



WASTE MANAGEMENT IN PROTECTED AREAS





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WASTE MANAGEMENT IN PROTECTED AREAS

**PARTNERI
PRIRODU**
PARTNERS FOR NATURE

 **ZELENA AKCIJA**
FRIENDS OF THE EARTH CROATIA

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 **PRIRODA**
MEDIALURSKA ZAŠTICE NA

 **ZELENI PRSTEN**
Zagrebačke županije

 **LASTOVSKO
OTOČJE** Park prirode
Nature Park

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La Montagnette, Château-d'Oex, Switzerland / photo: Benoît Renevey

INTRODUCTION

This brochure is one of the results of the “Partners for Nature”¹ project that was carried out from 1 April 2019 until 28 February 2021 and was financed through the Swiss-Croatian Cooperation Programme.

The project was coordinated by Zelena akcija / Friends of the Earth Croatia and it was carried out in partnership with: Public Institution Green Ring, Public Institution Nature Park Lastovo Islands, Međimurska priroda – Public Institution for Nature Protection, and the Swiss NGO Pro Natura / Friends of the Earth Switzerland.

The project’s general objective was building capacities of civil society organisations and public institutions for managing nature protection areas in Croatia through the cooperation and partnership with Swiss civil society organisations and public institutions, in a way that ensures sustainable socioeconomic development of local communities. Considering that waste management is an important aspect of environmental protection and socioeconomic development, it is extremely important for the management of protected areas. Therefore, the formulation of recommendations for sustainable waste management in protected areas was one of the project’s most important activities. The following chapters will analyse the existing state and practices in partner organisations and put forward recommendations for reducing the generation of waste and for sustainable waste management based on the zero waste approach.

THE CONTEXT OF WASTE MANAGEMENT IN PROTECTED AREAS

In terms of biodiversity, Croatia is one of the top ranking countries in Europe, which is also reflected in the fact that about a third of its territory is covered by protected areas (national categories) and/or included in the Natura 2000 network². If certain landscape protection instruments are also taken into consideration, which the official bodies usually don’t recognise as “real” protected areas (e.g. regional nature parks), there is a similar proportion of state territory in Switzerland that is protected.³ Depending on the category of protection, there are many cases where protected areas are also inhabited. This is the case, for example, with the Lastovo Archipelago Nature Park, where the park’s borders overlap with the borders of the Lastovo Municipality, which makes all the municipality’s inhabitants also the inhabitants of the park. In the context of the contemporary society and way of life, the presence of people in a certain area also presupposes the generation of waste. In both Croatia and Switzerland, local utility companies are responsible for waste management regardless if the protected areas are inhabited or not, and depending on the size and the shape of the territory, sometimes several utility companies are responsible for covering certain areas. Apart from waste management, these companies are also responsible for monitoring the situation on the ground and potentially making necessary interventions such as clean-ups of illegal landfills and similar activities.

Tourism poses an additional challenge for waste management in protected areas. Because of their abundant natural resources, but also because people who reside in larger cities are steadily becoming more alienated from nature, protected areas are becoming increasingly popular tourist destinations

² Hereinafter the term “protected area” will also refer to the ecological network areas (including the Natura 2000 network), unless otherwise indicated.

³ Urs Tester, Céline Richter, Martina Birrer (2020): Vue d’ensemble sur les aires protégées de Suisse, Basel.

¹ <https://cutt.ly/ak2bWbk>

among many citizens. Any economic activity, as well as the circulation of people through protected areas, creates the problem of waste generation, i.e. a problem for waste management. Be it the tourist season or social activities organised at a specific time of the year such as the fishing season, the dynamics of economic activities and developments through these areas affects the particularities of waste management. In the following chapters, this brochure will present the existing practices used in partner public institutions by assessing if there are any existing prevention mechanisms and positive trends in waste management, followed by an outline of the main issues that these institutions have to face. The brochure will also take a look at the context of waste management in almost the far south and almost the far north of Croatia, displaying the great systemic differences between these two geographical areas. Finally, the brochure will also introduce a variety of recommendations for reducing the generation of waste in protected areas, since reduction and reuse are the most important items in the hierarchy of sustainable waste management and in striving to become zero waste.

