



# The gardener and the project, towards an adaptation to climate change.

Parks and Gardens Expert,  
French Ministry of Culture  
Directorate General for Heritage and Architecture

**Italian-French Bilateral Cooperation in Heritage Science: “Human-centered approach for cultural heritage in green transition: disciplines talking to each other”**

Thursday, 27th April 2023

Human activity

International trade

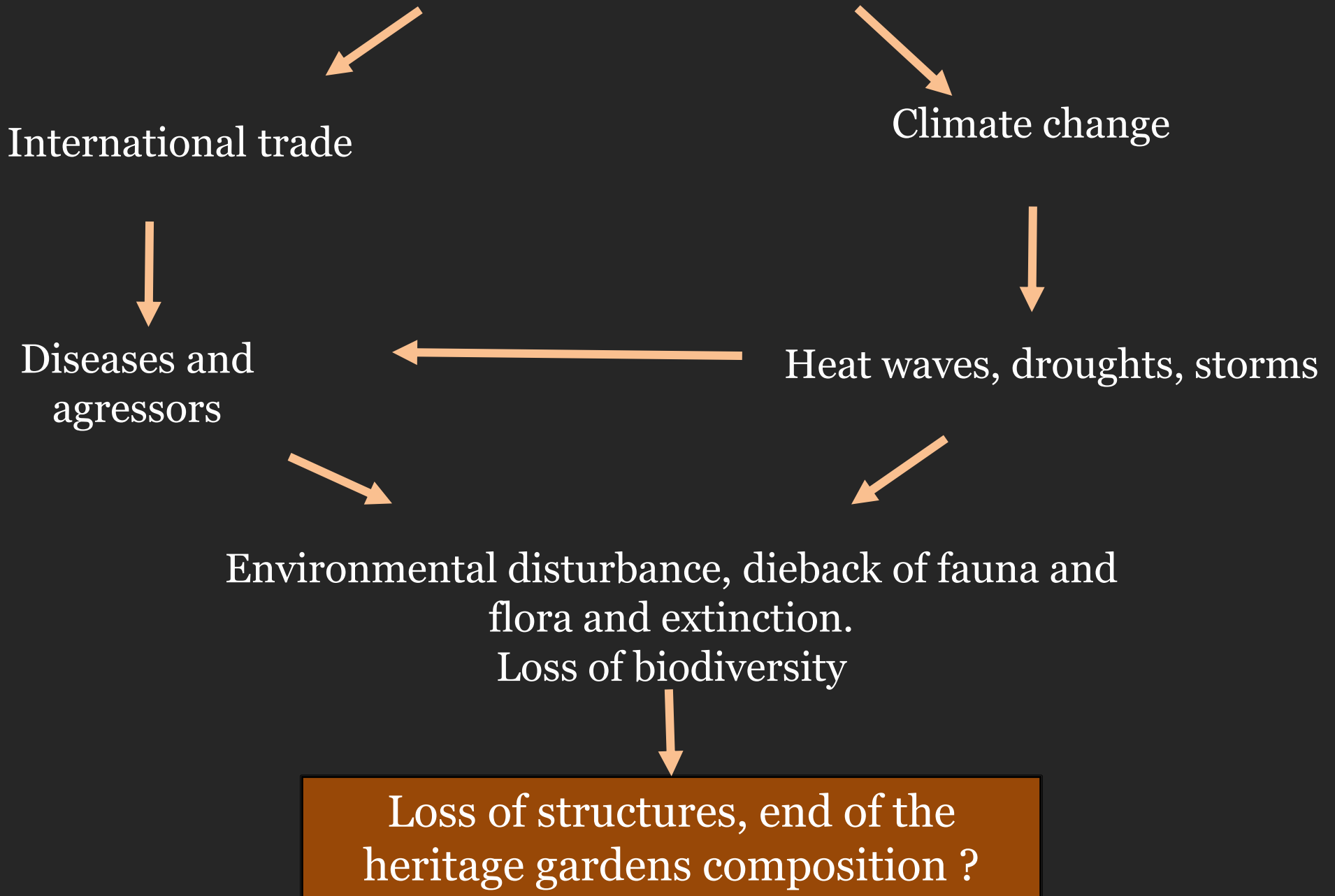
Climate change

Diseases and  
agressors

Heat waves, droughts, storms

Environmental disturbance, dieback of fauna and  
flora and extinction.  
Loss of biodiversity

Loss of structures, end of the  
heritage gardens composition ?





