the distinct freshwater fauna of the Permanent Mahgreb freshwater ecoregion. As for most freshwater KBAs in this region the construction of large dams and over-abstraction of water threaten freshwater biodiversity across the site (Samraoui & Samraoui 2008). A coherent management plan is required that accounts for hydrological connectivity and that addresses the current conflicting priorities of the various Ministries responsible.

Cap Serrat – Cap Blanc – Parc national de l'Ichkeul KBA in Tunisia includes the Garâa Sejenane, a vaste endorheic plain which is exceptionally rich in temporary wetlands with a rich diversity of species. The site includes *Rumex tunetanus* which is a Critically Endangered wetland plant found only in this locality as well as an Endangered steno-Mediterranean endemic plant, *Pilularia minuta.* This amphibious Pteridophyte, recently discovered in Garâa Sejenane, represents the largest known population within Mediterranean temporary pools (Daoud-Bouattour *et al.* 2009; Ghrabi-Gammar *et al.* 2009; Daoud-Bouattour *et al.* 2014). Today this site is a mosaic of cultivated lands and shallow temporary pools heavily impacted by drainage, overgrazing, pollution and infrastructure development, such as dam construction.

The final example site is the **Figuig Oasis and Oued Sauoura KBA**, a transboundary site crossing the Morocco / Algeria border that includes subterranean waters under the city of Figuig and seasonal refuge pools when the wadies dry (gueltas). The site holds two KBA trigger species of fish, the Critically Endangered *Aphanius saourensis* (Sahara Aphanius) and the restricted range *Luciobarbus figuiguensis* which mainly lives in subterranean habitats mostly within the city of Figuig. *Aphanius saourensis*, which was once thought widespread, was until recently only known from this one remnant population in the Oued Saoura catchment, but it now seems likely to be extinct in the wild (Freyhof, pers.

Guerbes Chichaya is part of the Guerbes-Senhadja wetlands within the Western Numidia KBA where the threat of introduced species and over-abstraction of water are a concern. © Samraoui Boudjéma



The Oum Er Rbia, Morocco's longest river, rises in the Middle Atlas and flows into the Atlantic near Agadir. © Flikr Mlutlivac42. **This river is important for the highly threatened fish, *Ptercapoeta maroccana*, and mussel *Margaritifera marocana* (CR).** © Mohamed Ghamizi

comm.). The freshwater species in the KBA are impacted by the damming of the Saoura River, introduction of *Gambusia holbrooki* which has led to the extirpation of similar fish and other freshwater species in other areas (Samraoui 2002), water abstraction, increasing frequency and severity of droughts and potential leaching of pesticides sprayed onto palm trees. There is an *ex situ* breeding programme for *A. saourensis* so habitat restoration, removal of *Gambusia*, and a plan for management of the hydrology of the KBA are a priority if this species is to be reintroduced to the wild.

In conclusion, the main issues are once again related to the shortage, redirection, pollution, and overuse of water. Greater awareness of the presence of these globally threatened and endemic species and the critical sites for their survival is a priority. Freshwater ecosystems are vital to the livelihoods and economies of the northern African countries (Juffe-Bignoli & Darwall 2012) but their importance remains largely under-estimated by local people and by decision makers and they are still considered as areas of waste land better converted for alternative uses such as for agriculture.

The Garâa Sejenane wetland, a mosaic of cultivated land and shallow temporary pools, is subject to water abstraction for crop irrigation and is also threatened by overgrazing. This wetland is home to the Critically Endangered *Rumex tunetanus* (inset) and a number of other important wetland plants yet it remains without protection. © A. Daoud-Bouattour.

Freshwater KBAs in the north-western Mediterranean sub-region

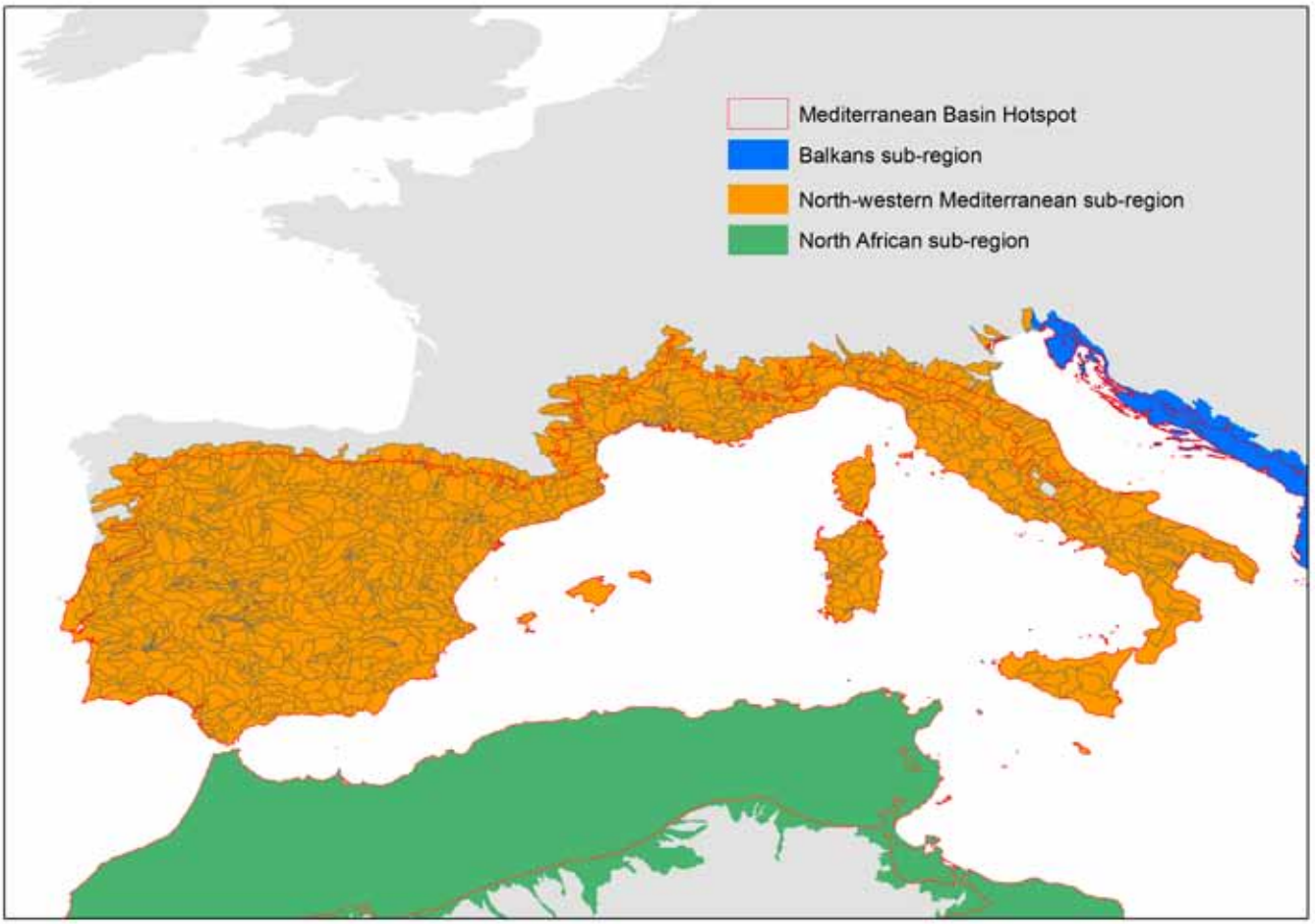
The north-western Mediterranean sub-region (Figure 19) includes southern, western and eastern Iberia, Cantabric Coast – Languedoc, and Italian Peninsula and Islands Freshwater Ecoregions (Abell *et al.* 2008). The following summary is largely based on the information obtained from the online Freshwater Ecoregions of the World (www.feow.org).

Southern Iberia contains two of the largest rivers in the Iberian Peninsula; the Guadiana and Guadalquivir, which drain into the Atlantic. The Guadiana flows through mountain lakes (Ruidera lakes), the Tablas de Daimiel wetlands, several large reservoirs, and has numerous small waterfalls in its headwaters. At its mouth the Guadiana forms a small delta and estuary with islands, marshes, and sandbars. The Guadalquivir is the deepest and only navigable river on the Iberian Peninsula. It lies in a depression surrounded by the Sierra Morena to the north and Bethic Cordillera to the south, with headwaters that rise in the Prebethic Range. At its mouth it forms a marsh called the Marismas del Guadalquivir and the Doñana marshes, one of Europe's most important wetlands which is protected as a National Park. This ecoregion also includes saline steppe lakes, saline lagoons, coastal marshlands, reservoirs, small lakes, wetlands, and aquifers.

Western Iberia includes rolling plains, plateaus, deep valleys, and steep mountains. The Tagus and Duero drain to large Cenozoic basins, which include high flat plateaus, also known as the Meseta Central. The Tagus, which stretches more than 1,000 km, is the longest river on the Iberian Peninsula. The upper river cuts through the plateau in deep gorges and is punctuated by waterfalls. It then flows through hills and plains before reaching the Atlantic. The Duero is the third largest river, after the Tagus and Ebro, flowing through steep valleys of the Iberian Range, and then meandering through an open valley to meet the Atlantic near Oporto, Portugal. There are also many important freshwater and brackish lagoons, marshes, and estuaries, as well as the largest representation of saline steppe wetlands in Europe.

Eastern Iberia includes the Ebro River, the largest Iberian river. After crossing the Catalan Coastal Range the river empties into the Mediterranean Sea at the Ebro Delta, which is a large wetland with valuable biodiversity. It has a number of freshwater upwellings, brackish and saline lagoons, salt marshes, and coastal sandy areas. However, more than

Figure 19. North-western Mediterranean sub-region.



half of the delta surface is now devoted to rice cultivation, resulting in a general reduction in salinity and an increase in eutrophication, also favouring the dominance of freshwater invasive species, especially fish, molluscs and crayfish. The Júcar is the next longest river in the ecoregion, rising in the Montes Universales and emptying into the Mediterranean Sea near Cullera. Important wetlands in the basin include the l'Albufera de Valencia. The Ter is the northernmost river in the ecoregion, rising in the Pyrenees it travels 209 km before reaching the Mediterranean Sea. One of the largest lakes in Spain, Estany de Banyoles, is located in the Ter basin.

The largest river in the Cantabric Coast – Languedoc ecoregion is the lower section of the Rhône, from the Isère confluence to the Mediterranean Sea. At Arles the river divides into the Grand Rhône and Petit Rhône. Between these two arms is the Camargue Delta which is composed of an extensive network of permanent and seasonal brackish lagoons, lakes, ponds, reedbeds, dunes, and marshes, making it the largest delta in western Europe. To the west is another area of marshes, brackish lagoons, and ponds called the Petite Camargue.

Finally, the rivers of the Italian Peninsula and Island ecoregion are short due to the shape of the peninsula and the Apennines that bisect this peninsula and divide the runoff on either side. The largest river in the ecoregion and second largest basin in Italy is the Tiber River. It originates in the northern Apennines and flows into the Tyrrhenian Sea south of Rome. The basin has unique karstic areas as well as lakes like Bolsena, Bracciano, and Vico, which originated from collapsed volcanic structures.

Although the regional richness of freshwater fish species is relatively low in this sub-region of Europe it has a high number of threatened species many of which are locally endemic, with natural ranges limited to just a few streams, springs or rivers. In certain areas almost every river has its own unique freshwater fish fauna composed of local endemics. Many of these species have only recently been discovered and described and have limited targeted protection. In many Mediterranean countries water abstraction, from ground water or from the rivers and streams themselves, remains unregulated or unsupervised in practice and puts much of freshwater biodiversity at risk. Within Europe the highest richness of freshwater molluscs is within the Mediterranean region, in particular the Iberian Peninsula, which is dominated by the small freshwater snails of the family Hydrobiidae. These species are frequently restricted to a small number of freshwater springs, particularly in the limestone regions of the Iberian Peninsula, French Mediterranean and Italy of this sub-region. In terms of the species richness of aquatic plants, Spain, France and Italy are among the top five countries in Europe although the levels of endemism are lower in the Mediterranean parts. The Iberian Peninsula is also a centre for threatened richness of aquatic plants – primarily a consequence of the combination of endemic species in vulnerable habitats, mainly ephemeral pools. The loss of these habitats through drainage for agricultural use is the biggest threat.

Table 13. Proposed KBA summary. Number of triggered catchments for threatened species (C1), restricted range species (C2), and ecoregion restricted communities (C3) for each taxon group. Note that numbers under the heading 'All Criteria' represent the total number of distinct catchments triggered and are thus not the sum of the rows.

	Number of Triggered sub-catchments			
	All Criteria	C1	C2	C3
Fishes	1271	1271	170	0
Molluscs	741	565	523	0
Odonata	336	336	0	0
Plants	607	606	32	0
Total	**1368**	**1325**	**633**	**0**

KBA overview

For this sub-region **1,368 proposed KBAs** were identified as sub-catchments meeting the KBA criteria for the freshwater taxonomic groups evaluated (Figure 20, Table 13). Identification is based on 181 species which meet at least one of the KBA criteria. A stakeholder validation process is planned in order to now validate and delineate KBAs from amongst this sub-set of the regions river/lake sub-catchments.

Discussion

Stakeholder workshops to validate the very large number of proposed freshwater KBAs, representing river/lake sub-catchments that appear to meet the KBA criteria are still to be conducted. The countries in this region of the hotspot were not eligible for funding under the CEPF granting programme so funds still need to be obtained from other sources to complete this work. As for other regions of this hotspot, freshwater biodiversity is under tremendous pressure, largely due to poor management of the scarce and dwindling water supplies required to support freshwater species. The high number of restricted range endemic species in the many short temporary rivers and streams of the Mediterranean coast are at risk of global extinction and, unfortunately, few people will make the required efforts to conserve them unless efforts are made to raise awareness.

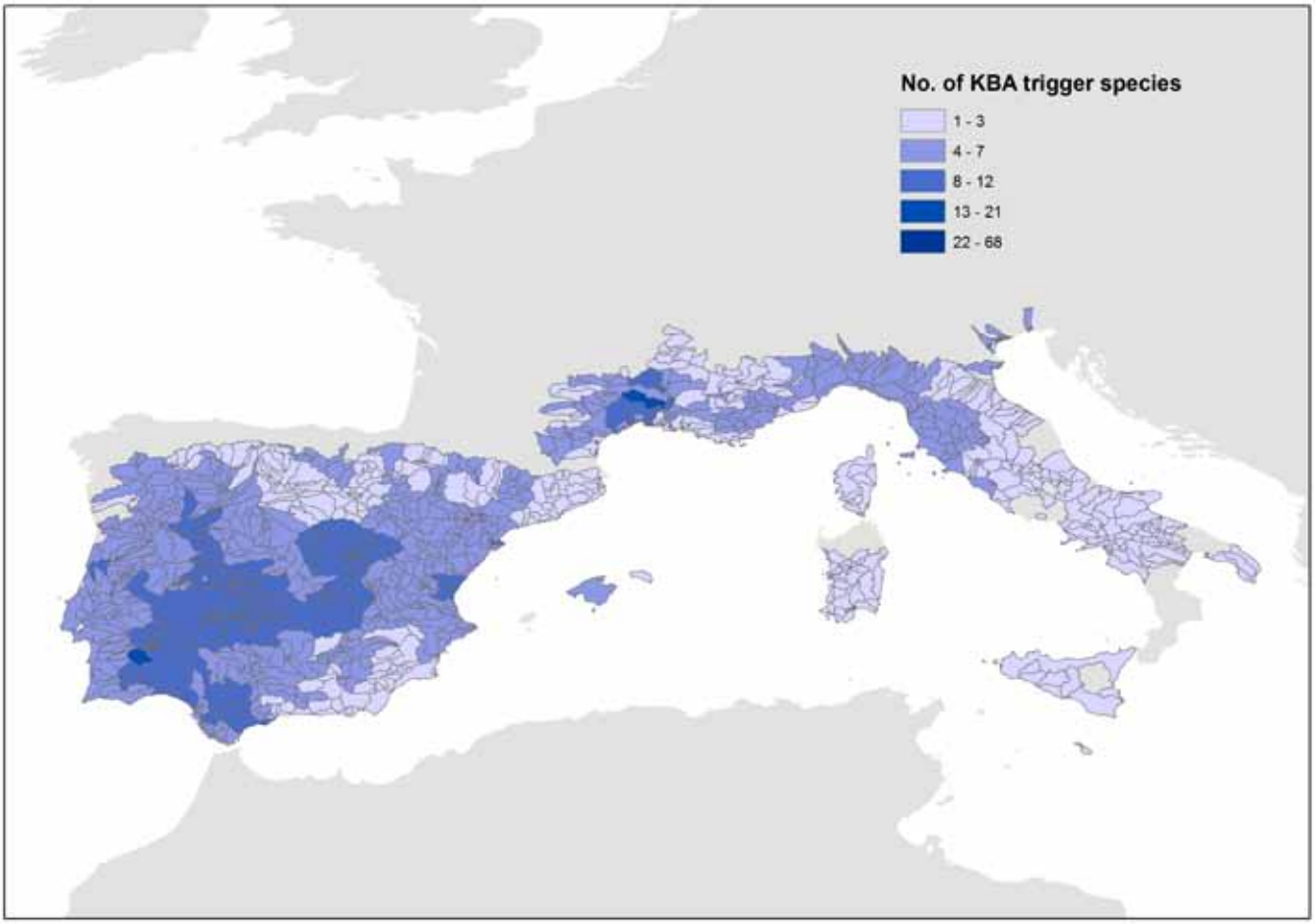


Figure 20. All <u>proposed</u> freshwater KBAs showing the number of KBA trigger species in the north-western Mediterranean sub-region.

Conclusions and recommendations

The Mediterranean basin hotspot has long been recognized as a globally important centre of biodiversity, based on criteria for the site holding at least 1,500 endemic vascular plants and suffering a 30% or greater loss of its original natural vegetation (Myers *et al.* 2000). However, the importance of the hotspot in terms of its freshwater biodiversity was previously not fully understood. This project has now confirmed the hotspot to be globally important for freshwater biodiversity. It supports exceptionally high levels of endemic and threatened freshwater species which have led to the validation of many river and lake catchments as freshwater KBAs, and AZEs. Of particular note is the large number of islands harbouring important, but poorly recognized, small wetlands hosting largely neglected threatened endemic species. WWF recently estimated there to be more than 11,000 wetlands (natural and artificial) on 140 Islands across the Mediterranean Basin (Maragou, pers. comm.).

The identification of freshwater KBAs, as presented here, is set to become one of the more important conservation actions we can take for the following reasons. KBAs have already been adopted within targets for global conventions such as the Convention on Biological Diversity (specifically, Target 11 on the expansion of the protected areas network) (IUCN & BirdLife International (2013)). Parties to these Conventions across the globe are obliged to work towards achieving the targets set. KBAs are also used by major donors, such as the Critical Ecosystem Partnership Fund (CEPF) and the MacArthur Foundation, to inform their spatial allocation of funding for biodiversity conservation. Finally, and potentially most important, KBAs are being built into the guidelines for Environmental Safeguards for many of the world's largest donors, such as the World Bank group (IFC), and private companies. Once KBAs are officially recognized it becomes the responsibility of donors and private sector parties to ensure efforts are taken to safeguard them and to avoid negatively impacting them whenever possible. The identification, delineation and validation of sites as freshwater KBAs effectively put freshwater biodiversity on the map.

In relation to the Ramsar Convention on Wetlands the criteria employed to identify freshwater KBAs are also equivalent to many of the Ramsar site selection criteria such that freshwater KBAs represent potential Ramsar sites (Figure 21). Given the ongoing efforts to expand Ramsar site designations to include more non-avian animal species (see Criterion 9) the KBAs identified here for fishes, molluscs, plants and odonates can serve well in helping to meet this objective for site network expansion throughout the Mediterranean Hotspot.

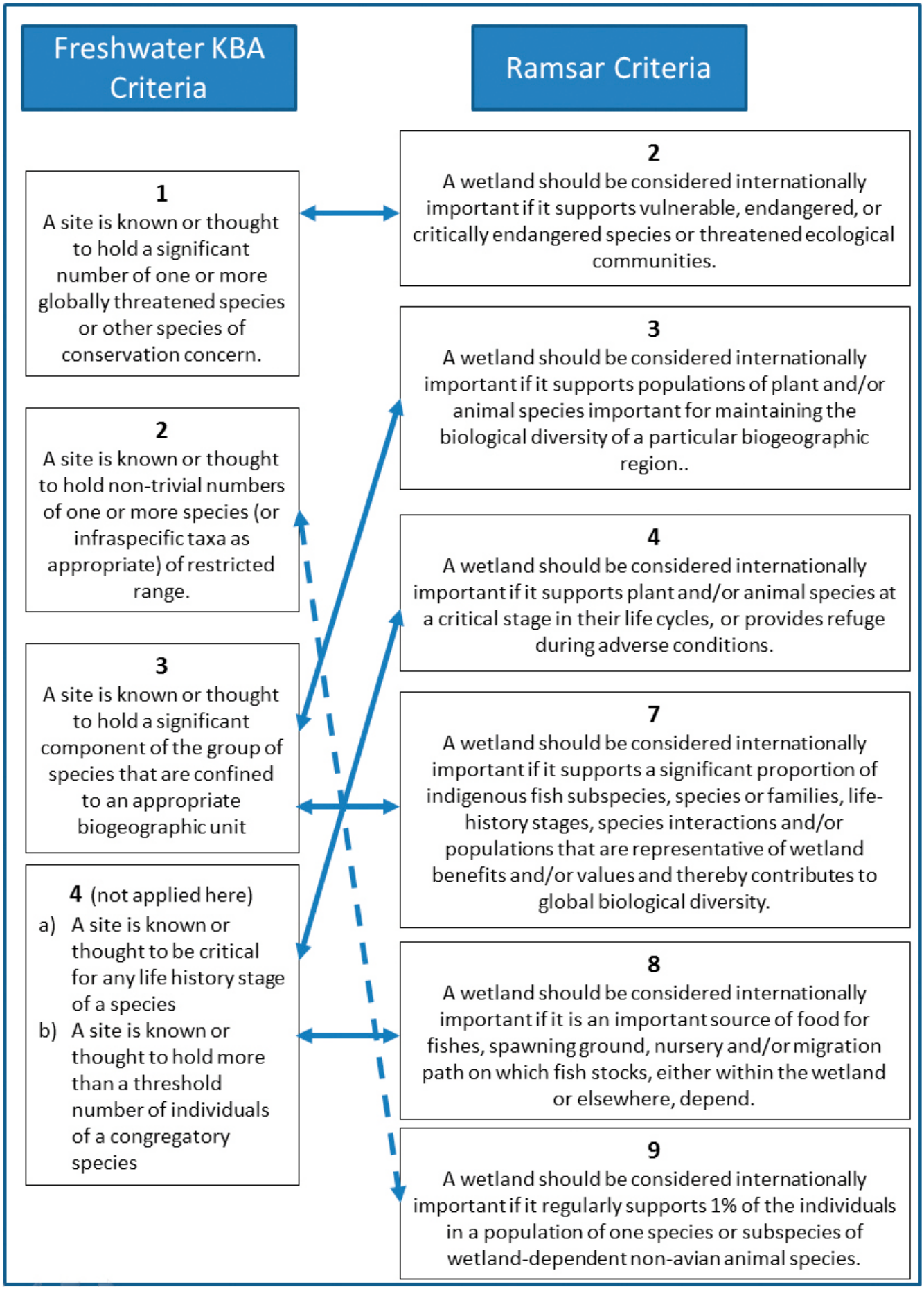
In most cases the high degree of connectivity within hydrological units (river and lake catchments) requires management at the catchment scale. Freshwater KBAs are delineated, as discussed above, primarily using catchment boundaries to encourage the wider adoption of **Integrated River Basin Management (IRBM)** throughout the hotspot. "Integrated river basin management (IRBM) is the process of coordinating conservation, management and development of water, land and related resources across sectors within a given river basin, in order to maximize the economic and social benefits derived from water resources in an equitable manner while preserving and, where necessary, restoring freshwater ecosystems." (source: http://wwf.panda.org/about_our_earth/about_freshwater/rivers/irbm/http://wwf.panda.org/about_our_earth/about_freshwater/rivers/irbm/). Unless all sectors and interested parties work together in an integrated way within a catchment the objectives of one sector will inevitably be at odds with those of another, in most cases with conservation objectives, although beneficial to other sectors, coming out as the loser.