METHODOLOGY

Taking all of this into account, 2 interviews were carried out with partner public institutions from Croatia, one from the mainland part and another from the Mediterranean part of the country. The interview consisted of questions grouped into 3 sections. The first part was comprised of 14 questions which were to assess the current situation and to gain insight into waste management practices in the respective institutions. The second part of the interview consisted of 5 questions with the goal of discovering potential targets for reducing waste generation and the generation of plastic and food waste, which, along with paper, make up the most common fractions of waste. The third and the last part of the interview consisted of four questions that were aimed at examining and detecting the potential problems that public institutions have to face, in order for the recommendations to be more appropriate to the situation on the ground. The interview was carried out with the following institutions: The Public Institution “Lastovo Archipelago Nature Park” and Međimurska priroda – Public Institution for Nature Protection. It should be mentioned that, due to the fact that Swiss institutions for protected area management included in this project don’t have the authority for waste management and don’t collect detailed data in relation to this topic, unfortunately, we couldn’t acquire any comparable data on practices in Switzerland.

THE INTERVIEW

As already mentioned in the previous chapter, in order to gain insight into the context of waste management in particular protected areas, 23 questions were formed for the interview. The answers provided by the two institutions’ representatives – the Public Institution “Lastovo Archipelago Nature Park” and the Public Institution for the Protection of Nature „Međimurske prirode“ – will be subject to analysis in the following chapter.

PRESENTING THE QUESTIONS AND RESPONSE ANALYSIS

THE CURRENT STATE OF AFFAIRS AND PRACTICES RELATED TO WASTE MANAGEMENT

The first set of questions referred to the current state of affairs and practices in relation to waste management in the respective public institutions. It was not possible to get a precise response to the question regarding the quantity of waste accumulated yearly in protected areas due to the lack of monitoring of how much waste accumulates specifically in these areas. Both in the case of the Lastovo Archipelago Nature Park and Međimurska priroda, waste management is the responsibility of the local utility companies and it is impossible to discern the exact site where particular quantities or fractions of waste were collected from the figures on total amount of waste collected in particular local self-government units. Therefore, data on the quantity and specific fractions of collected waste in current local waste management plans are not a relevant indicator of the situation on the ground. Monitoring the quantities of waste accumulated within the protected area is made even more difficult by various site specificities. Thus for example in the case of Međimurska priroda, due to the size and shape of the protected area (Mura-Drava Regional Park), waste management is handled by different utility companies, depending on which part of the protected area belongs to which local self-government unit.

WASTE MANAGEMENT IN SPECIFIC PERIODS

We then inquired if there was a noticeable increase in the accumulation of certain fractions of waste in a specific time period (e.g. in the summer months during the tourist season in the case of the Lastovo Archipelago Nature Park and the fishing season in the case of Međimurska priroda). The answers are strictly empirical and are determined by the experiences and observations of the respondents employed in these two institutions. In the case of the Lastovo Archipelago Nature Park, with around 500 residents inhabiting the park during the entire year, an increase in the

quantity of waste can be observed in the summer months when the number of people temporarily residing in the area increases around 5 times. This data is based on the number of accommodation units which contain around 2000 beds. Accommodation units are comprised of camps and other forms of temporary accommodation. Since waste accumulates per capita, it is therefore understandable that the quantity of waste increases in this period. On the other hand, the area in the jurisdiction of Međimurska priroda reported an increase of visitors during the fishing season, which also coincided with a larger quantity of waste (cans, tins and similar) observed, but also during the summer and near the bathing area which also belongs to the protected area. More waste is also recorded in the vegetation period due to the increase in human activity, but in the case of Međimurje county, this doesn’t necessarily result in the increase of waste discarded outside of the locations provided for its management. This observation can be explained bearing in mind the fact that the Međimurje region has been recognised as one of the most successful Croatian areas in terms of waste management. Owing to the efforts of the utility companies and their educational activities, the residents of this area are more aware of the negative impact of improper waste disposal, so the majority of visitors to the protected areas pick up their waste and discard it on sites with waste bins. One of the specific seasonal occurrences are waste deposits formed by wind or rivers in the spring period. Međimurska priroda solves this problem by organising clean-ups in cooperation with the local utility company, including the local population as volunteers. The utility company doesn’t impose an additional charge for this service. On the other hand, apart from improperly disposed of mixed municipal waste, large amounts of marine waste carried by the sea currents also pose a large problem on Lastovo and the Park’s other islands and islets. For this reason, the Lastovo Archipelago Nature Park Public Institution organises annual clean-ups of the island’s mainland and shores. The utility company picks up the collected waste on the shore and charges the pickup around HRK 500. However, since in this case, the waste in question isn’t only municipal, this type of charge is illegal, since shore and natural beach clean-ups from debris and its pickup fall under the responsibility of the concession holder – the utility company.

