Wetland compensation & EIA: lessons learnt from Hong Kong

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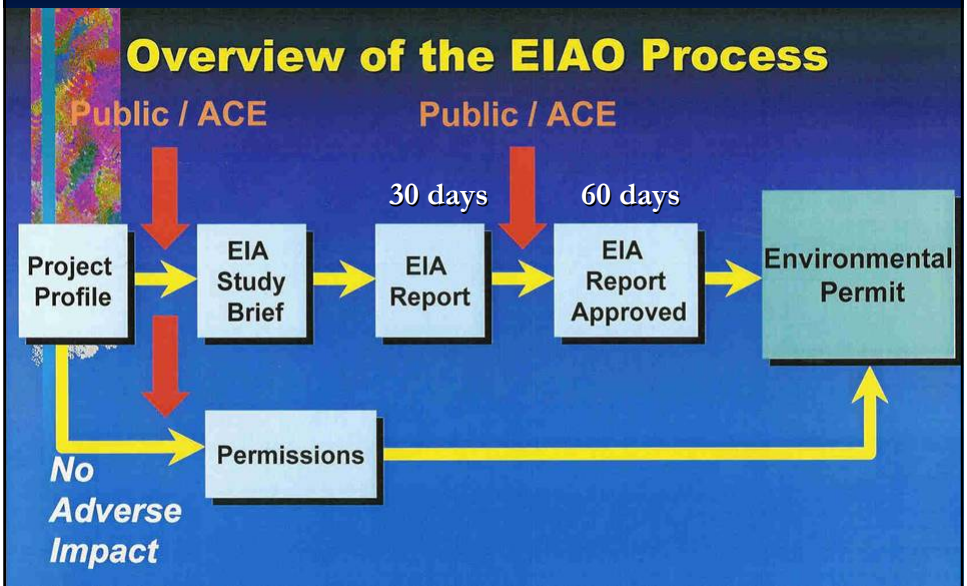
and
Chairman, EIA Subcommittee, ACE

In HK, the ACE has a role to play in the EIA process



…ACE has become the *de facto* consultees!

Advisory Council on the Environment (ACE)
(1/1/2005 – 31/12/2006) (Appointed by Chief Executive)

Professor LAM Kin-che, J.P. (Chairman)
Mr. James R. GRAHAM
Professor HO Kin-chung, B.B.S. (Green Power)
Professor HUANG Ju-chang, Howard
Professor LAM Kwan-sing, Paul
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Mr. Peter Y.C. LEE
Dr. NG Cho-nam, B.B.S. (The Conservancy Asso.)
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Professor POON Chi-sun
Mr. Markus J. SHAW (WWFHK)
Ms. TAM Siu-ying, Iris, J.P.
Mr. TSANG Kam-lam
Professor WONG Tze-wai
Professor WONG Yuk-shan, B.B.S., J.P.

EIA Subcommittee
(1 January 2005 - 31 December 2006)

Chairman *(elected by members)*

Dr. NG Cho-nam, B.B.S.

Deputy Chairman

Prof. HO Kin-chung, B.B.S.

Members

Prof. LAM Kwan-sing, Paul
Mr. Peter Y C LEE
Mrs. NG FONG Siu-mei, B.B.S.
Prof. POON Chi-sun
Mr. TSANG Kam-lam

Year	No. of meetings	EIA/SEA reports discussed	Other papers (informal dialogue items)
1994	*9*	*19*	*4*
1995	*10*	*23*	*0*
1996	*8*	***26***	*1*
1997	*10*	*20*	*0*
1998	*7*	*18*	*2*
1999	*12*	***31***	*1*
2000	*8*	*12*	*0*
2001	*9*	*15*	*1*
2002	*10*	*15*	*4 (2)*
2003	*7*	*9*	*0*
2004	*8*	*7*	*3*
2005	*4*	*6*	*1*
	102	***201***	***17***

So far ..

- EIASC (hence ACE) did not endorse only two/three projects amongst the 201 submissions
- The longest agenda item took 15 hours.

Guidelines for Ecological Impact Mitigation under EIAO

The general policy for mitigating impacts on important habitats and wildlife, in order of priority, are:

- *Avoidance*
- *Minimizing*
- *Compensation*

Avoidance is always better than mitigation!