As a key component within the IRBM approach the implementation of **Environmental Flows** (E-Flows) is also essential to future management of the freshwater KBAs of the Mediterranean hotspot. E-Flows describe the quality, quantity and timing of water flows required to sustain freshwater ecosystems and the human livelihoods that depend on them. It is therefore recommended that E-Flows be determined and implemented for freshwater KBAs. As a first priority E-Flows should be determined, where appropriate, for all freshwater AZE sites. The primary aim of E-Flows is to maintain river functions while at the same time providing for human benefits. In practice the balance most often favours human use of these ecosystems, usually at a cost to biodiversity. This unbalanced approach is not only harmful to freshwater biodiversity but also ultimately undermines the sustainable provision of services to humans.

It is very important within any conservation management strategy to incorporate basic survey and monitoring of aquatic biodiversity. Projects to promote conservation systematics and to map species distributions are important but unfortunately they are rarely seen as a scientific or management imperative. In nearly all Mediterranean countries, especially in the east and south of the basin, work towards baseline biodiveristy inventories has lagged behind. Even threatened species are often poorly mapped and supporting information is difficult to access. However, even when taxonomic uncertainties or knowledge of species distributions remain unresolved conservation efforts should not be delayed. In cases of uncertainty we should adopt an **adaptive management** approach where decisions taken can be modified and improved upon as new information emerges in response to managment actions taken. A delay in management actions while waiting for new information will often only lead to a loss or deterioration of the biodiversity we aim to conserve.

Finally, it is important for scientists and specialized conservation NGOs to continue their involvement in biodiversity inventory, monitoring and conservation science applications. Specialists must also inform the public and other

Figure 21. Cross links between freshwater KBA criteria and Ramsar site criteria.



stakeholders. Freshwater biodiversity is poorly appreciated by the public and careful communication and interpretation is valuable in increasing sensitivity to biodiversity needs. Without a clearer understanding by the public of the conservation issues within many KBAs we will lack the support needed to manage these sites effectively.

The next steps are to:

- Publish the freshwater KBAs in the World Biodiversity Database. This is the database currently managed by Birdlife International which stores, manages and publishes all data on KBAs.
- Integrate the freshwater KBAs data set in the Integrated Biodiversity Assessment Tool (IBAT). IBAT is a tool designed to facilitate access to a range of global and national data layers, such as protected area boundaries, biological information about habitats and species diversity indices, and KBAs. This might be considered as a one-stop-shop for conservationists, researchers, and the private sector. With respect to the private sector, IBAT for Business is already used to integrate biodiversity concerns into business planning and decision making.
- Circulate this report and related policy briefs to all Site Champions. It is hoped that Site Champions (see Annex V) will be encouraged to support conservation actions at freshwater KBAs and raise awareness of their existence and conservation needs, leading to actions that benefit the long-term survival of species in these sites.

KBA data availability

All the KBA data (including the KBA and focal area GIS shapefiles, and individual KBA data sheets) will be made available through a number of different online sources, including:

- Integrated Biodiversity Assessment Tool (https://www.ibat-alliance.org/ibat-conservation/login) – KBA data will be made available when the database is next updated
- World Biodiversity Database, Freshwater KBA datazone (www.birdlife.org/datazone/freshwater)
- BioFresh Data Portal to search for information on Feshwater KBAs and to submit additional data and proposed KBAs (http://data.freshwaterbiodiversity.eu/tools)
- IUCN (Global Species Programme, Freshwater Biodiversity Unit) (www.iucn.org/species/freshwater).

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Annex I. Examples of KBA data sheets

Figure 1. Example of a proposed (unvalidated) freshwater KBA factsheet. Vul = C1, Irr 1 = C2, Irr 5 = ecoregion-restricted community.

IUCN

Freshwater Key Biodiversity Areas

Back to results

2080011660

Basin ID	2080011660
Country/Territory	Albania
Central coordinates	40° 15.13' North 19° 36.54' East
Area	870.9 km^2
Basin Type	Catchment
Endorheic	No
River order	conglomerate of small coastal watershed
Altitude range	0 - 0 m
KBA qualification	confirmed
KBA criteria	Vul, Irr 1
Year of KBA criteria assessment	2014
WWF Freshwater Ecoregions	
Stakeholder review	None

No. of species triggering KBA criteria	Fish	Mollusc	Odonate	Crab	Other	All taxa
Vul: Globally threatened species	2	0	1	0	0	3
Irr1: Restricted-range species	3	1	1	0	0	5
Total distinct species	3	1	1	0	0	5

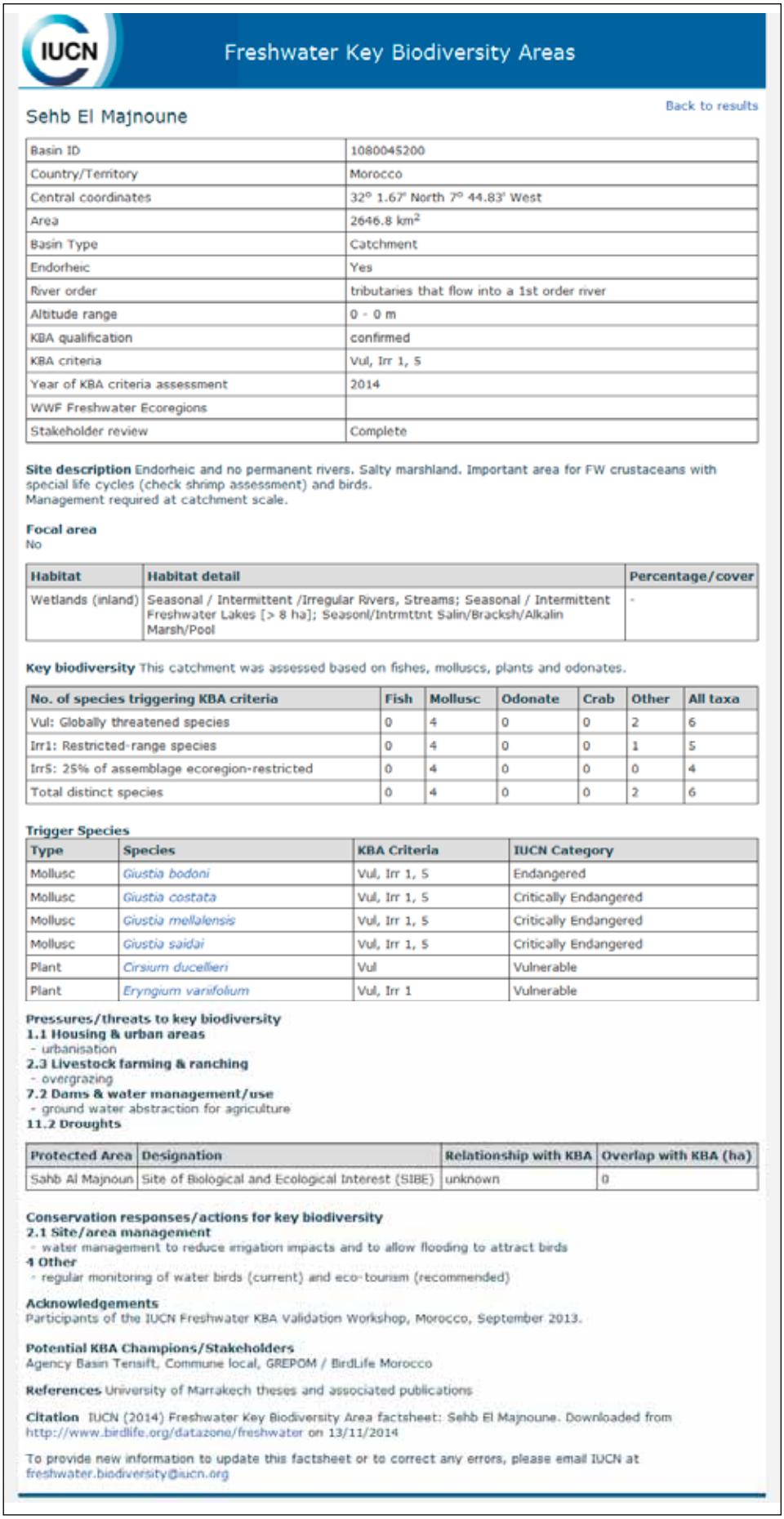
Trigger Species

Type	Species	KBA Criteria	IUCN Category
Fish	*Oxynoemacheilus pindus*	Vul, Irr 1	Vulnerable
Fish	Aoos Chub *Squalius sp. nov. 'Aoos'*	Irr 1	Near Threatened
Fish	*Valencia letourneuxi*	Vul, Irr 1	Critically Endangered
Odonate	Greek Red Damsel *Pyrrhosoma elisabethae*	Vul, Irr 1	Critically Endangered
Mollusc	*Radomaniola albanica*	Irr 1	Least Concern

Citation IUCN (2014) Freshwater Key Biodiversity Area factsheet: 2080011660. Downloaded from http://www.birdlife.org/datazone/freshwater on 13/11/2014

To provide new information to update this factsheet or to correct any errors, please email IUCN at freshwater.biodiversity@iucn.org

Figure 2. Example of a validated freshwater KBA factsheet containing site description and information on habitats, pressures and conservation actions in the KBA. Vul = C1, Irr 1 = C2, Irr 5 = ecoregion-restricted community.



IUCN

Freshwater Key Biodiversity Areas

Back to results

Sehb El Majnoune

Basin ID	1080045200
Country/Territory	Morocco
Central coordinates	32° 1.67' North 7° 44.83' West
Area	2646.8 km^2
Basin Type	Catchment
Endorheic	Yes
River order	tributaries that flow into a 1st order river
Altitude range	0 - 0 m
KBA qualification	confirmed
KBA criteria	Vul, Irr 1, 5
Year of KBA criteria assessment	2014
WWF Freshwater Ecoregions	
Stakeholder review	Complete

Site description Endorheic and no permanent rivers. Salty marshland. Important area for FW crustaceans with special life cycles (check shrimp assessment) and birds.
Management required at catchment scale.

Focal area
No

Habitat	Habitat detail	Percentage/cover
Wetlands (inland)	Seasonal / Intermittent /Irregular Rivers, Streams; Seasonal / Intermittent Freshwater Lakes [> 8 ha]; Seasonl/Intrmttnt Salin/Bracksh/Alkalin Marsh/Pool	-

Key biodiversity This catchment was assessed based on fishes, molluscs, plants and odonates.

No. of species triggering KBA criteria	Fish	Mollusc	Odonate	Crab	Other	All taxa
Vul: Globally threatened species	0	4	0	0	2	6
Irr1: Restricted-range species	0	4	0	0	1	5
Irr5: 25% of assemblage ecoregion-restricted	0	4	0	0	0	4
Total distinct species	0	4	0	0	2	6

Trigger Species

Type	Species	KBA Criteria	IUCN Category
Mollusc	*Giustia bodoni*	Vul, Irr 1, 5	Endangered
Mollusc	*Giustia costata*	Vul, Irr 1, 5	Critically Endangered
Mollusc	*Giustia mellalensis*	Vul, Irr 1, 5	Critically Endangered
Mollusc	*Giustia saidai*	Vul, Irr 1, 5	Critically Endangered
Plant	*Cirsium ducellieri*	Vul	Vulnerable
Plant	*Eryngium variifolium*	Vul, Irr 1	Vulnerable

Pressures/threats to key biodiversity
1.1 Housing & urban areas
- urbanisation
2.3 Livestock farming & ranching
- overgrazing
7.2 Dams & water management/use
- ground water abstraction for agriculture
11.2 Droughts

Protected Area	Designation	Relationship with KBA	Overlap with KBA (ha)
Sahb Al Majnoun	Site of Biological and Ecological Interest (SIBE)	unknown	0

Conservation responses/actions for key biodiversity
2.1 Site/area management
- water management to reduce irrigation impacts and to allow flooding to attract birds
4 Other
- regular monitoring of water birds (current) and eco-tourism (recommended)

Acknowledgements
Participants of the IUCN Freshwater KBA Validation Workshop, Morocco, September 2013.

Potential KBA Champions/Stakeholders
Agency Basin Tensift, Commune local, GREPOM / BirdLife Morocco

References University of Marrakech theses and associated publications

Citation IUCN (2014) Freshwater Key Biodiversity Area factsheet: Sehb El Majnoune. Downloaded from http://www.birdlife.org/datazone/freshwater on 13/11/2014

To provide new information to update this factsheet or to correct any errors, please email IUCN at freshwater.biodiversity@iucn.org

Annex II. Workshop Participants

KBA delineation and validation – Balkans

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* Participant joined the meeting remotely

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Annex III. Eastern Mediterranean broader extent

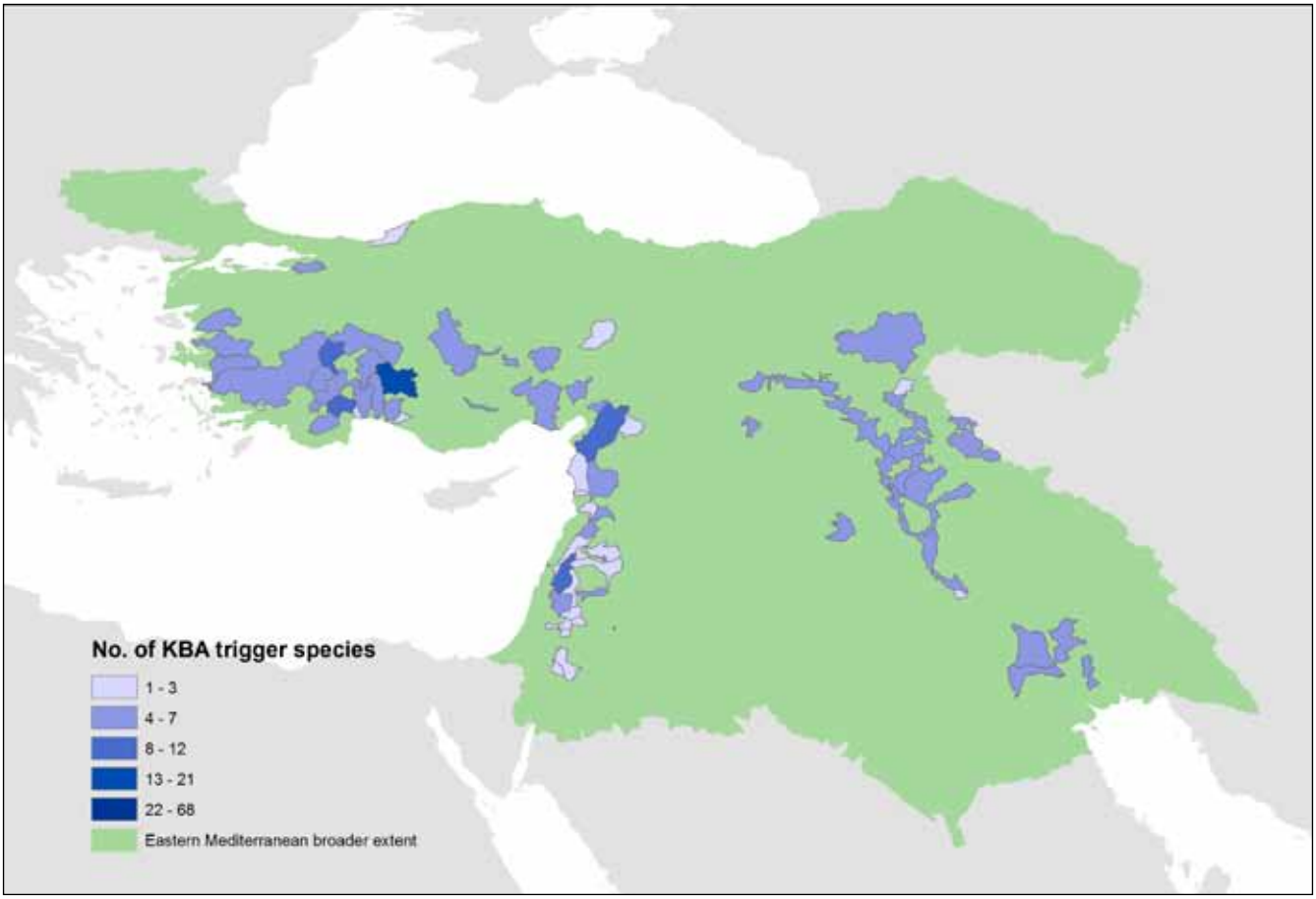
Here we present our analyses of freshwater KBAs in that part of the eastern Mediterranean region extending beyond the boundaries of the CEPF Mediterranean Basin Hotspot.

The validated freshwater KBAs are mostly found within three regions. Central Anatolia of Turkey, Lake Van catchment in eastern Anatolia and the middle and lower Euphrates and Tigris catchments in Syria and Iraq (and Iran) (Figure 1).

In the part of Central Anatolia outside of the Mediterranean Basin Hotspot boundary, there are four KBAs. **Tuz Golu Basin KBA** contains Turkey's second largest lake (Lake Tuz) which is extremely saline and almost completely dries up during the summer. It is fed by springs, rivers and groundwater (BirdLife International 2014). There is one fish species endemic to the KBA, the Cihanbeyli Gudgeon (*Gobio insuyanus*) which is Critically Endangered and only known from the Insuyu (Cihanbeyli) spring and stream (the Focal Area within the KBA) and is threatened by excessive water abstraction, water flow regulation and pollution. This species also qualifies the site as an AZE. **Melendiz Stream KBA** is a small river in a canyon impacted by water abstraction and a dam which leaves the lower stretch dry in summer (Freyhof 2014a). The KBA qualifies as an AZE site for two Critically Endangered endemic fish species which now only occur above the dam, the Cappadocian Chub (*Squalius cappadocicus*) and the Cappadocian Gudgeon (*Gobio gymnostethus*). The **Upper Zamanti KBA** is a headwater stream in the very upper reaches of the Seyhan River and qualifies as an AZE site for two fishes; the Critically Endangered Samanti Loach (*Oxynoemacheilus seyhanensis*) which is found in the main stem of the stream, and the Endangered Flathead Trout (*Salmo platycephalus*) which is found in the mountain tributaries. The Flathead Trout is threatened by illegal fishing and the introduced rainbow trout (*Oncorhynchus mykiss*), whereas the Samanti Loach is impacted by local pollution and water abstraction, and also possibly by introduced fish species (Crivelli 2006; Freyhof 2014b).

In eastern Anatolia, the only validated KBA outside the Hotspot (and not part of the Euphrates/Tigris system) is the **Lake Van Catchment KBA**. Five fish species are endemic to this KBA, two of which are highly threatened qualifying the KBA as an AZE site. The Critically Endangered Karasu Sha Kuli (*Alburnus timarensis*) is endemic to one inflowing stream (the Karasu) to Lake Van which is affected by the construction of a dam (for irrigation and flood control) and moderate levels of domestic pollution (Freyhof 2014c). The

Figure 1. All validated KBAs showing the number of KBA trigger species in the eastern Mediterranean broader context.



The Insuyu springs are one of the Focal Areas within the Tuz Golu Basin KBA. The Critically Endangered Cihanbeyli Gudgeon (*Gobio insuyanus*) is known only from these springs and the associated stream. As is the case throughout much of the region this site is threatened by the over-abstraction of water, flow regulation, and pollution. © Jörg Freyhof

Van Loach (*Oxynoemacheilus ercisianus*) is Endangered and currently only known from three streams flowing into the lake. It has lost a significant portion of its range due to the construction of dams (Freyhof 2014d).