FREQUENCY OF EMPTYING BINS AND WASTE PICKUPS

When it comes to emptying bins and the frequency of pickups on a weekly basis, the responsibility is in both cases borne by the utility companies. In the Lastovo Archipelago Nature Park, the frequency of pickups varies based on the summer season, so from June until September – the peak of the tourist season – bins are emptied every day, while outside of this period, mixed waste is emptied every second or third day. Due to the specific nature of the location, this data applies to the inhabited part of the island, while the uninhabited parts don’t

have waste bins and waste is instead stored and disposed of in bins. Despite this fact, most visitors aren't prone to irresponsibly discarding waste in nature, but the biggest problem with waste seems to be bulky waste discarded by citizens who, due to the lack of education and communication with the utility company, dispose of their waste illegally. In the case of the area of Međimurska priroda, mixed waste bins have been placed on less visited sites, while on more frequently visited areas, such as restaurants, bins for separate waste collection are placed considering that waste pickup is charged according to the "pay as you throw" principle and this results in smaller waste management fees.

COOPERATION WITH THE LOCAL UTILITY COMPANY

In terms of cooperation with the local utility company, the answers again point towards a discrepancy between the south and the north of Croatia. Namely, in the case of the Lastovo Archipelago Nature Park, the cooperation with the utility company depends on the local political situation (but also on the inability of the Lastovo Municipality to, first of all, establish a waste management system that would enable further cooperation in the first place), which considerably slows down the decision making process, and, consequently, the improvement of the situation on the ground. Inappropriately disposed of waste mostly stays where it is discarded until the Public Institution initiates clean-ups. Just like improperly disposed of waste collected during seashore and seabed clean-ups, this waste is also transported to the local landfill without prior sorting and the transportation is charged separately. In the north of Croatia, within the protected areas of Međimurska priroda, the situation is considerably different – here the cooperation with the utility companies responsible for certain parts of the protected areas is especially mentioned and praised. Just like in other public institutions, rangers are responsible for monitoring the situation on the ground, i.e. monitoring potential sites where waste could be disposed of improperly. The cooperation is reciprocal in that the local utility company notifies the rangers on potential deposits of improperly disposed of waste within the protected area. Clean-ups are organised afterwards in cooperation with the local utility company responsible for aiding the sorting of waste before it is removed from the site.

THE WASTE MANAGEMENT PRICE LIST

The price list is another instance where the difference is quite stark. Every two months throughout the year, the Lastovo Archipelago Nature Park pays a bill for the pickup of municipal waste from the Park's offices and facilities in the amount of HRK 271.20. The utility company additionally charges (HRK 500) the Public Institution for picking up waste from the shores and islands, although the waste at hand isn't communal waste, but marine waste carried to the shores by wind and currents, and despite the fact that the utility company is the only one actually

responsible for picking up and transporting such waste. Regarding the annual seabed clean-ups, where the most commonly discarded objects are plastic bottles and car tyres, but also car wreckages and other metal waste, these are carried out by diving clubs in cooperation with the Lastovo Municipality Tourist Board and the Lastovo Archipelago Nature Park Public Institution, which also often finances such activities. Difficulties arise with e-waste, which is transported to the recycling yard in Split, but this mostly happens at the initiative of the Lastovo Archipelago Nature Park's staff and is in most cases improvised collection. On the other hand, Međimurska priroda pays a fixed price of HRK 100 for waste pickups, while waste clean-ups usually aren't charged additionally because waste is sorted into fractions and the sorted waste is then sold on the market.

COOPERATION WITH PRIVATE/PUBLIC COMPANIES AND BUSINESSES

We also enquired about potential sponsorships from companies, to see if there is an extended producer responsibility scheme in place. While there is no cooperation with companies in Međimurska priroda, a container for collecting paper was set up in the Lastovo Archipelago Nature Park, since there is a market demand for separately collected paper. The contents of the container are transported once one or three tonnes of paper are collected.

THE ORIGIN OF WASTE GENERATION

Another important interview question was the origin of waste generation. A fraction of the waste enters the protected areas through natural pathways, e.g. by being carried by the wind, sea or rivers, which occurs during particular weather conditions. The occurrence of this type of pollution cannot be prevented, so it can only be solved by occasional clean-ups.

