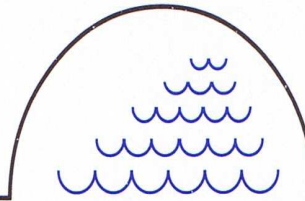


WITHAM FOURTH DISTRICT INTERNAL DRAINAGE BOARD



BIODIVERSITY ACTION PLAN

DATE: January 2010



LINCOLNSHIRE
PARTNERSHIP



WILDLIFE
CONSERVATION
PARTNERSHIP



CAMPAIGN
FOR THE FARMED
ENVIRONMENT



*Lincolnshire Coast
Rivers Catchment*



**A clear solution
for farmers**
ENGLAND CATCHMENT SENSITIVE
FARMING DELIVERY INITIATIVE



2010 International Year of Biodiversity



FORWARD

This Biodiversity Action Plan (BAP) has been prepared by the Witham Fourth District Internal Drainage Board in accordance with commitment in the Implementation Plan of the DEFRA Internal Drainage Board (IDB) Review for IDB’s to produce their own BAP by April, 2010.

It also demonstrates a commitment to fulfilling its duty as a public body under the Natural Environment and Rural Communities Act 2006 to conserve biodiversity.

Many routine maintenance activities have benefits for biodiversity and wider ecosystem in a predominantly lowland arable agricultural drainage district in the south Lincolnshire Fens, part of Britain’s largest lowland zone; not least its Water Level Management Plan (WLMP) and routine flood defence works on drains and sewers for Boston Borough and East Lindsey District Councils.

The BAP will help maximise biodiversity benefits from its activities, positive management regimes, and demonstrate its contribution to both the Lincolnshire BAP (LBAP) and UK BAP targets.

As a partner in the LBAP, the Board has adopted this BAP as one of its policies and is committed to its implementation. It will review the plan periodically and update it as appropriate.

.....

Date

Name: Mr. James Grant Esq
Chairman of the Board

This BAP is a public statement by the Board of its biodiversity objectives and the methods by which it intends to achieve them.
We would welcome appropriate involvement in delivering of the plan from interested organisations, companies, and individuals.
You can contact us about the BAP by writing to the following address:
Witham Fourth District Internal Drainage Board
47 Norfolk Street
Boston
Lincolnshire
PE21 6PP

Telephone: General Enquiries (01205) 310088
Engineering Office (01205) 310099
Fax: (01205) 311282

or by email: drainage@w4idb.co.uk or contact the Board’s Environment Officer, Martin Redding.
martin@w4idb.co.uk

Further detailed information on the Board’s activities is available on this website: www.w4idb.co.uk

VAT Registration No.128 5840 55

The Board is a member of the Association of Drainage Authorities (ADA)

* Cover photograph showing a southern marsh orchid on Cowbridge Drain.