Original

Compensation

Ecological Compensation under EIAO

- The loss of important species (e.g. trees) and habitats (e.g. woodland) may be provided elsewhere (on-site or off-site) as a compensation. Enhancement and other conservation measures shall always be considered, whenever possible.
- All mitigation measures recommended shall be feasible to implement within the context of HK. The effectiveness of the proposed mitigation measures shall be carefully evaluated and the significance of any residual impacts after implementing them shall be clearly stated.

Ecological Compensation under EIAO (cont')

- From an ecological point of view, mitigation measures for ecological impact shall preferably be carried out on-site, and well in advance of the works rather than off-site, and after the completion of works.
- Where off-site mitigation measures are involved, they shall be considered along with other alternatives e.g. change of site, layout, etc., including modifying or abandoning the project.

Guidelines for off-site ecological mitigation measures:

a) all possible design measures and all practicable on-site ecological mitigation measures shall be fully investigated in the EIA study and exhausted to minimise the loss or the damage caused by the project to the ecological habitats or species;

b) with the on-site ecological mitigation measures in place, the residual impacts on ecological habitats or species shall be defined, quantified and evaluated…

c) if the residual ecological impacts require mitigation and all practicable on-site ecological mitigation measures have been exhausted, off-site ecological mitigation measures shall be provided;

d) The off-site mitigation measures shall be on a "**like for like**" basis, to the extent that this is practicable**.**

i.e. any compensatory measures must be directly related to the habitats or species to be protected. Either the ***same kind*** of species or habitats of the ***same size*** shall be compensated, or the project proponent shall **demonstrate** that the **same kind** of ecological ***function*** and ***capacity*** can be achieved through the proposed measures. (e.g. the loss of a natural woodland shall be compensated by the replanting of native trees to form a woodland of a similar size)

e) The off-site ecological mitigation measures shall only be implemented within the boundaries of HK, and must be technically feasible and practicable;

f) The extent of such mitigation measures shall be limited to what is necessary to mitigate the residual ecological impacts arising from the project; and

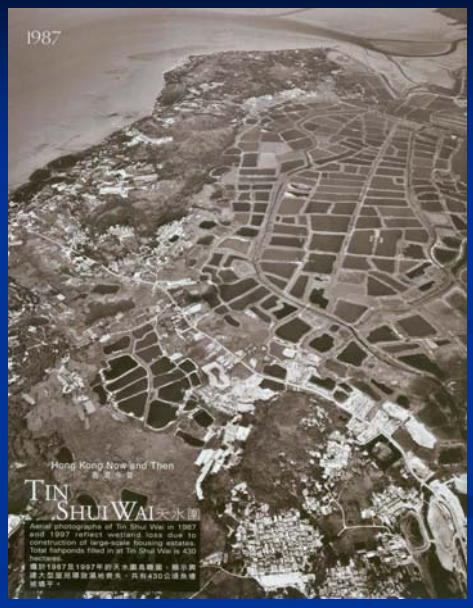
g) Any proposal off-site mitigation measures shall **not** require further EIA study for their implementation. Their feasibility, constraints, reliability, design and method of construction, time scale, monitoring, management and maintenance shall be confirmed during the EIA study.

Off-site compensation is not easily justified.

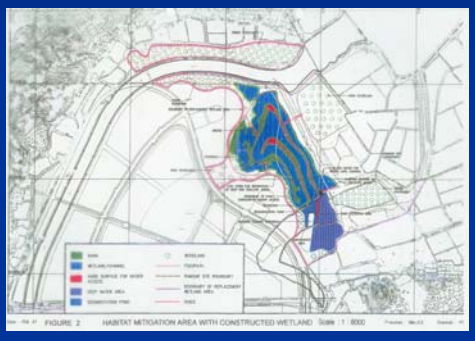
EIA reports included some forms of wetland mitigation and compensation since 1994

- Route 3
- Shenzhen River Regulation Project
- Main Drainage Channels for Ngau Tam Mei, Yuen Long & Kam Tin
- Discovery Bay North Development Master Plan
- Kau Sai Chau Golf Centre
- Sha Lo Tung Revised Development Plan
- Yuen Long Bypass Floodway
- Tin Shui Wai Development Engineering Works for Development of Areas 3, 30 & 31 of the Development Zone and the Reserve Zone
- West Rail
- Main drainage channels for Fanling, Sheung Shui and Hinterland
- Expansion of Kiosks and Other Facilities at Lok Ma Chau Boundary Crossing
- KCRC Sheung Shui to Lok Ma Chau Spur Line
- Deep Bay Link
- Shenzhen Western Corridor

