



Torenfort Uitermeer, a part of the New Dutch Waterline with a bridge construction, 2008, Bert van As for the Rijksdienst voor het Cultureel Erfgoed, Wikimedia, released under a Creative Commons Attribution-Share Alike 4.0 International license

Chapter 13

Hold the Line: The transformation of the New Dutch Waterline and the Future Possibilities of Heritage



Gerdy Verschuure-Stuip

Abstract The redevelopment of the New Dutch Waterline, also known as the New Hollandic Waterline, was crucial to a change in public appreciation of Dutch military heritage and its connection to landscape design. Starting in 1980, new methods of revitalization combined preservation, renewal, and narrative approaches. At the same time, the work on the New Dutch Waterline changed; a nationally driven project became a series of local interventions. Throughout the effort, it was critical to success to have different actors understand and promote it as a heritage landscape of national importance. The project undertook not only to revitalize individual fortresses, but to enhance regional identity and tourism, a new scale in heritage debates. This chapter shows the importance of understanding and intervening in defense heritage as landscape—as well as individual objects. It also indicates how addressing these different scales can help in future spatial challenges. Finally, it addresses how understanding water heritage can help to tackle the imminent challenge of climate change at the scale of the landscape.

Keywords New Dutch waterline · New Hollandic Waterline · Defense landscape · Heritage management · Landscape planning · Water · Transformation

Introduction

Dutch military heritage is gradually being reused for civilian purposes, as it has lost its active role in military defense and its position and features are no longer classified information. Over the last 20 years, local groups have successfully modernized many military properties, particularly fortresses and bunkers, in order to return them to public use (Fig. 1a, b).

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(a)



(b)



Fig. 1 a Detail, Honswijk Fortress near Everdingen. Courtesy of the author, (Verschuure-Stuip 2017); released under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License b Honswijk Fortress near Everdingen. Courtesy of the author, (Verschuure-Stuip 2017); released under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License

Because these transformed structures have been so popular, this modernization is referred to as the renaissance of military heritage in the Netherlands (Hannema 2014). Although the Dutch military past can be regarded as controversial (Verschuure-Stuip 2017), the New Dutch Waterline (NWD) has generally been held in public favor. The name New Dutch Waterline (Nieuwe Hollandse Waterlinie) was introduced and has been used in national and international literature, although in recent years, it has sometimes also been rendered as the New Hollandic Waterline.

The revitalization of properties, and objects such as bunkers and fortresses, as heritage at the scale of the landscape, rather than as individual items was new to the Netherlands. It approached that properties. Almost invisible to an uninformed observer, these landscapes had a military autograph that revitalization made visible in narratives of regional identity.

The integration of strategies inherent in this approach is consistent with current Dutch heritage policy, which holds regional identity to be vitally important to the local and national economy and tourism (Ministerie van OCW 2017). The revitalization of the New Dutch Waterline was first proposed as a pilot project in the Belvedere Memorandum (Feddes 1999), a national interdepartmental policy document which linked heritage to new spatial developments and planning. The main axiom of this influential memo was “renewal through development.” Its overarching idea was that heritage should relate to spatial intervention and, for that matter, become a leading factor in it. And policy and professional attention have shifted from object-oriented heritage preservation into development and heritage on a large scale. This chapter discusses how the built military objects were part of large defense lines, as well as how the New Dutch Waterline was transformed at regional and local levels from 1980 on. Further work might profitably address future energy challenges in terms of both objects and landscapes. The account presented here may aid in such an effort.

Large-Scale Military Landscapes

For centuries, it was the duty of the military to protect cities, regions, and even nations against foreign attacks by using characteristics of the landscape such as water, groundworks, soil, and planting to build defense systems. The Netherlands in particular used water defensively, building moats to protect castles and using bodies of water for city fortifications (which featured planted ramparts—massive earthen bodies overgrown with grass and trees). Dikes and roads, were protected by *stellingen*, small-scale military lines. These were often, in turn, part of larger defense structures, which could be as long as 80 kilometers.

For many years, the focus of heritage was at the level of the object. That orientation has recently shifted to include larger structures and their interaction with the landscape (RCE 2009a). This growing knowledge has led to the revitalization of

large-scale defense lines such as the Grebbe Line, Maas Line, IJssel Line, Southern Waterline, Peel-Raamstelling, State-Spanish Line, Stelling of Den Helder, Stelling of the Hollandsche Diep and Volkerak, Stelling of the Meuse estuary and Haringvliet, Stelling of the Afsluitdijk, Western Brabant Stelling, and many others (RCE 2009b). A digital map compiled by the State Heritage Department illustrates the variety of defense lines in different periods of time.

Large-scale defense systems can be classified very generally according to the military strategies which employed them as land defense lines or as water defense lines (Beek and Kooiman 2004). The largest land defense lines were those that formed the Roman border and the Atlantic wall built along the entire shore of the North Sea during World War II. The most well-known water defense lines are the Old Dutch Waterline (in use 1629–1815), the precursor of the New Dutch Waterline or New Hollandic Waterline (in use 1815–1964), and the Stelling van Amsterdam (built from 1880–1920, decommissioned in 1963). In the last two cases, water was used in the system to prevent the enemy from initial entry; the amount and role of water in each type of defense system varied.