CONTENTS

1 BIODIVERSITY – AN EXECUTIVE SUMMARY 4

1.1 Introduction 4

1.2 Location & Topography 4

1.3 Solid & Surface Geology 5

1.4 Species & Habitat Actions: An Overview 6

1.5 Routine & Capital Works: An Overview 6

1.6 Preparing for the Future: How the BAP Process Contributes 6

1.7 The Historic Environment: Relevance & Importance to the BAP & Board 6

1.8 The Historic Environment: A Legacy of the Board’s Past & Present Management 7

1.9 Biodiversity Targets: Species & Habitats 7

1.10 Board Maintained Local Wildlife Sites (LWS) & Principal Outcomes 9

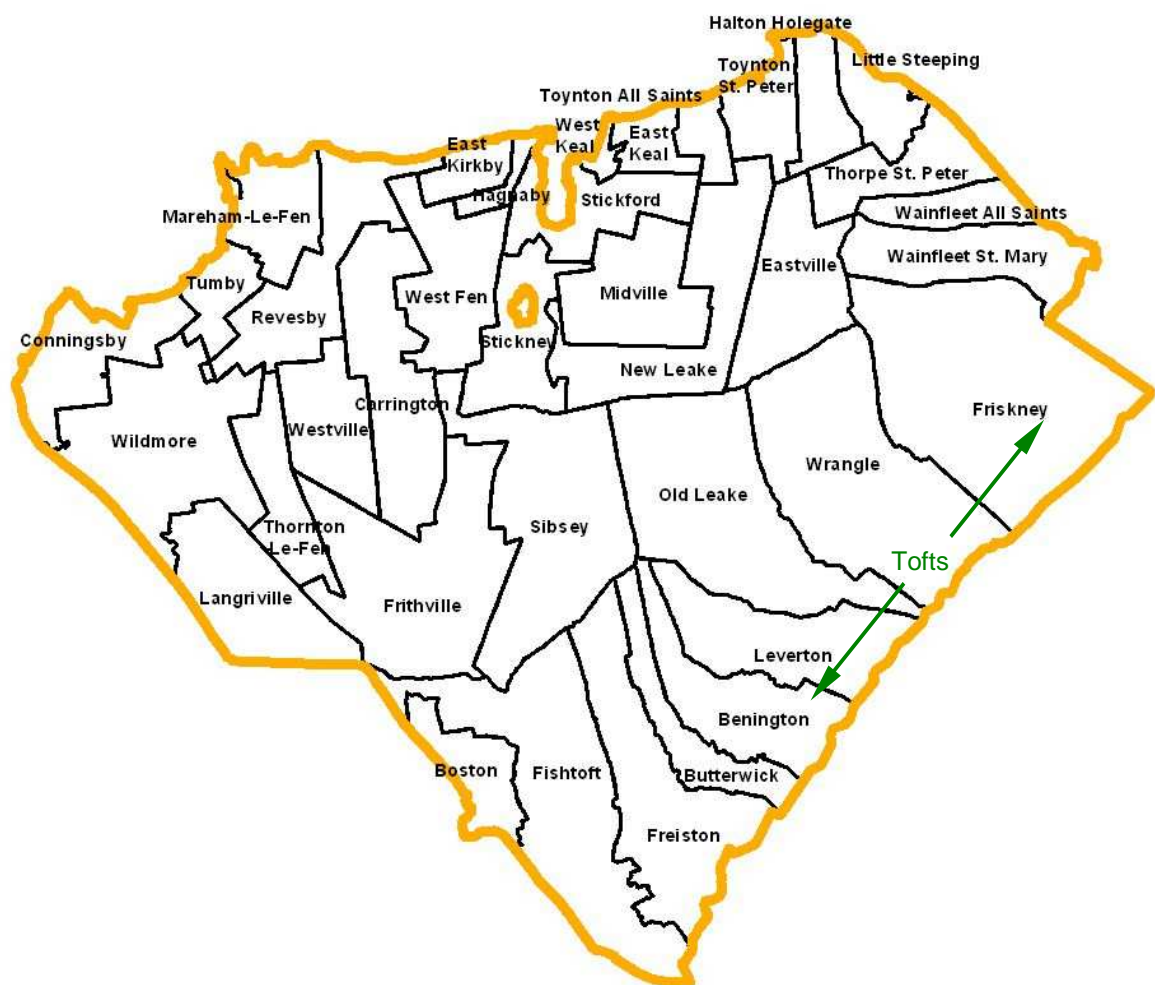
1.11 Summary 10

1 BIODIVERSITY – AN EXECUTIVE SUMMARY

1.1 Introduction

Assisted by other agencies, parties and partners, our Board has conducted a biodiversity audit of its drainage district and identified those species and habitats that would benefit from particular management regimes or actions. Following the piecemeal audit in 2005-10, the BAP developed using information collected from a selection of the 700km+ of drains and sewers that the Board maintains. It identified objectives set out in a Procedural Plan for the continued conservation and enhancement of biodiversity within the wider drainage district, and goes on to describe targets and appropriate actions and outcome measures that will deliver these objectives. The BAP will form the basis of an evolving document that will be reviewed and updated on a regular basis, say every 5-10 years or as seen necessary. It covers the entire drainage district (Figure 1 & see Table 1).

FIGURE 1: The Drainage District & Parishes Covered by the Board.



1.2 Location & Topography

Centred on TF 34/52, the drainage district is sub-divided into four Districts (see Table 1), located immediately north of the lower reaches of the River Witham Valley. It covers an area of 40,928 hectares or 409.28km² and contains 708km of Board maintained watercourses. These can be further broken down to 146.57 kilometres of arterial main drain and 529 kilometres of open sewer (small ditches), and 32 kilometres of piped sewer in predominantly urban areas. The area is shared between two Local Government Authorities, Boston

Borough Council in the south and East Lindsey District Council to the north. Predominantly rural, the area is 90% Grade 1 and II high quality arable agricultural land with only c.4% of urban areas, principally the town of Boston and regularly interspersed villages, notably along the nominally higher silt land known as the ‘Tofts’ or ‘Townlands’ that parallel The Wash coast straddling the A52. Inland settlements in Wildmore, West and East Fens, are generally small, widely scattered and relatively recent having been created since effectual large scale land drainage in the early nineteenth century.

