

Environmental Benefits and Drawbacks

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WP9 – Assessment of potential environmental benefits and impacts of nutrient management through fertiliser substitution (6 months)

WP10 Assessment of benefits to environmental protection (including GHG and ammonia emissions) and disease management on farms through introduction of AD (6 months)

WP11 Development of methods to assess potential benefits to biodiversity in a wider context as a result of diversification into farm energy production through AD (12 months)

WP9 – Assessment of potential environmental benefits and impacts of nutrient management through fertiliser substitution (6 months)

- **Literature gathered/reviewed on nutrient availability in digestates; current application methods, leaching issues, storage requirements.**
- **Database for fertiliser requirement of key crops and possibility for substitution**
- **Environmental cost/benefit/scenario analyses in conjunction with surveys in wp13-14.**
- **Experimentation to fill important gaps if necessary**

WP10 Assessment of benefits to environmental protection (including GHG and ammonia emissions) and disease management on farms through introduction of AD (6 months)

- **Use of ERA (USEPA) to address environmental impacts of farm diversification for AD**
- **Environmental Impact assessment – identifying risks from above but then assessing benefits and looking at overall impact**
- **Potential of Bow-tie risk management (Pidgeon ... Poppy, Proc Roy Soc 2007) to develop management/mitigation strategies for adopting AD**
- **Communication of risks/impact**

WP11 Development of methods to assess potential benefits to biodiversity in a wider context as a result of diversification into farm energy production through AD (12 months)

- **Collection of relevant ecological data**
- **Identification of scenarios/case studies (with economics and energetics considered) to be developed/modelled further**
- **Application of new methods for considering theoretical impact of change (Butler et al., Science 2007)**
- **Integration of management/mitigation strategies (Bow tie Pidgeon Poppy, Proc Roy Soc 2007) to optimise benefits whilst reducing risks**
- **Identification of key concerns for post-release monitoring using risk characterisation/confidence obtained through ERA procedure.**

Ecological Risk Assessments (ERA)

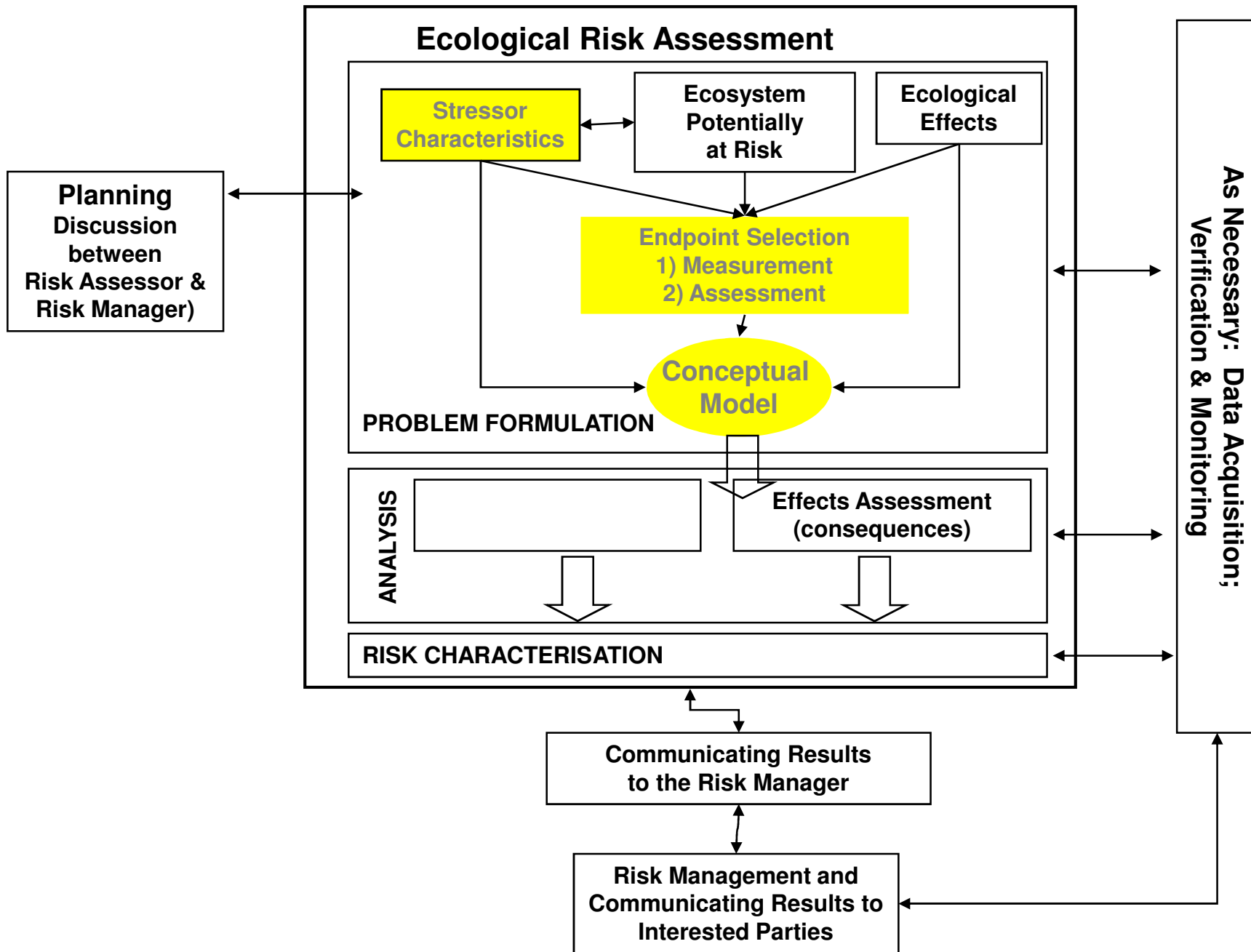
An evaluation of the likelihood that adverse ecological effects could result from exposure to one or more stressors (USEPA 1998)