In the Euphrates and Tigris system there are an additional 10 KBAs. Starting from the delta they include the **Lower Karun KBA** in Iran (a combination of wetlands, river and marshes) with seven trigger species including the Critically Endangered Leopard Barbel (*Luciobarbus subquincunciatus*). Three KBAs cover the marshlands of southern Iraq and Iran the **(East and West) Hamar Marshes KBA, Central Marshes KBA** and the **Al Hawizah Marshes KBA** which are triggered by four fish species including the Vulnerable Shabout (*Barbus grypus*) and the endemic (DD) snail *Gyraulus huwaizahensis*. Five KBAs for tributaries to the Tigris River in Iraq are largely triggered by widespread but declining large fish species such as the Vulnerable Pike Barbel (*Luciobarbus esocinus*), they are the **Dalmaj KBA, Sirvan – Shirvan – Dyala KBA, Lower Little Zab KBA, Upper Little Zab KBA,** and **Great Zab KBA.** The only KBA within the Euphrates catchment outside the Hotspot is the **Haditha Karst and Euphrates River KBA** which is triggered by the declining large fish species seen in the Tigris KBAs. This KBA also qualifies as an AZE site (Haditha Karst System) for two Critically Endangered cave fishes, the Haditha Cavefish (*Caecocypris basimi*) and Haditha Cave Garra (*Typhlogarra widdowsoni*) which are threatened by water abstraction and the lowering of groundwater levels due to hydrological modifications caused by the construction of a large dam close by on the Euphrates (Freyhof 2014e,f).

Two additional KBAs fall outside of the three areas described above: i) the **Black Sea Eregli and Duzce KBA**, which is a coastal spring, stream and cave system near the Black Sea coast, and; ii) **Azraq Wetlands KBA** in northern Jordan. The **Black Sea Eregli and Duzce KBA** also qualifies as an AZE site for two species: the Critically Endangered Bithynian Spined Loach (*Cobitis splendens*) which is endemic to only one small polluted stream in the KBA, and the Critically Endangered (Possibly Extinct) gastropod *Belgrandiella cavernica* which is endemic to the Hercules cave system, which is impacted by tourism, and has not been recorded in 60 years (Freyhof 2014g; Kebapçı & Seddon 2014). The **Azraq Wetlands KBA** site is triggered by only one fish species, the endemic and Critically Endangered Azraq Toothcarp (*Aphanius sirhani*). The wetlands were totally dried out (due to excessive water abstraction) in 1992 but have since been restored to 8% of their former area. However, the wetlands are now totally reliant on an artificial water supply as continued water abstraction has decreased the water table drying out the springs. The Azraq Toothcarp was taken into captive breeding and has been successfully re-introduced into the restored wetlands (Freyhof & Harrison 2014).

Post Script: The Iraqi Ministry of Environment and Nature Iraq have just published a report on the Key Biodiversity Areas of Iraq (Iraqi Ministry of Environment and Nature Iraq 2014). As would be expected, a number of KBAs they list overlap with those freshwater KBAs identified through our own study. Other sites identified here are additional to those listed through the Iraqi study. The information presented in our report will therefore be made available to the parties involved in the Iraqi study so that any new freshwater KBAs are included, KBA site boundaries may be harmonized for overlapping sites identified through these two processes, and priorities for action identified through each be duly noted.

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Annex IV. KBA trigger species

Table A. Balkans validated trigger species. C1 (Threatened species: CR Critically Endangered, EN Endangered, VU Vulnerable); C2 (Restricted Range); C3 (Biome-restricted community). * AZE sites. NA: not applicable.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
Balkans	Acheron*	*Knipowitschia milleri*	Fishes	CR	yes	NA
Balkans		*Pelasgus thesproticus*	Fishes	NA	yes	NA
Balkans		*Squalius pamvoticus*	Fishes	NA	yes	NA
Balkans		*Valencia letourneuxi*	Fishes	CR	yes	NA
Balkans	Aggitis*	*Alburnus sp. nov. 'Volvi'*	Fishes	NA	yes	NA
Balkans		*Cobitis punctilineata*	Fishes	VU	yes	NA
Balkans		*Eudontomyzon hellenicus*	Fishes	CR	yes	NA
Balkans		*Phoxinus strymonicus*	Fishes	EN	yes	NA
Balkans		*Turcorientalia hohenackeri*	Molluscs	VU	yes	NA
Balkans	Aliakmon Naoussa*	*Paladilhiopsis neaaugustensis*	Molluscs	CR	yes	NA
Balkans	Andros Tinos	*Pseudamnicola macrostoma*	Molluscs	NA	yes	NA
Balkans	Arachthos	*Cobitis arachthosensis*	Fishes	EN	yes	NA
Balkans		*Economidichthys pygmaeus*	Fishes	NA	yes	NA
Balkans		*Pelasgus thesproticus*	Fishes	NA	yes	NA
Balkans		*Squalius pamvoticus*	Fishes	NA	yes	NA
Balkans		*Valencia letourneuxi*	Fishes	CR	yes	NA
Balkans	Arkadia Plateau	*Pelasgus stymphalicus*	Fishes	NA	yes	NA
Balkans		*Squalius moreoticus*	Fishes	EN	yes	NA
Balkans		*Squalius peloponnensis*	Fishes	NA	yes	NA
Balkans		*Pseudamnicola exilis*	Molluscs	NA	yes	NA
Balkans		*Pyrrhosoma elisabethae*	Odonata	CR	yes	NA
Balkans	Butrint	*Pelasgus thesproticus*	Fishes	NA	yes	NA
Balkans		*Valencia letourneuxi*	Fishes	CR	yes	NA
Balkans		*Radomaniola albanica*	Molluscs	NA	yes	NA
Balkans		*Pyrrhosoma elisabethae*	Odonata	CR	yes	NA
Balkans	Catchment surrounding Niksic*	*Salmo obtusirostris*	Fishes	EN	NA	NA
Balkans		*Plagigeyeria gladilini*	Molluscs	VU	NA	NA
Balkans		*Plagigeyeria zetaprotogona*	Molluscs	EN	yes	NA
Balkans		*Saxurinator orthodoxus*	Molluscs	CR	yes	NA
Balkans		*Pilularia minuta*	Plants	EN	NA	NA
Balkans	Cetina river	*Aulopyge huegelii*	Fishes	EN	yes	NA
Balkans		*Cobitis dalmatina*	Fishes	VU	yes	NA
Balkans		*Chondrostoma phoxinus*	Fishes	EN	yes	NA
Balkans		*Phoxinellus alepidotus*	Fishes	EN	yes	NA
Balkans		*Salmo obtusirostris*	Fishes	EN	NA	NA
Balkans		*Scardinius dergle*	Fishes	NA	yes	NA
Balkans		*Squalius illyricus*	Fishes	NA	yes	NA
Balkans		*Squalius tenellus*	Fishes	EN	yes	NA
Balkans		*Bithynia cettinensis*	Molluscs	VU	yes	NA
Balkans		*Congeria kusceri*	Molluscs	VU	NA	NA
Balkans		*Hauffenia jadertina*	Molluscs	EN	yes	NA
Balkans		*Horatia klecakiana*	Molluscs	NA	yes	NA

Table A cont'd. Balkans validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
Balkans		*Lanzaia elephantotus*	Molluscs	NA	yes	NA
Balkans		*Lanzaia kotlusae*	Molluscs	VU	yes	NA
Balkans		*Damasonium polyspermum*	Plants	VU	NA	NA
Balkans	Corfu Island (Kerkyra)	*Knipowitschia goerneri*	Fishes	NA	yes	NA
Balkans		*Pelasgus thesproticus*	Fishes	NA	yes	NA
Balkans		*Iglica sidariensis*	Molluscs	VU	yes	NA
Balkans		*Pseudamnicola macrostoma*	Molluscs	NA	yes	NA
Balkans		*Ceriagrion georgifreyi*	Odonata	VU	NA	NA
Balkans		*Pyrrhosoma elisabethae*	Odonata	CR	yes	NA
Balkans	Crete Central South	*Bithynia candiota*	Molluscs	NA	yes	NA
Balkans		*Bythinella cretensis*	Molluscs	NA	yes	NA
Balkans		*Boyeria cretensis*	Odonata	EN	yes	NA
Balkans		*Coenagrion intermedium*	Odonata	VU	yes	NA
Balkans		*Carex troodi*	Plants	NA	yes	NA
Balkans	Crete Eastern	*Bithynia candiota*	Molluscs	NA	yes	NA
Balkans		*Bythinella cretensis*	Molluscs	NA	yes	NA
Balkans		*Boyeria cretensis*	Odonata	EN	yes	NA
Balkans		*Coenagrion intermedium*	Odonata	VU	yes	NA
Balkans		*Carex troodi*	Plants	NA	yes	NA
Balkans	Crete North-west	*Bithynia candiota*	Molluscs	NA	yes	NA
Balkans		*Bythinella cretensis*	Molluscs	NA	yes	NA
Balkans		*Boyeria cretensis*	Odonata	EN	yes	NA
Balkans		*Coenagrion intermedium*	Odonata	VU	yes	NA
Balkans		*Carex cretica*	Plants	NA	yes	NA
Balkans		*Carex troodi*	Plants	NA	yes	NA
Balkans	Crete South-west*	*Bythinella cretensis*	Molluscs	NA	yes	NA
Balkans		*Boyeria cretensis*	Odonata	EN	yes	NA
Balkans		*Coenagrion intermedium*	Odonata	VU	yes	NA
Balkans		*Callitriche pulchra*	Plants	CR	NA	NA
Balkans		*Carex cretica*	Plants	NA	yes	NA
Balkans		*Carex troodi*	Plants	NA	yes	NA
Balkans	Chios	*Pseudamnicola chia*	Molluscs	VU	yes	NA
Balkans	Doirani*	*Alburnus macedonicus*	Fishes	CR	yes	NA
Balkans		*Dreissena presbensis*	Molluscs	NA	yes	NA
Balkans	Dragonija drainage in Slovenia and Croatia, Reka River in Slovenia and Timavo spring, north of Trieste in Italy	*Cottus scaturigo*	Fishes	VU	yes	NA
Balkans		*Chondrostoma soetta*	Fishes	EN	NA	NA
Balkans		*Romanogobio benacensis*	Fishes	EN	NA	NA
Balkans		*Squalius janae*	Fishes	VU	yes	NA
Balkans		*Acroloxus tetensi*	Molluscs	VU	yes	NA
Balkans		*Belgrandiella crucis*	Molluscs	VU	yes	NA
Balkans		*Belgrandiella schleschi*	Molluscs	VU	yes	NA
Balkans		*Belgrandiella superior*	Molluscs	VU	yes	NA
Balkans		*Iglica forumjuliana*	Molluscs	NA	yes	NA
Balkans		*Iglica giustii*	Molluscs	NA	yes	NA

Table A cont'd. Balkans validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
Balkans		*Iglica hauffeni*	Molluscs	NA	yes	NA
Balkans		*Iglica tellinii*	Molluscs	VU	yes	NA
Balkans		*Istriana mirnae*	Molluscs	NA	yes	NA
Balkans		*Microcondylaea bonellii*	Molluscs	VU	NA	NA
Balkans		*Phreatica bolei*	Molluscs	NA	yes	NA
Balkans		*Plagigeyeria stochi*	Molluscs	VU	yes	NA
Balkans		*Vinodolia fiumana*	Molluscs	EN	yes	NA
Balkans		*Vinodolia fluviatilis*	Molluscs	EN	NA	NA
Balkans		*Damasonium polyspermum*	Plants	VU	NA	NA
Balkans	Eastern Attica	*Pelasgus marathonicus*	Fishes	NA	yes	NA
Balkans	Euboea Manikiatis*	*Barbus euboicus*	Fishes	CR	yes	NA
Balkans		*Squalius sp. nov. 'Evia'*	Fishes	CR	yes	NA
Balkans		*Clameia brooki*	Molluscs	NA	yes	NA
Balkans	Evrotas	*Pelasgus laconicus*	Fishes	CR	yes	NA
Balkans		*Squalius keadicus*	Fishes	EN	yes	NA
Balkans		*Tropidophoxinellus spartiaticus*	Fishes	VU	yes	NA
Balkans		*Pseudamnicola exilis*	Molluscs	NA	yes	NA
Balkans	Evrotas - Arniotikos	*Pseudamnicola exilis*	Molluscs	NA	yes	NA
Balkans	Evrotas - Gytheio	*Squalius keadicus*	Fishes	EN	yes	NA
Balkans		*Tropidophoxinellus spartiaticus*	Fishes	VU	yes	NA
Balkans		*Pseudamnicola exilis*	Molluscs	NA	yes	NA
Balkans	Ismaris-Vosvozis-Filiouris	*Anguilla anguilla*	Fishes	CR	NA	NA
Balkans		*Cyprinus carpio*	Fishes	VU	NA	NA
Balkans		*Unio crassus*	Molluscs	EN	NA	NA
Balkans	Kalamas	*Economidichthys pygmaeus*	Fishes	NA	yes	NA
Balkans		*Pelasgus thesproticus*	Fishes	NA	yes	NA
Balkans		*Squalius pamvoticus*	Fishes	NA	yes	NA
Balkans		*Valencia letourneuxi*	Fishes	CR	yes	NA
Balkans		*Pyrrhosoma elisabethae*	Odonata	CR	yes	NA
Balkans	Karla*	*Barbus sperchiensis*	Fishes	NA	yes	NA
Balkans		*Cobitis stephanidisi*	Fishes	CR	yes	NA
Balkans		*Knipowitschia thessala*	Fishes	EN	yes	NA
Balkans		*Daphniola exigua*	Molluscs	EN	yes	NA
Balkans	Karpathos	*Pseudamnicola pieperi*	Molluscs	VU	yes	NA
Balkans	Kastoria	*Salmo pelagonicus*	Fishes	VU	yes	NA
Balkans		*Bithynia kastorias*	Molluscs	CR	yes	NA
Balkans	Kastraki	*Cobitis trichonica*	Fishes	EN	yes	NA
Balkans		*Economidichthys pygmaeus*	Fishes	NA	yes	NA
Balkans		*Pelasgus stymphalicus*	Fishes	NA	yes	NA
Balkans		*Scardinius acarnanicus*	Fishes	NA	yes	NA
Balkans		*Silurus aristotelis*	Fishes	NA	yes	NA
Balkans		*Tropidophoxinellus hellenicus*	Fishes	NA	yes	NA
Balkans		*Belgrandiella haesitans*	Molluscs	NA	yes	NA
Balkans		*Dianella thiesseana*	Molluscs	CR	yes	NA
Balkans		*Dreissena blanci*	Molluscs	VU	yes	NA
Balkans		*Islamia trichoniana*	Molluscs	CR	yes	NA

Table A cont'd. Balkans validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
Balkans		*Pseudobithynia falniowskii*	Molluscs	CR	yes	NA
Balkans		*Pseudobithynia panetolis*	Molluscs	CR	yes	NA
Balkans		*Pseudobithynia trichonis*	Molluscs	EN	yes	NA
Balkans		*Pseudoislamia balcanica*	Molluscs	CR	yes	NA
Balkans		*Valvata klemmi*	Molluscs	EN	yes	NA
Balkans	Kephalonia and Ithaki	*Fissuria raehlei*	Molluscs	NA	yes	NA
Balkans	Kerkini	*Alburnus sp. nov. 'Volvi'*	Fishes	NA	yes	NA
Balkans	Krka drainage	*Aulopyge huegelii*	Fishes	EN	yes	NA
Balkans		*Knipowitschia mrakovcici*	Fishes	CR	yes	NA
Balkans		*Phoxinellus dalmaticus*	Fishes	CR	yes	NA
Balkans		*Salmo obtusirostris*	Fishes	EN	NA	NA
Balkans		*Scardinius dergle*	Fishes	NA	yes	NA
Balkans		*Squalius illyricus*	Fishes	NA	yes	NA
Balkans		*Squalius zrmanjae*	Fishes	NA	yes	NA
Balkans		*Telestes turskyi*	Fishes	CR	yes	NA
Balkans		*Congeria kusceri*	Molluscs	VU	NA	NA
Balkans		*Dalmatella sketi*	Molluscs	CR	yes	NA
Balkans		*Hadziella sketi*	Molluscs	VU	yes	NA
Balkans		*Lanzaia skradinensis*	Molluscs	CR	yes	NA
Balkans		*Pseudobithynia kirka*	Molluscs	VU	yes	NA
Balkans		*Damasonium polyspermum*	Plants	VU	NA	NA
Balkans	Ladon	*Pelasgus stymphalicus*	Fishes	NA	yes	NA
Balkans		*Squalius peloponnensis*	Fishes	NA	yes	NA
Balkans		*Hauffenia edlingeri*	Molluscs	CR	yes	NA
Balkans		*Pyrrhosoma elisabethae*	Odonata	CR	yes	NA
Balkans	Lake Bilecko	*Cobitis narentana*	Fishes	VU	yes	NA
Balkans		*Delminichthys ghetaldii*	Fishes	VU	yes	NA
Balkans		*Squalius svallize*	Fishes	CR	yes	NA
Balkans		*Antibaria notata*	Molluscs	NA	yes	NA
Balkans		*Belgrandia torifera*	Molluscs	VU	yes	NA
Balkans		*Congeria kusceri*	Molluscs	VU	NA	NA
Balkans		*Emmericia expansilabris*	Molluscs	VU	yes	NA
Balkans		*Emmericia ventricosa*	Molluscs	VU	yes	NA
Balkans		*Iglica absoloni*	Molluscs	NA	yes	NA
Balkans		*Iglica bagliviaeformis*	Molluscs	EN	NA	NA
Balkans		*Lanzaia vjetrenicae*	Molluscs	VU	yes	NA
Balkans		*Narentiana vjetrenicae*	Molluscs	EN	yes	NA
Balkans		*Paladilhiopsis pretneri*	Molluscs	NA	yes	NA
Balkans		*Paladilhiopsis solida*	Molluscs	NA	yes	NA
Balkans		*Plagigeyeria gladilini*	Molluscs	VU	NA	NA
Balkans		*Plagigeyeria tribunicae*	Molluscs	VU	yes	NA
Balkans		*Saxurinator brandti*	Molluscs	VU	NA	NA
Balkans		*Saxurinator labiatus*	Molluscs	CR	yes	NA
Balkans		*Saxurinator montenegrinus*	Molluscs	EN	yes	NA
Balkans		*Vinodolia fluviatilis*	Molluscs	EN	NA	NA
Balkans		*Vinodolia hadouphylax*	Molluscs	CR	yes	NA

Table A cont'd. Balkans validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
Balkans	Lake Busko	*Aulopyge huegelii*	Fishes	EN	yes	NA
Balkans		*Cobitis dalmatina*	Fishes	VU	yes	NA
Balkans		*Chondrostoma phoxinus*	Fishes	EN	yes	NA
Balkans		*Delminichthys adspersus*	Fishes	VU	yes	NA
Balkans		*Delminichthys ghetaldii*	Fishes	VU	yes	NA
Balkans		*Phoxinellus alepidotus*	Fishes	EN	yes	NA
Balkans		*Rutilus basak*	Fishes	NA	yes	NA
Balkans		*Salmo obtusirostris*	Fishes	EN	NA	NA
Balkans		*Scardinius dergle*	Fishes	NA	yes	NA
Balkans		*Scardinius plotizza*	Fishes	NA	yes	NA
Balkans		*Squalius illyricus*	Fishes	NA	yes	NA
Balkans		*Squalius tenellus*	Fishes	EN	yes	NA
Balkans		*Antibaria notata*	Molluscs	NA	yes	NA
Balkans		*Belgrandia torifera*	Molluscs	VU	yes	NA
Balkans		*Congeria kusceri*	Molluscs	VU	NA	NA
Balkans		*Emmericia expansilabris*	Molluscs	VU	yes	NA
Balkans		*Emmericia ventricosa*	Molluscs	VU	yes	NA
Balkans		*Iglica absoloni*	Molluscs	NA	yes	NA
Balkans		*Iglica bagliviaeformis*	Molluscs	EN	NA	NA
Balkans		*Lanzaia kotlusae*	Molluscs	VU	yes	NA
Balkans		*Paladilhiopsis pretneri*	Molluscs	NA	yes	NA
Balkans		*Plagigeyeria gladilini*	Molluscs	VU	NA	NA
Balkans		*Saxurinator brandti*	Molluscs	VU	NA	NA
Balkans		*Saxurinator labiatus*	Molluscs	CR	yes	NA
Balkans		*Saxurinator montenegrinus*	Molluscs	EN	yes	NA
Balkans		*Vinodolia fluviatilis*	Molluscs	EN	NA	NA
Balkans		*Damasonium polyspermum*	Plants	VU	NA	NA
Balkans	Lake Kastrakiou	*Cobitis trichonica*	Fishes	EN	yes	NA
Balkans		*Economidichthys pygmaeus*	Fishes	NA	yes	NA
Balkans		*Pelasgus stymphalicus*	Fishes	NA	yes	NA
Balkans		*Rutilus panosi*	Fishes	VU	yes	NA
Balkans		*Scardinius acarnanicus*	Fishes	NA	yes	NA
Balkans		*Silurus aristotelis*	Fishes	NA	yes	NA
Balkans		*Tropidophoxinellus hellenicus*	Fishes	NA	yes	NA
Balkans		*Belgrandiella haesitans*	Molluscs	NA	yes	NA
Balkans		*Dianella thiesseana*	Molluscs	CR	yes	NA
Balkans		*Dreissena blanci*	Molluscs	VU	yes	NA
Balkans		*Islamia trichoniana*	Molluscs	CR	yes	NA
Balkans		*Pseudobithynia falniowskii*	Molluscs	CR	yes	NA
Balkans		*Pseudobithynia panetolis*	Molluscs	CR	yes	NA
Balkans		*Pseudobithynia trichonis*	Molluscs	EN	yes	NA
Balkans		*Pseudoislamia balcanica*	Molluscs	CR	yes	NA
Balkans		*Valvata klemmi*	Molluscs	EN	yes	NA
Balkans	Lake Ohrid*	*Alburnoides ohridanus*	Fishes	VU	yes	yes
Balkans		*Alburnus scoranza*	Fishes	NA	yes	NA
Balkans		*Barbatula sturanyi*	Fishes	NA	yes	NA

