

WENZHO

温州湿地资源

温州

陈余钊 潘锡东 管加兴 著



中国林业出版社

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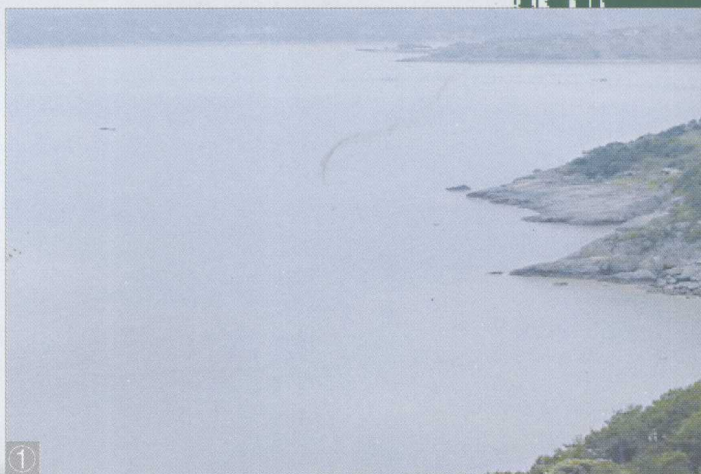
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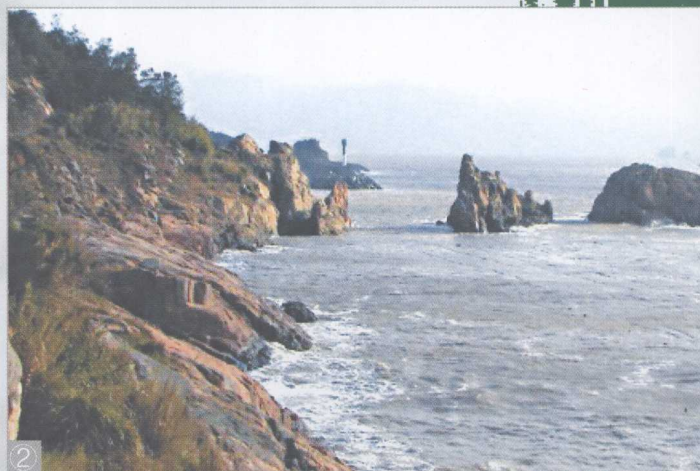
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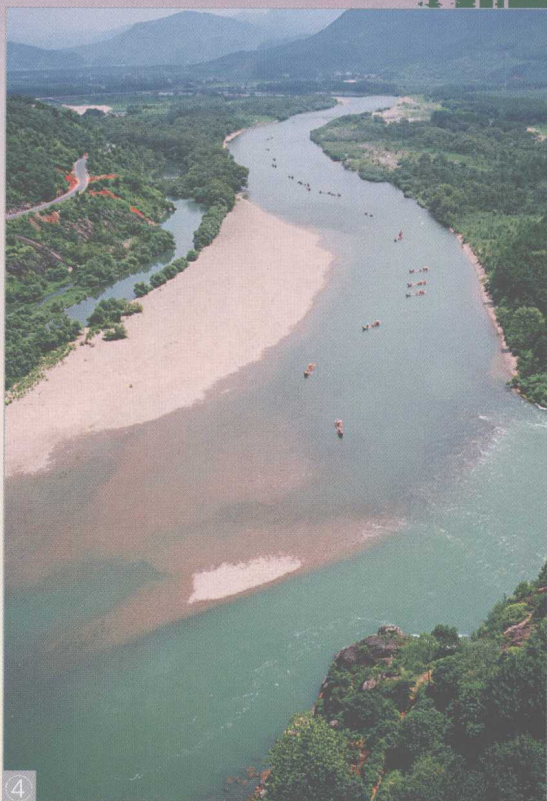
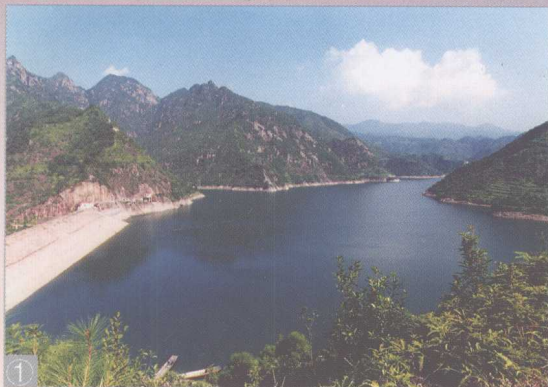
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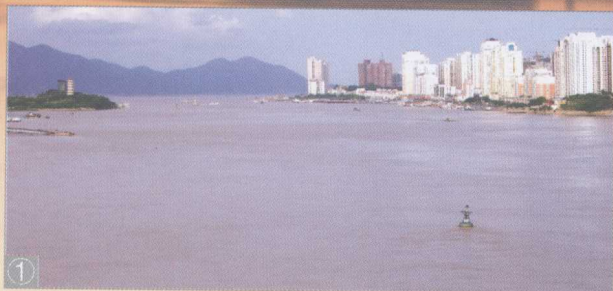