In the past thirty years :

storms : 1987 – 1991 – 1999 - 2009

heat waves and droughts : 1976 – 2003 – 2019 - 2020

Frosts and extreme cold: Winters 1985 et 1987



Domaine National de Champs-sur-Marne  
avant et après la tempête du 26 décembre  
1999



Domaine national de Pau  
Dépérissement sur hêtre



Domaine d'Orbigny à Pontaubert – Stress  
hydrique sur pin sylvestre  
Canicule 2020



# Past and present diseases

- 1860 : Ink disease of the chestnut,
- 1950 : Ink disease of the red oak,
- 1957 : Canker of the chestnut
- 1944 : Canker stain of plane
- 1968 : Dutch elm disease (last disease)
- 1957 : Fire blight Rosaceae



*jardin des Tuileries - Alignement of elm trees on the riverside banks replanted by basswood in 1977 after the Dutch elm disease.*

## Today :

Boxwood's bioagressors :  
the *Cylindrocladium buxicola et Volutella buxi*, Pyrale (*Cydalima perspectalis*)  
mushrooms

*Chestnut's eafminers*  
(*Cameraria ohridella*)

*Ink disease of the chestnut*  
(*Phytophthora cinnamomi and cambivora*)

*Ash dieback*  
(*Chalara fraxinea*)

**Tomorrow ?** *Ceratocystis fagacearum*, an aggressive fungus of American oaks that would have a devastating effect on European oaks.



*Cameraria ohridella*



*Canker stain of plane-Canal du Midi*

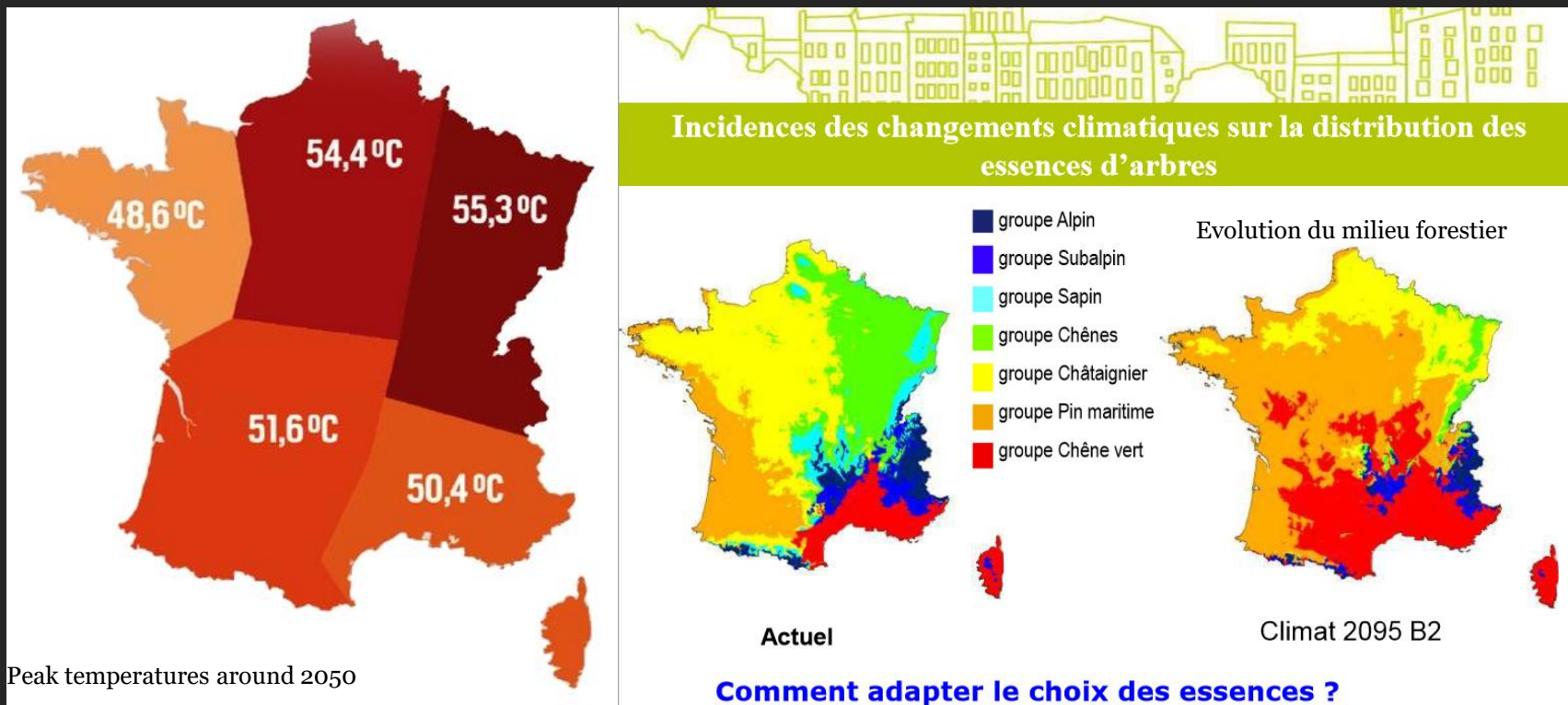


*Bio-aggressors progression in Vaux-le-Vicomte : Pyrale as well as Volutella buxi and Cydalima perspectalis fungi*

## Un saut vers l'inconnu

« In the next two or three decades, global warming will continue [due to the inertia of the climate machine], says Jean-Michel Soubeyroux, deputy director of climatology at Météo France and coordinator of the Drias report. However, from 2040-2050 onwards, everything is possible. It depends on our actions to reduce greenhouse gas emissions. Either the warming will slow down, or we will end up with a climate that is very different from the one we currently have in France.» A leap into the unknown in a climate never experienced in France or Europe.

