

# CWE2013 Conference on Wind Power and Environmental Impacts

Johann Köppel, TU Berlin, Germany

## **CAUTIOUS BUT COMMITTED – TOWARDS A MORE ADAPTIVE ENVIRONMENTAL PLANNING APPROACH FOR WIND ENERGY?**

Support came from our working group's

Marie Dahmen, Johanna Erdmann, Paul-Bastian Nagel, Eva Schuster and Gesa Geißler

# Outline: cautious but committed ...

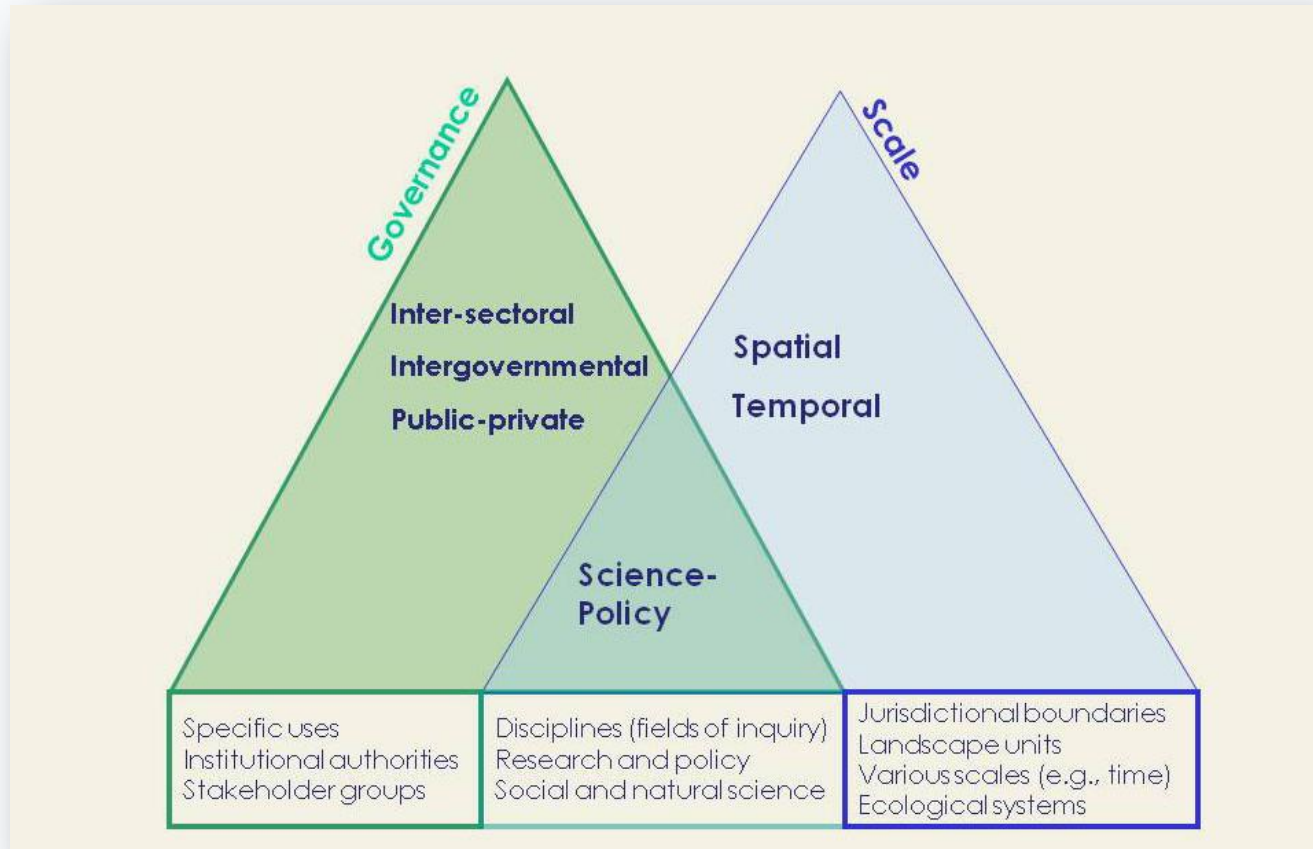
- (1) Planning theory as a starter
- (2) **CAUTIOUS** -> Strategies to tackle uncertainties
- (3) **CAUTIOUS** -> Precautionary principle's blessing and curse
- (4) **COMMITTED** -> Adaptive management/planning approaches
- (5) **COMMITTED** -> Making of synopses as an interim strategy
- (6) Not really conclusions, but hypotheses generated