In essence, the area is a lowland basin or embayment encapsulated by the higher skirtland of The Wolds to the north and north-west and the River Steeping to the north east. To the west, along the River Bain immediately south of Tattershall to Dogdyke, then southwards along the canalised freshwater and part tidal River Witham to The Wash bordering the North Sea to the east. Much of the basin is at sea level or just above.

TABLE 1: Parishes completely or partly covered by the Board’s Districts

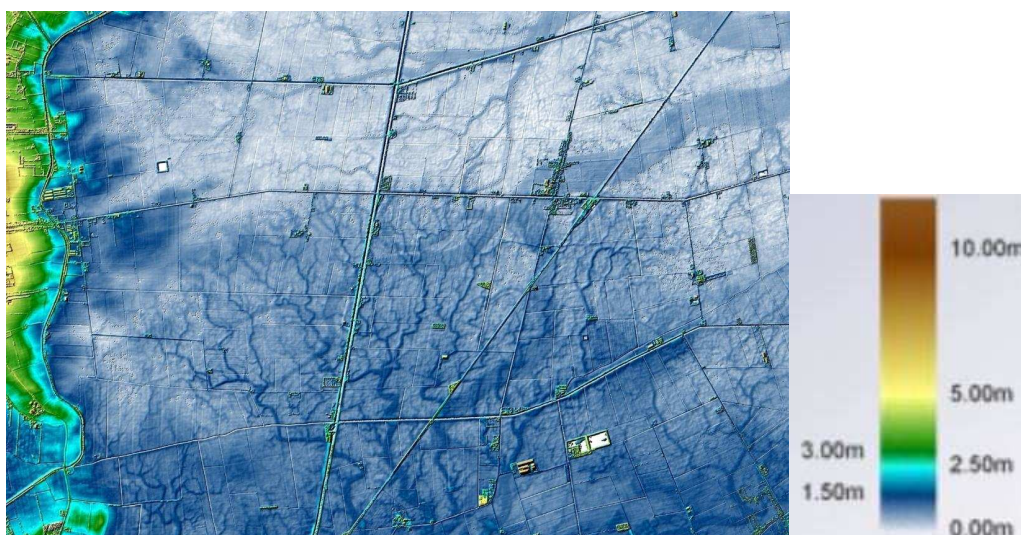
District 1 (Wildmore Fen)	District 2 (West Fen)	District 3 (East Fen)	District 4 (Court of Sewers)
Coningsby	Carrington	East Keal	Benington
Frithville	East Kirkby	Eastville	Butterwick
Langville	Frithville	Friskney	Freiston
Mareham le Fen	Hagnaby	Halton Holegate	Fishtoft
Revesby	Revesby	Little Steeping	Friskney
Thornton le Fen	Sibsey	Midville	Leverton
Tumby	Stickford	New Leake	Old Leake
Wildmore	Stickney	Sibsey	Wrangle
	Thornton le Fen	Stickford	* Tofts = higher silt berm

1.3 Solid & Surface Geology

Solid geology of the area is Jurassic Kimmeridge Clay partially capped by Later Quaternary (1.8 million years BC to 8,000 BC) geological changes by glacially derived River Bain Sands and Terrace Gravels that form higher spurs and ‘islands’ and the north western skirtland.

The basin is filled with a series of laminated Late Holocene (end of the last Ice Age, c.12,500 BC to present day) drift deposits of peat, later alluvium and silt. These vary tremendously in depth and consistency across the basin, as do their levels of truncation and desiccation since drainage began. Surface deposits are complicated by a dendritic pattern of Late Holocene former ancient tidal river channels known as roddons. Formed of denser fine silt, as a result of shrinkage by the surrounding peat since drainage began, their derelict courses meander and permeate the basin causing subtle, yet significant, changes in localised microtopography. Some roddons stand a metre or more proud of the modern landscape, whereby these higher silt levees appear like huge trees when seen on aerial photographs or Light Detection and Ranging (LiDAR) images.