Table A cont'd. Balkans validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
Balkans		*Barbus rebeli*	Fishes	NA	yes	NA
Balkans		*Gobio ohridanus*	Fishes	VU	yes	yes
Balkans		*Pelasgus minutus*	Fishes	NA	yes	NA
Balkans		*Rutilus karamani*	Fishes	NA	yes	NA
Balkans		*Rutilus ohridanus*	Fishes	NA	yes	NA
Balkans		*Salmo aphelios*	Fishes	NA	yes	yes
Balkans		*Salmo balcanicus*	Fishes	NA	yes	yes
Balkans		*Salmo letnica*	Fishes	NA	yes	yes
Balkans		*Salmo lumi*	Fishes	NA	yes	yes
Balkans		*Salmo ohridanus*	Fishes	VU	yes	yes
Balkans		*Scardinius knezevici*	Fishes	NA	yes	yes
Balkans		*Acroloxus improvisus*	Molluscs	VU	yes	yes
Balkans		*Acroloxus macedonicus*	Molluscs	CR	yes	yes
Balkans		*Ancylus lapicidus*	Molluscs	EN	yes	yes
Balkans		*Ancylus scalariformis*	Molluscs	VU	yes	yes
Balkans		*Ancylus tapirulus*	Molluscs	EN	yes	yes
Balkans		*Chilopyrgula sturanyi*	Molluscs	NA	yes	yes
Balkans		*Dreissena presbensis*	Molluscs	NA	yes	NA
Balkans		*Ginaia munda*	Molluscs	VU	yes	yes
Balkans		*Gocea ohridana*	Molluscs	CR	yes	yes
Balkans		*Gyraulus albidus*	Molluscs	VU	yes	yes
Balkans		*Gyraulus crenophilus*	Molluscs	EN	yes	yes
Balkans		*Gyraulus fontinalis*	Molluscs	EN	yes	yes
Balkans		*Gyraulus lychnidicus*	Molluscs	NA	yes	yes
Balkans		*Gyraulus trapezoides*	Molluscs	EN	yes	yes
Balkans		*Lyhnidia gjorgjevici*	Molluscs	EN	yes	yes
Balkans		*Lyhnidia hadzii*	Molluscs	CR	yes	yes
Balkans		*Lyhnidia karamani*	Molluscs	CR	yes	yes
Balkans		*Lyhnidia stankovici*	Molluscs	CR	yes	yes
Balkans		*Lyhnidia sublitoralis*	Molluscs	NA	yes	yes
Balkans		*Micropyrgula stankovici*	Molluscs	VU	yes	yes
Balkans		*Neofossarulus stankovici*	Molluscs	VU	yes	yes
Balkans		*Ochridopyrgula macedonica*	Molluscs	NA	yes	yes
Balkans		*Ohridohauffenia depressa*	Molluscs	EN	yes	yes
Balkans		*Ohridohauffenia rotonda*	Molluscs	EN	yes	yes
Balkans		*Ohridohauffenia sanctinaumi*	Molluscs	EN	yes	yes
Balkans		*Ohridohauffenia sublitoralis*	Molluscs	NA	yes	yes
Balkans		*Ohridohoratia carinata*	Molluscs	EN	yes	yes
Balkans		*Ohridohoratia polinskii*	Molluscs	VU	yes	yes
Balkans		*Ohridohoratia pygmaea*	Molluscs	NA	yes	yes
Balkans		*Ohridohoratia sturanyi*	Molluscs	NA	yes	yes
Balkans		*Ohrigocea karevi*	Molluscs	EN	yes	yes
Balkans		*Ohrigocea miladinovorum*	Molluscs	EN	yes	yes
Balkans		*Ohrigocea ornata*	Molluscs	EN	yes	yes
Balkans		*Ohrigocea samuili*	Molluscs	EN	yes	yes
Balkans		*Ohrigocea stankovici*	Molluscs	EN	yes	yes

Table A cont'd. Balkans validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
Balkans		*Pisidium edlaueri*	Molluscs	EN	yes	yes
Balkans		*Planorbis macedonicus*	Molluscs	EN	yes	yes
Balkans		*Pseudohoratia brusinae*	Molluscs	VU	yes	yes
Balkans		*Pseudohoratia lacustris*	Molluscs	VU	yes	yes
Balkans		*Pseudohoratia ochridana*	Molluscs	VU	yes	yes
Balkans		*Pyrgohydrobia grochmalickii*	Molluscs	VU	yes	yes
Balkans		*Pyrgohydrobia jablanicensis*	Molluscs	CR	yes	yes
Balkans		*Pyrgohydrobia sanctinaumi*	Molluscs	VU	yes	yes
Balkans		*Radix relicta*	Molluscs	NA	yes	yes
Balkans		*Stankovicia baicaliiformis*	Molluscs	CR	yes	yes
Balkans		*Stankovicia pavlovici*	Molluscs	VU	yes	yes
Balkans		*Stankovicia wagneri*	Molluscs	VU	yes	yes
Balkans		*Trachyochridia filocincta*	Molluscs	CR	yes	yes
Balkans		*Valvata hirsutecostata*	Molluscs	VU	yes	yes
Balkans		*Valvata relicta*	Molluscs	VU	yes	yes
Balkans		*Valvata rhabdota*	Molluscs	NA	yes	yes
Balkans		*Valvata stenotrema*	Molluscs	NA	yes	yes
Balkans		*Xestopyrgula dybowskii*	Molluscs	VU	yes	yes
Balkans		*Zaumia kusceri*	Molluscs	CR	yes	yes
Balkans	Lake Skadar*	*Alburnus scoranza*	Fishes	NA	yes	NA
Balkans		*Alosa sp. nov. 'Skadar'*	Fishes	VU	yes	NA
Balkans		*Barbus rebeli*	Fishes	NA	yes	NA
Balkans		*Gobio skadarensis*	Fishes	EN	yes	NA
Balkans		*Pelasgus minutus*	Fishes	NA	yes	NA
Balkans		*Scardinius knezevici*	Fishes	NA	yes	NA
Balkans		*Telestes montenigrinus*	Fishes	NA	yes	NA
Balkans		*Bithynia hambergerae*	Molluscs	NA	yes	NA
Balkans		*Bithynia radomani*	Molluscs	NA	yes	NA
Balkans		*Bithynia skadarskii*	Molluscs	EN	yes	NA
Balkans		*Bithynia zeta*	Molluscs	EN	yes	NA
Balkans		*Bracenica spiridoni*	Molluscs	EN	yes	NA
Balkans		*Dreissena presbensis*	Molluscs	NA	yes	NA
Balkans		*Gyraulus meierbrooki*	Molluscs	EN	yes	NA
Balkans		*Plagigeyeria gladilini*	Molluscs	VU	NA	NA
Balkans		*Pyrgula annulata*	Molluscs	NA	yes	NA
Balkans		*Radix skutaris*	Molluscs	EN	yes	NA
Balkans		*Radomaniola elongata*	Molluscs	CR	yes	NA
Balkans		*Radomaniola lacustris*	Molluscs	CR	yes	NA
Balkans		*Stagnicola montenegrinus*	Molluscs	NA	yes	NA
Balkans		*Valvata montenegrina*	Molluscs	EN	yes	NA
Balkans		*Vinodolia matjasici*	Molluscs	CR	yes	NA
Balkans		*Vinodolia scutarica*	Molluscs	EN	yes	NA
Balkans		*Pilularia minuta*	Plants	EN	NA	NA
Balkans	Lakes Limnothalassa Rodias, Limnothalassa Tsoukaliou, Limnothalassa Lagarou	*Cobitis arachthosensis*	Fishes	EN	yes	NA
Balkans		*Cobitis hellenica*	Fishes	EN	yes	NA

Table A cont'd. Balkans validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
Balkans		*Economidichthys pygmaeus*	Fishes	NA	yes	NA
Balkans		*Pelasgus thesproticus*	Fishes	NA	yes	NA
Balkans		*Squalius pamvoticus*	Fishes	NA	yes	NA
Balkans		*Valencia letourneuxi*	Fishes	CR	yes	NA
Balkans		*Belgrandiella haesitans*	Molluscs	NA	yes	NA
Balkans	Lakes Trichonis and Lisimachia*	*Cobitis trichonica*	Fishes	EN	yes	NA
Balkans		*Economidichthys pygmaeus*	Fishes	NA	yes	NA
Balkans		*Economidichthys trichonis*	Fishes	EN	yes	NA
Balkans		*Pelasgus stymphalicus*	Fishes	NA	yes	NA
Balkans		*Rutilus panosi*	Fishes	VU	yes	NA
Balkans		*Salaria economidisi*	Fishes	CR	yes	NA
Balkans		*Scardinius acarnanicus*	Fishes	NA	yes	NA
Balkans		*Silurus aristotelis*	Fishes	NA	yes	NA
Balkans		*Tropidophoxinellus hellenicus*	Fishes	NA	yes	NA
Balkans		*Belgrandiella haesitans*	Molluscs	NA	yes	NA
Balkans		*Dianella thiesseana*	Molluscs	CR	yes	NA
Balkans		*Dreissena blanci*	Molluscs	VU	yes	NA
Balkans		*Islamia trichoniana*	Molluscs	CR	yes	NA
Balkans		*Pseudobithynia falniowskii*	Molluscs	CR	yes	NA
Balkans		*Pseudobithynia panetolis*	Molluscs	CR	yes	NA
Balkans		*Pseudobithynia trichonis*	Molluscs	EN	yes	NA
Balkans		*Pseudoislamia balcanica*	Molluscs	CR	yes	NA
Balkans		*Valvata klemmi*	Molluscs	EN	yes	NA
Balkans	Lesvos	*Squalius cii*	Fishes	NA	yes	NA
Balkans		*Pilularia minuta*	Plants	EN	NA	NA
Balkans	Listica river and Mostarsko blato	*Alburnus neretvae*	Fishes	NA	yes	NA
Balkans		*Delminichthys adspersus*	Fishes	VU	yes	NA
Balkans		*Delminichthys ghetaldii*	Fishes	VU	yes	NA
Balkans		*Phoxinellus pseudalepidotus*	Fishes	VU	yes	NA
Balkans		*Rutilus basak*	Fishes	NA	yes	NA
Balkans		*Scardinius plotizza*	Fishes	NA	yes	NA
Balkans		*Congeria kusceri*	Molluscs	VU	NA	NA
Balkans		*Paladilhiopsis solida*	Molluscs	NA	yes	NA
Balkans	Lower Acheloos	*Cobitis trichonica*	Fishes	EN	yes	NA
Balkans		*Economidichthys pygmaeus*	Fishes	NA	yes	NA
Balkans		*Pelasgus stymphalicus*	Fishes	NA	yes	NA
Balkans		*Scardinius acarnanicus*	Fishes	NA	yes	NA
Balkans		*Silurus aristotelis*	Fishes	NA	yes	NA
Balkans		*Tropidophoxinellus hellenicus*	Fishes	NA	yes	NA
Balkans		*Valencia letourneuxi*	Fishes	CR	yes	NA
Balkans		*Belgrandiella haesitans*	Molluscs	NA	yes	NA
Balkans		*Dianella thiesseana*	Molluscs	CR	yes	NA
Balkans		*Dreissena blanci*	Molluscs	VU	yes	NA
Balkans		*Islamia epirana*	Molluscs	VU	yes	NA
Balkans		*Islamia trichoniana*	Molluscs	CR	yes	NA
Balkans		*Pseudobithynia falniowskii*	Molluscs	CR	yes	NA

Table A cont'd. Balkans validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
Balkans		*Pseudobithynia panetolis*	Molluscs	CR	yes	NA
Balkans		*Pseudobithynia trichonis*	Molluscs	EN	yes	NA
Balkans		*Valvata klemmi*	Molluscs	EN	yes	NA
Balkans	Lower Axios	*Pelasgus stymphalicus*	Fishes	NA	yes	NA
Balkans		*Squalius peloponnensis*	Fishes	NA	yes	NA
Balkans		*Valencia letourneuxi*	Fishes	CR	yes	NA
Balkans		*Iglica wolfischeri*	Molluscs	CR	yes	NA
Balkans		*Zingel balcanicus*	Fishes	NA	yes	NA
Balkans	Lower Bojana river basin*	*Alburnus scoranza*	Fishes	NA	yes	NA
Balkans		*Pelasgus minutus*	Fishes	NA	yes	NA
Balkans		*Rutilus karamani*	Fishes	NA	yes	NA
Balkans		*Telestes montenigrinus*	Fishes	NA	yes	NA
Balkans		*Bithynia radomani*	Molluscs	NA	yes	NA
Balkans		*Gyraulus ioanis*	Molluscs	CR	yes	NA
Balkans		*Gyraulus shasi*	Molluscs	CR	yes	NA
Balkans		*Plagigeyeria gladilini*	Molluscs	VU	NA	NA
Balkans		*Radomaniola montana*	Molluscs	NA	yes	NA
Balkans		*Saxurinator brandti*	Molluscs	VU	NA	NA
Balkans		*Vinodolia gluhodolica*	Molluscs	EN	yes	NA
Balkans		*Pilularia minuta*	Plants	EN	NA	NA
Balkans	Magnisia*	*Barbus sperchiensis*	Fishes	NA	yes	NA
Balkans		*Pelasgus marathonicus*	Fishes	NA	yes	NA
Balkans		*Graecorientalia vrissiana*	Molluscs	CR	yes	NA
Balkans		*Heleobia tritonum*	Molluscs	CR	yes	NA
Balkans		*Turcorientalia hohenackeri*	Molluscs	VU	yes	NA
Balkans	Matica river and Bacina lakes	*Alburnus neretvae*	Fishes	NA	yes	NA
Balkans		*Delminichthys adspersus*	Fishes	VU	yes	NA
Balkans		*Delminichthys ghetaldii*	Fishes	VU	yes	NA
Balkans		*Rutilus basak*	Fishes	NA	yes	NA
Balkans		*Salmo obtusirostris*	Fishes	EN	NA	NA
Balkans		*Scardinius plotizza*	Fishes	NA	yes	NA
Balkans		*Squalius microlepis*	Fishes	EN	yes	NA
Balkans		*Antibaria notata*	Molluscs	NA	yes	NA
Balkans		*Belgrandia torifera*	Molluscs	VU	yes	NA
Balkans		*Emmericia expansilabris*	Molluscs	VU	yes	NA
Balkans		*Emmericia ventricosa*	Molluscs	VU	yes	NA
Balkans		*Iglica absoloni*	Molluscs	NA	yes	NA
Balkans		*Iglica bagliviaeformis*	Molluscs	EN	NA	NA
Balkans		*Paladilhiopsis pretneri*	Molluscs	NA	yes	NA
Balkans		*Plagigeyeria gladilini*	Molluscs	VU	NA	NA
Balkans		*Saxurinator brandti*	Molluscs	VU	NA	NA
Balkans		*Saxurinator labiatus*	Molluscs	CR	yes	NA
Balkans		*Saxurinator montenegrinus*	Molluscs	EN	yes	NA
Balkans		*Vinodolia fluviatilis*	Molluscs	EN	NA	NA
Balkans	Mornos	*Anguilla anguilla*	Fishes	CR	NA	NA
Balkans		*Economidichthys pygmaeus*	Fishes	NA	yes	NA

Table A cont'd. Balkans validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
Balkans		*Pelasgus stymphalicus*	Fishes	NA	yes	NA
Balkans		*Valencia letourneuxi*	Fishes	CR	yes	NA
Balkans		*Unio crassus*	Molluscs	EN	NA	NA
Balkans	Naxos	*Anguilla anguilla*	Fishes	CR	NA	NA
Balkans	Neretva delta and associated springs/ lakes including Hutovo Blato	*Alburnus neretvae*	Fishes	NA	yes	NA
Balkans		*Cobitis narentana*	Fishes	VU	yes	NA
Balkans		*Chondrostoma knerii*	Fishes	VU	yes	NA
Balkans		*Delminichthys adspersus*	Fishes	VU	yes	NA
Balkans		*Delminichthys ghetaldii*	Fishes	VU	yes	NA
Balkans		*Knipowitschia croatica*	Fishes	VU	yes	NA
Balkans		*Knipowitschia radovici*	Fishes	VU	yes	NA
Balkans		*Rutilus basak*	Fishes	NA	yes	NA
Balkans		*Salmo obtusirostris*	Fishes	EN	NA	NA
Balkans		*Scardinius plotizza*	Fishes	NA	yes	NA
Balkans		*Squalius svallize*	Fishes	CR	yes	NA
Balkans		*Bithynia mostarensis*	Molluscs	NA	yes	NA
Balkans		*Congeria kusceri*	Molluscs	VU	NA	NA
Balkans		*Iglica bagliviaeformis*	Molluscs	EN	NA	NA
Balkans		*Paladilhiopsis solida*	Molluscs	NA	yes	NA
Balkans		*Plagigeyeria mostarensis*	Molluscs	NA	yes	NA
Balkans		*Saxurinator brandti*	Molluscs	VU	NA	NA
Balkans		*Theodoxus subterrelictus*	Molluscs	EN	yes	NA
Balkans		*Vinodolia fluviatilis*	Molluscs	EN	NA	NA
Balkans	Nevesinjsko polje, Gatacko polje, Cernicko polje, Fatnicko polje and Dabarsko polje	*Alburnus neretvae*	Fishes	NA	yes	NA
Balkans		*Cobitis narentana*	Fishes	VU	yes	NA
Balkans		*Chondrostoma knerii*	Fishes	VU	yes	NA
Balkans		*Delminichthys adspersus*	Fishes	VU	yes	NA
Balkans		*Delminichthys ghetaldii*	Fishes	VU	yes	NA
Balkans		*Knipowitschia croatica*	Fishes	VU	yes	NA
Balkans		*Rutilus basak*	Fishes	NA	yes	NA
Balkans		*Salmo obtusirostris*	Fishes	EN	NA	NA
Balkans		*Scardinius plotizza*	Fishes	NA	yes	NA
Balkans		*Squalius svallize*	Fishes	CR	yes	NA
Balkans		*Telestes metohiensis*	Fishes	VU	yes	NA
Balkans		*Bithynia mostarensis*	Molluscs	NA	yes	NA
Balkans		*Congeria kusceri*	Molluscs	VU	NA	NA
Balkans		*Iglica bagliviaeformis*	Molluscs	EN	NA	NA
Balkans		*Paladilhiopsis solida*	Molluscs	NA	yes	NA
Balkans		*Plagigeyeria mostarensis*	Molluscs	NA	yes	NA
Balkans		*Saxurinator brandti*	Molluscs	VU	NA	NA
Balkans		*Theodoxus subterrelictus*	Molluscs	EN	yes	NA
Balkans		*Vinodolia fluviatilis*	Molluscs	EN	NA	NA
Balkans	Northern Korinthiakos	*Anguilla anguilla*	Fishes	CR	NA	NA
Balkans	Pamvotis Lake*	*Economidichthys pygmaeus*	Fishes	NA	yes	NA

Table A cont'd. Balkans validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
Balkans		*Pelasgus epiroticus*	Fishes	CR	yes	NA
Balkans		*Squalius pamvoticus*	Fishes	NA	yes	NA
Balkans		*Belgrandiella haesitans*	Molluscs	NA	yes	NA
Balkans		*Bithynia graeca*	Molluscs	VU	yes	NA
Balkans		*Dreissena blanci*	Molluscs	VU	yes	NA
Balkans		*Dreissena presbensis*	Molluscs	NA	yes	NA
Balkans		*Islamia epirana*	Molluscs	VU	yes	NA
Balkans		*Pseudobithynia westerlundii*	Molluscs	NA	yes	NA
Balkans		*Trichonia trichonica*	Molluscs	CR	yes	NA
Balkans	Part of the Neretva upper catchment	*Alburnus neretvae*	Fishes	NA	yes	NA
Balkans		*Aulopyge huegelii*	Fishes	EN	yes	NA
Balkans		*Cobitis narentana*	Fishes	VU	yes	NA
Balkans		*Chondrostoma knerii*	Fishes	VU	yes	NA
Balkans		*Delminichthys adspersus*	Fishes	VU	yes	NA
Balkans		*Delminichthys ghetaldii*	Fishes	VU	yes	NA
Balkans		*Phoxinellus alepidotus*	Fishes	EN	yes	NA
Balkans		*Phoxinellus pseudalepidotus*	Fishes	VU	yes	NA
Balkans		*Rutilus basak*	Fishes	NA	yes	NA
Balkans		*Salmo obtusirostris*	Fishes	EN	NA	NA
Balkans		*Scardinius plotizza*	Fishes	NA	yes	NA
Balkans		*Squalius svallize*	Fishes	CR	yes	NA
Balkans		*Squalius tenellus*	Fishes	EN	yes	NA
Balkans		*Bithynia mostarensis*	Molluscs	NA	yes	NA
Balkans		*Congeria kusceri*	Molluscs	VU	NA	NA
Balkans		*Iglica bagliviaeformis*	Molluscs	EN	NA	NA
Balkans		*Paladilhiopsis solida*	Molluscs	NA	yes	NA
Balkans		*Plagigeyeria mostarensis*	Molluscs	NA	yes	NA
Balkans		*Saxurinator brandti*	Molluscs	VU	NA	NA
Balkans		*Theodoxus subterrelictus*	Molluscs	EN	yes	NA
Balkans		*Vinodolia fluviatilis*	Molluscs	EN	NA	NA
Balkans	Part of the Neretva upper catchment - eastern mid catchment	*Alburnus neretvae*	Fishes	NA	yes	NA
Balkans		*Cobitis narentana*	Fishes	VU	yes	NA
Balkans		*Chondrostoma knerii*	Fishes	VU	yes	NA
Balkans		*Delminichthys adspersus*	Fishes	VU	yes	NA
Balkans		*Delminichthys ghetaldii*	Fishes	VU	yes	NA
Balkans		*Rutilus basak*	Fishes	NA	yes	NA
Balkans		*Salmo obtusirostris*	Fishes	EN	NA	NA
Balkans		*Scardinius plotizza*	Fishes	NA	yes	NA
Balkans		*Squalius svallize*	Fishes	CR	yes	NA
Balkans		*Telestes metohiensis*	Fishes	VU	yes	NA
Balkans		*Bithynia mostarensis*	Molluscs	NA	yes	NA
Balkans		*Congeria kusceri*	Molluscs	VU	NA	NA
Balkans		*Iglica bagliviaeformis*	Molluscs	EN	NA	NA
Balkans		*Paladilhiopsis solida*	Molluscs	NA	yes	NA
Balkans		*Plagigeyeria mostarensis*	Molluscs	NA	yes	NA
Balkans		*Saxurinator brandti*	Molluscs	VU	NA	NA