Audrey Garric *La France pourrait connaître un climat extrême à la fin du siècle*, le Monde February 2021



Arbres et Plan Climat, la stratégie de la Métropole de Lyon

<https://docplayer.fr/57655766-Arbres-et-plan-climat-la-strategie-de-la-metropole-de-lyon.html>



# Government responses

## Green transition

The ecological transition is an evolution towards a new economic and social model, a model of sustainable development that renews our ways of consuming, producing, working and living together in order to meet the major environmental challenges of climate change, resource scarcity, the accelerated loss of biodiversity and the increase in environmental health risks.

## Ministry of Ecology

- de mobiliser les établissements de votre ministère (musées ou monuments avec patrimoine végétal important et Cité de l'architecture et du patrimoine) autour d'engagements volontaires en faveur de la biodiversité. Vous veillerez ainsi à l'extension du dispositif de plan de gestion des jardins historiques mis en place par votre ministère et serez force de proposition sur l'évolution de la place et du rôle des jardins en ville : vous me proposerez notamment un plan d'extension concerté pour les jardins historiques ;

2013 – Framework letter for green transition from the Prime Minister to the Minister of Culture

## In gardens domain... From cultural to natural ...

- **New representation of gardens - Renaturation.**

*[ ...] with a wooded park that stands out from the surrounding areas [ ...]*

Convention d'obligations réelles environnementales (ORE)

*How to reconcile the necessary diversification of forms and species with four centuries of regular and monospecific tradition? ( Ville de Lyon)*

- **Regionalist withdrawal with rejection of exotic plants.**

*the landscape gardener organised the gradual planting of indigenous characteristic plants of the region's oak forests, recreating an ideal one (Restauration du Parc Bordelais)*

- **The role of man, practices and uses.**

*our association is working for the creation of a vast area of European dimension and a large surface area - around 70,000 hectares - in which an intact forest will evolve autonomously, renewing and developing its fauna and flora without any human intervention over a period of several centuries. (Association Francis Hallé)*

*to preserve an area of natural/spontaneous biodiversity of at least 10% of the surface area of the castle park where interventions are reduced to a minimum and limited to safety maintenance; leave this area to evolve freely, with the exception of invasive species; do not carry out any new planting or pruning operations there. Convention d'obligations réelles environnementales (ORE)*

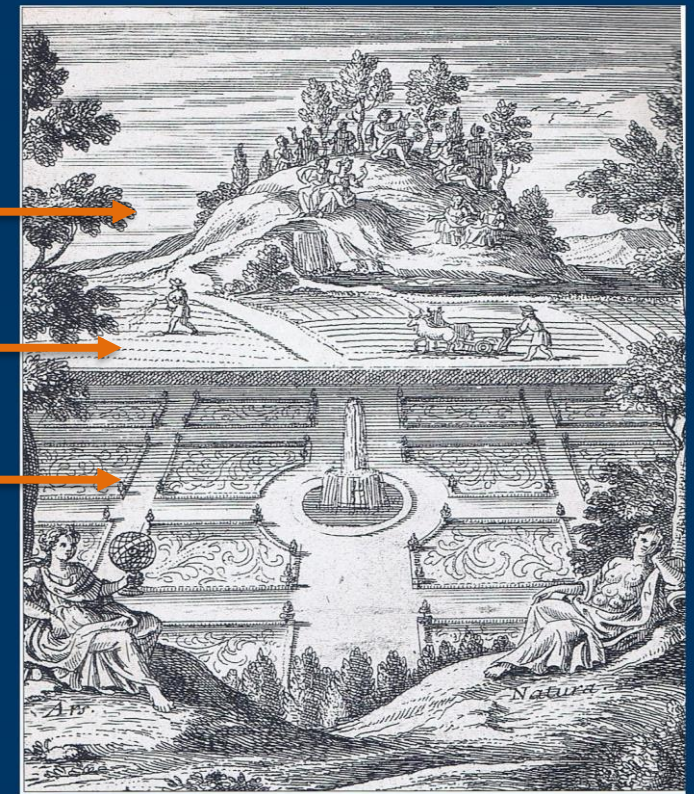
Breakups

Frontispiece to the book *Curiosités de la nature et de l'art*, by Pierre Le Lorrain de Vallemont (1703).