FIGURE 2: LiDAR Image of East Fen Showing Two Phases of Roddons



1.4 Species & Habitat Actions: An Overview

Species Action Plan (SAP) and Habitat Action Plan (HAP) resulting from the audit will uphold the biodiversity of the drainage district now and for future generations. Key localised factors such as geology, topography and hydrology determine the formation of habitat categories and dictate to a great extent their survival in the landscape today, and those species that colonise different soil types and conditions. In particular, it is hoped that implementing the BAP will contribute to the achievement of Lincolnshire BAP (LBAP) and national targets for UK BAP priority species and habitats. It is perhaps worth mentioning that species and habitats not listed in the UK BAP that are locally significant for a variety of reasons have also been considered.

1.5 Routine & Capital Works: An Overview

An important element is to examine the methodology of any routine maintenance or capital work and consider if there are any practical and economical alternatives to take into consideration or not as the case may be, if appropriate measures and Standard Operating Procedures (SOP's) are in place. Without proper environmental consideration for actions within the Boards jurisdiction and statutory powers, this may have serious consequences affecting the areas ecology and habitat and potentially, the wider environs beyond its boundary. However, this scenario is unlikely given that the existing management techniques have been in place for many years without incident.

1.6 Preparing for the Future: How the BAP Process Contributes

Inevitably, continued commercial developments in the drainage district have consequences affecting land drainage, the immediate environment and possibly the wider landscape and ecology. The engineering office already builds in a 20% increase in design capacity for any schemes and has done for a number of years. Determining any detrimental affects of any potential development concerning surface and treated water discharge or culvert consent is by conducting or recommending an Environmental Impact Assessment (EIA) beforehand. This is crucial to minimise any potential impact by commercial developments or during routine maintenance or heavy engineering schemes undertaken by the Board. In order to maintain a natural balance during its works, particularly as a majority is seasonally dependant, it is approached with a Best Practicable Option (BPO). Of course, wildlife and ecology has a seasonal life cycle too and all measures are taken to ensure that programmed works limit any impact.

1.7 The Historic Environment: Relevance & Importance to the BAP & Board

As part of the BAP process, the historic environment also has to be considered, as the distinction between the natural, manipulated or harnessed and planted landscape is crucial in defining an ancient landscape where conditions tend to be better suited to the survival of a diverse habitat and environment. This tends to be due to past land managements practices whereby herbicides and pesticides were not used, and where strip fields (ridge & furrow or dylings), whereby crop rotation and fallow ground were common land management practices that encouraged soil fertility and cross pollination. Moreover, particularly where grazing was the dominant practice with stock fields enclosed by ditches with native hawthorn hedge along the field boundary and absent from the myriad of intervening drove roads between fields. In both such instances, a large proportion of District 4 (Court of Sewers) was one such landscape throughout the medieval and early post medieval periods, but fields had to be incorporated into the existing and new land drainage and flood defence infrastructure. Medieval land reclamation of the southern fringe of East Fen and saltmarsh resulted in embanked inner fen and prograding seaward sea defences. This meant individual catchments between these banks resulted in enclosed 'polder like' sub-catchments with larger gravity fed drainage outlets into The Wash, and now fossilised as Parish boundaries on Figure 1. These early reclamations and improvements to the land drainage infrastructure are well documented in monastic manuscripts, royal edicts and by numerous other land owning Lords of the time who made considerable profits from exporting wool which is recorded in medieval port records for Wainfleet, Wrangle and Boston. Much of this drainage infrastructure was also due to the immense contemporary saltern or salt producing industry that prospered along the Toft's, hence the term salary today. As a by-product of this industry, massive residual mounds of silt artificially raised the ground level and helped prevent further

inundation. These are equal in scale (millions of tonnes of made ground) to match anything in the later Industrial Revolution in the UK.