Land defense lines were divided into frontier lines, which controlled an area, and dominance lines, which controlled a specific location in the landscape, such as a road or a dike. The lines also included adjacent fortified cities or fortresses flanked by earthen *schansen*, or casemates (i.e., concrete group shelters) and other military objects. The focus in this system was on the fortified cities or fortresses which were changed and updated many times. Most cities were originally surrounded by brick walls or palisades. The system connected these in order to dominate an area and lakes or swaps were used to direct the enemy to places. In 1672, cities like Bourtange, Coevorden, Zwolle, Deventer, Zutphen, Doesburg, Arnhem, Nijmegen, Grave, Heusden, Geertruidenberg, Bergen op Zoom, Breda, Hulst, and Aardenburg formed the main Dutch defense landline (Will 2002).

During the Dutch Revolt against Philip II of Spain and the Eighty Years' War of 1568 to 1648, cities updated their fortifications with ramparts to withstand the impact of cannon shots. These massive earthen works were created by engineers who used mathematical calculations to produce regularly shaped bastions and courtines, which are still visible in historic inner cities today. They initially surrounded the ramparts with wide, wet ditches to hamper attackers. This system, the *Old-Dutch fortification model*, was improved several times into more ingenious systems of bastions and courtines, with spreads of earthen ramparts to keep the enemy further from the city borders. One updated system was the *Renewed Old Dutch fortification model*; a later one was the *New Dutch fortification model* (Huizinga and Deinema 1994). These different methods of defense can be found under other names in the city patterns of many historic European cities, including UNESCO World Heritage cities.

In short, fortified or frontier cities were the main element of these defense lines, which also used characteristics of the landscape for defense (Huizinga and Deinema 1994). Systems to inundate smaller fields, rivers, and marshland were installed to hin-

der the enemy, but they also became parts of water transportation, water management, and other non-military infrastructure. These fortification systems were both a blessing and a curse. So when the Dutch Waterline was installed, cities behind that line could start to dismantle their ramparts in order to expand. This dismantling of inner city walls started in 1805 and ended in 1951. In the first period (1805–1813), cities turned ramparts into city parks, as in Haarlem and Leiden. In both the second phase (1854–1874), which started with the Kringenwet, and the third phase (1874–1900), which started with the “Vestingwet” (1874), more cities were allowed to dismantle ramparts. In the fourth phase (1900–1951), the complete system was judged to be outdated and all cities were allowed to dismantle ramparts. Some cities kept their fortification system for cultural-historical reasons or water management issues (‘s Hertogenbosch, one such instance, is shown in Fig. 2a–c) (Verschuure-Stuip 2014).

Water defense lines are a typical lowland innovation, based on military experience with the use of water in the sixteenth century. To end the sieges of Brielle (1572) and Alkmaar (1573) during the Revolt against Philip II of Spain, rebels broke the polder dikes of and inundated a polder. Learning from this success, the Prince of Orange, Willem I, ended the long siege of Leiden (1573–1574) by ordering his forces to break the sea dikes near Rotterdam to flood a large part of the province of Holland. These improvised and defensive moves were used by his sons, Maurits of Orange and Frederik Hendrik of Orange, in the introduction of a waterline in 1598, which was installed to block hostile attacks from east of the province of Holland, the economic heart of the Netherlands. However, the plans were not completed at the time. Then, in 1672, the young republic was attacked heavily and the Dutch hastily implemented inundation plans and built the Dutch Waterline (these excluded Utrecht). In valleys and lower parts of the Netherlands, smaller waterlines were created. The seventeenth century Grebbe Linie, located in the lower areas of Gelderland between Soest, Amersfoort, and Woudenberg—and moving up to Wageningen—is one such example.

These water defense lines cleverly combined two systems: a series of adjacent inundation fields to create a vast amount of unbridgeable water and systems of fortresses to defend areas where inundation was not possible: the access points. In peace, the line was almost invisible, as even the fortresses, group shelters, and bunkers were planted with trees and shrubs to hide their existence. During a hostile approach, an ingenious system of waterworks, canals, and sluices would flood these inundation fields to a depth of about fifty centimeters of water to prevent the enemy’s entry. This was not deep enough for boats, it was deep enough to hide the ditches of the peat meadow landscape. Soldiers who would try to wade through would fall and drown in their woolen uniforms.