First stage : Mountain with jagged flanks;

Second stage : Farmland and peasants;

Third stage : the walled garden;



*It is always about working with nature ...*  
(Gilles Clément, *Le jardin Planétaire*, 1999)

*If nature is not conducive enough to grant the garden spontaneously, without which it would soon revert to a wild state, it is up to art to play this role.*

(John Evelyn (1620 1706) , *Garden treaty*, unpublished)

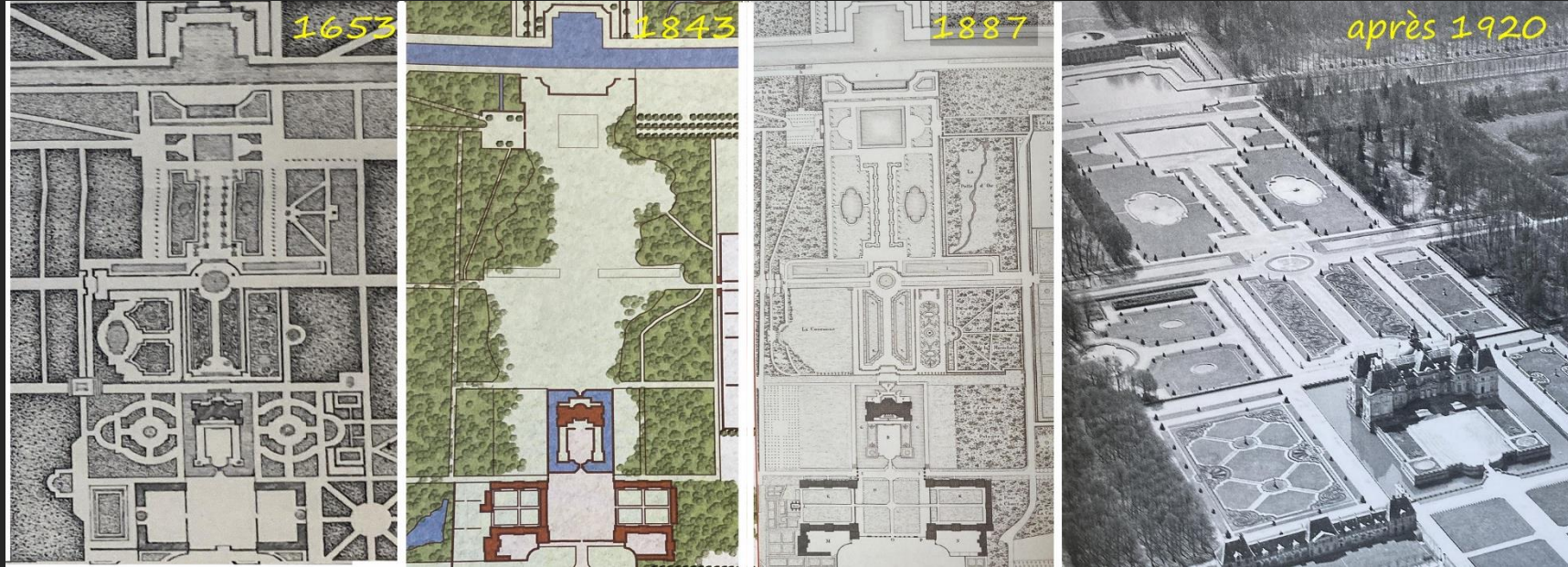


*The invention of the village and the (Melanesian) garden by mythical heroes marks the advent of civilisation. Both the garden and the village represent life, the real life, which man is gaining over the equatorial forest*

André Itéanu, *Le potager papou ou comment faire pousser les relations* - 2011



# The project response

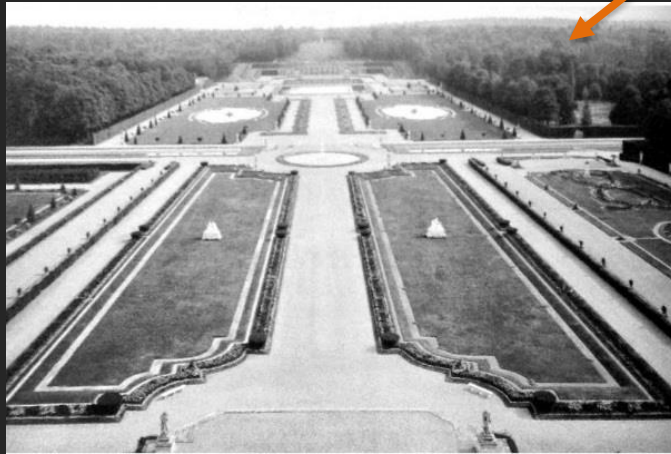


*Engraved plan, Israël Silvestre around 1653*

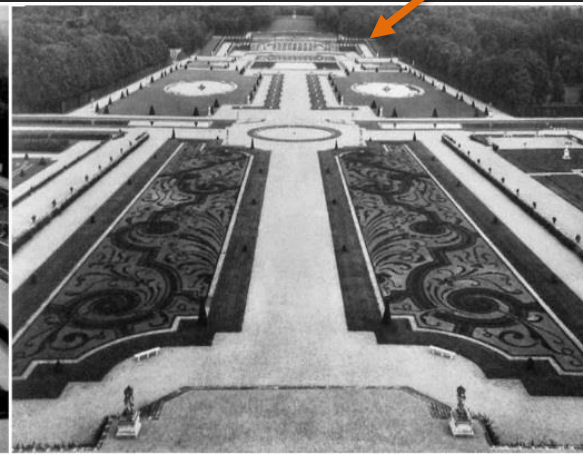
*Interpretation of Vaux gardens in 1843  
Dessin Jacques Moulin*