## (1a) Planning theory as a starter

- The *precautionary principle* is based on preventive actions and shifts the burden of proof to proponents and calls for control by public participation (Kriebel et al. 2001, Harremoës et al. 2001)
- *Adaptive planning* theory relies on predictions and modeling upfront, recognizes dynamics and involves monitoring and stakeholder based adaptations (Kato & Ahern 2008)
- Environmental *policy integration* is necessary to prevent the shifting of externalities from one medium to another (Portman & Fishhendler 2011)

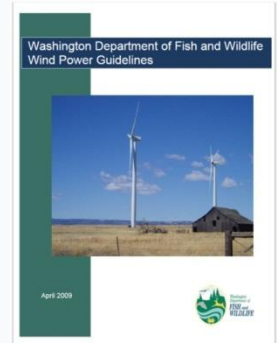
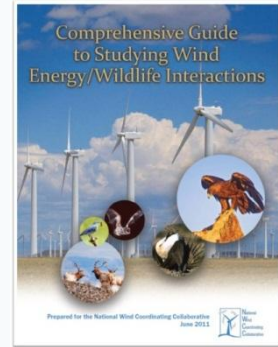
# (1b) Planning theory as a starter



- Dimensions of ICZM and other integrated resource management approaches (Portman & Fishhendler 2011)

## (2) Strategies to tackle uncertainties so far

- *Increasing the knowledge* base by research and monitoring; vivid discourse on survey methods and standards, collision risk modelling, mitigation measures and respective efficiencies etc. (cf. CWW/E)
- *The making of guidances* (Strickland et al. 2011), unilaterally or collaboratively (WADFW 2009)
- Pursuing the precautionary principle, combining research and a *mandate for vigilance* (e.g. Voigt et al. 2012 for wind farm's effects on migratory bats)



## (3a) Precautionary principle's blessing

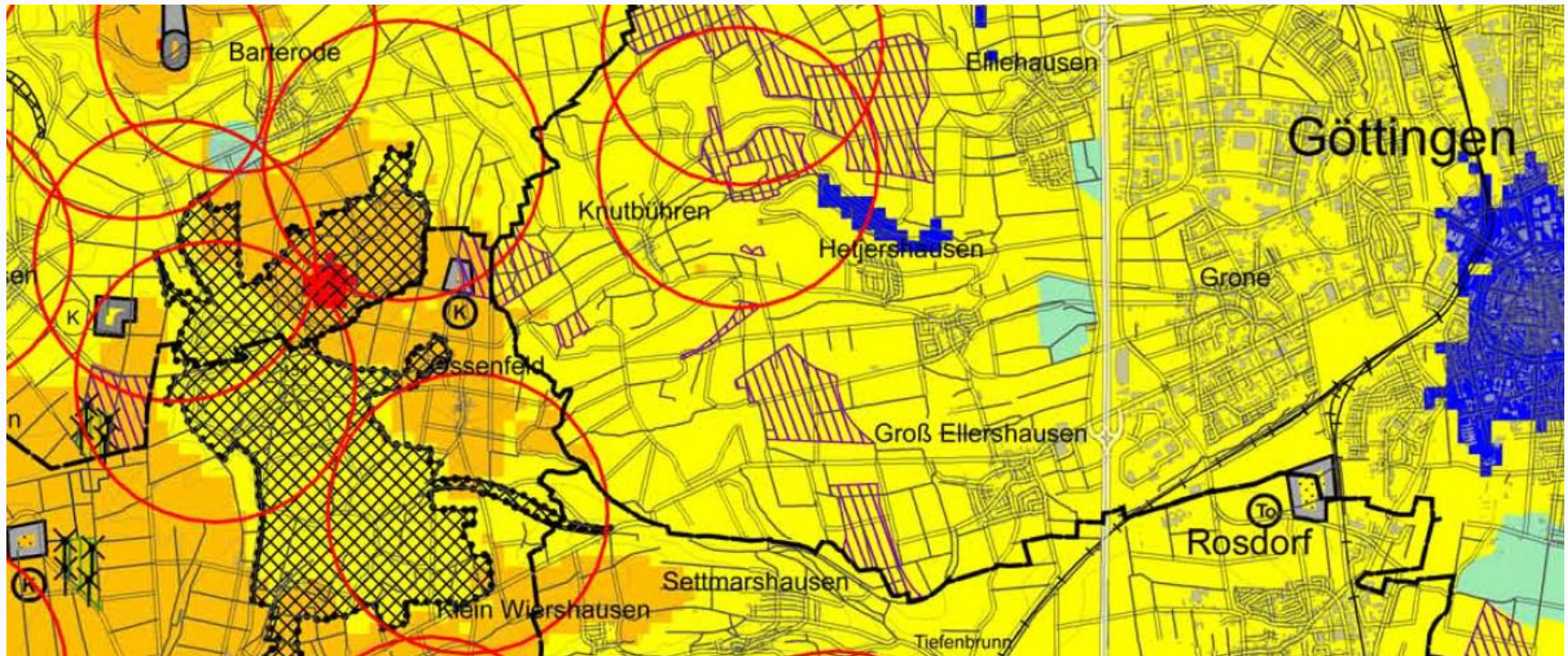
- A well established and long struggled for environmental policy approach (“*Vorsorgeprinzip*”, Kriebel et al. 2001): sensitivity maps, avoidance when siting wind farms (no go areas), *buffer zones* etc.
- Germany's “*Tierökologische Abstandskriterien*” (Working Group of German State Bird Conservancies 2007)