(a)



(b)



Fig. 2 a, b, c Fortification zone of 's Hertogenbosch redevelopment in the last ten years. Courtesy of Verschuure-Stuip 2016; released under a Creative Commons Attribution-Non Commercial-No Derivatives 4.0 International License

(c)



Fig. 2 (continued)

Growing Knowledge of Defense Landscapes

Since 1999, two national policy documents, the Belvedere Memorandum (1999) and the policy letter on the Modernisation of Monuments Care (MoMo) (Ministerie OCW 2009) have stressed the importance of research on large-scale heritage landscapes, including military lines, to understanding regional identity and regional narratives (Ministerie van OCW 2017). In the last few years, Dutch knowledge of these large-scale defense systems has grown rapidly. In 1999, only a few defense lines were identified and mapped in the Belvedere Memorandum (Feddes 1999); that project was completed in 2004 with an inventory of military objects (Beek and Kooiman 2004). In spring 2017, the State Heritage Service (SHS) put a digital map online, classifying defense systems in six periods by time of construction, state organizations, and conflicts (Fig. 3a, b): Spain/Republic (from 1482, different shades of blue), French period (from 1795, yellow), Kingdom of the Netherlands (from 1815, different shades of red), World War I (from 1914, orange), World War II (from 1940, green), and the Cold War (from 1948, purple). Generally, these defense or heritage landscapes have both physical aspects (objects, lines, and areas), and social and mental aspects; they are both tangible and intangible.

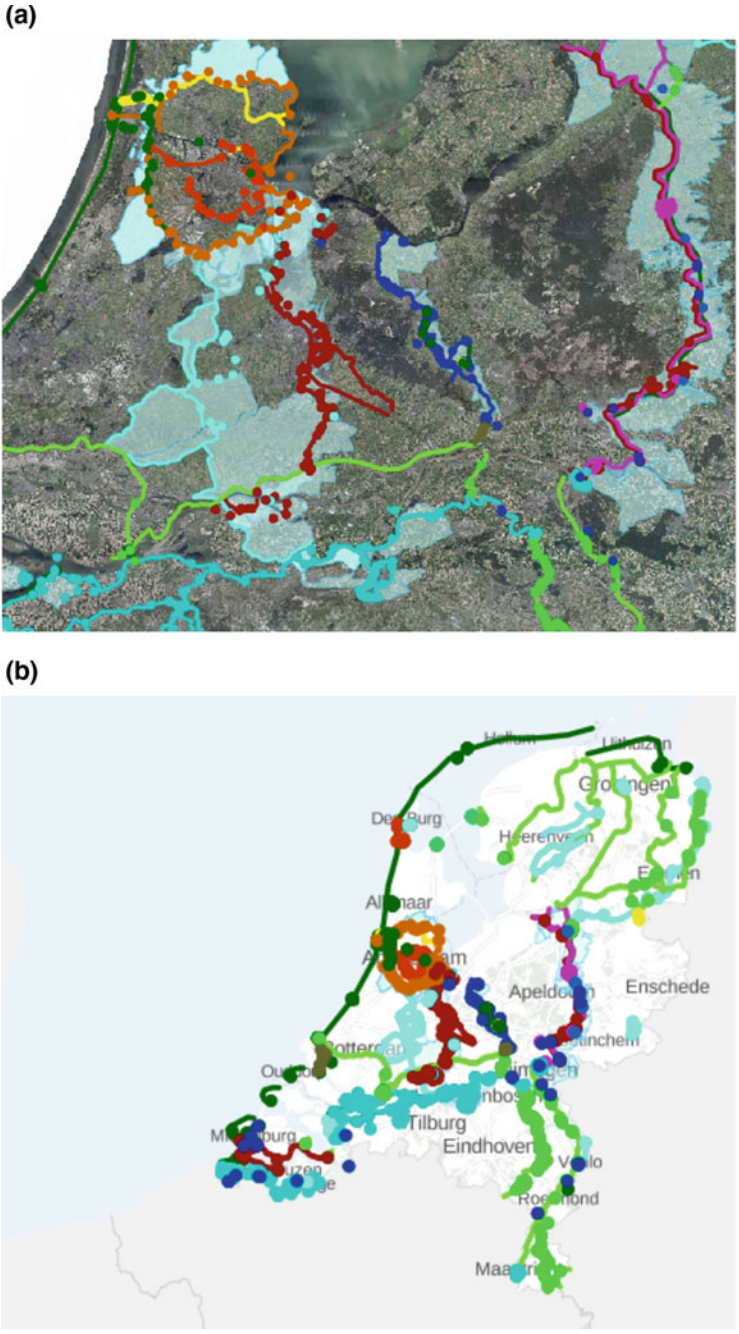


Fig. 3 a, b The State Heritage Service created this digital map of all military objects from the sixteenth to the twentieth century. Courtesy SHS 2017; released under a Creative Commons Attribution-Non Commercial-No Derivatives 4.0 International License

Although knowledge of its history and technical use is a good start, it is not enough for reusing this historic line for the future. The challenge of rehabilitating the New Dutch Waterline (NDW) can be summarized: creating public awareness and local participation, growing popular knowledge of the past, securing cultural historic values, embedding the project in various governmental policies, and creating a financial plan and a widely accepted transformation plan (Verschuure-Stuip 2016). The plan needed to map out ways to preserve historic buildings and attract tourism to boost the economy, and to be part of current spatial developments, like water management and tourism. One of the possibilities was to reuse the inundation field for water storage during peak load moments, as part of adapting river landscapes to climate change. The fate of the New Dutch Waterline became a national project because the defense line was spread over four provinces, and several water boards, many municipalities, and other stakeholders were involved. But the most important issue was that the transformation of the New Dutch Waterline was a completely new approach, taking on the heritage of a large landscape.