USEPA – 8steps – can be simplified to 3

Problem Formulation

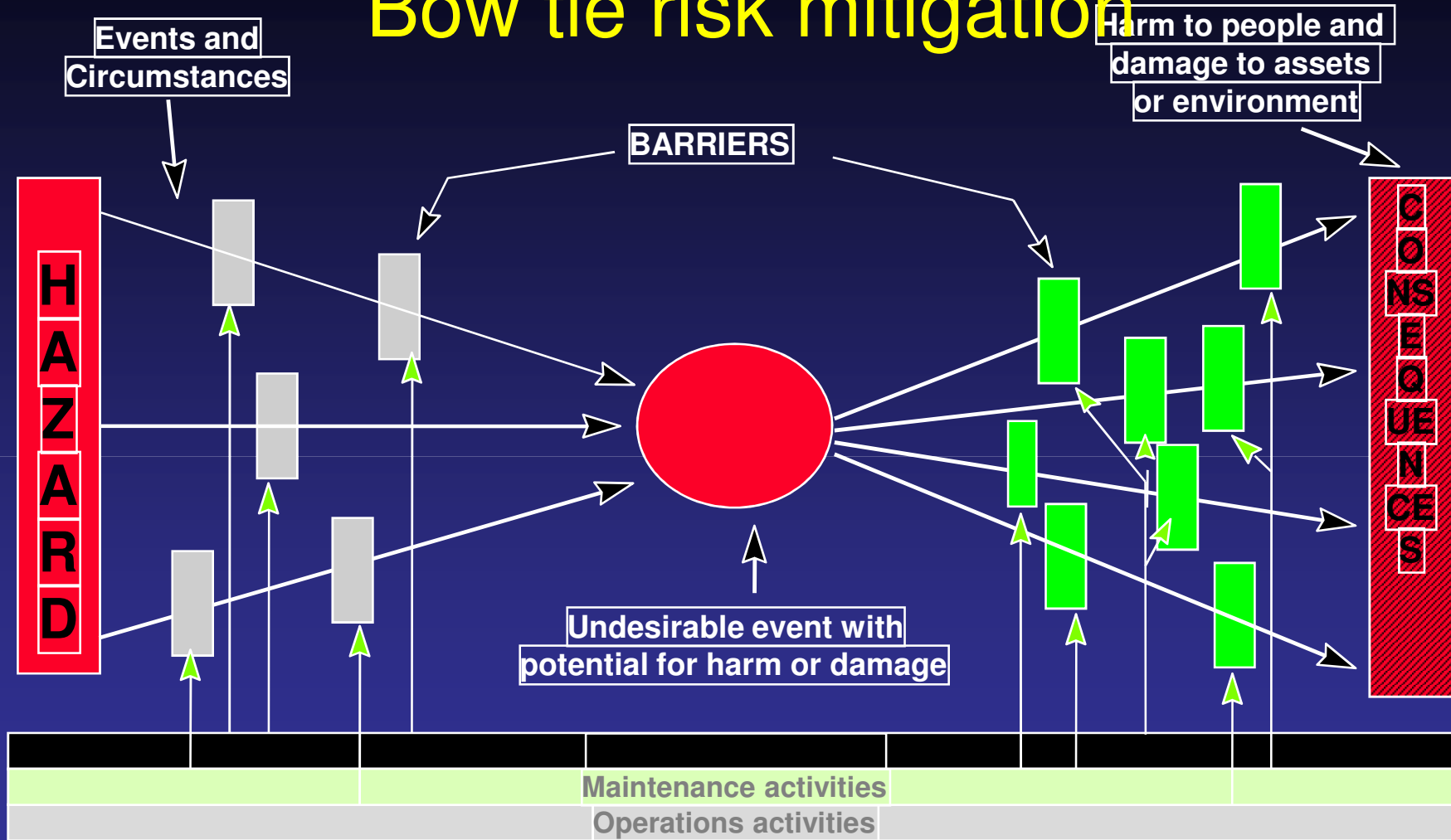
Analysis Phase

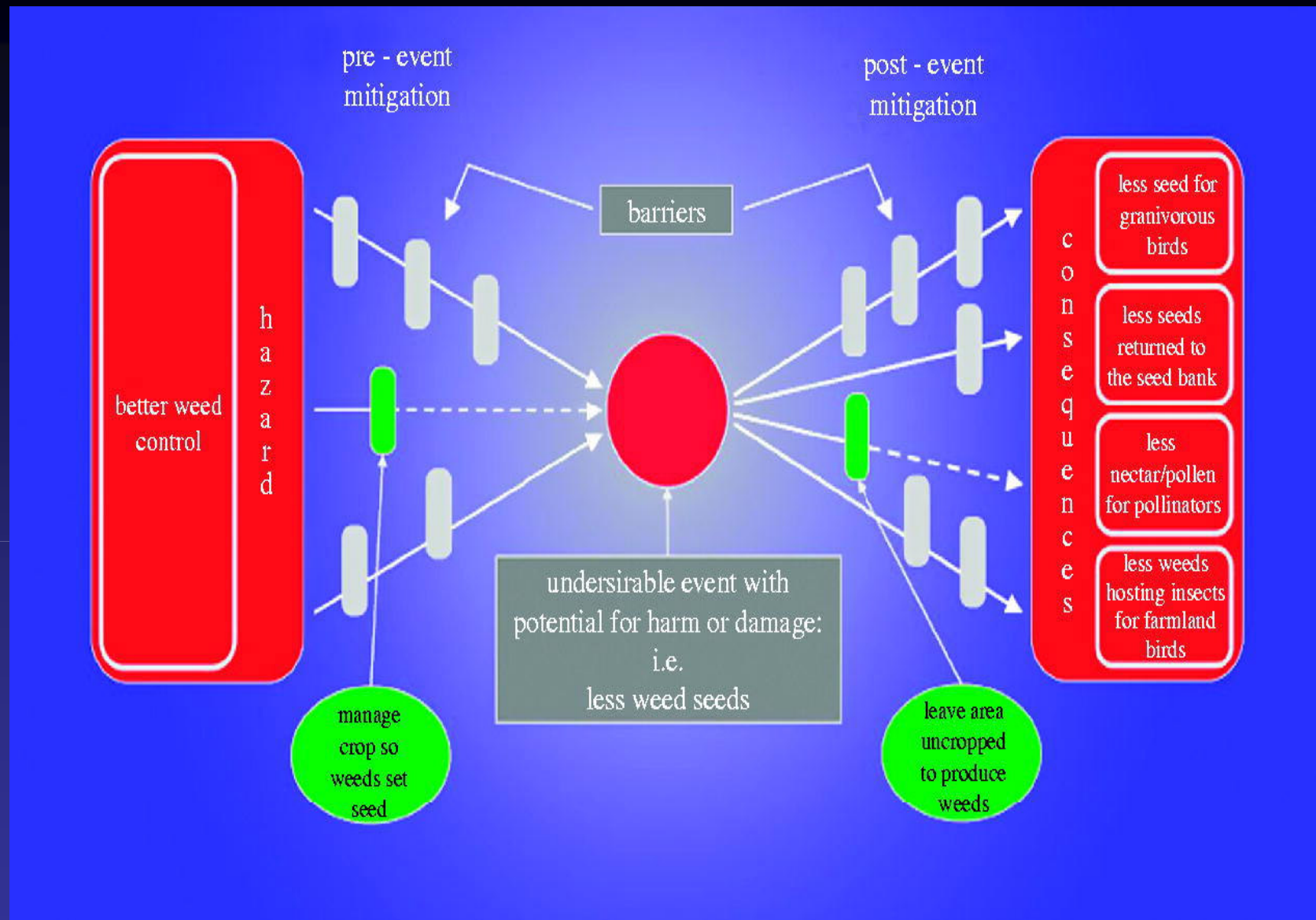
Risk Characterisation



Framework for an Ecological Risk Assessment (after US EPA)

Bow tie risk mitigation





Pidgeon, May, Perry & Poppy

Proc Roy Soc 2007 274:1475-1479

Fig. 1. Risk analysis and management framework