*Engraving Rodolphe Pfnoer 1887*

*Oblique picture 1950*



*The Parterre in 1887*



*in 1920*



*Today*



# La réponse par le projet



*Bridge Park, M.R. Van Valkenburgh,  
Landscape gardener*



*Strip of forest, Jardins des Tuileries,  
Dominique Larpin, ACMH.*

*Alignements  
irréguliers :  
Berggruen Institute,  
Californie  
© Michel Desvigne,  
paysagiste*

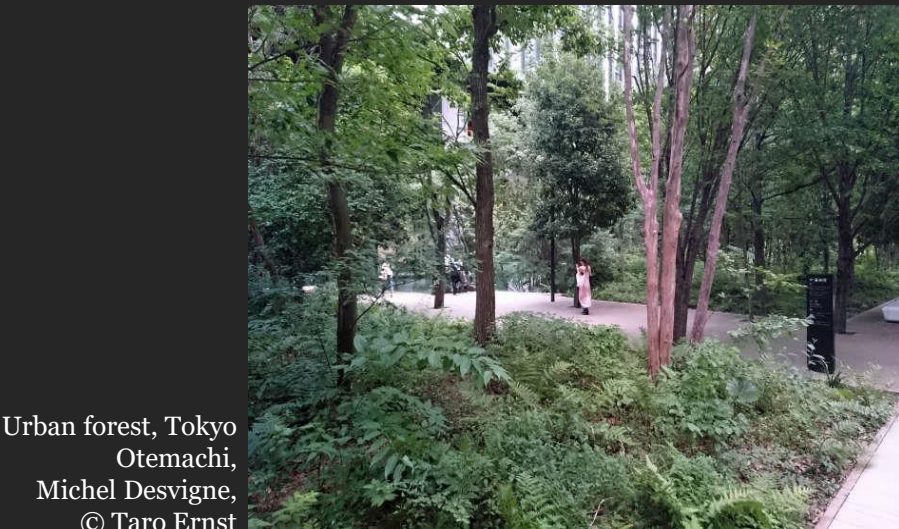


*Strip of forest in Paris*

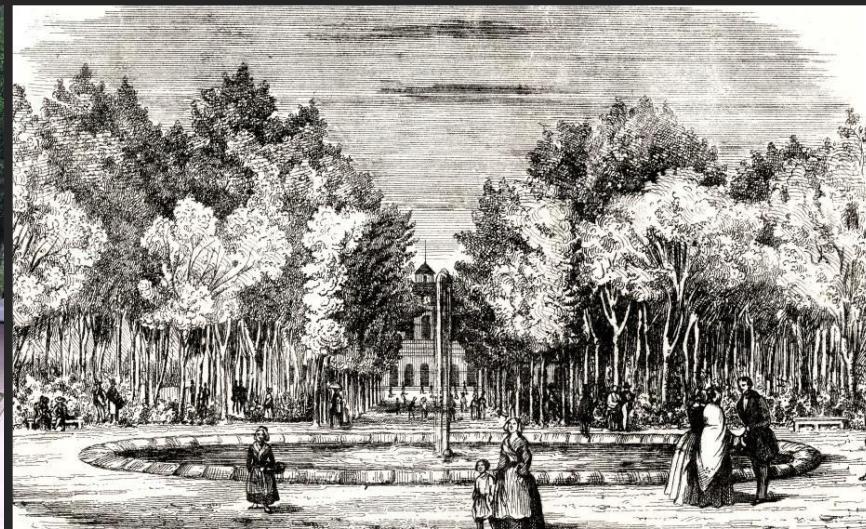


*The Manceau Bocage*

*Alignement  
irrégulier, Bois-  
Rouaud, Edouard  
André XIXe siècle*



*Urban forest, Tokyo  
Otemachi,  
Michel Desvigne,  
© Taro Ernst*



*Forêt urbaine  
Parc des Sources,  
Vichy,  
Bariau, 1851*



# Anticipatory responses to climate change

**Sources**  
bibliographie, Bases de données, Échanges avec les services des collectivités

**Méthodes**  
85 espèces, SES rendus, Contraintes, Contraintes physiques, Caractérisation selon les services rendus

**Produits**  
Un outil d'aide à la conception, ... des fiches « espèces »

**ERABLE PLANE, ACER PLATANOIDES**  
FAMILLE : Acereceae  
TAILLE : 25 m  
DESCRIPTION GÉNÉRALE :  
Grand érable à écorce peu crevassée, fleur jaune d'or. Grandes feuilles caduques à 5 lobes pointus. Autochtone

**FLORAISON :**  
J F M A M J J A S O N D

**ÉCOLOGIE :**  
Besoin en lumière : ++  
Supporte la chaleur : +  
Continental : +  
Supporte un air sec : -  
Supporte un sol pauvre : +

**FACTEURS LIMITANTS**  
Liés au contexte urbain :  
Supporte un sol compact :   
Supporte un sol sec :

**ADAPTATION AU CLIMAT MESSIN, DANS LE CONTEXTE DU CHANGEMENT CLIMATIQUE :**  
Naturellement présent dans la région, l'érable plane est adapté aux sols urbains compacts, résistant à la pollution, et très résistant à la sécheresse.