The New Dutch Waterline was nationally revitalized (1980-now) in a well-documented process of change, from which other heritage development projects could learn. This process of change was described in publications by Raats (2011, 2016), Luiten (2011), and Verschuure-Stuip (2016). The last publication was based on studies in the MSc Landscape elective, Heritage Landscapes (2014–2017) and researched under the name Historic Urban Landscapes in the research group Design & History at Delft University of Technology (Luiten, Verschuure-Stuip 2014).

The New Dutch Waterline

It was the French emperor Napoleon Bonaparte who ordered his Minister of War general Cornelis Kraysenhoff and hydraulic engineer Jan Blanken to improve the design of the former Dutch Waterline and to extend it to include Utrecht at the end of the eighteenth century. After Napoleon's defeat, King William I of Orange had his military construct this renewed defense line, the New Dutch Waterline, between 1815 and 1885. The Dutch kept improving the Waterline until the advent of World War II (Brand and Brand 1986; Luiten et al. 2004; Will 2002; Steenbergen et al. 2009; Steenbergen and Van der Zwart 2006; Klinkert 2007).

The New Dutch Waterline ran between the cities of Muiden (the Zuider sea) and Gorinchem (to the tide area Biesbosch) (Fig. 4), and it cleverly used the geomorphology of the landscape: it was situated at the transition of the lower western area and the higher eastern of the Netherlands. It combined two systems. The first system contained a main resistance line, forming the backbone in the defense with a series of adjacent inundation fields plus waterworks (water inlet locks, inundation canals, and dikes) to flood the land as quickly as possible. The second system defended non-

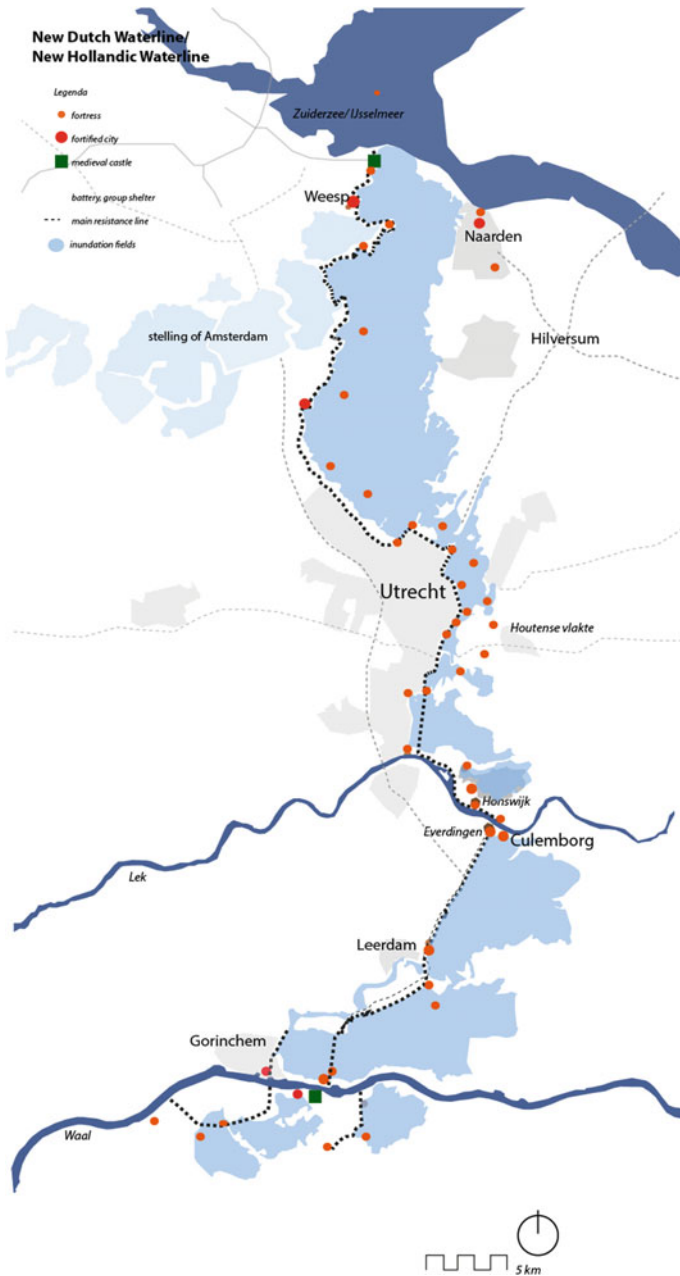


Fig. 4 Outline of the New Dutch Waterline, showing the main resistance line, the inundation fields in times of war and the various fortresses, Werken and Stellingen. Courtesy Verschuure-Stuip 2016; released under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License

floodable places with military objects: two old castles, several tower fortresses, and seven fortified cities. Due to changes in warfare, this clear outline later incorporated numerous casemates, bunkers for group shelter, and so on. Further military change rendered the defense line useless: during World War II, airplanes simply flew over it. The New Dutch Waterline was officially taken out of national defense in 1961; since then, nature has gradually taken over its fortresses, casemates, and bunkers.