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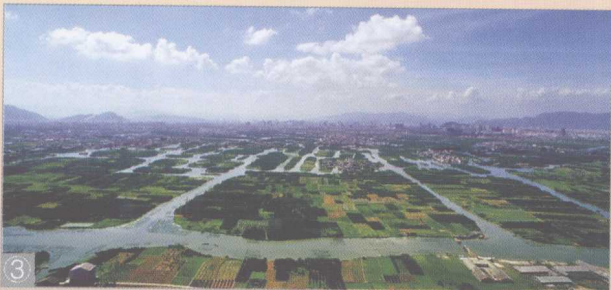




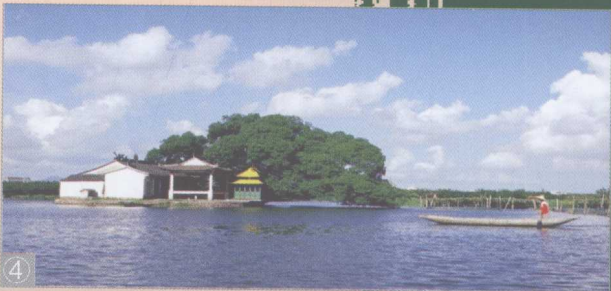
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2. 三角洲——瓯江
3. 平原河网湿地——瓯海三垟湿地（郑高华供）
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5. 黑翅长脚鹬 (陈辉供)
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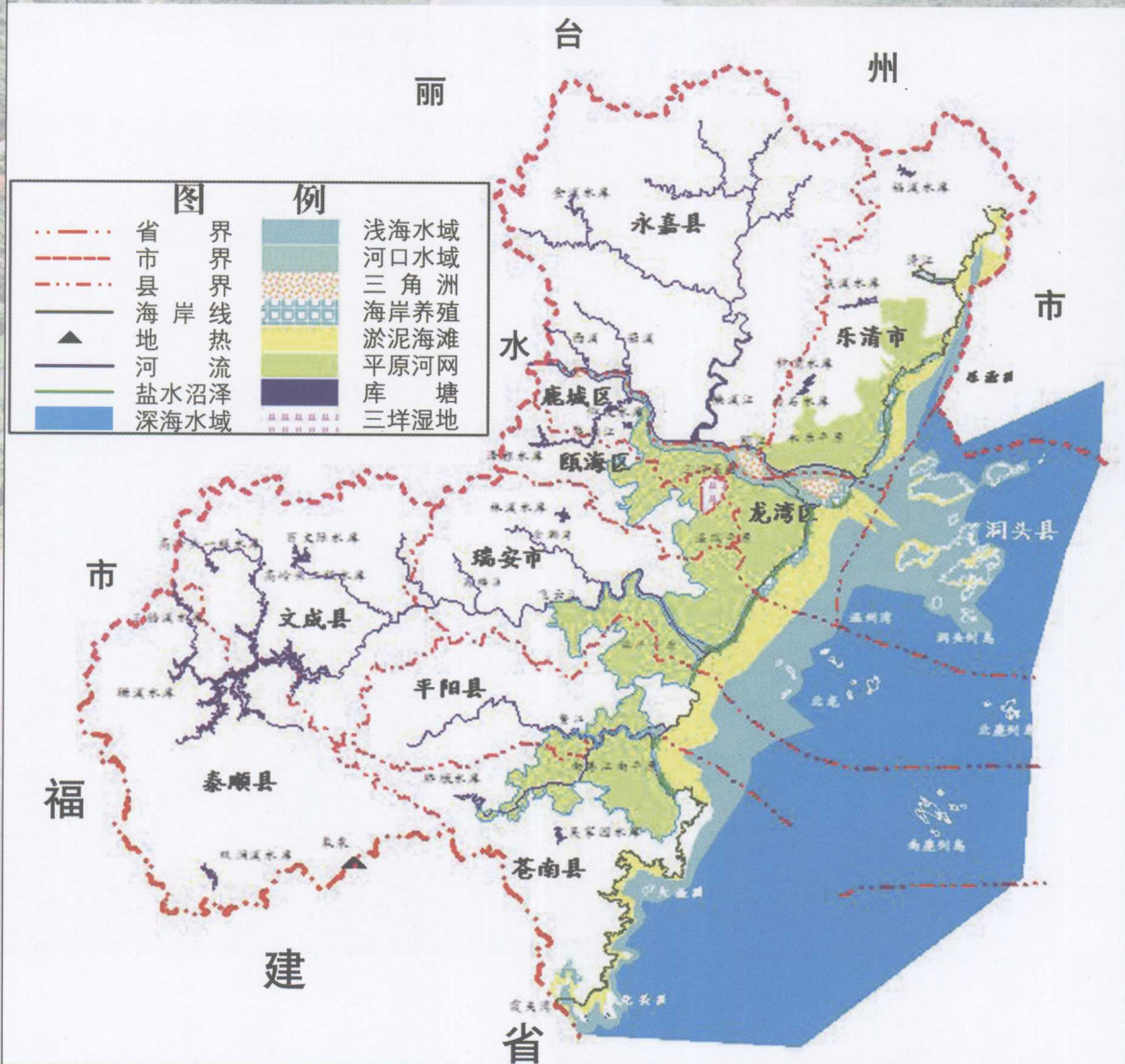