Tin Shui Wai in the 1980s



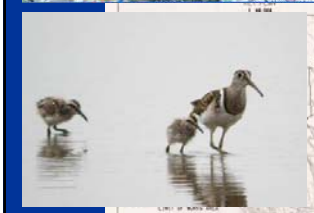
Compensation for the ecological impacts of Tin Shui Wai North Development

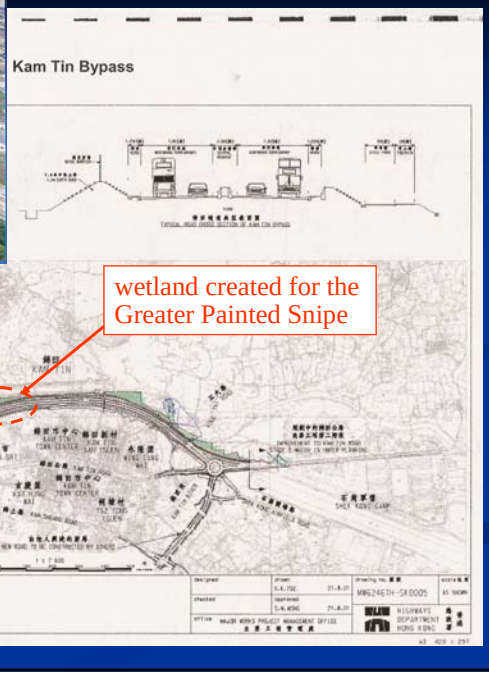


Very different from what you see now!

Other outstanding example …

- A wetland created for the Greater Painted Snipes





Some recreated wetlands are not even wet!

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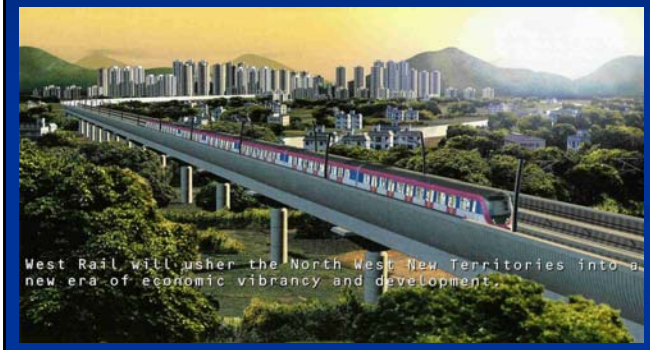
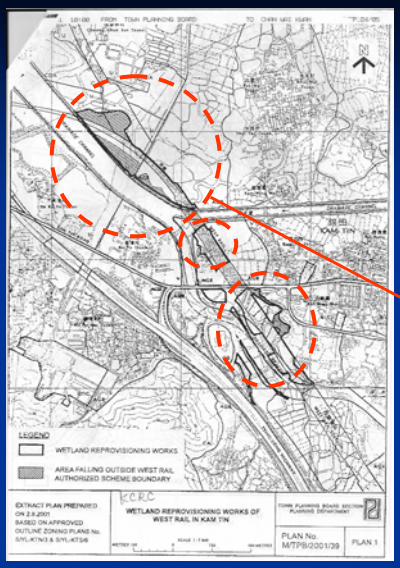
Route 3 - Tai Lam Tunnel and Yuen Long Approach, Northern Section (1994)

- Reinstatement of fishponds lost to temporary works and creation of 'stream' channels, totaling 20.9ha. It reduced the residual permanent losses from 34.09 to 13.09 ha.

West Rail (1997/98)



Habitat	Loss (ha)
Agr lands	60.1
fishpond	10
Marsh	0.3
Kam Tin R. meander	1.8



- any precedent?

Compensatory wetlands underneath the rail-ducts

- re-create freshwater wetland habitat
- re-provide habitat suitable for dragonflies
- re-provide habitat suitable for reptiles & amphibians
- re-provide habitat suitable for wetland-dependent birds

Any precedent? Any successful example?