*The city of Metz has published 85 sheets on regional trees and shrub species online. For each tree, the "technical" sheet gives a score from 1 to 10 on multiple criteria: impact on air quality, fixing of fine particles, regulation of the local climate, adaptation to local climatic changes, impact on the urban landscape, hosting biodiversity. The "negative" aspects (allergies, superficial roots, etc.) of trees are also evaluated. The sheets also specify whether the species has the capacity to adapt to compact or dry soil.*

*SESAME project: an innovative project on urban trees and shrubs and adaptation to climate change*

# Promoting plant dynamics and protecting the richness mechanism

**Conséquence** : orientation de cette étude vers des formations forestières semi-arides d'altitude qui se caractérisent par des précipitations faibles des températures estivales élevées, une humidité de l'air faible et des rigueurs thermiques nocturnes et hivernales.

Les plus vastes réservoirs de plantes supportant ce climat se trouve en Amérique du Nord.



Les grands déserts nord-américains

Le désert de Chihuahuan

**D'autres étendues comparables** se situent en Asie centrale, à l'Ouest de l'Himalaya (Pakistan, Afghanistan), en Turquie, en Iran, au Proche-Orient, en Afrique du Nord ainsi qu'en secteur saharien (hauts plateaux et sommets : Hoggar, Tibesti et Tassili des Ajjers).



Arboretum of the château d'Harcourt

*« adapting forest management to climate change is a priority, and the forester must identify forest species that are well adapted to climatic conditions and soil types, preserve soils by limiting settlements by forestry machinery, and boost silviculture to improve resistance to water stress »*

La performance environnementale, pillar of ONF sustainable management», <http://www.onf.fr>. le 1er mai 2014

*[...] we do not quantify nature as a series of objects, it is not a list that must be protected, it is the mechanism of wealth.*

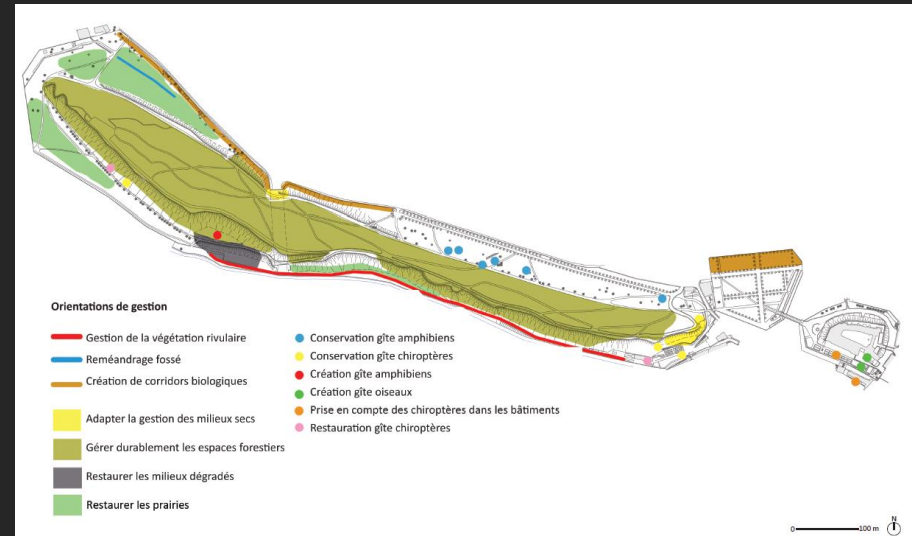
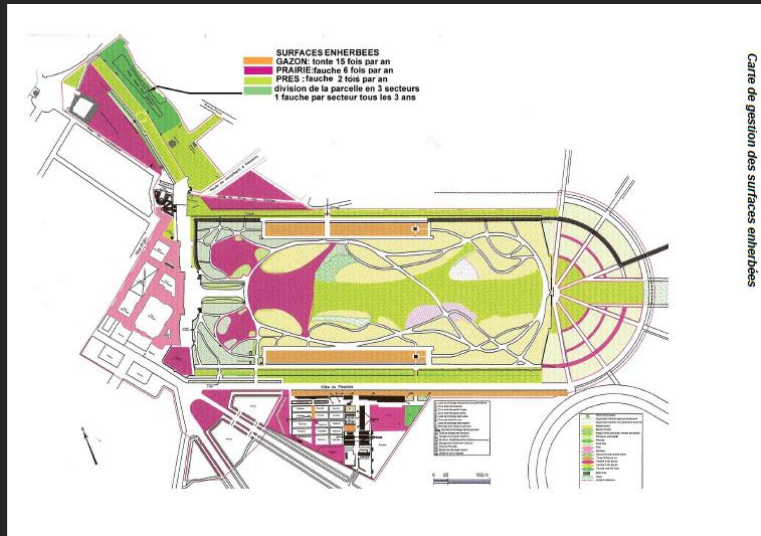
Gilles Clément, *Jardins en mouvement, friches urbaines et mécanismes de la vie*, 1997