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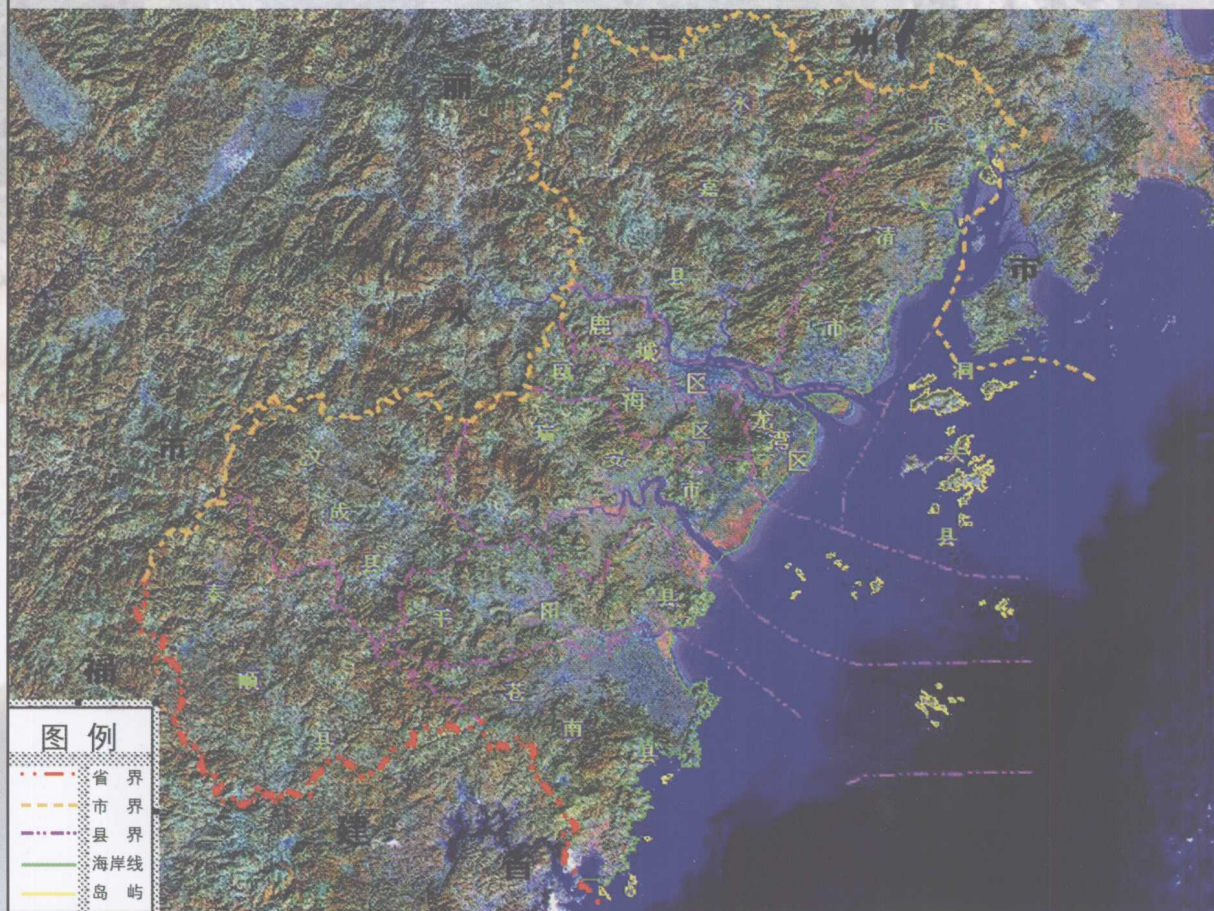