Revitalization of the New Dutch Waterline

The revitalization of the New Dutch Waterline originally focused on landscape planning and restoring objects for tourism and recreation. The shift began in 1980, when renewed attention to the physical remains also triggered the long process of change of these military objects into a large-scale landscape heritage structure (Brand and Brand 1986).

To understand the process of connecting heritage values to future development, the revitalization of the New Dutch Waterline can be divided into six phases (Fig. 5): initiatives (1980–1993), reflection (1993–1997), starting (1997–2003), transition (2003–2008), national implementation (2008–2013), and provincial implementation (2014–future) (Fig. 5) (Verschuure-Stuip 2016).

The first phase started in 1980. At the time, historic buildings were protected under the 1961 Monument laws. Historic buildings were physically reused by preservation and restoration, a field of expertise that was still largely separate from the development of large-scale landscapes and the expansion of cities to fit the needs of a growing population. Some fortresses were named as preserved monuments. This phase included two separate initiatives. First, due to financial cuts, the Department of Defence started to sell military sites in 1980 (Luiten et al. 2004): one fortress went

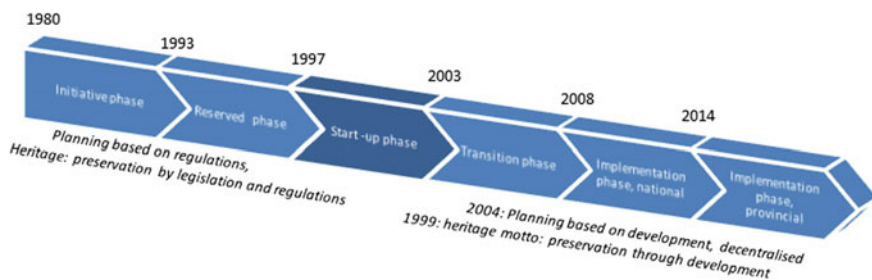


Fig. 5 Six phases in the transformation process of the New Dutch Waterline (1980–now) and changes in spatial planning and heritage management. Courtesy (Nadin et al. 2018); released under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License

to an individual wine trader, three to the State Forestry Service (*Staatsbosbeheer*), and three to the province of Utrecht. Second, in 1986, an art project and exhibition at Fortress Asperen featured the New Dutch Waterline, then an almost forgotten defense line, and a book was published about its history in 1986 (Brand and Brand 1986). The resulting public awareness was the start of the growing attention to military heritage in the Netherlands. At first, these initiatives were local and small-scale and focused on local use. Then, the province of Utrecht, municipalities, and even ministries became involved through ownership and plans were made which started in 1988 (Raats 2011). In 1990, the planning process came to the national level when the State Heritage Service (SHS), the State Spatial Planning Service, the Ministry of Traffic, Spatial Planning, and Environment, and the Ministry of Agriculture, Nature, and Fishery made joint plans for the future of the New Dutch Waterline. By 1993, three separate, visionary plans had been published, all addressing the natural and cultural aspect of this defense line and highlighting future spatial possibilities; these resulted in governmental attention to cultural aspects of the landscape and national involvement. These plans in turn became part of the Nature Policy Plan on the cultural aspects of the landscape and led to a planning instrument: National (protected) landscapes (Raats 2011). So within only 13 years, an almost forgotten history became a promising multi-disciplinary spatial project (Bosma 2009).

The second phase was one of reflection (1993–1997). Although future plans were presented, which one would think would speed up the transformation into a heritage site, the contrary happened. Due to unclear ministerial responsibilities, the planning project paused at a national level. Meanwhile, however, researchers, experts and amateur researchers within all kinds of organizations, including SHS and historic military foundation Menno Coehoorn (who wrote two books on the subject), continued to collect information on the history and the cultural value of the Waterline: historic overviews, oral histories, drawings, maps, and archival documents. This research on how the line functioned in the past became critically important in the transition phase (Luiten 2011). In 1995, the New Dutch Waterline was placed on the preliminary list of Dutch UNESCO World Heritage Sites for its cultural-historical value (Bosma 2009). A range of actors were involved in this phase: researchers and heritage experts, and attention shifted from the preservation of single objects to understanding the history and cultural value of systems.

In the third phase, revitalization actually started (1997–2003). In 1997, more changes in the ownership of fortresses renewed public interest in revitalizing military objects. The National Government decided to reform the State Forestry Service into an independent organization, and one of their first tasks was renewal plans for its fortresses (Raats 2011). Even more important for our purposes, the 1999 Belvedere Memorandum, highlighted the New Dutch Waterline as a pilot project. Heritage should be preserved by reuse, was its motto, a rather new insight at that time that gave heritage a forward-driven approach (Feddes 1999); and indeed, it accelerated rehabilitation of the New Dutch Waterline. Many professionals were attracted to this new approach.