Table A cont'd. Balkans validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
Balkans		*Theodoxus subterrelictus*	Molluscs	EN	yes	NA
Balkans		*Vinodolia fluviatilis*	Molluscs	EN	NA	NA
Balkans	Peloponnese Maleas*	*Pseudamnicola exilis*	Molluscs	NA	yes	NA
Balkans	Pineios Peloponnisou	*Pelasgus stymphalicus*	Fishes	NA	yes	NA
Balkans		*Squalius peloponnensis*	Fishes	NA	yes	NA
Balkans		*Tropidophoxinellus hellenicus*	Fishes	NA	yes	NA
Balkans		*Valencia letourneuxi*	Fishes	CR	yes	NA
Balkans	Pinios Thessalias	*Barbus sperchiensis*	Fishes	NA	yes	NA
Balkans		*Gobio feraeensis*	Fishes	VU	yes	NA
Balkans		*Paladilhiopsis thessalica*	Molluscs	VU	yes	NA
Balkans	Popovo polje and Trebišnjica	*Cobitis narentana*	Fishes	VU	yes	NA
Balkans		*Delminichthys ghetaldii*	Fishes	VU	yes	NA
Balkans		*Squalius svallize*	Fishes	CR	yes	NA
Balkans		*Antibaria notata*	Molluscs	NA	yes	NA
Balkans		*Belgrandia torifera*	Molluscs	VU	yes	NA
Balkans		*Congeria kusceri*	Molluscs	VU	NA	NA
Balkans		*Emmericia expansilabris*	Molluscs	VU	yes	NA
Balkans		*Emmericia ventricosa*	Molluscs	VU	yes	NA
Balkans		*Iglica absoloni*	Molluscs	NA	yes	NA
Balkans		*Iglica bagliviaeformis*	Molluscs	EN	NA	NA
Balkans		*Lanzaia vjetrenicae*	Molluscs	VU	yes	NA
Balkans		*Narentiana vjetrenicae*	Molluscs	EN	yes	NA
Balkans		*Paladilhiopsis pretneri*	Molluscs	NA	yes	NA
Balkans		*Paladilhiopsis solida*	Molluscs	NA	yes	NA
Balkans		*Plagigeyeria gladilini*	Molluscs	VU	NA	NA
Balkans		*Plagigeyeria tribunicae*	Molluscs	VU	yes	NA
Balkans		*Saxurinator brandti*	Molluscs	VU	NA	NA
Balkans		*Saxurinator labiatus*	Molluscs	CR	yes	NA
Balkans		*Saxurinator montenegrinus*	Molluscs	EN	yes	NA
Balkans		*Vinodolia fluviatilis*	Molluscs	EN	NA	NA
Balkans		*Vinodolia hadouphylax*	Molluscs	CR	yes	NA
Balkans	Rhodes Island	*Ladigesocypris ghigii*	Fishes	VU	yes	NA
Balkans	Spercheios*	*Barbus sperchiensis*	Fishes	NA	yes	NA
Balkans		*Luciobarbus graecus*	Fishes	EN	yes	NA
Balkans		*Pelasgus marathonicus*	Fishes	NA	yes	NA
Balkans		*Pungitius hellenicus*	Fishes	CR	yes	NA
Balkans	Tempi	*Barbus sperchiensis*	Fishes	NA	yes	NA
Balkans		*Gobio feraeensis*	Fishes	VU	yes	NA
Balkans		*Knipowitschia thessala*	Fishes	EN	yes	NA
Balkans		*Daphniola exigua*	Molluscs	EN	yes	NA
Balkans		*Paladilhiopsis thessalica*	Molluscs	VU	yes	NA
Balkans	Thassos	*Turcorientalia hohenackeri*	Molluscs	VU	yes	NA
Balkans		*Ceriagrion georgifreyi*	Odonata	VU	NA	NA
Balkans	Tragos	*Pelasgus stymphalicus*	Fishes	NA	yes	NA
Balkans		*Squalius peloponnensis*	Fishes	NA	yes	NA
Balkans		*Hauffenia edlingeri*	Molluscs	CR	yes	NA

Table A cont'd. Balkans validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
Balkans		*Pyrrhosoma elisabethae*	Odonata	CR	yes	NA
Balkans	Transboundary Prespa Park*	*Alburnoides prespensis*	Fishes	VU	yes	yes
Balkans		*Alburnus belvica*	Fishes	VU	yes	yes
Balkans		*Cobitis meridionalis*	Fishes	VU	yes	yes
Balkans		*Chondrostoma prespense*	Fishes	VU	yes	NA
Balkans		*Pelasgus prespensis*	Fishes	EN	yes	yes
Balkans		*Rutilus prespensis*	Fishes	VU	yes	yes
Balkans		*Salmo peristericus*	Fishes	EN	yes	NA
Balkans		*Squalius prespensis*	Fishes	NA	yes	yes
Balkans		*Bithynia prespensis*	Molluscs	EN	yes	NA
Balkans		*Dreissena blanci*	Molluscs	VU	yes	NA
Balkans		*Gyraulus stankovici*	Molluscs	EN	yes	NA
Balkans		*Malaprespia albanica*	Molluscs	CR	yes	NA
Balkans		*Parabythinella macedonica*	Molluscs	EN	yes	NA
Balkans		*Parabythinella malaprespensis*	Molluscs	CR	yes	NA
Balkans		*Pisidium maasseni*	Molluscs	EN	yes	NA
Balkans		*Planorbis presbensis*	Molluscs	VU	yes	NA
Balkans		*Prespolitorea malaprespensis*	Molluscs	CR	yes	NA
Balkans		*Prespolitorea valvataeformis*	Molluscs	CR	yes	NA
Balkans		*Pyrgohydrobia prespaensis*	Molluscs	EN	yes	NA
Balkans		*Radix pinteri*	Molluscs	EN	yes	NA
Balkans		*Vinodolia lacustris*	Molluscs	CR	yes	NA
Balkans	Trebizat drainage including Imotsko polje*	*Alburnus neretvae*	Fishes	NA	yes	NA
Balkans		*Cobitis illyrica*	Fishes	CR	yes	NA
Balkans		*Cobitis narentana*	Fishes	VU	yes	NA
Balkans		*Chondrostoma knerii*	Fishes	VU	yes	NA
Balkans		*Delminichthys adspersus*	Fishes	VU	yes	NA
Balkans		*Delminichthys ghetaldii*	Fishes	VU	yes	NA
Balkans		*Knipowitschia croatica*	Fishes	VU	yes	NA
Balkans		*Rutilus basak*	Fishes	NA	yes	NA
Balkans		*Salmo obtusirostris*	Fishes	EN	NA	NA
Balkans		*Scardinius plotizza*	Fishes	NA	yes	NA
Balkans		*Squalius microlepis*	Fishes	EN	yes	NA
Balkans		*Squalius svallize*	Fishes	CR	yes	NA
Balkans		*Bithynia mostarensis*	Molluscs	NA	yes	NA
Balkans		*Congeria kusceri*	Molluscs	VU	NA	NA
Balkans		*Iglica bagliviaeformis*	Molluscs	EN	NA	NA
Balkans		*Paladilhiopsis solida*	Molluscs	NA	yes	NA
Balkans		*Plagigeyeria mostarensis*	Molluscs	NA	yes	NA
Balkans		*Saxurinator brandti*	Molluscs	VU	NA	NA
Balkans		*Theodoxus subterrelictus*	Molluscs	EN	yes	NA
Balkans		*Vinodolia fluviatilis*	Molluscs	EN	NA	NA
Balkans	Tributaries of lower and middle Neretva including Hutovo Blato	*Alburnus neretvae*	Fishes	NA	yes	NA
Balkans		*Cobitis narentana*	Fishes	VU	yes	NA
Balkans		*Chondrostoma knerii*	Fishes	VU	yes	NA

Table A cont'd. Balkans validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
Balkans		*Delminichthys adspersus*	Fishes	VU	yes	NA
Balkans		*Delminichthys ghetaldii*	Fishes	VU	yes	NA
Balkans		*Knipowitschia croatica*	Fishes	VU	yes	NA
Balkans		*Rutilus basak*	Fishes	NA	yes	NA
Balkans		*Salmo obtusirostris*	Fishes	EN	NA	NA
Balkans		*Scardinius plotizza*	Fishes	NA	yes	NA
Balkans		*Squalius svallize*	Fishes	CR	yes	NA
Balkans		*Bithynia mostarensis*	Molluscs	NA	yes	NA
Balkans		*Congeria kusceri*	Molluscs	VU	NA	NA
Balkans		*Iglica bagliviaeformis*	Molluscs	EN	NA	NA
Balkans		*Paladilhiopsis solida*	Molluscs	NA	yes	NA
Balkans		*Plagigeyeria mostarensis*	Molluscs	NA	yes	NA
Balkans		*Saxurinator brandti*	Molluscs	VU	NA	NA
Balkans		*Theodoxus subterrelictus*	Molluscs	EN	yes	NA
Balkans		*Vinodolia fluviatilis*	Molluscs	EN	NA	NA
Balkans	Upper Alfeios	*Pelasgus laconicus*	Fishes	CR	yes	NA
Balkans		*Pelasgus stymphalicus*	Fishes	NA	yes	NA
Balkans		*Squalius peloponnensis*	Fishes	NA	yes	NA
Balkans		*Pseudamnicola exilis*	Molluscs	NA	yes	NA
Balkans		*Pyrrhosoma elisabethae*	Odonata	CR	yes	NA
Balkans	Upper Aliakmon	*Salmo pelagonicus*	Fishes	VU	yes	NA
Balkans		*Heleobia tritonum*	Molluscs	CR	yes	NA
Balkans	Upper Aoos	*Oxynoemacheilus pindus*	Fishes	VU	yes	NA
Balkans		*Squalius sp. nov. 'Aoos'*	Fishes	NA	yes	NA
Balkans		*Radomaniola albanica*	Molluscs	NA	yes	NA
Balkans	Upper Kifissos*	*Daphniola louisi*	Molluscs	CR	yes	NA
Balkans	Vistonis	*Alburnus vistonicus*	Fishes	CR	yes	NA
Balkans		*Alosa vistonica*	Fishes	CR	yes	NA
Balkans	Volvi-Koronia	*Alburnus sp. nov. 'Volvi'*	Fishes	NA	yes	NA
Balkans		*Alburnus volviticus*	Fishes	EN	yes	NA
Balkans		*Alosa macedonica*	Fishes	VU	yes	NA
Balkans	West Karst poljes	*Aulopyge huegelii*	Fishes	EN	yes	NA
Balkans		*Cobitis dalmatina*	Fishes	VU	yes	NA
Balkans		*Chondrostoma phoxinus*	Fishes	EN	yes	NA
Balkans		*Delminichthys adspersus*	Fishes	VU	yes	NA
Balkans		*Delminichthys ghetaldii*	Fishes	VU	yes	NA
Balkans		*Phoxinellus alepidotus*	Fishes	EN	yes	NA
Balkans		*Rutilus basak*	Fishes	NA	yes	NA
Balkans		*Salmo obtusirostris*	Fishes	EN	NA	NA
Balkans		*Scardinius dergle*	Fishes	NA	yes	NA
Balkans		*Scardinius plotizza*	Fishes	NA	yes	NA
Balkans		*Squalius illyricus*	Fishes	NA	yes	NA
Balkans		*Squalius tenellus*	Fishes	EN	yes	NA
Balkans		*Antibaria notata*	Molluscs	NA	yes	NA
Balkans		*Belgrandia torifera*	Molluscs	VU	yes	NA
Balkans		*Congeria kusceri*	Molluscs	VU	NA	NA

Table A cont'd. Balkans validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
Balkans		*Emmericia expansilabris*	Molluscs	VU	yes	NA
Balkans		*Emmericia ventricosa*	Molluscs	VU	yes	NA
Balkans		*Iglica absoloni*	Molluscs	NA	yes	NA
Balkans		*Iglica bagliviaeformis*	Molluscs	EN	NA	NA
Balkans		*Lanzaia kotlusae*	Molluscs	VU	yes	NA
Balkans		*Paladilhiopsis pretneri*	Molluscs	NA	yes	NA
Balkans		*Plagigeyeria gladilini*	Molluscs	VU	NA	NA
Balkans		*Saxurinator brandti*	Molluscs	VU	NA	NA
Balkans		*Saxurinator labiatus*	Molluscs	CR	yes	NA
Balkans		*Saxurinator montenegrinus*	Molluscs	EN	yes	NA
Balkans		*Vinodolia fluviatilis*	Molluscs	EN	NA	NA
Balkans		*Damasonium polyspermum*	Plants	VU	NA	NA
Balkans	Yliki-Paralimni-Kifissos*	*Luciobarbus graecus*	Fishes	EN	yes	NA
Balkans		*Pelasgus marathonicus*	Fishes	NA	yes	NA
Balkans		*Rutilus ylikiensis*	Fishes	EN	yes	NA
Balkans		*Scardinius graecus*	Fishes	CR	yes	NA
Balkans		*Telestes beoticus*	Fishes	EN	yes	NA
Balkans	Zakynthos	*Fissuria raehlei*	Molluscs	NA	yes	NA
Balkans		*Pseudamnicola macrostoma*	Molluscs	NA	yes	NA
Balkans		*Ceriagrion georgifreyi*	Odonata	VU	NA	NA
Balkans	Zrmanja River	*Aulopyge huegelii*	Fishes	EN	yes	NA
Balkans		*Squalius zrmanjae*	Fishes	NA	yes	NA
Balkans		*Belgrandia torifera*	Molluscs	VU	yes	NA
Balkans		*Belgrandiella krupensis*	Molluscs	NA	yes	NA
Balkans		*Belgrandiella zermanica*	Molluscs	VU	yes	NA
Balkans		*Congeria kusceri*	Molluscs	VU	NA	NA
Balkans		*Hadziella sketi*	Molluscs	VU	yes	NA
Balkans		*Saxurinator sketi*	Molluscs	EN	yes	NA
Balkans		*Vinodolia fluviatilis*	Molluscs	EN	NA	NA
Balkans		*Damasonium polyspermum*	Plants	VU	NA	NA

Table B. North African validated trigger species. C1 (Threatened species: CR Critically Endangered, EN Endangered, VU Vulnerable); C2 (Restricted Range); C3 (Biome-restricted community). * AZE sites. NA: not applicable.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
North Africa	Abid river downstream	*Barbus harterti*	Fishes	VU	NA	yes
North Africa		*Barbus nasus*	Fishes	NA	NA	yes
North Africa		*Barbus paytonii*	Fishes	VU	NA	yes
North Africa		*Giustia costata*	Molluscs	CR	yes	NA
North Africa		*Heideella sp. nov. 'valai'*	Molluscs	CR	yes	NA
North Africa		*Margaritifera marocana*	Molluscs	CR	NA	NA
North Africa		*Theodoxus marteli*	Molluscs	VU	NA	NA
North Africa		*Theodoxus numidicus*	Molluscs	VU	NA	NA
North Africa		*Unio durieui*	Molluscs	EN	NA	NA
North Africa		*Calopteryx exul*	Odonata	EN	NA	NA
North Africa		*Cordulegaster princeps*	Odonata	NA	yes	NA
North Africa		*Campanula mairei*	Plants	VU	NA	NA
North Africa		*Damasonium polyspermum*	Plants	VU	NA	NA
North Africa		*Euphorbia nereidum*	Plants	VU	yes	NA
North Africa	Arhreme River*	*Anguilla anguilla*	Fishes	CR	NA	NA
North Africa		*Barbus issenensis*	Fishes	VU	yes	yes
North Africa		*Barbus massaensis*	Fishes	NA	yes	yes
North Africa		*Iglica soussensis*	Molluscs	CR	yes	yes
North Africa		*Maroccopsis agadirensis*	Molluscs	EN	yes	yes
North Africa	Assif El Mal	*Cordulegaster princeps*	Odonata	NA	yes	NA
North Africa		*Carum asinorum*	Plants	EN	yes	NA
North Africa		*Damasonium polyspermum*	Plants	VU	NA	NA
North Africa		*Eryngium variifolium*	Plants	VU	yes	NA
North Africa		*Limonium ornatum*	Plants	VU	yes	NA
North Africa	Assif El Mal east	*Cordulegaster princeps*	Odonata	NA	yes	NA
North Africa		*Carum asinorum*	Plants	EN	yes	NA
North Africa	Assif Meloul river	*Barbus nasus*	Fishes	NA	NA	yes
North Africa		*Barbus paytonii*	Fishes	VU	NA	yes
North Africa		*Giustia costata*	Molluscs	CR	yes	NA
North Africa		*Gyraulus laevis*	Molluscs	NA	yes	NA
North Africa		*Heideella sp. nov. 'valai'*	Molluscs	CR	yes	NA
North Africa		*Theodoxus marteli*	Molluscs	VU	NA	NA
North Africa		*Theodoxus numidicus*	Molluscs	VU	NA	NA
North Africa		*Unio durieui*	Molluscs	EN	NA	NA
North Africa		*Calopteryx exul*	Odonata	EN	NA	NA
North Africa		*Cordulegaster princeps*	Odonata	NA	yes	NA
North Africa		*Carum lacuum*	Plants	VU	NA	NA
North Africa		*Cirsium ducellieri*	Plants	VU	NA	NA
North Africa		*Damasonium polyspermum*	Plants	VU	NA	NA
North Africa	Beni Belaid	*Anguilla anguilla*	Fishes	CR	NA	NA
North Africa		*Barbus setivimensis*	Fishes	NA	NA	yes
North Africa		*Belgrandiella nana*	Molluscs	NA	NA	yes
North Africa		*Belgrandiella seminium*	Molluscs	NA	yes	yes
North Africa		*Hydrobia elachista*	Molluscs	NA	NA	yes
North Africa		*Pseudamnicola constantinae*	Molluscs	NA	yes	yes

Table B cont'd. North African validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
North Africa		*Pseudamnicola luteola*	Molluscs	NA	NA	yes
North Africa		*Damasonium polyspermum*	Plants	VU	NA	NA
North Africa		*Rumex algeriensis*	Plants	EN	NA	NA
North Africa	Cap Serrat - Cap Blanc - Parc national de l'Ichkeul	*Pleurodeles nebulosus*	Amphibian	VU	NA	NA
North Africa		*Anguilla anguilla*	Fishes	CR	NA	NA
North Africa		*Barbus callensis*	Fishes	NA	NA	yes
North Africa		*Anodonta lucasi*	Molluscs	CR	yes	NA
North Africa		*Gomphus lucasii*	Odonata	VU	NA	yes
North Africa		*Bellis prostrata*	Plants	NA	yes	NA
North Africa		*Pilularia minuta*	Plants	EN	NA	NA
North Africa		*Rumex tunetanus*	Plants	CR	yes	NA
North Africa		*Serapias stenopetala*	Plants	CR	yes	NA
North Africa	Eastern Numidia	*Anguilla anguilla*	Fishes	CR	NA	NA
North Africa		*Barbus callensis*	Fishes	NA	NA	yes
North Africa		*Pseudophoxinus punicus*	Fishes	EN	yes	yes
North Africa		*Anodonta lucasi*	Molluscs	CR	yes	NA
North Africa		*Bellis prostrata*	Plants	NA	yes	NA
North Africa		*Convolvulus durandoi*	Plants	CR	yes	NA
North Africa		*Epilobium numidicum*	Plants	CR	yes	NA
North Africa		*Juncus sorrentinii*	Plants	VU	NA	NA
North Africa		*Lepidium violaceum*	Plants	VU	NA	NA
North Africa		*Rhynchospora modesti-lucennoi*	Plants	EN	NA	NA
North Africa		*Rumex algeriensis*	Plants	EN	NA	NA
North Africa		*Serapias stenopetala*	Plants	CR	yes	NA
North Africa	El Kala - Les Tourbières de Dar Fatma transboundary site	*Anguilla anguilla*	Fishes	CR	NA	NA
North Africa		*Barbus callensis*	Fishes	NA	NA	yes
North Africa		*Pseudophoxinus punicus*	Fishes	EN	yes	yes
North Africa		*Pseudamnicola meluzzii*	Molluscs	VU	yes	NA
North Africa		*Calopteryx exul*	Odonata	EN	NA	NA
North Africa		*Gomphus lucasii*	Odonata	VU	yes	NA
North Africa		*Bellis prostrata*	Plants	NA	yes	NA
North Africa		*Pilularia minuta*	Plants	EN	NA	NA
North Africa		*Rhynchospora modesti-lucennoi*	Plants	EN	NA	NA
North Africa	Figuig oasis and Oued Saoura	*Aphanius saourensis*	Fishes	CR	NA	NA
North Africa		*Barbus figuiguensis*	Fishes	NA	yes	NA
North Africa	Hauts Plateaux	*Anguilla anguilla*	Fishes	CR	NA	NA
North Africa		*Aphanius apodus*	Fishes	DD[1]	NA	NA
North Africa		*Damasonium polyspermum*	Plants	VU	NA	NA
North Africa	Le Grand Nador	*Anguilla anguilla*	Fishes	CR	NA	NA
North Africa		*Calopteryx exul*	Odonata	EN	NA	NA
North Africa		*Damasonium polyspermum*	Plants	VU	NA	NA
North Africa		*Limonium duriaei*	Plants	VU	NA	NA
North Africa		*Spergularia embergeri*	Plants	VU	yes	NA
North Africa	Lower Moulouya	*Anguilla anguilla*	Fishes	CR	NA	NA
North Africa		*Spergularia doumerguei*	Plants	VU	NA	NA