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温州市湿地分布示意图



温州市卫星影像图



序

温州市位于浙江省东南部，居中国黄金海岸线中段，东濒东海，南与福建省毗邻，西与丽水市接壤，北与台州市相连。地处中亚热带南部亚地带，气候温暖湿润，冬无严寒，夏稀酷暑，是名副其实的“温”州。境内控山带海，西北部有括苍山脉、洞宫山脉、雁荡山脉等名山绵亘；中部河谷、滨海平原水网纵横交错；东部沿海岸线蜿蜒曲折、岛屿环列、滩涂平坦辽阔，瓯江、飞云江、鳌江自西向东贯穿入海。得天独厚、集山水海洋之地利的优越自然条件，使温州拥有森林、海洋和湿地三大生态系统，孕育了极其丰富的生物多样性。同时，也造就了类型多样、资源丰富、富有生物多样性、优势资源显著的湿地生态系统。特别是温州沿海湿地在国内外湿地生物多样性保护中具有重要地位：沿海湿地是黑嘴鸥、黑脸琵鹭等世界性珍稀濒危鸟类和雁鸭类、鹬鸻类等国际性候鸟的主要越冬地或迁徙停息地，有3处被国际鸟类保护联盟列入重要鸟区；近海湿地的贝、藻类物种特别丰富，被列入国际重要湿地，素有“贝藻王国”之称的南麂列岛海洋自然保护区拥有我国贝类总数的20%，浙江沿海贝类总数的80%；我国海洋底栖藻类总数的20%，堪称我国近海贝藻类的一个重要基因库；乐清湾沿海是红树林正常生长的最北端，温州平原是榕树分布的最北区。

湿地是温州最重要的环境资本和较高生产力的生态系统之一，在温州市生态环境建设和国民经济可持续发展中具有十分重要的战略地位。保护和合理利用湿地，是维护生态平衡，改善生态状况，实现人与自然和谐，促进经济社会可持续发展的需要。打造“绿色温州”，构筑“和谐温州”，高质量地搞好温州生态市建设，都必须保护好、利用好宝贵的湿地资源。