The transformation was led by the newly funded New Dutch Waterline project bureau, which started to lobby provinces, water boards, municipalities, the public, and landowners for ideas and funding. In 2000, a design competition delivered an overall plan, which became part of the master plan “Line perspective: Panorama Krayenhoff” (Luiten et al. 2004). The basic idea was that the cultural history of this defense landscape would be the “backbone for current and future large-scale spatial challenges” (Luiten, et al. 2004, p 22). To do so, the history of the line was not a set of rules restricting how to preserve. It was presented as an inspiration for urban and landscape quality and for finding methods to connect (local) people to these sites. Designers wrote that it could be developed as a contemporary mega-large-scale green zone, a park for the urbanized western part of the Netherlands, just as nineteenth-century planners turned the earthen ramparts of fortified cities into parks for city folk. Recreation, ecology, and water management could be connected to identity and heritage. And the water system of the historic inundation fields could be used for current water management issues (Luiten et al. 2004). This last value was not actually realized, however.

The master plan was a landscape plan that contained three different maps: a “blue” map (water), “green” map (nature and ecological structures), and “red” map (urbanization and tourism). But it was formulated on a high level of abstraction without pilots, case studies, or in-depth research. This approach encircled the plan with a visionary atmosphere, a positive vibe that inspired many stakeholders, aldermen, and future owners to committed themselves to participating in the revitalization (Raats 2011).

This master plan was finally installed as national policy in 2003. Finances were secured by national funding and through public/private cooperation (PPS). A private party could propose their own plan with matching funding, within a set of clear rules determined by the involved ministries. To ensure the high quality of new plans, a Q-team was installed (Luiten et al 2004). This starting phase was dominated by the state in cooperation with the involved ministries, not by public actors or municipalities.

The fourth phase was one of transition (2003–2008) in which the ideas were worked out in real-life plans, spatially, organizationally, governmentally, and financially. The transformation of the New Dutch Waterline was basically top down, organized by state and provinces and the enthusiastic people of the project bureau in Utrecht and connected to national and provincial spatial policies (Raats 2011). The New Dutch Waterline project bureau divided the entire line into seven areas or envelopes, each with a smaller team of experts. The State Service Rural Landscape (*Dienst Landelijk Gebied*) had the challenging job of getting all of the governmental actors to sign on, including five ministries, five provinces, 25 municipalities, five Water boards, and a fair number of organizations and heritage groups (Colebrander 2009).

For a quick start, it was important to make an iconic design which would attract (inter)national attention (Actieprogramma Ruimte en Cultuur 2005). The cut-through



Fig. 6 Cut-through bunker 599 as part of the water storage and preservation of a bunker landscape. Courtesy Verschuure-Stuip 2014; released under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License

Bunker 599 served this purpose (Fig. 6). Designed by RAAAF, and initiated by the SSRL and the Culemborg municipality, the design showed a refreshing approach, telling the story of a bunker and also addressing its cultural-historical values and preservation. The closed bunker was cut in half to show its interior and how it was connected by a wooden path to a large pond storing water.

The New Dutch Waterline project bureau focused on economic viability and connection to current large-scale intervention, which was expressed in three main goals: spatial recognizability; the line in head, heart, and hands; and socially and economically sustainable use (PHB NHW 2011).

The fifth phase was the first implementation phase, starting at nationally level but with a growing role for the provinces (2008–2013). The “New implementation agreement Pact van Rijnauwen” was meant to identify the main priorities and organize cooperation between state and provinces (PB NHW 2006). The focus was on the physically reusing military objects and sites in the various envelopes; almost no plans were introduced to address the entire line.

Some funding for the project came from the budget of the New Dutch Waterline bureau but most of it came from the budgets of projects under other national spatial development programs (PB NHW 2011) (Raats 2011). Managers of the New Dutch Waterline discussed how to connect initiatives and budgets, so that both initiatives would benefit (Luiten 2011). For the most part, transformation a top-down process, partly involving municipalities and local actors. In one exception, the Culemborg municipality and a group of local people turned Fortress “Werk aan het Spoe!” (Culemborg) into an open-air theater and restaurant.

In the sixth phase, work on the New Dutch Waterline shifted to the provinces (2014–future). Officially, this phase was set for 2012 and 2015, extending to 2020 for new plans. But the national decentralization in spatial planning in the Netherlands, first mentioned in 2004 and implemented gradually, changed this timeline and the revitalization itself. *Government*, or governmental planning, for which the Dutch are famous, changed into *governance*, in which provinces and municipalities as well as local people are planning together (Van der Zande and During 2010). New projects emerged from these new players; plans were more connected to community needs, resulting in growing public commitment in use and maintenance, or “co-creation.” In this shift, the provinces Utrecht, Gelderland, North Holland, and North Brabant became responsible for implementing new plans until 2020 (Provinces 2014). In this phase, they revitalized many fortresses, bunkers, community roads, and sluice complexes; preservation methods were combined with modern and robust architecture. An example is the new national New Dutch Waterline museum at fortress Vechten, designed by Anne Holtrop: A ordinary casemate formed the front; the earthen backside was turned into a large patio, with all rooms of the museum were facing it.