# The Management Plan response

*A management plan is a tool for the garden's technical, scientific, health and economical monitoring to preserve and even increase its heritage and environmental value.*

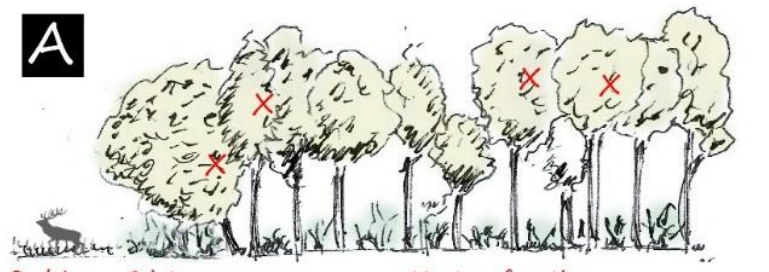
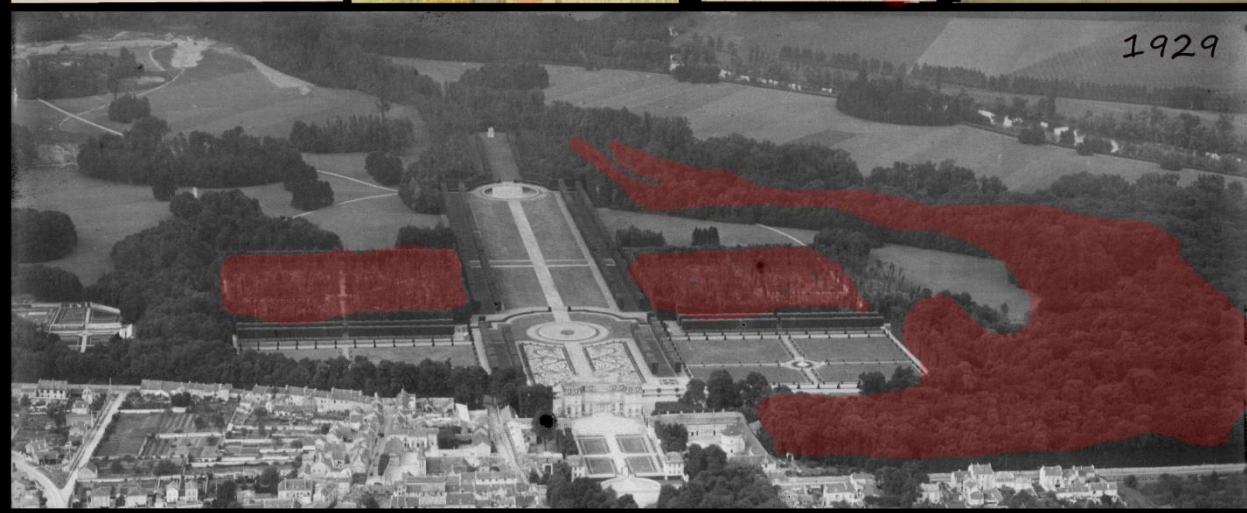
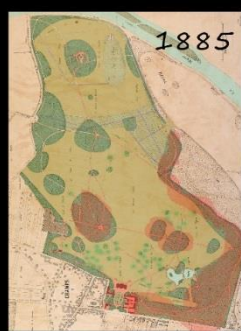
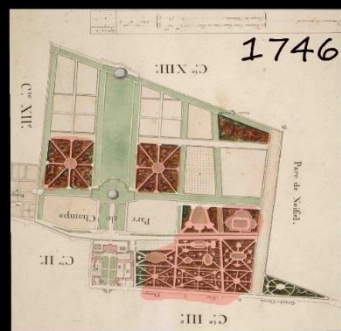
*Definition of the Ministry of Culture's garden management plan from the specifications of the Champs-sur-Marne national estate 2006*



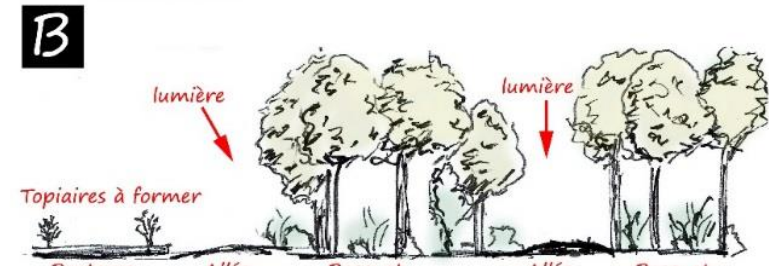
*Management plans for the Compiègne 2007 and Pau 2020 domains reflecting biodiversity*