1.8 The Historic Environment: A Legacy of the Board's Past & Present Management

Here is where the legacy of today's biodiversity so often lies and like several other Fenland IDB's, this Board is seen as a Local Authority who's legacy stems from the formation of the Courts and Commissioners of Sewers in the mid thirteenth century. In essence, these were a medieval formalisation of a process already in place in England on a localised level to ensure drainage and sea defences were maintained and in good order. Not many Local Authorities can boast they have managed and continue to manage landscapes within their districts for more than 700 years! Albeit now managed by mechanised machines rather than by hand, this ancient legacy still survives in the area today, notably in District 4 where c.50% of Board maintained sewers adhere to their medieval layout and were unaffected by the 1807 Lincolnshire Enclosure Act. Nowadays, skilled operatives with appropriate training and modern equipment fit for the task can continue to manage and enhance the environment just as they did in the past. Using tried and tested techniques manifested before the publication of the ADA IDB biodiversity manual in 2008, coupled with a intimate familiarity of their working environs, the Board is confident it is fulfilling its environmental obligations to the best of its abilities and more besides.

1.9 Biodiversity Targets: Species & Habitats

12 species were identified: barn owl/owls, bees, bee orchid, European eel, kestrel, marsh mallow, otter, peregrine falcon, reed bunting, southern marsh orchid, water vole, and the Witham orb mussel.

10 habitats were identified: berms, lowland calcareous grassland, neutral grassland, hedges, reed bed, saline lagoons, static freshwater drain, swamp/marsh/fen, and native woodland.

- Targets are seen as SMART (Specific, Measurable, Achievable, Relevant and Time-limited) and are considered achievable, proportionate, practicable, and economical given the resources available.

TABLE 2: Simplified Targets for Species & Habitats

SPECIES TARGETS	ACTION	OBJECTIVE	TARGET DATE
Barn owl/owls	Continue to erect boxes on drains & sewers. Replace old ones as necessary	2-3 per annum	Ongoing
Bees	Maintain condition of existing habit & improve where possible	Increase declining numbers	Ongoing
Bee orchid	Maintain condition of existing habit & improve where possible	Increase diversity	Ongoing
European eel	Add eel passes at WLMP control structures & mobile ones for damming works	Increase declining numbers	2015
Kestrel	* As per Barn Owl	<i>ibid</i>	<i>ibid</i>
Marsh mallow	Maintain late flailing regime at 4/23 & spread seed in other suitable habitats	Increase diversity	Annual - ongoing
Otter	Water quality is improving, fish & biomass increasing. River Bain has otters, so erect simple holts in	Entice otters into drainage district	2015

Wildmore Fen			
Peregrine falcon	Peregrines known to be in area. Tray erected on Lade Bank P/S chimney	Entice peregrines into drainage district	2015
Reed bunting	Maintain existing habit & improve where possible	Establish 100m of reed bed per annum	Ongoing
Southern marsh orchid	* As per Bee orchid	<i>ibid</i>	<i>ibid</i>
Water vole	Maintain condition of existing habit & improve where possible. Continue with mink control programme	Annual - ongoing	Ongoing
Witham orb mussel	De-silt central drain channel leaving fringe & margins untouched & phase works to be bi-annual (only applicable to Frith Bank Drain & Medlam Drain outfall).	Ongoing & as per advice from EA	Ongoing
HABITAT TARGETS	ACTION	OBJECTIVE	TARGET DATE
Berms	Modify watercourses as required to increase flood storage & attenuate flows	Establish 100m of berm per annum	2015 - Ongoing
Lowland calcareous grassland	Maintain condition of existing habit & improve where possible	Ongoing	Ongoing
Neutral grassland	* As per LCG	<i>ibid</i>	<i>ibid</i>
Hedges	Manage hedges along Board's & private sewers & land for faggots & stakes. Create additional shelter belt hedges for faggots where possible in the drainage district & elsewhere in partnership with Aveland Trees Ltd	Ongoing – Annual collection of native tree fruits from Forestry Commission's Zone of Provenance 402 for hedge planting & woodland creation	Ongoing
Reed bed	Maintain existing habit & improve where possible	Establish 100m of berm per annum	Ongoing
Saline lagoons	Maintain & monitor condition, water quality, surface/treated discharge consent & impoundment applications	Ongoing	Ongoing
Static freshwater drain	* As per Saline lagoon	<i>ibid</i>	<i>ibid</i>
Swamp/marsh/fen	Maintain condition & existing habit & improve where possible. Little or no management of headwaters. No change required in WLMP	Ongoing	Ongoing
Native woodland	* As per Hedges	<i>ibid</i>	<i>ibid</i>

1.10 Board Maintained Local Wildlife Sites (LWS) & Principal Outcomes

Since 2008, 9.5 km of drain and sewer have been allocated LWS status following ecological surveys commissioned by BBC & ELDC: Cowbridge Lock freshwater lagoon, lower reach of Hobhole Drain, Hobhole Drain headwater, southern bank of Frith Bank Drain, and part of sewer 4/23 near Butterwick. These account for 6.5% of the drain network and reflect past and present positive environmental management undertaken by the Board.