In this last phase, the provinces Utrecht, North Holland and Brabant are taking the lead instead of the state. The state will only be involved in the application for monumental status from UNESCO. The New Dutch Waterline will be part of the UNESCO World Heritage site Stelling van Amsterdam.

Challenges for a Sustainable Future

Some of the most important issues of this century—in general and for our built heritage—will be energy transition (and its consequences for our surroundings) and making our landscapes resilient in the face of climate change. Recently, the State Heritage department started to plan to combine heritage with sustainable energy production (Ministerie van OCW 2017). Although plans were initially presented in “Lineperspective Panorama Krayenhoff” to use the inundation fields for occasional high floods, these plans were not realized. Recently, H + N+S landscape architects, and Volharding Breda and RO&AD Architects, based on work in a joint design laboratory, presented ideas for creating renewable energy in the Stelling of Amsterdam and The New Dutch Waterline. Their general idea was to restore the old values of these defense landscapes by creating new values in the fight against climate change. Plans were made on different scales. One of these ideas was to use parts of the inundation fields to store CO₂, in order to have room for water storage during peak-level moments and to slow down the oxidation of peat, which causes subsidence. (Peat is a subsoil dehydrated by the digging of ditches in the past and the extraction of water.) Modern “inundation” can help to slow down this process, create a “historic appearance,” and make our landscape more resilient. Another idea was to use the cold, wet, and stable inner climate of fortresses for functions which needs cold climates like beer brewing and ICT centers (Dietz et al. 2017).

City temperatures are much higher than those in the rural landscapes, which is called the urban heat island effect (Kleerekoper et al. 2012). In turn, people need their cooling systems more, using more electricity, causing more deaths, and so on. Water around fortified cities and castles, as part of the New Dutch Waterline, might be used to “cool” these urban areas. These flowing historic water bodies with their trees and parks, called green-blue structures, might have a cooling effect during summer and preserve regional identity at the same time.

New green-blue systems have been realized in cities, but the effects of reuse on military heritage need more testing. To optimize their effects, these plans should not be made for every fortress or even city, but used for these large-scale defense lines.

Conclusion

The transformation of the New Dutch Waterline (1980–now) from military large-scale defense line to a line with touristic attention accelerated civilian use of historic military heritage of all types and scales and with all types of methods in the Netherlands. This new attention resulted in research on both large-scale defense lines to objects, and to new interventions on both the regional scale to individual sites. These interventions connected heritage sites to spatial planning, mainly tourism. To tackle future problems, the New Dutch Waterline should also be used to create energy both on the small scale and at the level of the landscape.

The strength of the New Dutch Waterline project that was combining small-scale work on fortresses with plans for large-scale development, although projects at the landscape scale less common than those on individual objects. Individual projects would not have won so much attention when these were only be addressed as objects. Because of its scale, heritage became an important factor. The narrative of this hidden line and the success in the beginning of the transformation was part of the positive awareness.

Moreover, the New Dutch Waterline brought military heritage and industrial heritage, two rather new types of heritage, into fashion for new developments, which combined them with modern architecture. This combination helped the public understand the historical dynamics of larger scale landscapes and acknowledge the value of our military past as part of regional identity.

The next phase, building on the previous shift from a nationally driven process to local participation and co-creation, should tackle one of our greatest challenges: to turn our heritage landscapes into energy landscapes, using the full potential of these large amounts of water (historically used for defensive inundation) and to enhance the green-blue systems around fortified cities and castles. Streaming water, as part of green-blue structures, can help by its cooling capacity. The role of water in our military heritage is changing. In the past, water was used to keep the enemy out. Nowadays, water can help us in our to battle with climate change and energy transition.