为科学管理、有效保护、合理利用湿地资源提供科学依据，温州市林业局组织科研工作者，开展完成了“温州湿地资源调查及保护研究”课题的调查研究工作，《温州湿地资源》一书，系该研究成果之汇总，其资料翔实、数据可靠、内容丰富、图文并茂，对开展湿地保护管理和科学研究以及地方林业建设、环境美化、生物多样性保护、经济发展具有重要参考价值。

特借此书付梓之际，谨向参与项目研究的林业、海洋、渔业、环保等部门同志们表示衷心的感谢。并作短序，聊表贺忱。

廖秀梅
二〇〇五年六月

Preface

Wenzhou, situated in the southeast coastal area of Zhejiang province, influenced by subtropical climate, is warm and abundant in rainfalls. With its special geographic position with the typical microclimate topography, it is really a “Warm” city, as not too cold in winter, and not too hot in summer. With Oujiang River, Feiyun River and Aojiang River traversing from the west to the east, flowing through the whole region, provided with the forest, ocean and wetland these three ecosystems, it is one of the regions, which is richest in natural resources. It is also a critical distribution of some typical biology as a transitional area between the torrid zone and the frigid zone. There are plenty of seashell resources in Nanji Archipelago, which is about 80% of Zhejiang province, and 20% of the country. It's famous as the mollusc resource museum in the world, with “the south species north moving, the north species south moving” of acclimatization base. Yueqing Gulf is the most northern region that normal growth in mangrove forest. And Wenzhou plain is the most northern region to plant banyans. Wenzhou is also major winter habitats and migrant rest place of some world rare and endangered birds such as *Larus saundersi*, *Ptarmica minor* etc. and international migrant birds such as Anatidae type, Scolopacidae type and Charadriidae type can stop and live. The resources of Wenzhou wetland measure and its importance are all obvious for the province of Zhejiang and the whole country.

Wenzhou Wetland Resource is finished by tallying up the past intelligence of mankind, and by using current advanced methods and scientific technology of forestry investigation on the foundation of former scholars' and experts' studies. The book is accurate in information, dependable in data, affluent in contents, excellent in pictures and texts, with clear and definite contention, and enrich in local colour. It will surely bring far-reaching influences and enormous promotions in forest constructing, environment beautification, biodiversity protection, local economic development and culture organization of Wenzhou. With the publishing of this book, we would like to express sincere thanks to all of the organs and individuals from the forestry, ocean, fishery and environment branches. Also make a brief preface here to express our congratulations.

Liao XiuShu

2006-06

前言

《关于特别是作为水禽栖息地的国际重要湿地公约》(简称《湿地公约》)把湿地定义为:“湿地是指不问其为天然或人工,长久或暂时之沼泽地、泥炭地或水域地带,带有或静止或流动,或为淡水、半咸水或咸水水体者,包括低潮时水深不超过6m的水域”。按照这一定义,湿地包括沼泽、泥炭地、湿草甸、湖泊、河流及泛洪平原、河口三角洲、滩涂、珊瑚礁、红树林、水库、池塘、水稻田以及低潮时水深浅于6m的海岸带等。此外,湿地可以包括邻接湿地的河湖沿岸、沿海区域以及湿地范围的岛屿或低潮时水深超过6m的水域。

湿地是重要的自然生态系统和自然资源,具有巨大的经济、生态和社会效益,是实现可持续发展的重要基础。它不仅为人类的生产和生活提供多种资源,而且具有巨大的环境效益,包括维持生物的多样性、调蓄洪水、调节气候、促淤造陆、降解污染、美化环境等,被誉为“地球之肾”。湿地可以提供丰富的动植物产品、水资源、矿物资源,还能提供能源和水运,湿地可为人们提供观光场所,提供教育与科研基地,并具有重要的文化价值。在世界自然资源保护联盟(IUCN)、联合国环境规划署(UNEP)和世界自然基金会(WWF)世界自然保护大纲中,湿地与森林、海洋一起并称为全球三大生态系统。