FIGURE 3: Hobhole Drain LWS Headwater. Note: Highways Managed Verge in Contrast



It is important to highlight that these watercourses were singled out for survey, whereas in reality, many other watercourses display similar diverse habitat which are seen as locally important sites to the Board and public alike. Biodiversity is thriving across the drainage district and the BAP can build on the positive diversity already established:

- As a partner with the Lincolnshire BAP, the Board is well placed to comment on positive or negative environmental management regimes. Furthermore, it has an Environment Committee to oversee practice and policy, and feed into the wider Lincolnshire ADA Environment Committee.
- Strong relationships developed with our BAP partners and others have led to wider connections and sources of data to add into the BAP. This can only benefit the Board in the future.
- Eight Sites of Nature Conservation Importance (SNCI) are in the area and the boundaries of three abut Board maintained sewers.
- Crucial to the BAP is the present Water Level Management Plan which is fit for purpose and requires no change.
- Artificial drainage networks form communicative corridors for wildlife and habitat and provide an effective method of flood defence. Many drains already have wet and diverse machine berms so there are little scope to improve on these. In contrast, new urban developments in rural areas with increased discharge present potential sites to modify sewers to increase flood storage and include a berm.

Figures 4 & 5: Cowbridge Drain with berm & selection of 1000+ Southern Marsh Orchids found here along a 1km stretch. Note: the site is not an LWS but clearly a very important site locally



- Monitoring consent fees for surface and treated water disposal has increased water quality.
- Water quality has significantly improved in the past 20 years and trends shows this to be continuing with respect to reducing nutrient and ph levels with increased dissolved oxygen. This directly reflects the overall improving health of the drainage network and wider catchment.
- Biomass (all living organisms) in main drains has increased by +40% in recent years.
- Fish stocks and the size of specimens are increasing year on year.
- The Board was in the syndicate of Lincolnshire IDB's that won the Lincolnshire Environmental Award 2009 for 'Operation Barn Owl'. Their numbers have markedly increased in the past 25 years and there is still plenty of scope to build on this success.

FIGURES 6 & 7: Barn Owl & Kestrel collected annually from the Board's boxes



- The nationally rare marsh mallow in sewer 4/23 is the most northerly known naturally established site in the UK. Two other sites have since come to light in District 4 and these will be investigated by an ecologist commissioned by BBC in spring 2010.

FIGURE 8: Marsh Mallow in flower on 4/23



- Seen as an important education and leisure resource, drains are enjoyed by navigation boat tourists, anglers and others.
- The BAP will compliment the recent Landscape Character Assessments by BBC and ELDC.
- Arguably, based on recent research, a majority of District 4 could be classed as a 'historic landscape'.
- The Board always strives to incorporate biodiversity into in routine management

1.11 Summary

The Board already integrate biodiversity into statutory activities such as routine annual maintenance programmes and, as appropriate, in capital works projects.

FIGURE 9: Operatives reinstating ‘home-grown’ common reed (*Phragmites*) after an improvement on sewer 3/62 near Friskney



With very few exceptions, target species and habitats already exist, so the targets and Procedural Action Plan objectives recommend the Board continue to operate as it does now. Crucially, the BAP is also meant to highlight any weaknesses and gaps to improve on, but there is little to comment in detail. Many drains exhibit mixed habitats and diverse species. For example, the Lower Hobhole has habitat that includes i) a berm ii) open water iii) mixed native woodland along one bank & iv) a mosaic of rich calcareous grassland. These habitats are LBAP and UK BAP priorities.

Therefore, the overall conclusion is that current environmental management regimes are maintaining and enhancing diversity, and largely being implemented by skilful and experienced operatives and staff throughout the drainage district. Perhaps the importance of this BAP is that for the first time in the Board's history, it shows a near complete picture of the diversity and positive environmental initiatives and regimes the Board has in the drainage district. Hopefully it will open eyes of others, and encourage other partners and stakeholders to join us.