After much damage has been done during the construction phase!

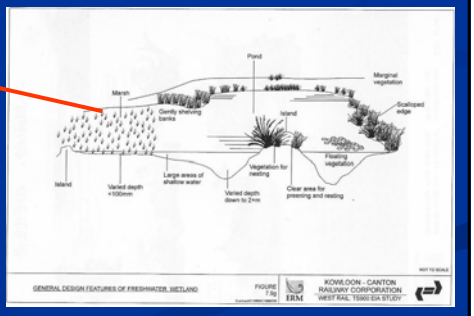
The wetlands recreation programme began …

vegetation is actively managed …

the whole site
is fenced off ...

something unexpected!

The expected problems – how to recreate a wetland underneath the shadow of rail-duct near the Kam Tin Station



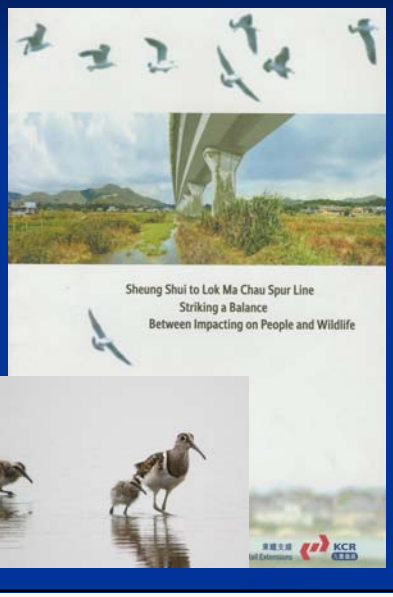
An artificial Sun may be needed!

Where is the flood lights? Where are the birds?

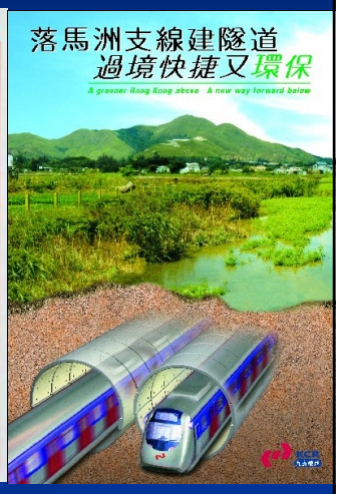
Have the objectives been met?

- Yes/No? God knows.
- no benchmarking, no targets set

That's why the green groups were against the Sheung Shui- Luk Ma Chau Spurline project!



The proponent had to opt for a much more expensive alternative!



The new Sheung Shui - Lok Ma Chau Spurline project (2002)

wetland compensation off-site/at adjacent site at Lok Ma Chau

A very heated debate on the "like for like" principle for off-site compensation during the EIASC meeting

- *"Either the **same kind** of species or habitats of the **same size** shall be compensated, or the project proponent shall **demonstrate** that the **same kind** of ecological **function** and **capacity** can be achieved through the proposed measures."*
- Topics discussed included: how to define the ecological functions and capacity of the affected sites, how to monitor and audit the performance of the compensation programmes, etc.

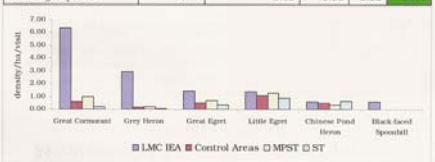
Mitigation objectives defined

- The mitigation objectives for the Ecological Compensation Area (ECA) is the provision of suitable habitat for the key target species of ecological importance regularly occuring within and adjacent to the Spur Line & LMC station site rather than the restoration of specific habitats of intrinsic ecological value.
- The numbers of the target species are the primary measure of success of the Initial Enhancement Areas and ECA

Performance be benchmarked against observations from some control sites nearby

LMC IEA Running Targets
2 May 2005 to 30 April 2006

Density (mean/ha)	LMC IEA	Control Areas	MPST	ST	Ratio
Great Cormorant	6.35	0.59	0.99	0.19	10.70
Grey Heron	2.95	0.14	0.22	0.07	20.63
Great Egret	1.42	0.51	0.68	0.33	2.80
Little Egret	1.37	1.07	1.25	0.89	1.28
Chinese Pond Heron	0.58	0.49	0.37	0.62	1.17
Black-faced Spoonbill	0.60	0.01	0.02	0.01	45.04
Total target species	*13.27*	***2.82***	***3.52***	***2.12***	*4.71*