温州地处浙江省东南沿海,又是江南水乡,湿地在保持该地区良好生态环境和社会经济可持续发展中具有十分重要的战略地位。同时,温州湿地在国内外湿地中具有重要地位。温州湿地的保护现状和全国一样,自然湿地呈恶化的趋势没有得到根本上的遏制,保护和发展的矛盾很突出,如何保护和合理利用湿地,已是摆在我们面前迫在眉睫的、必须解决的问题。

为查清温州全市湿地资源现状及其保护利用中存在的问题,为有效保护湿地生态系统及其物种和遗传多样性、科学管理湿地和合理利用湿地资源提供科学依据,我们于2003年组织开展了“温州湿地资源调查及保护研究”课题研究,课题组在省、市主管部门和相关科研机构的大力协助、指导下,历时两年半时间,运用地理信息等现代科学技术,完成了温州湿地较为系统的调查和研究任务。

调查研究结果显示,温州湿地具有如下特点:

(1) 面积大、类型多样、海岸湿地分布集中。温州全市现有湿地总面积321 732hm²,占国土总面积(包括海域)的14.1%,相当于陆地总面积的27.3%。其中:近海和海岸湿地207 904 hm²,占64.6%;天然湿地207 156 hm²,占浙江全省天然湿地的30.1%,为浙江省湿地资源最丰富的地区之一。湿地类型多样,可划分为近海与海岸湿地、河流湿地、沼泽湿地、平原河网湿地、库塘湿地等5大类和浅海水域等15种类型。近海与海岸湿地分布集中,占全市湿地面积的64.6%,在温州湿地中具有重要地位。

(2) 湿地生物多样性丰富,珍稀濒危物种种类多。湿地地区共有藻类植物566种;湿地高等植物839种,隶属于453属159科;湿地植被共有11个植被型,83个群系;较为重要的湿地野生动物共有89目397科1559种。珍稀濒危物种种类多,其中列为国家一级重点保护的有12种,二级重点保护的62种,省级重点保护的15种;列入IUCN濒危等级的鸟类26种,列入《中日候鸟保护协定》的鸟类100种,列入《中澳候鸟保护协定》的鸟类47

种,其他所有鸟类均被列为浙江省一般保护动物。在全国以及全球生物多样性保护和自然环境保护中占据十分重要的地位。

(3) 重点湿地多。在浙江省确定的 10 个重点湿地中,温州市占了 4 个—南麂列岛海洋自然保护区、乐清湾海岸湿地、泰顺雅阳承天含氡硅氟复合型热矿泉地质遗迹保护区、温州湾及瓯江河口三角洲湿地;有 3 处湿地被列入《中国重要湿地名录》或《中国湿地》名录,即南麂列岛海洋自然保护区、灵昆东滩湿地已在中国湿地保护行动计划中列入《中国重要湿地名录》,灵昆东滩湿地和乐清湾海岸湿地被列入《中国湿地》名录。南麂列岛海洋自然保护区被列为国际重要湿地(我国共有 7 个)。

(4) 在湿地生物多样性保护中具有重要地位。温州沿海湿地是湿地水鸟栖息、越冬与繁殖的重要场所和国际性候鸟迁徙停息的重要驿站,有 3 处被国际鸟类保护联盟列入重要鸟区;是世界性濒危物种黑嘴鸥最重要的越冬地,是世界极危物种黑脸琵鹭最重要的迁徙停息地之一,是大量的湿地水鸟的栖息地。其近海湿地的贝、藻类物种特别丰富,堪称我国近海贝藻类的一个重要基因库,被列入国际重要湿地,素有“贝藻王国”之称的南麂列岛海洋自然保护区海域就有贝类 403 种,藻类 174 种,占我国贝类总数的 20%,浙江沿海贝类总数的 80%,海洋底栖藻类约占我国藻类总数的 20%;是中国红树林分布的最北缘。

(5) 温州湿地资源多样,优势资源显著。湿地资源包括植物、动物等生物资源和水、港口航道、能源、土地、矿物、景观旅游等非生物资源两大类。其中,沿海港口航道、水产、滩涂土地、海洋能、景观旅游和砂砾料资源等属于优势资源,开发利用潜力巨大。