Art, Artengruppe	Abstand der WEA
Raufußhühner Tetraoninae	1.000 m
Kormoran <i>Phalacrocorax carbo</i> , Brutkolonien	1.000 m (4.000 m)
Rohrdommel <i>Botaurus stellaris</i>	1.000 m (4.000 m)
Zwergdommel <i>Ixobrychus minutus</i>	1.000 m (4.000 m)
Reiher Ardeidae, Brutkolonien	1.000 m (4.000 m)
Schwarzstorch <i>Ciconia nigra</i>	3.000 m (10.000 m)
Weißstorch <i>Ciconia ciconia</i>	1.000 m (6.000 m)
Fischadler <i>Pandion haliaetus</i>	1.000 m (4.000 m)
Schreiadler <i>Aquila pomarina</i>	6.000 m
Kornweihe <i>Circus cyaneus</i>	3.000 m (6.000 m)
Wiesenweihe <i>Circus pygargus</i>	1.000 m (6.000 m)
Rohrweihe <i>Circus aeruginosus</i>	1.000 m (6.000 m)
Schwarzmilan <i>Milvus migrans</i>	1.000 m (4.000 m)
Rotmilan <i>Milvus milvus</i>	1.000 m (6.000 m)
Seeadler <i>Haliaeetus albicilla</i>	3.000 m (6.000 m)
Baumfalke <i>Falco subbuteo</i>	1.000 m (4.000 m)
Wanderfalke <i>Falco peregrinus</i>	1.000 m; Baum- und

Abstände zu Brutplätzen bestimmter Arten

## (3b) Precautionary principle's curse

Lower Saxony - > 100 breeding sites of the *red kite* *Milvus milvus* led to a far going exclusion of sites on a regional planning level



red circle = 1250m buffer

## (3c) Precautionary principle's limitations

- No proper *environmental policy integration* (cf. Portman & Fishhendler 2011) safeguarded, even more when spatial restrictions matter a lot (as in Germany)
- The serious “*green against green*” dilemma (Woody 2010): climate protection by renewable energies vs. biodiversity protection and goals [resp. UNFCCC vs. CBD], resp. “green vs. green” (Yonk et al. 2013): “green groups v. green energy”