References

- Actieprogramma Ruimte en Cultuur (2005) *Architectuur en Belvédère beleid 2005–2008*. SDU uitgeverij, Den Haag
- Beek and Kooiman *Cultuurhistorie* (2004) *Het post-militaire landschap 2.0, een overzicht van linies en stellingen in Nederland*. Den Haag, pp 9–10
- Bosma K (2009) *Nieuwe Hollandse Waterlinie, een sculpturaal landschap met een dubbele bodem*, in: Steenbergen C, van der Zwart J, Grootens J, Brons R, Colebrander B, Bosma K (eds) *Atlas Nieuwe Hollandse Waterlinie*, Rotterdam: 010 Publishing, p 55
- Brand H (1986) *De Hollandse Waterlinie*. Veen uitgeverij, Utrecht/Antwerpen
- Colebrander B (2009) *Inleiding*, in: *Strategisch Laagland, Atlas Nieuwe Hollandse Waterlinie*, Rotterdam: 010 Publishing, pp 84–85
- Dietz N, Hugtenburg J, Veul J, Kil A, Koster R, van Ree B, Schouw J (2017) *Energielinie, erfgoed in transitie*, Amersfoort 2017
- Feddes F (1999) *Nota Belvédère Beleidsnota over de relatie cultuurhistorie en ruimtelijke inrichting*. SDU uitgeverij, Den Haag, pp 6–16
- Hannema K (2014) *Wedergeboorte van Militair erfgoed*, in: *ArchitectuurNL 1*, pp 18–23
- Huizinga S, Deinema J (1994) *Vestingsteden*. Alphen aan den Rijn, Atrium, pp 3–16
- Kleerekoper L, Van Esch M, Baldiri Salcedo T (2012) *How to make a city climate-proof, adressing the urban heat island effect*. *Resour Conserv Recycl* 64:30–38
- Klinkert W (2007) *Water in oorlog, de rol van het water in de militaire geschiedenis van Holland na 1550* In Beukers E (ed) *Hollanders en het water, twintig eeuwen strijd en profijt 2*. Hilversum: Verloren, pp 486–504

- Luiten E (2011) Gereanimeerd erfgoed; Nationaal Project Nieuwe Hollandse Waterlinie als format voor het landschapsbeleid, In: Bulletin KNOB 2011: 6, pp 223–230
- Luiten E, Verschuure-Stuip G (2014) Heritage landscapes New Dutch Waterline (Delft University of Technology), Delft
- Luiten E, van Hezewijk J, Joosting Bunk E, Witsen PP (2004) Panorama Krayenhoff. Linieperspectief Ruimtelijk Perspectief Nieuwe Hollandse Waterlinie, Utrecht, pp 22–40
- Ministerie van OCW (2017) Projectplan Erfgoed telt: naar een toekomstbestendig erfgoedbeleid. Den Haag, pp 1–2
- Nadin V, van der Toorn Vrijthoff W, Arjomand Kermani A, Piskorek K, Alewijn N, Mashayekhi A, Verschuure-Stuip G, Brand N, Pendlebury J (2018) The impact of urban planning and governance on the historic built environment (PICH): final report. Delft 2018
- PH NHW (2006) Een linie, samen sterk in uitvoering, overkoepelende uitvoeringsprogramma Nationaal landschap Nieuwe Hollandse Waterlinie, Utrecht: projectbureau Nieuwe Hollandse Waterlinie, pp 19–24
- Pn NHW (2011) Linie in Bedrijf, ambitie, strategie en uitvoeringsambitie 2020. Projectbureau Nieuwe Hollandse Waterlinie, Utrecht, pp 13–26
- Provinces (Gelderland, Noord Brabant, Noord Holland, Utrecht) (2014) Pact van Altena bestuursvereenkomst Nieuwe Hollandse Waterlinie 2014–2020, Utrecht
- Raats K (2011) Het gemeenschappelijk offensief voor de Nieuwe Hollandse Waterlinie in de 21^{ste} eeuw, Dillema's bij het samen werken aan de Nieuwe Hollandse Waterlinie. Amsterdam, pp 13–31
- Raats K (2016) De herbestemming van de Nieuwe Hollandse Waterlinie, hoe collectieve actie werd bereikt in een geschakeerd landschap. Groningen 2016
- RCE (2009a) Aanwijzingsprogramma Nieuwe Hollandse Waterlinie, Amersfoort
- RCE (2009b) Erfgoedbalans 2009, Archeologie, monumenten en cultuurlandschap in Nederland, Amersfoort, p 89
- RCE (SHS) Landschap in Nederland, kaart van verdedigingswerken. <https://landschapin nederland.nl/bronnen-en-kaarten/militaire-landschapskaart>. 21 Aug 2017
- Steenbergen C, van der Zwart J (2006) Strategisch laagland, Digitale atlas Nieuwe Hollandse waterlinie, Rotterdam: 010 Publishing
- Steenbergen C, van der Zwart J, Grootens J, Brons R, Colebrander B, Bosma K (2009) Atlas Nieuwe Hollandse Waterlinie, Rotterdam: 010 Publishing
- van de Zande A, During R (2010) Erfgoed en Ruimtelijke planning; beleid, wetenschap, instrumenten en uitvoering. SDU uitgeverij, Den Haag, p 19
- Verschuure-Stuip GA (2016) Military brownfields. The New Dutch Waterline. In: Bagaeen S, Clark C (eds) Sustainable transformation of military terrains, Routledge: Taylor and Francis, pp 143–158
- Verschuure-Stuip GA (2017) Musserts' Wall in Lunteren, design approaches for perpetrator-victim heritage in: Atlantis pp 36–41, 28 oct
- Verschuure-Stuip GA, Labuhn B (2014) Urbanisation of former city fortifications in the Netherlands 1805–2013. In: Brebbia CA, Clark C, Defence sites, II, Heritage and future, Vol 143, Southampton: Witt press, pp 247–248, pp 245–256
- Will C (2002) De Hollandse Waterlinie. Matrijs, Utrecht

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