Table B cont'd. North African validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
North Africa		*Spergularia embergeri*	Plants	VU	yes	NA
North Africa	Lower Souss and tributaries	*Leptochloa ginae*	Plants	EN	yes	NA
North Africa	Maden River	*Pleurodeles nebulosus*	Amphibian	VU	NA	yes
North Africa		*Anguilla anguilla*	Fishes	CR	NA	NA
North Africa		*Barbus callensis*	Fishes	NA	NA	yes
North Africa		*Anodonta lucasi*	Molluscs	CR	yes	NA
North Africa		*Calopteryx exul*	Odonata	EN	yes	yes
North Africa		*Gomphus lucasii*	Odonata	VU	yes	yes
North Africa		*Bellis prostrata*	Plants	NA	yes	NA
North Africa		*Convolvulus durandoi*	Plants	CR	yes	NA
North Africa		*Serapias stenopetala*	Plants	CR	yes	NA
North Africa	M'Goun river basin	*Ranunculus dyris*	Plants	NA	yes	NA
North Africa	Middle N'Fiss river	*Eryngium variifolium*	Plants	VU	yes	NA
North Africa	Middle Oum Er Rbia - Beni Mellal	*Barbus harterti*	Fishes	VU	NA	yes
North Africa		*Barbus nasus*	Fishes	NA	NA	yes
North Africa		*Barbus paytonii*	Fishes	VU	NA	yes
North Africa		*Giustia costata*	Molluscs	CR	NA	NA
North Africa		*Giustia mellalensis*	Molluscs	CR	NA	NA
North Africa		*Giustia saidai*	Molluscs	CR	NA	NA
North Africa		*Heideella sp. nov. 'valai'*	Molluscs	CR	NA	NA
North Africa		*Margaritifera marocana*	Molluscs	CR	yes	NA
North Africa		*Melanopsis mourebeyensis*	Molluscs	EN	NA	NA
North Africa		*Theodoxus numidicus*	Molluscs	VU	NA	NA
North Africa		*Unio durieui*	Molluscs	EN	NA	NA
North Africa		*Calopteryx exul*	Odonata	EN	NA	NA
North Africa		*Cirsium ducellieri*	Plants	VU	NA	NA
North Africa		*Euphorbia nereidum*	Plants	VU	NA	NA
North Africa	Middle Upper Moulouya	*Heideella andreae*	Molluscs	NA	yes	NA
North Africa		*Melanopsis scalaris*	Molluscs	EN	NA	NA
North Africa		*Pseudamnicola leprevieri*	Molluscs	CR	yes	NA
North Africa		*Pseudamnicola pallaryi*	Molluscs	CR	yes	NA
North Africa		*Theodoxus marteli*	Molluscs	VU	NA	NA
North Africa		*Calopteryx exul*	Odonata	EN	NA	NA
North Africa		*Cordulegaster princeps*	Odonata	NA	yes	NA
North Africa		*Cirsium ducellieri*	Plants	VU	NA	NA
North Africa	Oued Amizmiz	*Cordulegaster princeps*	Odonata	NA	yes	NA
North Africa		*Carum asinorum*	Plants	EN	yes	NA
North Africa		*Damasonium polyspermum*	Plants	VU	NA	NA
North Africa		*Limonium ornatum*	Plants	VU	yes	NA
North Africa	Oued Bouhlou	*Cobitis maroccana*	Fishes	VU	NA	NA
North Africa		*Heideella knidirii*	Molluscs	EN	yes	NA
North Africa		*Horatia sp. nov. 'haasei'*	Molluscs	EN	yes	NA
North Africa		*Calopteryx exul*	Odonata	EN	NA	NA
North Africa		*Cordulegaster princeps*	Odonata	NA	yes	NA
North Africa		*Plantago lacustris*	Plants	VU	yes	NA
North Africa	Oued Bouregreg	*Anguilla anguilla*	Fishes	CR	NA	NA

Table B cont'd. North African validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
North Africa		*Barbus harterti*	Fishes	VU	NA	NA
North Africa		*Melanopsis magnifica*	Molluscs	EN	NA	NA
North Africa		*Unio durieui*	Molluscs	EN	NA	NA
North Africa		*Calopteryx exul*	Odonata	EN	NA	NA
North Africa		*Callitriche mathezii*	Plants	EN	NA	NA
North Africa		*Lotus benoistii*	Plants	CR	yes	NA
North Africa		*Pilularia minuta*	Plants	EN	NA	NA
North Africa	Oued el Harrach	*Anguilla anguilla*	Fishes	CR	NA	NA
North Africa		*Barbus setivimensis*	Fishes	NA	NA	yes
North Africa		*Belgrandiella nana*	Molluscs	NA	NA	yes
North Africa		*Hydrobia brondeli*	Molluscs	NA	NA	yes
North Africa		*Mercuria perforata*	Molluscs	NA	NA	yes
North Africa		*Sphaerium maroccanum*	Molluscs	NA	NA	yes
North Africa		*Lepidium violaceum*	Plants	VU	NA	NA
North Africa		*Rumex algeriensis*	Plants	EN	NA	NA
North Africa	Oued Imouzzer Kandar	*Cobitis maroccana*	Fishes	VU	NA	NA
North Africa		*Horatia sp. nov. 'haasei'*	Molluscs	EN	NA	NA
North Africa		*Melanopsis scalaris*	Molluscs	EN	NA	NA
North Africa		*Theodoxus marteli*	Molluscs	VU	NA	NA
North Africa		*Theodoxus numidicus*	Molluscs	VU	NA	NA
North Africa		*Calopteryx exul*	Odonata	EN	NA	NA
North Africa		*Cordulegaster princeps*	Odonata	NA	yes	NA
North Africa		*Plantago lacustris*	Plants	VU	yes	NA
North Africa	Oued Ksob - Igrounzar	*Anguilla anguilla*	Fishes	CR	NA	NA
North Africa		*Barbus ksibi*	Fishes	VU	yes	NA
North Africa		*Hydrobia maroccana*	Molluscs	EN	NA	NA
North Africa		*Melanopsis chlorotica*	Molluscs	CR	yes	NA
North Africa		*Melanopsis turgida*	Molluscs	NA	yes	NA
North Africa	Oued Lakhdar	*Barbus harterti*	Fishes	VU	NA	yes
North Africa		*Barbus nasus*	Fishes	NA	NA	yes
North Africa		*Barbus paytonii*	Fishes	VU	NA	yes
North Africa		*Giustia costata*	Molluscs	CR	yes	yes
North Africa		*Giustia mellalensis*	Molluscs	CR	yes	yes
North Africa		*Giustia saidai*	Molluscs	CR	yes	yes
North Africa		*Theodoxus marteli*	Molluscs	VU	NA	NA
North Africa		*Unio durieui*	Molluscs	EN	NA	NA
North Africa		*Calopteryx exul*	Odonata	EN	NA	NA
North Africa		*Cordulegaster princeps*	Odonata	NA	yes	NA
North Africa		*Carex fissirostris*	Plants	EN	NA	NA
North Africa		*Cirsium ducellieri*	Plants	VU	NA	NA
North Africa	Oued Laou	*Anguilla anguilla*	Fishes	CR	NA	NA
North Africa		*Horatia sp. nov. 'haasei'*	Molluscs	EN	yes	NA
North Africa		*Theodoxus marteli*	Molluscs	VU	NA	NA
North Africa		*Calopteryx exul*	Odonata	EN	NA	NA
North Africa		Genista ancistrocarpa	Plants	EN	NA	NA
North Africa	Oued Massa	*Anguilla anguilla*	Fishes	CR	NA	NA

Table B cont'd. North African validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
North Africa		*Barbus massaensis*	Fishes	NA	yes	yes
North Africa		*Giustia gofasi*	Molluscs	EN	NA	yes
North Africa		*Heideella sp. nov. 'salahi'*	Molluscs	EN	yes	yes
North Africa		*Maroccopsis agadirensis*	Molluscs	EN	yes	yes
North Africa		*Unio foucauldianus*	Molluscs	CR	yes	yes
North Africa	Oued Tizguite and Oued Ouaslane	*Cobitis maroccana*	Fishes	VU	NA	NA
North Africa		*Giustia midarensis*	Molluscs	EN	yes	NA
North Africa		*Heideella knidirii*	Molluscs	EN	yes	NA
North Africa		*Horatia sp. nov. 'aghbalensis'*	Molluscs	EN	yes	NA
North Africa		*Calopteryx exul*	Odonata	EN	NA	NA
North Africa	Oued Zhour	*Anguilla anguilla*	Fishes	CR	NA	NA
North Africa		*Barbus callensis*	Fishes	NA	yes	yes
North Africa		*Salmo macrostigma*	Fishes	NA	NA	yes
North Africa		*Rumex algeriensis*	Plants	EN	NA	NA
North Africa	Oued Ziz Errachidia	*Barbus lepineyi*	Fishes	NA	yes	NA
North Africa		*Melanopsis scalaris*	Molluscs	EN	NA	NA
North Africa		*Calopteryx exul*	Odonata	EN	NA	NA
North Africa	Saidia Coastal Plain	*Anguilla anguilla*	Fishes	CR	NA	NA
North Africa		*Mercuria perforata*	Molluscs	NA	NA	yes
North Africa		*Limonium duriaei*	Plants	VU	NA	NA
North Africa		*Pulicaria filaginoides*	Plants	CR	NA	NA
North Africa		*Spergularia doumerguei*	Plants	VU	NA	NA
North Africa		*Spergularia embergeri*	Plants	VU	yes	NA
North Africa	Sehb El Majnoune	*Giustia bodoni*	Molluscs	EN	yes	yes
North Africa		*Giustia costata*	Molluscs	CR	yes	yes
North Africa		*Giustia mellalensis*	Molluscs	CR	yes	yes
North Africa		*Giustia saidai*	Molluscs	CR	yes	yes
North Africa		*Cirsium ducellieri*	Plants	VU	NA	NA
North Africa		*Eryngium variifolium*	Plants	VU	yes	NA
North Africa	Seybouse catchment	*Pleurodeles poireti*	Amphibian	EN	NA	NA
North Africa		*Anguilla anguilla*	Fishes	CR	NA	NA
North Africa		*Barbus callensis*	Fishes	NA	NA	yes
North Africa		*Pseudophoxinus punicus*	Fishes	EN	yes	yes
North Africa		*Hydrobia elachista*	Molluscs	NA	NA	yes
North Africa		*Pseudamnicola luteola*	Molluscs	NA	NA	yes
North Africa		*Calopteryx exul*	Odonata	EN	NA	NA
North Africa		*Gomphus lucasii*	Odonata	VU	yes	NA
North Africa		*Damasonium polyspermum*	Plants	VU	NA	NA
North Africa		*Rhynchospora modesti-lucennoi*	Plants	EN	NA	NA
North Africa		*Rumex algeriensis*	Plants	EN	NA	NA
North Africa	Tafna catchment	*Anguilla anguilla*	Fishes	CR	NA	NA
North Africa		*Hydrobia brondeli*	Molluscs	NA	NA	yes
North Africa		*Hydrobia maroccana*	Molluscs	EN	NA	NA
North Africa		*Melanopsis letourneuxi*	Molluscs	EN	NA	yes
North Africa		*Melanopsis scalaris*	Molluscs	EN	NA	NA
North Africa		*Mercuria perforata*	Molluscs	NA	NA	yes

Table B cont'd. North African validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
North Africa		*Pseudamnicola luteola*	Molluscs	NA	NA	yes
North Africa		*Sphaerium maroccanum*	Molluscs	NA	NA	yes
North Africa		*Theodoxus marteli*	Molluscs	VU	NA	NA
North Africa		*Damasonium polyspermum*	Plants	VU	NA	NA
North Africa	Tifnout basin	*Barbus issenensis*	Fishes	VU	yes	yes
North Africa		*Barbus massaensis*	Fishes	NA	yes	yes
North Africa		*Salmo akairos*	Fishes	VU	yes	yes
North Africa		*Cordulegaster princeps*	Odonata	NA	yes	NA
North Africa		*Carex fissirostris*	Plants	EN	NA	NA
North Africa		*Romulea antiatlantica*	Plants	CR	yes	NA
North Africa	Tigrigra stream	*Cobitis maroccana*	Fishes	VU	NA	NA
North Africa		*Horatia sp. nov. 'aghbalensis'*	Molluscs	EN	yes	NA
North Africa		*Melanopsis arbalensis*	Molluscs	NA	yes	NA
North Africa		*Melanopsis scalaris*	Molluscs	EN	NA	NA
North Africa		*Theodoxus numidicus*	Molluscs	VU	NA	NA
North Africa		*Unio durieui*	Molluscs	EN	NA	NA
North Africa		*Calopteryx exul*	Odonata	EN	NA	NA
North Africa		*Cordulegaster princeps*	Odonata	NA	yes	NA
North Africa		*Lepidium violaceum*	Plants	VU	NA	NA
North Africa	Upper Dades	*Calopteryx exul*	Odonata	EN	NA	NA
North Africa		*Cordulegaster princeps*	Odonata	NA	yes	NA
North Africa		*Campanula mairei*	Plants	VU	NA	NA
North Africa		*Ranunculus dyris*	Plants	NA	yes	NA
North Africa	Upper Medjarda River	*Anguilla anguilla*	Fishes	CR	NA	NA
North Africa		*Barbus callensis*	Fishes	NA	NA	yes
North Africa		*Pseudophoxinus punicus*	Fishes	EN	NA	NA
North Africa		*Unio durieui*	Molluscs	EN	NA	NA
North Africa		*Calopteryx exul*	Odonata	EN	NA	NA
North Africa		*Gomphus lucasii*	Odonata	VU	yes	NA
North Africa	Upper Oued N'Fiss	*Cordulegaster princeps*	Odonata	NA	yes	NA
North Africa		*Carum asinorum*	Plants	EN	yes	NA
North Africa	Upper Oum Er Rbia	*Barbus harterti*	Fishes	VU	NA	yes
North Africa		*Barbus paytonii*	Fishes	VU	NA	yes
North Africa		*Melanopsis scalaris*	Molluscs	EN	NA	NA
North Africa		*Calopteryx exul*	Odonata	EN	NA	NA
North Africa		*Cordulegaster princeps*	Odonata	NA	yes	NA
North Africa		*Cirsium ducellieri*	Plants	VU	NA	NA
North Africa		*Damasonium polyspermum*	Plants	VU	NA	NA
North Africa		*Rorippa hayanica*	Plants	VU	NA	NA
North Africa	Upper Oum Er Rbia above Kasba Tadla	*Barbus harterti*	Fishes	VU	NA	yes
North Africa		*Barbus nasus*	Fishes	NA	NA	yes
North Africa		*Barbus paytonii*	Fishes	VU	NA	yes
North Africa		*Gyraulus laevis*	Molluscs	NA	yes	NA
North Africa		*Margaritifera marocana*	Molluscs	CR	yes	NA
North Africa		*Theodoxus numidicus*	Molluscs	VU	NA	NA
North Africa		*Unio durieui*	Molluscs	EN	NA	NA

Table B cont'd. North African validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
North Africa		*Calopteryx exul*	Odonata	EN	NA	NA
North Africa		*Cirsium ducellieri*	Plants	VU	NA	NA
North Africa		*Damasonium polyspermum*	Plants	VU	NA	NA
North Africa	Western Numidia*	*Pleurodeles poireti*	Amphibian	EN	NA	NA
North Africa		*Anguilla anguilla*	Fishes	CR	NA	NA
North Africa		*Barbus setivimensis*	Fishes	NA	NA	yes
North Africa		*Pseudophoxinus punicus*	Fishes	EN	yes	yes
North Africa		*Damasonium polyspermum*	Plants	VU	NA	NA
North Africa		*Rhynchospora modesti-lucennoi*	Plants	EN	NA	NA
North Africa		*Rumex algeriensis*	Plants	EN	NA	NA

Table C. Turkey and Levant validated trigger species. C1 (Threatened species: CR Critically Endangered, EN Endangered, VU Vulnerable); C2 (Restricted Range); C3 (Biome-restricted community). * AZE sites. NA: not applicable.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
Turkey and Levant	Aksu River	*Alburnus baliki*	Fishes	EN	yes	NA
Turkey and Levant		*Capoeta antalyensis*	Fishes	VU	yes	NA
Turkey and Levant		*Oxynoemacheilus mediterraneus*	Fishes	NA	yes	NA
Turkey and Levant		*Pseudophoxinus alii*	Fishes	EN	yes	NA
Turkey and Levant		*Unio crassus*	Molluscs	EN	NA	NA
Turkey and Levant	Akyaka springs*	*Bithynia pesicii*	Molluscs	EN	yes	NA
Turkey and Levant		*Unio crassus*	Molluscs	EN	NA	NA
Turkey and Levant	Amman	*Oxynoemacheilus insignis*	Fishes	NT1	NA	NA
Turkey and Levant		*Melanopsis buccinoidea*	Molluscs	NA	yes	NA
Turkey and Levant	Bakirçay	*Alburnus attalus*	Fishes	EN	yes	NA
Turkey and Levant		*Chondrostoma holmwoodii*	Fishes	VU	NA	NA
Turkey and Levant		*Knipowitschia mermere*	Fishes	VU	yes	NA
Turkey and Levant		*Squalius cii*	Fishes	NA	yes	NA
Turkey and Levant		*Pseudorientalia natolica*	Molluscs	NA	yes	NA
Turkey and Levant		*Unio crassus*	Molluscs	EN	NA	NA
Turkey and Levant	Burdur lake and catchments*	*Aphanius sureyanus*	Fishes	EN	yes	yes
Turkey and Levant		*Cobitis phrygica*	Fishes	EN	yes	NA
Turkey and Levant		*Chondrostoma fahirae*	Fishes	EN	yes	NA
Turkey and Levant		*Oxynoemacheilus anatolicus*	Fishes	EN	yes	NA
Turkey and Levant		*Graecoanatolica brevis*	Molluscs	CR	yes	NA
Turkey and Levant		*Tefennia tefennica*	Molluscs	VU	yes	NA
Turkey and Levant	Büyük Menderes river	*Alburnus demiri*	Fishes	VU	yes	NA
Turkey and Levant		*Chondrostoma meandrense*	Fishes	VU	NA	NA
Turkey and Levant		*Luciobarbus kottelati*	Fishes	VU	yes	NA
Turkey and Levant		*Oxynoemacheilus germencicus*	Fishes	VU	NA	NA
Turkey and Levant		*Vimba mirabilis*	Fishes	NA	yes	NA
Turkey and Levant		*Pseudamnicola geldiayana*	Molluscs	EN	yes	NA
Turkey and Levant		*Unio crassus*	Molluscs	EN	NA	NA
Turkey and Levant	Central Jordan River	*Luciobarbus longiceps*	Fishes	EN	NA	NA
Turkey and Levant		*Oxynoemacheilus insignis*	Fishes	NT[1]	NA	NA
Turkey and Levant		*Melanopsis buccinoidea*	Molluscs	NA	yes	NA
Turkey and Levant		*Potomida littoralis*	Molluscs	EN	NA	NA
Turkey and Levant		*Unio terminalis*	Molluscs	VU	NA	NA
Turkey and Levant	Duden river*	*Pseudophoxinus antalyae*	Fishes	VU	yes	yes
Turkey and Levant		*Hydrobia anatolica*	Molluscs	CR	yes	NA
Turkey and Levant	Eğirdir Lake catchment*	*Capoeta pestai*	Fishes	CR	yes	NA
Turkey and Levant		*Pseudophoxinus egridiri*	Fishes	EN	yes	NA
Turkey and Levant		*Seminemacheilus ispartensis*	Fishes	VU	NA	NA
Turkey and Levant		*Bythinella turca*	Molluscs	CR	yes	NA
Turkey and Levant		*Falsipyrgula pfeiferi*	Molluscs	EN	yes	yes
Turkey and Levant		*Graecoanatolica kocapinarica*	Molluscs	VU	yes	NA
Turkey and Levant		*Graecoanatolica lacustristurca*	Molluscs	EN	yes	yes
Turkey and Levant	Gökdere (Yeşildere) stream*	*Capoeta mauricii*	Fishes	EN	yes	NA
Turkey and Levant		*Gobio hettitorum*	Fishes	CR	yes	NA

Table C cont'd. Turkey and Levant validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
Turkey and Levant		*Oxynoemacheilus eregliensis*	Fishes	VU	NA	NA
Turkey and Levant		*Unio crassus*	Molluscs	EN	NA	NA
Turkey and Levant	Işıklı/Çivril lake and catchment*	*Chondrostoma meandrense*	Fishes	VU	NA	NA
Turkey and Levant		*Gobio maeandricus*	Fishes	EN	yes	NA
Turkey and Levant		*Oxynoemacheilus mesudae*	Fishes	EN	yes	NA
Turkey and Levant		*Pseudophoxinus maeandri*	Fishes	EN	yes	NA
Turkey and Levant		*Pseudophoxinus maeandricus*	Fishes	CR	yes	NA
Turkey and Levant		*Squalius carinus*	Fishes	EN	yes	NA
Turkey and Levant		*Graecoanatolica tenuis*	Molluscs	VU	yes	NA
Turkey and Levant		*Pseudamnicola geldiayana*	Molluscs	EN	yes	NA
Turkey and Levant	Jerico catchment	*Luciobarbus longiceps*	Fishes	EN	NA	NA
Turkey and Levant		*Oxynoemacheilus insignis*	Fishes	NT[1]	NA	NA
Turkey and Levant		*Melanopsis buccinoidea*	Molluscs	NA	yes	NA
Turkey and Levant	Karpuzçay stream*	*Capoeta caelestis*	Fishes	NA	yes	NA
Turkey and Levant		*Kirelia murtici*	Molluscs	CR	yes	NA
Turkey and Levant		*Unio crassus*	Molluscs	EN	NA	NA
Turkey and Levant	Köprü Çay*	*Alburnus baliki*	Fishes	EN	yes	NA
Turkey and Levant		*Capoeta antalyensis*	Fishes	VU	yes	NA
Turkey and Levant		*Oxynoemacheilus mediterraneus*	Fishes	NA	yes	NA
Turkey and Levant		*Pseudophoxinus fahrettini*	Fishes	EN	yes	NA
Turkey and Levant		*Unio crassus*	Molluscs	EN	NA	NA
Turkey and Levant	Korkuteli and Elmali plains	*Pseudophoxinus evliyae*	Fishes	EN	yes	NA
Turkey and Levant		*Graecoanatolica pamphylica*	Molluscs	EN	yes	NA
Turkey and Levant		*Unio crassus*	Molluscs	EN	NA	NA
Turkey and Levant		*Scardinius elmaliensis*		EN	NA	NA
Turkey and Levant	Küçük Menderes	*Oxynoemacheilus germencicus*	Fishes	VU	NA	yes
Turkey and Levant		*Bythinella occasiuncula*	Molluscs	VU	yes	NA
Turkey and Levant		*Pseudorientalia natolica*	Molluscs	NA	yes	NA
Turkey and Levant		*Unio crassus*	Molluscs	EN	NA	NA
Turkey and Levant		*Knipowitschia ephesi*	Fishes	CR	yes	yes
Turkey and Levant	Lake Beyşehir and catchments*	*Capoeta mauricii*	Fishes	EN	yes	NA
Turkey and Levant		*Cobitis battalgili*	Fishes	EN	yes	NA
Turkey and Levant		*Cobitis bilseli*	Fishes	EN	yes	NA
Turkey and Levant		*Chondrostoma beysehirense*	Fishes	EN	yes	NA
Turkey and Levant		*Gobio battalgilae*	Fishes	NA	yes	NA
Turkey and Levant		*Gobio microlepidotus*	Fishes	VU	yes	NA
Turkey and Levant		*Oxynoemacheilus atili*	Fishes	NA	yes	NA
Turkey and Levant		*Pseudophoxinus anatolicus*	Fishes	EN	yes	NA
Turkey and Levant		*Pseudophoxinus hittitorum*	Fishes	EN	yes	NA
Turkey and Levant		*Seminemacheilus lendlii*	Fishes	VU	NA	NA
Turkey and Levant		*Falsipyrgula beysehirana*	Molluscs	CR	NA	NA
Turkey and Levant		*Graecoanatolica lacustristurca*	Molluscs	EN	NA	NA
Turkey and Levant		*Kirelia carinata*	Molluscs	CR	yes	NA
Turkey and Levant	Lake Homs (Qatinah)	*Alburnus orontis*	Fishes	VU	yes	NA
Turkey and Levant		*Capoeta barroisi*	Fishes	EN	yes	NA
Turkey and Levant		*Anodonta pseudodopsis*	Molluscs	EN	yes	NA