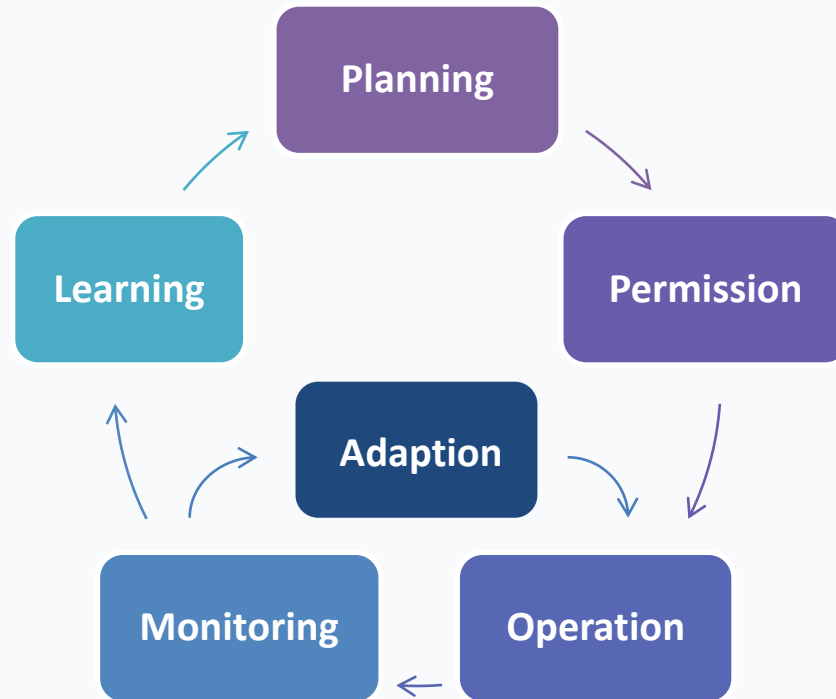


## (3d) Precautionary principle's limitations

- Instruments at hand to deal with this challenge like SEA (Strategic Environmental Assessment) *tend to fail to cope with* (at least in Germany, Geissler accepted JEAPM)
- [Mismatched environmental *vs. economic (wind yield)* governance phenomenon (cf. Ohl & Eichhorn 2010)]
- Limitations of the underlying rational-comprehensive planning approach: *“loose ends will remain forever”*

## (4a) Loose ends (i. e. uncertainty) will remain forever

- Response: *Adaptive planning and management* approaches
- *Iterative* decision-making processes, based on *monitoring* and *stakeholder participation* ( $\neq$  mitigation upfront; Williams et al. 2009, Dahmen 2012)



## (4b) Operational adaptive management approaches

- *cons*: proponents, developers and banks might face a loss of *planning security* (-> counter-incentives required)

Adaption	What	Example	Dahmen 2012
Removal	High fatality turbines to be removed or repowered	5 to 10 % of turbines cause > 60% of fatalities (Spain)	
Curtailment	Temporary shutdown at times of high fatality risks	Shaffer Mt. wind farm (U.S.) population based curtailment	
Scare or tempt away	Adaptive mitigation measures	Adapted maintenance, vulture restaurants (Spain)	
Step-wise expansion	Enlargement based on encouraging monitoring	Uruguay wind farm phased development	

- *pros*: collaborative planning approach, designed to create trust, requires accountability at the same time (Dahmen 2012)