(6) 湿地资源具有明显的区域性和动态性。东部沿海地区集中分布着丰富的近海和海岸湿地,且资源量较大;中部平原地区主要分布河流和农田湿地,而西部山区主要是库塘湿地和少量星散分布的山地沼泽;湿地资源又具有明显的时间动态性,沿海大部分的滩涂是处于淤涨状态,由于人工围垦等原因,天然湿地面积在逐渐减少,而水库等人工湿地面积有所增加。

《温州湿地资源》是在调查成果的基础上,通过补充、修改、完善编写而成的。全书共分 8 章,2 个附录。第一、四、七、八章由温州市林业局陈余钊执笔(第一章第三节由温州市环境监测中心站任一力完成,第七章第二节由李克恩完成);第二、六章由温州市瓯海区农林渔业局潘锡东执笔;第三章由温州市海洋与渔业局管加兴执笔;第五章由温州市金洲动物博物馆刘鸣、刘永正和温州市海洋与渔业局管加兴执笔;“湿地生物名录”由刘永正、管加兴、陈余钊完成。所有照片除注明外均由温州林业局李克恩和潘锡东摄影,GIS 制图由潘锡东完成。英文翻译吴凤仙、潘锡东。全书由陈余钊和潘锡东统稿。

本书编写过程中,得到以下单位、领导和同志的大力支持:浙江省森林资源监测中心陈征海副总工程师,浙江省林业生态工程管理中心李士生主任,浙江大学生命科学学院丁平教授,温州大学宋国利教授、赵敏教授、丁炳扬教授,浙江省亚热带作物研究所金川所长、陈秋夏副研究员,浙江省海洋水产养殖研究所林志华高级工程师,温州市环境保护局季文锦高级工程师。此外,各有关县(市、区)林业主管单位部分技术人员参与了外业调查工作,恕不一一列举。在此,一并表示最诚挚的感谢。

鉴于作者水平有限,书中定有许多瑕疵之处,敬请读者批评指正。

著 者
2006 年 6 月

Foreword

In the *Convention on Wetlands of International Importance especially as Waterfowl Habitat* (short for *Ramsar Convention*), wetland was defined as “Areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary with water that is static, flowing, fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six meters.” According to the definition, wetlands including marsh, peatland, marsh meadows, lakes, rivers and floodplains, estuarine systems of deltas, sands, coral reef, mangrove, reservoir, ponds, paddy field, and the marine water, the depth of which at low tide does not exceed six meters. Besides, wetlands also comprise coastwise of rivers and lakes, coastal regions, islands or marine water around or abutting on wetlands.

Wetlands are important ecosystem and nature resources with significant economical, ecological and social effects. They are main elements of achieving sustainable development. It not only provides diverse resources for human being's production and living, but also has considerable environmental values, including maintaining biodiversity, resisting floods, storing floodwater, regulating climate, helping the formation of soil sediment, decreasing pollution and beautifying environment etc., for which it is thought highly as “kidney of the earth”. Wetland can provide abundant products of animals and plants, provides water resources, mineral resources, energy sources and water carriage. It not only provides sightseeing landscapes for people, but also has important values of culture, education and scientific research. In the outline of world nature protection drawn by IUCN, UNEP and WWF, wetlands, forests and oceans are called three major global ecosystems.

Situated in the southeast coastal area of Zhejiang province as a city abundant in water from rivers and lakes, Wenzhou wetland has significant strategic status both in preserving right regional environment and in sustainable development of social economic. It also has important status in the wetlands inside and outside. The present condition of wetland protection in Wenzhou is similar to the whole country, the trend of wetland worsening has not been suppressed basically, and the obvious antinomy of wetland protection and development brings forward the serious problem we have to face and resolve, that is how to protect and utilize the wetland rightly.

In order to investigate the situation of Wenzhou wetland resources and settle the existent problem of wetland protection and utilization, to provide objective basis for the operative protection of ecosystem and species inheriting diversity, and the coordination of scientific management and utilization of wetlands resources, we organized the research of “Studies on the Resources Investigation and Protection of Wetlands in Wenzhou” in 2003. With the great instruction of the supervisors and scientific research institutions at all levels in Zhejiang and Wenzhou over the past two and half years, the research group has finished the systemic investigation and study work by making use of geographic information and other modern scientific technology.