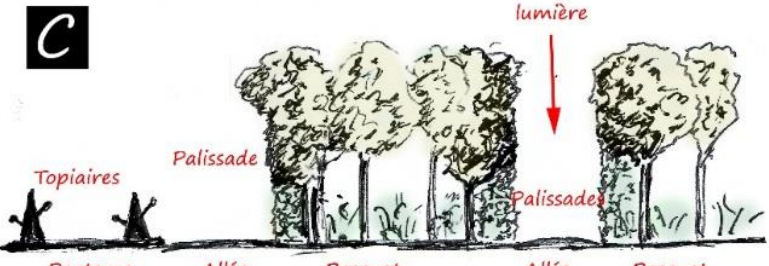
Domain of Champs-sur-Marne, CAF 1929



Ourlet      Ceinture buissonnante      Manteau forestier



Parterre      Allée      Bosquet      Allée      Bosquet



Parterre      Allée      Bosquet      Allée      Bosquet

*These French-style gardens masterfully tended with an exceptionally high design standard, are nevertheless home to fauna, flora and habitats of surprising biological diversity and quality, demonstrating that formal rigour and biodiversity coexist! Aurélien Hugué, Écologue (A propos des jardins de Versailles )*

*The permanence of wooded areas on the Champs-sur-Marne estate*





26 december 1999, Champs-sur-Marne destroyed by a storm. © JM Sainsard

# Implementation of the management plan

Multiple objectives

The plan

The means



Staffing, skills and competencies

Determination of the future potential of groves

**PARCELLE 011**

Cette parcelle est composée de deux typologies végétales. La partie la plus proche du château est constituée de arbres chênus pédonculés très espacés les uns des autres. Ces arbres sont destinés à se voir complètement. Le traitement de l'espace est permis par de petites haies denses végétales en vigneaux. Le deuxième moitié de la parcelle est composée d'un peuplement feuillu de hautes densités avec un sous étage très peu présent. Les arbres en place constituent un bon support pour assurer l'évolution de l'espace.

Parcelle	Age	Essence	Statut	Observations	Travaux prévus
011	1999	Chêne	Chêne	Chêne	Chêne
011	1999	Hêtre	Hêtre	Hêtre	Hêtre
011	1999	Alisier	Alisier	Alisier	Alisier
011	1999	Orme	Orme	Orme	Orme
011	1999	Frêne	Frêne	Frêne	Frêne
011	1999	Chêne	Chêne	Chêne	Chêne
011	1999	Hêtre	Hêtre	Hêtre	Hêtre
011	1999	Alisier	Alisier	Alisier	Alisier
011	1999	Orme	Orme	Orme	Orme
011	1999	Frêne	Frêne	Frêne	Frêne

**RECOMMANDATIONS:** Les haies de haut diamètre l'empêchent d'être dans un jardin, nous passons dans le jardin pour rentrer dans la forêt. Dans le jardin, nous ne les touchons pas.

**RECOMMANDATIONS:** NEUFME: TRAITEMENT DE TYPE TAILLE SOUS FORÊT

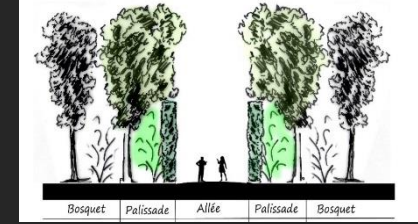
**RECOMMANDATIONS:** Sélection dans un site pour favoriser le développement en largeur des arbres sélectionnés. Dans l'attente d'un traitement par coupe Rega. Démontage dans l'attente d'un traitement.

Travaux à ne pas réaliser: profondément l'éclaircie de charmes le long du mur. Suppression de certains arbres adultes, après élimination préalable sur la parcelle 3.

Regeneration of groves



State of play



Objective



1999



2010



2016

Champs-sur-Marne, Regeneration of groves

*As I practice it more directly, I realise that a true gardener is not a man who cultivates flowers: he is a man who tends the earth, he is a creature who buries himself in the ground, [...] He lives deep in the soil. He builds himself a monument by heaping up the earth. If he came to the garden known as Paradise, he would sniff ecstatically and say: "Good God, this is hummus! "*

Karel Čapek, *L'année du jardinier*, 1929.



# Thanks for your attention!

Jean-Michel Sainsard, Parks and Gardens  
Expert, French Ministry of Culture - Stéphanie  
de Courtois, Garden historian, Denis Mirallié,  
Landscape engineer

Jean-michel.sainsard@culture.gouv.fr

+33 1 40 15 82 22

<https://www.culture.gouv.fr/Thematiques/Monuments-Sites/Monuments-historiques-sites-patrimoniaux/Les-monuments-historiques>