## (4c) Adaptive planning and management

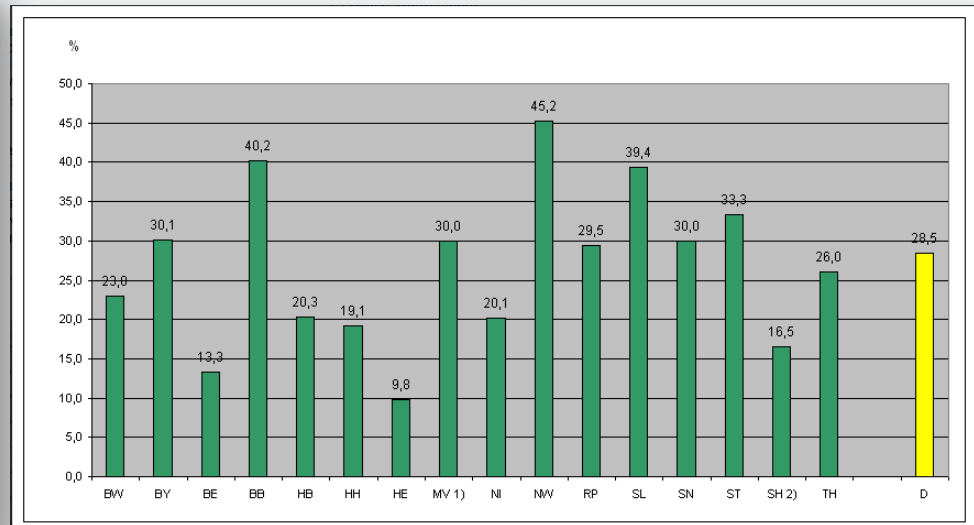
- Thus, adaptive approaches on policy (BY, B.-Wü. states), planning (TAK's adaption), siting (repowering) and operational (algorithms) *levels*
- Triggers *planning* (e.g. „Teil-Regional-/Flächennutzungspläne“ in Germany, sectoral land use plans on wind energy) and *institutional innovations* (WADFW 2009, cf. Coote CWE2013: SWBSG)
- The „*BLWE*“ Task (joined federal & state onshore wind energy working group in Germany)



<http://www.erneuerbare-energien.de/die-themen/windenergie/bund-laender-initiative-windenergie/>

# (4d) Adaptive planning on landscape level

“Naturparke” and “Landschaftsschutzgebiete” (BNatSchG) in Germany cover about 30% of protected cultural landscapes

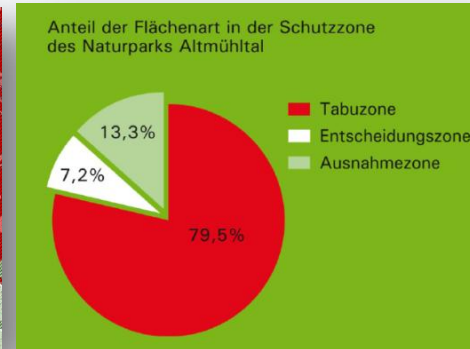
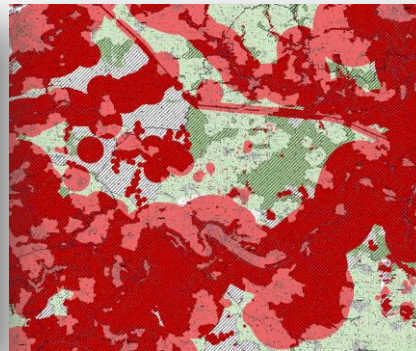


Flächenanteil der Landschaftsschutzgebiete in den Bundesländern und in Deutschland Stand: 31.12.2009

Bundesamt für Naturschutz, [http://www.bfn.de/0308\\_np.html](http://www.bfn.de/0308_np.html), [http://www.bfn.de/0308\\_lsg.html](http://www.bfn.de/0308_lsg.html)

# (4e) Adaptive planning on landscape level

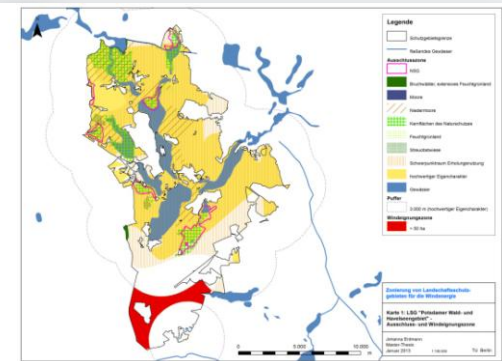
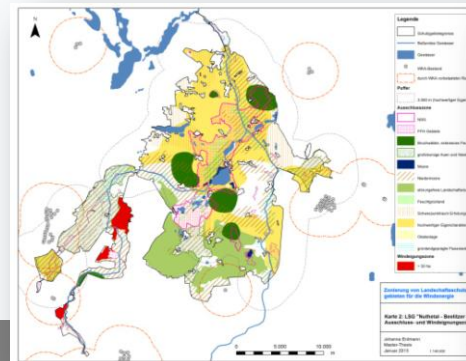
- A model zoning plan has recently been launched for the Naturpark Altmühltal, Bavaria state (**no go areas = red**)