Table C cont'd. Turkey and Levant validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
Turkey and Levant		*Margaritifera homsensis*	Molluscs	EN	yes	NA
Turkey and Levant		*Melanopsis dircaena*	Molluscs	EN	yes	NA
Turkey and Levant		*Potomida littoralis*	Molluscs	EN	NA	NA
Turkey and Levant		*Unio terminalis*	Molluscs	VU	NA	NA
Turkey and Levant	Lake Iznik and catchment*	*Oxynoemacheilus phoxinoides*	Fishes	CR	yes	NA
Turkey and Levant		*Falsibelgrandiella bunarica*	Molluscs	NA	yes	NA
Turkey and Levant		*Pseudorientalia natolica*	Molluscs	NA	yes	NA
Turkey and Levant		*Sadleriana byzanthina*	Molluscs	NA	yes	NA
Turkey and Levant		*Unio crassus*	Molluscs	EN	NA	NA
Turkey and Levant	Lakes Acıgöl and Salda	*Aphanius transgrediens*	Fishes	CR	yes	NA
Turkey and Levant		*Cobitis phrygica*	Fishes	EN	yes	NA
Turkey and Levant		*Graecoanatolica conica*	Molluscs	CR	yes	NA
Turkey and Levant		*Graecoanatolica tenuis*	Molluscs	VU	yes	NA
Turkey and Levant		*Tefennia tefennica*	Molluscs	VU	yes	NA
Turkey and Levant	Lakes Akşehir - Eber system	*Alburnus nasreddini*	Fishes	CR	yes	NA
Turkey and Levant		*Gobio intermedius*	Fishes	EN	yes	NA
Turkey and Levant		*Seminemacheilus ispartensis*	Fishes	VU	yes	NA
Turkey and Levant		*Squalius recurvirostris*	Fishes	VU	yes	NA
Turkey and Levant		*Bithynia pseudemmericia*	Molluscs	VU	yes	NA
Turkey and Levant	Litani River*	*Oxynoemacheilus leontinae*	Fishes	NA	yes	NA
Turkey and Levant		*Potomida littoralis*	Molluscs	EN	NA	NA
Turkey and Levant	Lower Asi drainage	*Acanthobrama centisquama*	Fishes	CR	NA	NA
Turkey and Levant		*Alburnus orontis*	Fishes	VU	yes	NA
Turkey and Levant		*Capoeta barroisi*	Fishes	EN	yes	NA
Turkey and Levant		*Cobitis levantina*	Fishes	EN	yes	NA
Turkey and Levant		*Chondrostoma kinzelbachi*	Fishes	EN	yes	NA
Turkey and Levant		*Oxynoemacheilus hamwii*	Fishes	EN	yes	NA
Turkey and Levant		*Anodonta pseudodopsis*	Molluscs	EN	yes	NA
Turkey and Levant		*Potomida littoralis*	Molluscs	EN	NA	NA
Turkey and Levant		*Unio crassus*	Molluscs	EN	NA	NA
Turkey and Levant		*Unio terminalis*	Molluscs	VU	NA	NA
Turkey and Levant	Lower Gediz river	*Alburnus battalgilae*	Fishes	VU	yes	NA
Turkey and Levant		*Chondrostoma holmwoodii*	Fishes	VU	NA	NA
Turkey and Levant		*Knipowitschia mermere*	Fishes	VU	yes	NA
Turkey and Levant		*Oxynoemacheilus germencicus*	Fishes	VU	NA	NA
Turkey and Levant		*Vimba mirabilis*	Fishes	NA	yes	yes
Turkey and Levant		*Unio crassus*	Molluscs	EN	NA	NA
Turkey and Levant	Lower Yarmouk	*Luciobarbus longiceps*	Fishes	EN	NA	NA
Turkey and Levant		*Oxynoemacheilus insignis*	Fishes	NT[1]	NA	NA
Turkey and Levant	Main stem of the Tigris River	*Barbus grypus*	Fishes	VU	NA	NA
Turkey and Levant		*Carasobarbus kosswigi*	Fishes	VU	NA	NA
Turkey and Levant		*Luciobarbus esocinus*	Fishes	VU	NA	NA
Turkey and Levant		*Luciobarbus subquincunciatus*	Fishes	CR	NA	NA
Turkey and Levant		*Luciobarbus xanthopterus*	Fishes	VU	NA	NA
Turkey and Levant	Manavgat River	*Alburnus baliki*	Fishes	EN	yes	NA
Turkey and Levant		*Capoeta caelestis*	Fishes	NA	yes	NA

Table C cont'd. Turkey and Levant validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
Turkey and Levant		*Cobitis battalgili*	Fishes	EN	yes	NA
Turkey and Levant		*Oxynoemacheilus atili*	Fishes	NA	yes	NA
Turkey and Levant		*Unio crassus*	Molluscs	EN	NA	NA
Turkey and Levant	Middle and lower Seyhan river	*Capoeta turani*	Fishes	NA	yes	NA
Turkey and Levant		*Hemigrammocapoeta culiciphaga*	Fishes	NA	yes	NA
Turkey and Levant		*Oxynoemacheilus seyhanicola*	Fishes	EN	yes	NA
Turkey and Levant		*Potomida littoralis*	Molluscs	EN	NA	NA
Turkey and Levant		*Unio crassus*	Molluscs	EN	NA	NA
Turkey and Levant		*Unio terminalis*	Molluscs	VU	NA	NA
Turkey and Levant	Middle Orontes	*Alburnus orontis*	Fishes	VU	yes	NA
Turkey and Levant		*Melanopsis dircaena*	Molluscs	EN	yes	NA
Turkey and Levant		*Potomida littoralis*	Molluscs	EN	NA	NA
Turkey and Levant		*Unio terminalis*	Molluscs	VU	NA	NA
Turkey and Levant	Nahr al Aouaj	*Acanthobrama tricolor*	Fishes	CR	NA	NA
Turkey and Levant		*Oxynoemacheilus panthera*	Fishes	EN	NA	NA
Turkey and Levant		*Pseudophoxinus drusensis*	Fishes	EN	NA	NA
Turkey and Levant	Nahr al Kabir	*Margaritifera homsensis*	Molluscs	EN	yes	NA
Turkey and Levant		*Potomida littoralis*	Molluscs	EN	NA	NA
Turkey and Levant		*Unio terminalis*	Molluscs	VU	NA	NA
Turkey and Levant	Nahr al Marqiya*	*Pseudophoxinus hasani*	Fishes	CR	yes	NA
Turkey and Levant	Northern Coastal Streams of Syria*	*Alburnus qalilus*	Fishes	EN	yes	NA
Turkey and Levant		*Potomida littoralis*	Molluscs	EN	NA	NA
Turkey and Levant	Qweik*	*Oxynoemacheilus tigris*	Fishes	CR	yes	NA
Turkey and Levant		*Potomida littoralis*	Molluscs	EN	NA	NA
Turkey and Levant		*Unio crassus*	Molluscs	EN	NA	NA
Turkey and Levant	Savrun catchment (Ceyhan drainage)	*Capoeta erhani*	Fishes	NA	yes	NA
Turkey and Levant		*Cobitis evreni*	Fishes	EN	yes	NA
Turkey and Levant		*Hemigrammocapoeta culiciphaga*	Fishes	NA	yes	NA
Turkey and Levant		*Potomida littoralis*	Molluscs	EN	NA	NA
Turkey and Levant		*Unio crassus*	Molluscs	EN	NA	NA
Turkey and Levant		*Unio terminalis*	Molluscs	VU	NA	NA
Turkey and Levant	Spring of Barada (En Fidje)	*Oxynoemacheilus panthera*	Fishes	EN	yes	NA
Turkey and Levant		*Pseudophoxinus syriacus*	Fishes	CR	yes	NA
Turkey and Levant	Sultan Sazlığı Marshes*	*Aphanius danfordii*	Fishes	CR	yes	NA
Turkey and Levant		*Pseudophoxinus elizavetae*	Fishes	CR	yes	NA
Turkey and Levant		*Gyraulus argaeicus*	Molluscs	VU	yes	NA
Turkey and Levant		*Pseudobithynia pentheri*	Molluscs	NA	yes	NA
Turkey and Levant		*Unio crassus*	Molluscs	EN	NA	NA
Turkey and Levant	Upper Asi Lebanon*	*Alburnus orontis*	Fishes	VU	yes	NA
Turkey and Levant		*Carasobarbus chantrei*	Fishes	NT[1]	NA	NA
Turkey and Levant		*Pseudophoxinus kervillei*	Fishes	EN	NA	NA
Turkey and Levant		*Pseudophoxinus zeregi*	Fishes	LC[1]	NA	NA
Turkey and Levant		*Pseudobithynia kathrinae*	Molluscs	CR	yes	NA
Turkey and Levant		*Pseudobithynia levantica*	Molluscs	EN	yes	NA
Turkey and Levant	Upper Dalaman	*Alburnus demiri*	Fishes	VU	yes	NA
Turkey and Levant		*Cobitis phrygica*	Fishes	EN	yes	NA

Table C cont'd. Turkey and Levant validated trigger species.

Sub-region	KBA Name	Trigger species	Group	C1	C2	C3
Turkey and Levant		*Chondrostoma fahirae*	Fishes	EN	yes	NA
Turkey and Levant		*Torosia proschwitzi*	Molluscs	NA	yes	NA
Turkey and Levant	Upper Jordan Valley	*Hemigrammocapoeta nana*	Fishes	NT[1]	NA	NA
Turkey and Levant		*Luciobarbus longiceps*	Fishes	EN	NA	NA
Turkey and Levant		*Mirogrex terraesanctae*	Fishes	NA	yes	NA
Turkey and Levant		*Oxynoemacheilus leontinae*	Fishes	NA	yes	NA
Turkey and Levant		*Pseudophoxinus drusensis*	Fishes	EN	yes	NA
Turkey and Levant		*Pseudophoxinus kervillei*	Fishes	EN	NA	NA
Turkey and Levant		*Tristramella simonis*	Fishes	NA	yes	NA
Turkey and Levant		*Falsipyrgula barroisi*	Molluscs	EN	yes	yes
Turkey and Levant		*Potomida littoralis*	Molluscs	EN	NA	NA
Turkey and Levant	Upper Khabour	*Barbus grypus*	Fishes	VU	NA	NA
Turkey and Levant		*Carasobarbus kosswigi*	Fishes	VU	NA	NA
Turkey and Levant		*Luciobarbus esocinus*	Fishes	VU	NA	NA
Turkey and Levant		*Luciobarbus subquincunciatus*	Fishes	CR	NA	NA
Turkey and Levant		*Melanopsis khabourensis*	Molluscs	CR	yes	yes
Turkey and Levant		*Theodoxus cinctellus*	Molluscs	NA	yes	NA
Turkey and Levant		*Unio crassus*	Molluscs	EN	NA	NA
Turkey and Levant	Upper Mujib*	*Oxynoemacheilus insignis*	Fishes	NT[1]	NA	NA
Turkey and Levant		*Pseudamnicola solitaria*	Molluscs	EN	NA	NA
Turkey and Levant	Wadi Karak Basin	*Garra ghorensis*	Fishes	EN	yes	NA
Turkey and Levant		*Oxynoemacheilus insignis*	Fishes	NT[1]	NA	NA
Turkey and Levant	Wadi Shuaib	*Luciobarbus longiceps*	Fishes	EN	NA	NA
Turkey and Levant		*Oxynoemacheilus insignis*	Fishes	NT[1]	NA	NA
Turkey and Levant	Yarmuk basin*	*Hemigrammocapoeta nana*	Fishes	NT[1]	NA	NA
Turkey and Levant		*Luciobarbus longiceps*	Fishes	EN	NA	NA
Turkey and Levant		*Mirogrex terraesanctae*	Fishes	NA	yes	NA
Turkey and Levant		*Oxynoemacheilus galilaeus*	Fishes	CR	NA	NA
Turkey and Levant		*Oxynoemacheilus insignis*	Fishes	NT[1]	NA	NA
Turkey and Levant		*Pseudophoxinus kervillei*	Fishes	EN	NA	NA
Turkey and Levant	Yarpuz and Hamus catchment (in Ceyhan basin)	*Capoeta erhani*	Fishes	NA	yes	NA
Turkey and Levant		*Cobitis evreni*	Fishes	EN	yes	NA
Turkey and Levant		*Hemigrammocapoeta culiciphaga*	Fishes	NA	yes	NA
Turkey and Levant		*Pseudophoxinus zekayi*	Fishes	VU	yes	NA
Turkey and Levant		*Potomida littoralis*	Molluscs	EN	NA	NA
Turkey and Levant		*Unio crassus*	Molluscs	EN	NA	NA
Turkey and Levant	Zarqa River	*Hemigrammocapoeta nana*	Fishes	NT[1]	NA	NA
Turkey and Levant		*Oxynoemacheilus insignis*	Fishes	NT[1]	NA	NA
Turkey and Levant		*Melanopsis ammonis*	Molluscs	CR	NA	NA

[1] These species are included as KBA trigger species as, at the time of the analysis, they were either classifed as being threatened or were proposed to be reclassified as threatened. The status of these species still needs to be clarified with regard to them being "trigger Species" for KBAs.

Annex V. Site Champions

Table D. Organizations or individuals to be considered as potential 'Site Champions' for each KBA (i.e. those who can undertake conservation actions or raise the KBA profile) or those who have an interest in, or are impacting, the KBA. * AZE site.

Sub-region	Country	KBA Name	Site Champion
Balkans	Albania	Butrint	Albanian Ministry of Environment, Forests and Water Administration, Butrint National Park
Balkans	Bosnia and Herzegovina	Lake Busko	Site Champions still to be identified
Balkans	Bosnia and Herzegovina	Listica river and Mostarsko blato	Government of Herzegovina-Neretva and West Herzegovina county and federation of BiH, International and local NGOs: EuroNatur, WWF, Nase Ptice, Lijepa Nasa, EkoMost, Buna etc
Balkans	Bosnia and Herzegovina	Nevesinjsko polje, Gatacko polje, Cernicko polje, Fatnicko polje and Dabarsko polje	Ministry of Spatial Planning Civil Engineering and Ecology, Nature Protection Institute of RS, NGOs: EuroNatur, WWF, Nase Ptice, Centre for Environment from Banja Luka, Bastina from Tomislavgrad, Lijepa Nasa from Capljina, Mocvara from Capljina, EkoMost etc
Balkans	Bosnia and Herzegovina	Part of the Neretva upper catchment	Site Champions still to be identified
Balkans	Bosnia and Herzegovina	Part of the Neretva upper catchment – eastern mid catchment	Site Champions still to be identified
Balkans	Bosnia and Herzegovina	Popovo polje and Trebišnjica	Site Champions still to be identified
Balkans	Bosnia and Herzegovina	Tributaries of lower and middle Neretva	Government of Herzegovina-Neretva and West Herzegovina county and federation of BiH, International and local NGOs: EuroNatur, WWF, Nase Ptice, Lijepa Nasa, EkoMost, Buna etc
Balkans	Bosnia and Herzegovina	West Karst poljes	Bosnia Ornithological Society, Energy Companies, EuroNatur, Government Municipality, UNDP, WWF, Youth Centre
Balkans	Croatia	Cetina river	County public institution for nature protection of Split-Dalmatian County, Local NGO Sunce
Balkans	Croatia	Matica river and Bacina lakes	County public institution for nature protection of Dubrovnik-Neretva County, County public institution for nature protection of Split-Dalmatian County, Local NGO Sunce
Balkans	Croatia	Zrmanja river	County public institution for nature protection of Zadar county, Velebit Nature Park
Balkans	Greece	Acheron*	Department of Aquaculture & Fisheries, Technological Educational Institute of Epirus, Institute of Inland Waters, Hellenic Centre for Marine Research, Anavyssos, Greece, Managing Authority of Kalamas and Aherontas Rivers, Region of Ipiros + management body
Balkans	Greece	Aggitis*	Region of East Macedonia Thrace (CIVIL ARCH), Water Management Authority of Eastern Macedonia and Thrace
Balkans	Greece	Aliakmon Naoussa*	Water Management Authority of Central Macedonia
Balkans	Greece	Andros Tinos	Region of Southern Aegean, Direction Water Resources Management
Balkans	Greece	Arachthos	Institute of Marine Biological Resources and Inland Waters
Balkans	Greece	Arkadia Plateau	Prefecture of Arcadia
Balkans	Greece	Chios	Region of North Aegean Department of Environment and Hydroeconomy RE of Chios
Balkans	Greece	Corfu Island (Kerkyra)	Mr Stamatis Ginis Fisheries Biologist, Region of Ionian Direction Water Resourses Management
Balkans	Greece	Crete Central South	Natural History Museum of Crete, WWF Crete
Balkans	Greece	Crete Eastern	Natural History Museum of Crete, Region of Crete Direction Water Resourses Management, WWF Crete
Balkans	Greece	Crete North-west	Natural History Museum of Crete, WWF Crete
Balkans	Greece	Crete South-west*	Management Body of Samaria National Park, Natural History Museum of Crete, Region of Crete Direction Water Resourses Management, WWF Crete

Table D cont'd. Organizations or individuals to be considered as potential 'Site Champions' for each KBA.

Sub-region	Country	KBA Name	Site Champion
Balkans	Greece	Eastern Attica	Site Champions still to be identified
Balkans	Greece	Euboea Manikiatis*	Region of Sterea Ellada, Department of Environment and Hydroeconomy RE of Euboea
Balkans	Greece	Evrotas	Site Champions still to be identified
Balkans	Greece	Evrotas - Arniotikos	Site Champions still to be identified
Balkans	Greece	Evrotas - Gytheio	Site Champions still to be identified
Balkans	Greece	Ismaris-Vosvozis-Filiouris	Management body for the National park (www.fd.nestosvistonis.gr)
Balkans	Greece	Kalamas	Site Champions still to be identified
Balkans	Greece	Karla*	Management body of Karla -Mavrovounio - Velestino and Kefalobryso
Balkans	Greece	Karpathos	Management Body of Karpathos-Saria
Balkans	Greece	Kastoria	Site Champions still to be identified
Balkans	Greece	Kastraki	Site Champions still to be identified
Balkans	Greece	Kephalonia and Ithaki	Region of Ionian Direction Water Resourses Management
Balkans	Greece	Kerkini	Management Authority of Kerkini Lake
Balkans	Greece	Krka drainage	County public institution for nature protection of Sibenik - Knin County, Public institution National park Krka
Balkans	Greece	Ladon	Western Greece Region
Balkans	Greece	Lake Kastrakiou	Site Champions still to be identified
Balkans	Greece	Lakes Limnothalassa Rodias, Limnothalassa Tsoukaliou, Limnothalassa Lagarou	Site Champions still to be identified
Balkans	Greece	Lakes Trichonis and Lisimachia*	Site Champions still to be identified
Balkans	Greece	Lesvos	Basin Management Authority of Northern Aegean, NGO Naftilus En Drasi, Region of North Aegean, Department of Hydroeconomy RE of Lesvos
Balkans	Greece	Lower Acheloos	Site Champions still to be identified
Balkans	Greece	Lower Alfeios	Site Champions still to be identified
Balkans	Greece	Lower Axios	Axios-Loudias -Aliakmonas Management authority
Balkans	Greece	Magnisia*	Site Champions still to be identified
Balkans	Greece	Mornos	Site Champions still to be identified
Balkans	Greece	Naxos	Region of Southern Aegean, Direction Water Resources Management
Balkans	Greece	Northern Korinthiakos	Site Champions still to be identified
Balkans	Greece	Pamvotis Lake*	Management Body of Lake Pamvotis, University of Ioannina
Balkans	Greece	Peloponnese Maleas*	Water Management Authority of Peloponnese
Balkans	Greece	Pineios Peloponnisou	Site Champions still to be identified
Balkans	Greece	Pinios Thessalias	Site Champions still to be identified
Balkans	Greece	Rhodes Island	Forest department, Local NGO Aithria; Agro-Environmental Research and Action Team, Moschous Stamatios, Region of Southern Aegean, Direction Water Resources Management
Balkans	Greece	Spercheios*	Managnement body of MT OITI National Park, Region of Sterea Ellada Section of Environment and Hydroeconomy of Pfthiotidi, Water Management Authority of the region of Central Greece
Balkans	Greece	Tempi	Site Champions still to be identified
Balkans	Greece	Thassos	IBA caretaker, Water Management Authority of Eastern Macedonia and Thrace
Balkans	Greece	Tragos	Site Champions still to be identified
Balkans	Greece	Upper Alfeios	Site Champions still to be identified
Balkans	Greece	Upper Aliakmon	Site Champions still to be identified
Balkans	Greece	Upper Aoos	Site Champions still to be identified
Balkans	Greece	Upper Kifissos*	Site Champions still to be identified

Table D cont'd. Organizations or individuals to be considered as potential 'Site Champions' for each KBA.