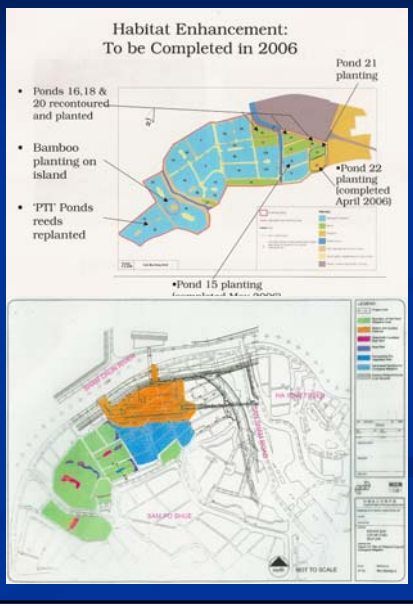


Target species January – April 2006

Number of ponds / replicates	Count method	Jan 06	Feb 06	Mar 06	Apr 06
Great Cormorant	A	18.583	6.430	5.892	0.004
Grey Heron	A	5.330	4.587	2.276	0.001
Great Egret	A	1.603	1.781	0.191	0.436
Little Egret	A	1.060	0.476	0.218	0.561
Chinese Pond Heron	B	0.334	0.147	0.045	0.325
Black-faced Spoonbill	A	1.202	1.015	0.267	0.116
Common Teal	B	4.275	0.143	1.416	0
Greater Spotted Eagle	A	0.009	0.001	0	0
Imperial Eagle	A	0.027	0.016	0.004	0
Japanese Quail	B	0	0	0	0
Black-winged Stilt	B	0.245	0*	0	0*
Common Snipe	B	0.022	0.011	0.027	0.022
Richard's Pipit	B	0.067	0.067	0.107	0.089
Bluethroat	B	0	0.033	0.009	0
Common Stonechat	B	0.125	0.156	0.214	0.134
Zitting Cisticola	B	0.111	0.236	0.205	0.022
Red-billed Starling	B	7.562	15.230	6.315	0
Black-naped Oriole	B	0	0	0	0.058

An Environmental Monitoring Committee is set up to oversee the progress and the variations of the compensation measures

- Members included rep from green groups



Better results seem achieved off-site or at adjacent site

KCRC Lok Ma Chau wetland compensation

Major lessons learnt

- The effectiveness of some on-site wetland compensation programmes is open to question.
  - Major site constraints
  - Small size & wrong sharp
  - Incompatible surrounding

Is on-site mitigation a cost-effective solution?

Major lessons learnt

- Are the required justifications for off-site ecological mitigation too stringent?

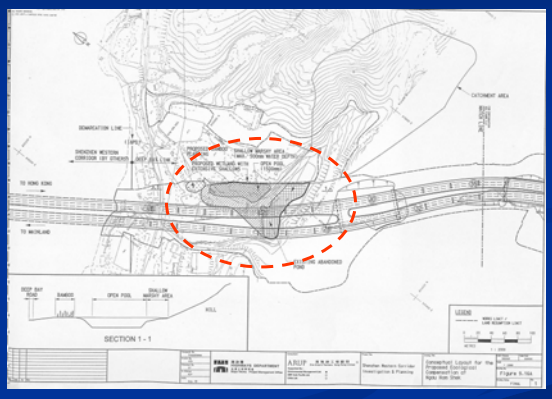
Can we have a choice of various ecological mitigation options

	On-site mitigation	Off-site Compensation Option 1	Off-site Option 2	..
Ecological benefits	A	C (C > A)	E (E > A)	..
Costs	B	D	F	..
Financial contribution to other nature conservation programmes of the same kind		Costs saved (D – B)	Costs saved (F – B)	..

Major lessons learnt

- Objectives & measurable targets should be clearly defined.
- A sound monitoring & maintenance scheme is needed.
- Construction phase impacts are often neglected - compensation before con/destruction
- Should learn more from the successful cases
  - resources & commitment
  - geographical factors and compatibility etc.

Yet another wetland compensation underneath the via-duct: Deep Bay Link & Western Corridor



The End