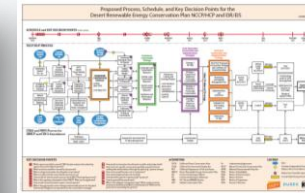
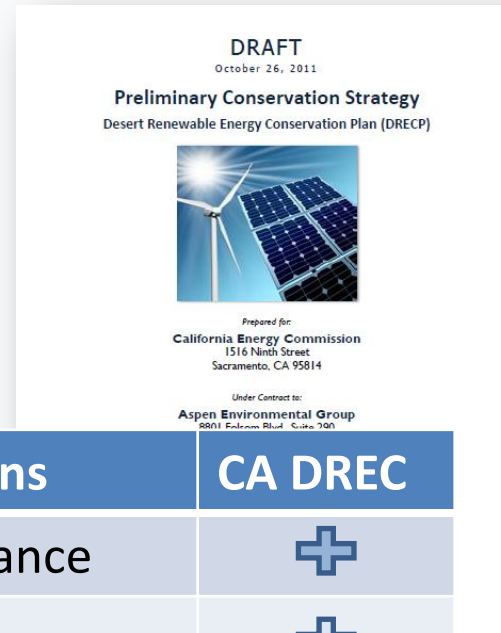
University of Applied Sciences Weihenstephan-Triesdorf <http://www.naturpark-almuehtal.de/windenergie/>

- A model zoning approach for selected “Landschaftsschutzgebiete” in Brandenburg state found similar results (**feasible areas = red**)

Johanna Erdmann (2013): MA Thesis, TUB, Environm. Assessm. Plan. Research Group



# (4fa) DRECP Integrated Governance Approach



Integration dimensions	CA DREC
Inter-sectoral governance	+
Inter-governmental	+
Public-private	+
Spatial scales	+
Temporal scales	+
Science-policy	+
Portman & Fishhendler 2011	

**Planning Agreement**





by and among

**California Department of Fish and Game,  
California Energy Commission,  
United States Bureau of Land Management, and  
United States Fish and Wildlife Service**

for the

**Desert Renewable Energy Conservation Plan**

May 2010

# (4fb) DRECP Interim Mitigation Strategy (ARRA Projects)

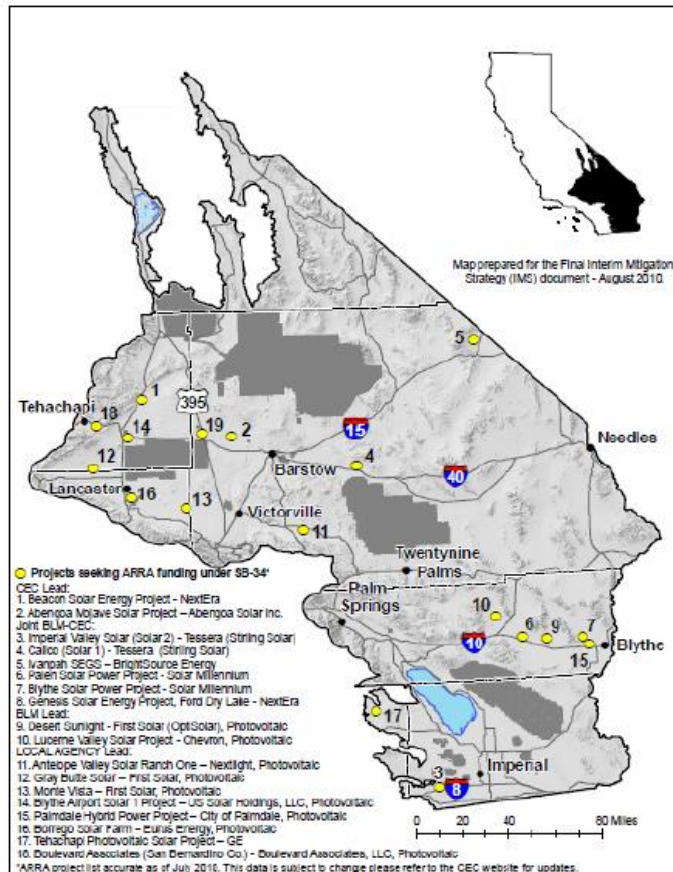


Figure 2: Projects seeking ARRA funding under SB-34 within the boundary of the DRECP.