Sub-region	Country	KBA Name	Site Champion
Balkans	Greece	Vistonis	Management Body of National Park of Eastern Macedonia and Thrace
Balkans	Greece	Volvi-Koronia	Site Champions still to be identified
Balkans	Greece	Yliki-Paralimni-Kifissos*	Site Champions still to be identified
Balkans	Greece	Zakynthos	Region of Ionian Direction Water Resourses Management
Balkans	Montenegro	Catchment surrounding Niksic*	Site Champions still to be identified
Balkans	Montenegro / Albania	Lake Skadar*	Critical Ecosystem Partnership Fund (CEPF), Institute for Nature Conservation in Albania (INCA), NGO Green Home Montenegro
Balkans	Albania, FYR Macedonia	Lake Ohrid*	Despina Kitanova. Society for Nature Conservation of Macedonia, University of Tirana Albania
Balkans	Albania, Greece, FYR Macedonia	Transboundary Prespa Park*	PrespaNet representative organizations: Dr L. Melovski - Macedonia Ecological Society Dr S. Shumka - PPNEA Ms I. Koutseri Society for the Protection of Prespa
Balkans	Albania, Montenegro	Lower Bojana river basin*	Site Champions still to be identified
Balkans	Bosnia and Herzegovina / Montenegro	Lake Bilecko	Site Champions still to be identified
Balkans	Bosnia and Herzegovina, Croatia	Neretva delta and associated springs/lakes	County public institution for nature protection of Dubrovnik-Neretva County, Croatian waters, Elektroprivreda HZHB RS and HEP, Government of Herzegovina-Neretva and West Herzegovina county and federation of BiH, Public enterprise Nature park Hutovo blato
Balkans	Bosnia and Herzegovina, Croatia	Trebizat drainage including Imotsko polje*	County public institution for nature protection of Split-Dalmatian County, Government of Herzegovina-Neretva and West Herzegovina county and federation of BiH, Local engagement in endemic trout protection and local angling society
Balkans	Croatia, Slovenia, Italy	Dragonija drainage in Slovenia and Croatia, Reka river in Slovenia and Timavo spring, north of Trieste in Italy	Community of Monfalcone/Italy, Natura 2000 responsible entities in Italy and Slovenia
Balkans	Greece / FYR Macedonia	Doirani*	Water directorate of Region of Central Macedonia
North Africa	Algeria	Beni Belaid	Laboratoire de Recherche et de Conservation des Zones Humides, University of Guelma, Ministère de l'Agriculture et du Développement Rural, Ministry of Environment
North Africa	Algeria	Hauts Plateaux	Laboratoire de Recherche et de Conservation des Zones Humides, University of Guelma, Ministère de l'Agriculture et du Développement Rural, Ministry of Environment
North Africa	Algeria	Oued el Harrach	Laboratoire de Recherche et de Conservation des Zones Humides, University of Guelma, Ministère de l'Agriculture et du Développement Rural, Ministry of Environment
North Africa	Algeria	Oued Zhour	Wilaya de Skikda
North Africa	Algeria	Seybouse catchment	Laboratoire de Recherche et de Conservation des Zones Humides, University of Guelma
North Africa	Algeria	Tafna Catchment	Laboratoire de Recherche et de Conservation des Zones Humides, University of Guelma
North Africa	Algeria	Western Numidia*	Laboratoire de Recherche et de Conservation des Zones Humides, University of Guelma, La Direction Générale des Forêts (DGF), Ministry of Environment
North Africa	Morocco	Abid river downstream	Agence du Bassin Hydraulique de l'Oum Er Rbia, Groupe de Recherche pour la Protection des Oiseaux au Maroc (GREPOM), Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Ministry of Interior / Direction General Collectivités Locales (DGCL), Ministry of Tourism, Muséum d'Histoire Naturelle de Marrakech
North Africa	Morocco	Arhreme river*	Agence du Bassin Hydraulique du Souss Massa, Arhreme commune
North Africa	Morocco	Assif El Mal	Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD)

Table D cont'd. Organizations or individuals to be considered as potential 'Site Champions' for each KBA.

Sub-region	Country	KBA Name	Site Champion
North Africa	Morocco	Assif El Mal east	Agence du Bassin Hydraulique du Tensift ABHT, Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Ministry of Interior / Direction General Collectivités Locales (DGCL)
North Africa	Morocco	Assif Meloul river	Commune of Imilchil, Groupe de Recherche pour la Protection des Oiseaux au Maroc (GREPOM), Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Université Moulay Ismail
North Africa	Morocco	Lower Moulouya	Agence du Bassin Hydraulique de la Moulouya, Amis de Tafouralt, Communes locales, Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Ministry of Interior / Direction General Collectivités Locales (DGCL), Université Mohammed I
North Africa	Morocco	Lower Souss and tributaries	Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Local NGOs, Ministry of Interior / Direction General Collectivités Locales (DGCL), Sous Massa-Draa Hydraulic Basin Agency
North Africa	Morocco	M'Goun river basin	Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Local NGOs, Ministry of Interior / Direction General Collectivités Locales (DGCL), Ministry of Tourism / Regional Delegation, Office Régional de Mise en Valeur Agricole de Ouarzazate, Sous Massa-Draa Hydraulic Basin Agency
North Africa	Morocco	Middle N'Fiss river	Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD)
North Africa	Morocco	Middle Oum Er Rbia - Beni Mellal	Agence du Bassin Hydraulique de l'Oum Er Rbia, Centre de reproduction carpes de Deroua (CNHP Azou), Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Local NGOs, Ministry of Interior / Direction General Collectivités Locales (DGCL)
North Africa	Morocco	Middle Upper Moulouya	Agence du Bassin Hydraulique de la Moulouya, Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Local NGOs, Ministry of Interior / Direction General Collectivités Locales (DGCL)
North Africa	Morocco	Oued Amizmiz	Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Tensift Hydraulic Basin Agency, Toubkal National Park
North Africa	Morocco	Oued Bouhlou	Agence du Bassin Hydraulique de Sebou, Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), local NGOs from Taza, Ministry of Interior / Direction General Collectivités Locales (DGCL)
North Africa	Morocco	Oued Bouregreg	Agence du Bassin Hydraulique du Bouregreg et de la Chaouia, Bouregreg Management Agency, Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Local NGOs, Ministry of Interior / Direction General Collectivités Locales (DGCL)
North Africa	Morocco	Oued Imouzzer Kandar	Agence du Bassin Hydraulique de Sebou, Groupe de Recherche pour la Protection des Oiseaux au Maroc (GREPOM), Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Local NGOs (e.g. SVT), Ministry of Interior / Direction General Collectivités Locales (DGCL)
North Africa	Morocco	Oued Ksob - Igrounzar	Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Mohammed VI Foundation for Research and Protection of the Argan Tree
North Africa	Morocco	Oued Lakhdar	Agence du Bassin Hydraulique de l'Oum Er Rbia, Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Tensift Hydraulic Basin Agency
North Africa	Morocco	Oued Laou	Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Local NGOs (e.g. SVT), Ministry of Interior / Direction General Collectivités Locales (DGCL), Rhiss-Nekkor Basin Agency, Université Abdelmalek Essaadi, Université Hassan II de Casablanca
North Africa	Morocco	Oued Massa	Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Local NGOs cooperatives, Ministry of Fisheries, Ministry of Handicraft, Ministry of Tourism, Sous Massa-Draa Hydraulic Basin Agency, Université Ibnou Zohr

Table D cont'd. Organizations or individuals to be considered as potential 'Site Champions' for each KBA.

Sub-region	Country	KBA Name	Site Champion
North Africa	Morocco	Oued Tizguite and Oued Ouaslane	Agence du Bassin Hydraulique de Sebou, Conseil municipal d'Ifrane, Groupe de Recherche pour la Protection des Oiseaux au Maroc (GREPOM), Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Ministry of Interior / Direction General Collectivités Locales (DGCL), Ministry of Tourism
North Africa	Morocco	Oued Ziz Errachidia	Agence du Bassin Hydraulique du Guir-Ziz-Rhéris- Errachidia, Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Local NGOs, Ministry of Interior / Direction General Collectivités Locales (DGCL)
North Africa	Morocco	Saidia Coastal Plain	Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Groupe de Recherche pour la Protection des Oiseaux au Maroc (GREPOM), Tensift Hydraulic Basin Agency
North Africa	Morocco	Tifnout basin	Agence du Bassin Hydraulique du Souss Massa, Collectivités locales, Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD)
North Africa	Morocco	Tigrigra stream	Agence du Bassin Hydraulique de Sebou, Centre d'Hydrobiologie et pisciculture d'Azrou, Groupe de Recherche pour la Protection des Oiseaux au Maroc (GREPOM), Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Local NGOs, Ministry of Interior / Direction General Collectivités Locales (DGCL), Université Moulay Ismail
North Africa	Morocco	Upper Dades	Draa Hydraulic Basin Agency / Oum Er Rbia Hydraulic Basin Agency, Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Ministry of Interior / Direction General Collectivités Locales (DGCL)
North Africa	Morocco	Upper Oued N'Fiss	Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Ministry of Interior / Direction General Collectivités Locales (DGCL), Tensift Hydraulic Basin Agency
North Africa	Morocco	Upper Oum Er Rbia	Agence du Bassin Hydraulique de l'Oum Er Rbia, Associations de pêcheurs, Groupe de Recherche pour la Protection des Oiseaux au Maroc (GREPOM), Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Ministry of Interior / Direction General Collectivités Locales (DGCL)
North Africa	Morocco	Upper Oum Er Rbia above Kasba Tadla	Agence du Bassin Hydraulique de l'Oum Er Rbia, Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Ministry of Interior / Direction General Collectivités Locales (DGCL)
North Africa	Tunisia	Cap Serrat - Cap Blanc - Parc national de l'Ichkeul	Agence de Protection et d'Amenagement du Littoral (APAL), Agence Nationale de Protection de l'Environnement (ANPE), La Direction Générale des Forêts (DGF), REACT Association
North Africa	Tunisia	Maden River	La Direction Générale des Forêts (DGF), REACT Association, Association des amis des oiseaux
North Africa	Algeria, Morocco	Figuig oasis and Oued Saoura	Laboratoire de Recherche et de Conservation des Zones Humides, University of Guelma, Ministère de l'Agriculture et du Développement Rural, Ministry of Environment, World Heritage - UNESCO
North Africa	Algeria, Tunisia	El Kala - Les Tourbières de Dar Fatma transboundary site	Site Champions still to be identified
North Africa	Morocco, Spain (Melilla)	Le Grand Nador	Agence du Bassin Hydraulique de la Moulouya, Le Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD), Local NGOs, Ministry of Fisheries, Ministry of Interior / Direction General Collectivités Locales (DGCL), Nador lagoon agency, Université Mohammed I
Turkey and Levant	Jordan	Amman	Site Champions still to be identified
Turkey and Levant	Jordan	Upper Mujib*	Development Zones Authority, Royal Society for Conservation of Nature (RSCN)
Turkey and Levant	Jordan	Zarqa River	Ministry of Environment, Royal Botanic Garden Jordan, Royal Society for Conservation of Nature (RSCN)
Turkey and Levant	Syria	Middle Orontes	Ministry of irrigation and Ministry of water, Syrian Society for the conservation of Wildlife
Turkey and Levant	Syria	Nahr al Aouaj	Ministry of irrigation and Ministry of water, SSCW Syrian Society for the conservation of wildlife

Table D cont'd. Organizations or individuals to be considered as potential 'Site Champions' for each KBA.

Sub-region	Country	KBA Name	Site Champion
Turkey and Levant	Syria	Nahr al Marqiya*	Ministry of irrigation and Ministry of water, Syrian Society for the conservation of Wildlife
Turkey and Levant	Syria	Upper Khabour	Site Champions still to be identified
Turkey and Levant	Turkey	Aksu River	Site Champions still to be identified
Turkey and Levant	Turkey	Akyaka springs*	Ministry of Forestry and Hydraulic affairs, UKAM (International Karstic Water Resources Center - Hacettepe University)
Turkey and Levant	Turkey	Bakirçay	Celal Bayar University
Turkey and Levant	Turkey	Burdur lake and catchments*	Burdur Municipality, Doga Dernegi, Ministry of Forestry and Hydraulic affairs
Turkey and Levant	Turkey	Büyük Menderes river	Adnan Menderes University, Akcay Sol Sahil Irrigation Chamber, Aydin Memurlar Society, Buyuk Menderes Platform, Coca Cola Life Plus Foundation, Ekosistemi Koruma ve Doga Sevenler Dernegi, Pamukkale University, Soke Irrigation Chamber, WWF Turkey
Turkey and Levant	Turkey	Duden river*	Antalya Municipality, DSI (State Hydraulic Works), UKAM (International Karstic Water Resources Center - Hacettepe University)
Turkey and Levant	Turkey	Eğirdir Lake catchment*	Bizim Isparta Dernegi, Doğa Derneği, Egirdir Su Urunleri Arastirma Enstitusu, WWF
Turkey and Levant	Turkey	Gökdere (Yesildere) stream*	Site Champions still to be identified
Turkey and Levant	Turkey	Isikli/Civril lake and catchment*	Hacettepe University, Pamukkale University, WWF Turkey
Turkey and Levant	Turkey	Karpuzcay stream*	Suleyman Demirel University Fisheries Faculty
Turkey and Levant	Turkey	Kopru Çay*	Directorate of National Parks
Turkey and Levant	Turkey	Korkuteli and Elmali plains	Site Champions still to be identified
Turkey and Levant	Turkey	Küçük Menderes	Aegean Birdwatching Society, Doga Dernegi, Ege University, Sefrihisar municipality, WWF Turkey
Turkey and Levant	Turkey	Lake Beysehir and catchments*	Egirdir Su Urunleri Arastirma Enstitusu, Middle East Technical University, Selcuk University, WWF
Turkey and Levant	Turkey	Lake Iznik and catchment*	Istanbul University, Uludag University
Turkey and Levant	Turkey	Lakes Acigöl and Salda	Hacettepe University, Municipality of Basmakci
Turkey and Levant	Turkey	Lakes Aksehir - Eber system	Aksehir - Eber Golleri Koruma Birligi (protection chamber)
Turkey and Levant	Turkey	Lower Gediz river	Doga Dernegi, Dokuz Eylul University, Ege University, Izmir Kus Cennetini Konima ve Gelistirme Birligi, Tour du Valat Institut
Turkey and Levant	Turkey	Manavgat River	Antalya Orkidelerini ve Biyolojik Cesitliligini Koruma Dernegi, Tema Antalya, UKAM (International Karstic Water Resources Center - Hacettepe University)
Turkey and Levant	Turkey	Middle and lower Seyhan river	Cukurova University, Doga Arastimalari Dernegi, Ministry of Forestry and Hydraulic affairs, WWF Turkey
Turkey and Levant	Turkey	Savrun catchment (Ceyhan drainage)	Cukurova University, Ministry of Forestry and Hydraulic affairs, Sutcu Imam University
Turkey and Levant	Turkey	Sultan Sazligi Marshes*	Doga Dernegi, Irrigation Unions, Ministry of Forestry and Hydraulic affairs, State Hydraulic Works (DSI)
Turkey and Levant	Turkey	Upper Dalman	Site Champions still to be identified
Turkey and Levant	Turkey	Yarpuz and Hammus catchment (in Ceyhan basin)	Sutcu Imam University
Turkey and Levant	Jordan, Israel	Wadi Karak Basin	Ministry of Environment, Natural resources authority, Royal Society for Conservation of Nature (RSCN), Water Authority of Jordan (WAJ)
Turkey and Levant	Jordan, Israel	Wadi Karak Basin	Ministry of Water and irrigation
Turkey and Levant	Jordan, Israel, Palestinian Occupied Territories	Central Jordan River	Bab Es-Salam Womens Cooperative, Friends of the Earth Middle East (manage Sherahbeel Ibn-Hasnah Park), Royal Society for Conservation of Nature (RSCN)
Turkey and Levant	Jordan, Syria	Yarmuk basin	Ministry of Environment, Syrian Society for the conservation of Wildlife
Turkey and Levant	Lebanon, Syria	Litani River*	A Rocha, Al-Shouf Cedar Nature Reserve
Turkey and Levant	Palestinian Occupied Territories	Jerico catchment	Environment Quality Authority, IUCN ROWA, Ministry of Agriculture

Table D cont'd. Organizations or individuals to be considered as potential 'Site Champions' for each KBA.

Sub-region	Country	KBA Name	Site Champion
Turkey and Levant	Syria, Jordan, Israel	Lower Yarmouk	Israel Nature and Parks Authority, Royal Society for Conservation of Nature (RSCN), Waq'qas municipality
Turkey and Levant	Syria, Lebanon	Lake Homs (Qatinah)	Site Champions still to be identified
Turkey and Levant	Syria, Lebanon	Nahr al Kabir	Ministry of irrigation and Ministry of water, Syrian Society for the conservation of Wildlife
Turkey and Levant	Syria, Lebanon	Spring of Barada (En Fidje)	Ministry of irrigation and Ministry of water, Syrian Society for the conservation of Wildlife
Turkey and Levant	Syria, Lebanon	Upper Asi Lebanon*	International conventions Lebanese NGOs, Society for the Protection of Nature – Lebanon
Turkey and Levant	Syria, Lebanon, Israel	Upper Jordan Valley	SPNI Society for the protection of nature (Israel)
Turkey and Levant	Syria, Turkey	Northern Coastal Streams of Syria	Ministry of irrigation and Ministry of water, Syrian Society for the conservation of Wildlife
Turkey and Levant	Turkey, Syria	Lower Asi drainage	Doğa Derneği, Subasi Bidwatching Society, TTKD Turkish Society for the Protection of Nature
Turkey and Levant	Turkey, Syria	Qweik*	Doğa Derneği, TTKD Turkish Society for the Protection of Nature
Turkey and Levant	Turkey, Syria, Iraq	Main stem of the Tigris River	Doğa Derneği, Nature Iraq

Annex VI. Proposed KBAs for plants and odonates in the Turkey and Levant sub-region

There are relatively few KBA trigger species for odonates (seven) and freshwater plants (five) in the eastern Mediterranean part of the Hotspot.

All odonate trigger species overlap to some degree with existing KBAs. As their distributions are mapped to point localities species presence within a KBA, while not yet officially validated, is considered to be confirmed. Additional proposed KBAs to expand the coverage of two odonate species (*Onychogomphus assimilis* and *Onychogomphus flexuosus*, both Vulnerable and only partially covered by the validated KBA network) include: i) Koycegiz Lake and its catchment, and; ii) the lower Esen River. Both of these proposed KBAs are near Dalaman in the Province of Mugla, SW coastal Turkey.

Validated freshwater KBAs where trigger species of odonates occur include:

- *Brachythemis fuscopalliata* (VU) – currently present within the following KBAs; Al Jabbul, Karpuzçay Stream, Köprü Çay, Lower Asi drainage, Middle and Lower Seyhan River, Middle Orontes, Northern Coastal Streams of Syria, and Upper Jordan Valley.
- *Calopteryx hyalina* (EN) – currently present within the following KBAs; Lake Homs (Qatinah), Litani River, Middle Orontes, Nahr al Kabir, Northern Coastal Streams of Syria, Spring of Barada (En Fidje), Upper Jordan Valley (though may be extirpated from here), and Nahr Al Aouaj.
- *Calopteryx syriaca* (EN) – currently present within the following KBAs; Amman, Central Jordan River, Jerico catchment, Lake Homs (Qatinah), Litani River, Lower Yarmouk, Middle Orontes, Nahr Al Aouaj, Nahr al Kabir, Spring of Barada (En Fidje), Upper Asi Lebanon, Upper Jordan Valley, Wadi Karak Basin, Wadi Shuaib, and Zarqa River.
- *Onychogomphus assimilis* (VU) – currently present within the following KBAs; Düden River, Köprü Stream, and Middle and lower Seyhan River.
- *Onychogomphus flexuosus* (VU) – currently present within the following KBAs; Büyük Menderes River, Jerico, and Lower Yarmouk.
- *Onychogomphus macrodon* (VU) – currently present within the following KBAs; Central Jordan River, Lake Homs (Qatinah), Lower Asi drainage, Middle Orontes, Upper Jordan Valley, and Upper Khabour (though the species may be extirpated from here).

For aquatic and wetland plants three new freshwater KBAs (one an AZE site) need to be delineated and validated to ensure that all trigger species are incorporated into the KBA network. Two species are already covered by validated KBAs; i) *Rumex bithynicus* (VU) is partially covered by Lake Iznik and Catchment KBA, and ii) *Thermopsis turcica* (CR) is fully covered by the Lakes Akşehir - Eber System KBA (which would qualify as an AZE for the species). Two (possibly all three) of these proposed freshwater KBAs are already covered by existing 'terrestrial' KBAs (see below for details).

Additional proposed KBAs for aquatic and wetland plants are:

Ömerli Basin (41.036 N, 29.374 E) – the upper parts of this catchment are just within the Mediterranean Basin Hotspot. This would qualify as an AZE site for *Amsonia orientalis* (CR), known as Blue Star, which is only reported from Greece (possibly extinct) and from north-west Turkey where it is only known from the Ömerli Basin. The other known localities in north west Turkey have been lost. This proposed freshwater KBA is covered by an existing Important Plant Area (IPA) called 'Omerli Havzasi'.

J'bel Druze (32.697 N, 36.729 E) – a massif in southern Syria. This site would qualify as an AZE for *Isoetes olympica* (CR), Olympic Quillwort, as the species is possibly extirpated from its only other know locality at Bithynia at Bursa (Mount Olympus) in Turkey. This area is also covered by an existing IPA called 'Jabal al Arab/Jabal Druze'.

Part(s) of the western slopes of the Lebanese mountain chain (33.785 N, 35.656 E). This would qualify as a potential KBA for *Ranunculus schweinfurthii* (VU) which is endemic to the area. There are a number of existing KBAs in this area (e.g. Al Chouf Cedars Nature Reserve and Beirut River Valley) so the species may already be included in one or more of these.

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