Through the investigation, some characteristics of wetlands in Wenzhou are shown as follows:

(1) The wetland area is large, the type is various, and coastal wetlands are centrally distributed. The total area of wetlands in Wenzhou is 321 732hm², which is about 14.1 percent of the total area (including sea area), and is about 27.3 percent of total land area. Thereinto, the area of ma-

rine and coastal wetlands is 207 904hm², which is about 64.6 percent of total, and the total area of natural wetlands is 207 156hm², which of 30.1 percent of the total area of natural wetlands in Zhejiang. It is one of the regions that possesses the most abundant wetlands resources in Zhejiang. Various types of wetlands can be grouped into 5 main categories as marine and coastal wetland, rivers, swamps, plain and rivers and reservoirs, and 15 types as shallow marine waters. Marine and coastal wetlands are centrally distributed which is of 64.6 percent of the total area of wetland in Wenzhou, and has an important position in Wenzhou wetlands.

(2) The diverse creatures of wetland area are extremely abundant and there exist numerous rare and endangered species. There are 566 species of algae plants, 839 species of higher plants, falling into 453 genera and 159 families. Wetland vegetation has 11 types and 83 formations. There are 89 orders, 397 families and 1559 types of important wetland wildlife.

Among a variety of rare and endangered species, 12 species are put into national first - grade protective wildlife, 62 national second - grade protective wildlife, 15 provincial key protective wildlife, and 26 species of birds are listed as endangered birds by IUCN, 100 species of birds are listed by the *Sino - Japan agreement for the protection of migratory birds and their habitat*. 47 by the *Sino - Australia agreement for the protection of migratory birds and their habitat*, and the other birds are put into Zhejiang general protective wildlife. These indicate that wetlands of Wenzhou play a very important role in the protection of Chinese and globe biodiversity and nature environment.

(3) Important wetlands are abundant. In the list of 10 important wetlands in Zhejiang, Wenzhou shares four, they are: State - level Oceanic Nature Reserve of Nanji Archipelago, Coastal Wetland of Yueqing Gulf, Geological relic reserve of compound radon, silicon and fluorine hot mineral water in Chengtian, Yayang, Taishun, Coastal wetland of Wenzhou Gulf and estuarine systems of deltas of Oujiang River. Three of them are placed in the *List of Key Wetlands in China*, or *China Wetlands List*, they are: Oceanic Nature Reserve of Nanji Archipelago and East Sands Wetlands of Lingkun, which have been listed in *List of Key Wetlands in China* by proceeding plan of China Wetlands Protection, East Sands Wetlands of Lingkun and Coastal Wetland of Yueqing Gulf are listed in *China Wetlands*. Oceanic Nature Reserve of Nanji Archipelago has also been listed in the international important wetlands (China shares seven in total) .

(4) Has important status in protection of wetland biodiversity. Wetland along Wenzhou sea is an important stop where wetland waterfowl perch, winter and reproduce, and migrant birds around the world rest during migration, and three wetlands are put into important bird region by international birds protection Alliance, and one of the most important habitat for *Larus saundersi* and *Ptatalea minor* and other wetland waterfowls; because of more plentiful species such as shell and algae of the inshore wetland, Wenzhou wetland has been included in international important wetland as an important gene pool. Oceanic Nature Reserve of Nanji Archipelago, which has the name of shell and algae kingdom, has 403 species shell and 174 species algae, about 20 percent shell in our country and 80 percent shell in our province, the ocean algae is of 20 percent of total in China. Wenzhou wetland is also the northernmost edge of mangrove forest distribution in China.

(5) Wenzhou wetland has abundant resources with remarkable advantage resources. The two main classes of wetland resources are living resources such as plants and animals and non - living resources such as water, port and sea - route resources, hydroenergy, land, mineral and landscape etc. , among them, coastal port and waterway resources, aquatic resources, sands and land re-