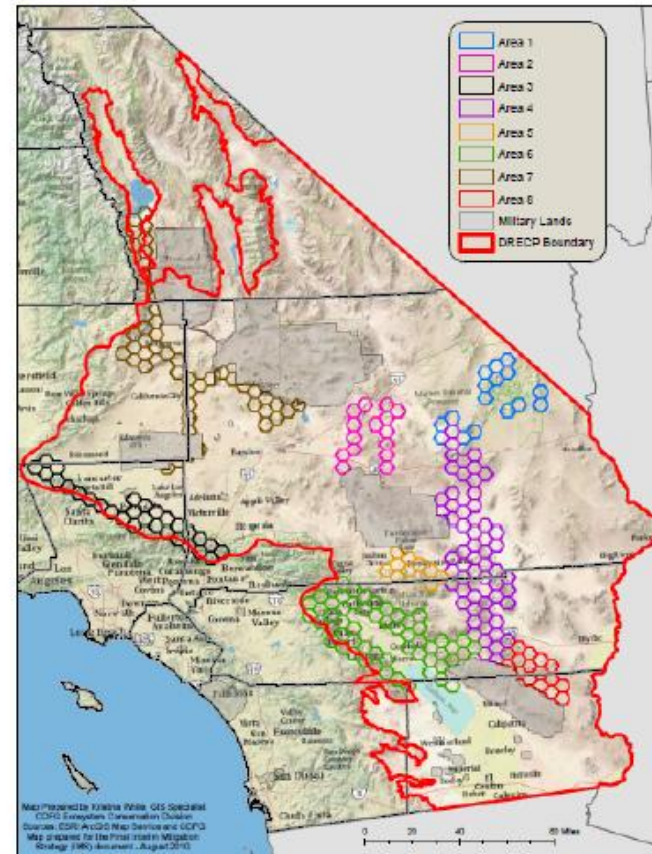
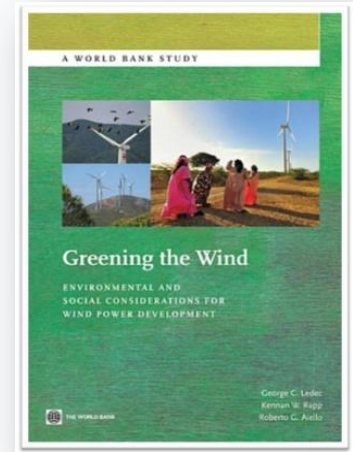


Figure 3: IMS Mitigation Target Areas developed specifically for use with the IMS and SB-34 projects only.



# (5a) The making of synopses as an interim strategy

- A *prerequisite* for adaptive approaches ( $\neq$  trial and error) as well
- A myriad of *research and monitoring results* has already been found over the last decade or so
- For example, the World Bank has published a basic *synopsis* „Greening the wind“ (Ledec et al. 2011)
- NWCC (National Wind Coordinating Committee) Fact Sheet classified: „*what studies have shown*“, „*what is less well understood*“, „*areas where little is known*“ (<http://www.nationalwind.org/publications/bbfactsheet.aspx>)



## (5b) The making of synopses as an interim strategy

- In Germany, a research project funded by the Federal Ministry of the Environment has been launched to contribute respectively: “Wind energy impacts on wildlife – an *International synopses*”
- As a focal point, main findings will be discussed on a further conference in the *CWW/E series 2015 in Berlin, Germany*
- *IEA (International Energy Agency) Task 34 Proposal: Assessment of Environmental Effects and Monitoring Efforts for Wind Energy Systems in Offshore and Land Based Settings* (Sinclair et al. 2013, work program, revised draft) -> 06.02.2013

# Not really conclusions, but hypotheses generated

- Adaptive planning and management approaches can help to *overcome the precautionary principle's unintended limitations*
- In turn, adaptive approaches can be established for *policy, planning, operational and institutional settings*
- A decade of research on wind energy and wildlife interactions allows for *the making of interim synopses* as a prerequisite
- Environmental planning tools as SEA require further research on *environmental policy integration* (cf. Mörtberg CWE)
- CWW 2011, CWE2013 etc. contribute a lot to pave the road for a *cautious but committed* development of wind energy ...)

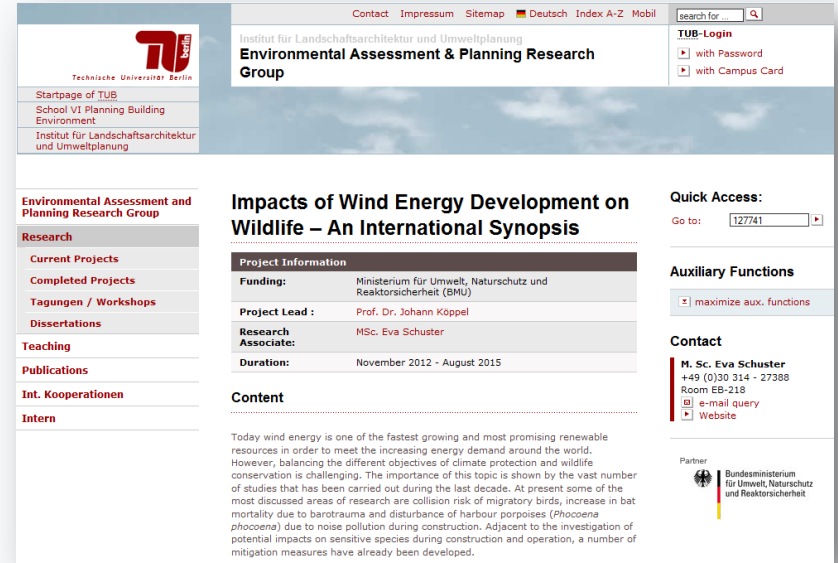
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**CAUTIOUS BUT COMMITTED – TOWARDS A MORE  
ADAPTIVE ENVIRONMENTAL PLANNING APPROACH  
FOR WIND ENERGY? THANK YOU AND SEE YOU!**



The screenshot shows the website for the Environmental Assessment & Planning Research Group at TU Berlin. The page features a navigation menu with links for Contact, Impressum, Sitemap, Deutsch, Index A-Z, and Mobil. A search bar is located in the top right corner. The main content area is titled "Impacts of Wind Energy Development on Wildlife – An International Synopsis" and includes a "Project Information" table with details on funding, project lead, research associate, and duration. A "Content" section provides a summary of the research, and a "Quick Access" section offers a search function. The footer includes contact information for M. Sc. Eva Schuster and a partner logo for the German Federal Environment Agency.

Project Information	
<b>Funding:</b>	Ministerium für Umwelt, Naturschutz und Reaktorsicherheit (BMU)
<b>Project Lead :</b>	Prof. Dr. Johann Köppel
<b>Research Associate:</b>	MSc. Eva Schuster
<b>Duration:</b>	November 2012 - August 2015

**Content**

Today wind energy is one of the fastest growing and most promising renewable resources in order to meet the increasing energy demand around the world. However, balancing the different objectives of climate protection and wildlife conservation is challenging. The importance of this topic is shown by the vast number of studies that has been carried out during the last decade. At present some of the most discussed areas of research are collision risk of migratory birds, increase in bat mortality due to barotrauma and disturbance of harbour porpoises (*Phocoena phocoena*) due to noise pollution during construction. Adjacent to the investigation of potential impacts on sensitive species during construction and operation, a number of mitigation measures have already been developed.

# CWW/E 2015 BERLIN, GERMANY

## CONFERENCE ON WIND POWER & WILDLIFE/ENVIRONMENTAL IMPACTS

### BMU & TUB



- Since 2002 > 50 Mio. Euro for *offshore* research programs, e.g. currently for the amendment of the „Standards for Environmental Impact Assessment“, bubble curtain research etc. (BSH)
- > 10 Mio. Euro for *onshore* research programs, e.g. currently on wind & wildlife monitoring and good practice approaches in forested landscapes (with developers/industry)
- > Upcoming importance of respective research for the ambitious transmission grid expansion in Germany

## **ECOLOGICAL RESEARCH PROGRAMS ON OFFSHORE & ONSHORE WIND ENERGY**