In the context of preventing the generation of waste, it was examined whether there are any locations where bottled water is sold in plastic bottles. Considering the already mentioned particularity of the Lastovo Archipelago Nature Park (the overlap of the Nature Park and the Municipality), plastic bottles are sold in local stores, which later repurchase them within the deposit return system. Except for products in the deposit return system, local stores also collect old light bulbs and used batteries, which are later transported to the recycling yard in Split. The facilities owned by the Lastovo Archipelago Nature Park consist of two information booths (Ubli and Skrivena Luka) which don't sell food products, but only provide information and sell locally produced souvenirs. Souvenirs are not wrapped in plastic and no plastic bags are being distributed.

Protected areas within the competence of Međimurska priroda have only one facility – the Visitor Centre – with a range of restrictions and measures for the reduction of waste generation. The centre also doesn't sell food products and the

wrapping used for selling their souvenirs is made of materials such as paper. Reusable cutlery is used at events held in the facility and information notices are used to encourage visitors to bring their own refillable bottles. For this, two water fountains were adapted for refilling with water (the tap had to be placed high enough) and set up in two locations.

MIXED WASTE LANDFILLS

As for the landfills in the case of the Lastovo Archipelago Nature Park, collected waste is transported to Sozanj, a landfill for non-hazardous waste. The landfill was cleaned up in 2012., but a sorting house and a recycling yard were never built, and non-hazardous waste is still being transported to the cleaned up area. Considering that no part of the Lastovo Archipelago is excluded from the protected area and the fact that the landfill is therefore situated within the protected area itself, setting up the waste management system in a sustainable manner must be one of the priorities.

In the case of Međimurska priroda, the collected mixed (non-hazardous) waste is taken to the Totovec landfill, while separately collected recyclables are taken to recycling yards within particular local utility companies (PRE-KOM, Murs-ekom, Čakom), which is, along with measures to reduce waste generation, the correct solution. Administrations of other protected areas should also follow this example, but adapt it to the local context of different protected area sites



Lastovo (settlement) / photo: Ante Gugić

EFFORTS TO REDUCE WASTE GENERATION AND EXAMPLES OF GOOD PRACTICE

The second part of the interview questions referred to existing practices, objectives and efforts to reduce the generation of waste, while trying to identify the examples of good practice that could be applicable to other protected areas in Croatia and Switzerland.

Firstly, it should be examined whether there are any targets set for the reduction of waste generation or separate waste collection. In the case of the Lastovo Archipelago, there are no quantitative targets for waste reduction, only reduction initiatives coming from the National Park. Our respondent informed us that the local utility company has difficulties in achieving the national separate waste collection targets (50% until 2020, 60% until 2022), which prompted the Park to take initiative in that regard. This reply shows the extent to which the Lastovo Archipelago Nature Park indeed represents a driving force for change in the community. A pilot-project has been proposed for those who want to separate waste, but considering that the initiative wasn't undertaken by the utility company itself, there has still been no major change.

When it comes to areas under the jurisdiction of Međimurska priroda, the waste reduction targets or the targets for separate waste collection are in accordance with the Act on Sustainable Waste Management, which shows that higher targets at national level would surely result in more ambitious local targets.

As the conversation went on, we wanted to find out if there are any prohibitions for bringing certain products into the park such as single-use plastics or food and beverages in plastic packaging.

In the case of the Lastovo Archipelago Nature Park, there are no limitations, although there were attempts at negotiating with the local salespeople regarding the ban on selling plastic bags, but unfortunately to no avail. However, if the draft proposal of the Act on Sustainable Waste Management from December 2020 gets adopted, the sale of lightweight plastic carrier bags will be banned, and there is still willingness to work on this problem among the Nature Parks' employees.

In Međimurska priroda, the institution uses its internal policy to reduce the generation of waste, especially single-use plastic waste, by actively encouraging the users of its premises to use and wash their own tableware. They identify single-use plastic waste as the main problem, so until now, they have completely removed all single-use plastic that could be distributed in the Visitor Centre and have put effort into organising educational workshops for visitors moving through the park in different vessels.

In the Lastovo Archipelago Nature Park, the use of plastic straws for beverages is the biggest problem, but these straws will be banned as from 1 July 2021 under the draft proposal of the Waste Management Act from December 2020, in accordance with the EU Single Use Plastics Directive. Even before the adoption of the Waste Management Act, hospitality facilities located within the protected area stopped using plastic spoons, while two summer festivals and several summer events stopped using single-use plastic cups and instead use reusable plastic "CupUp" cups, which are returned to the serving system after use by paying a HRK 10 deposit. This practice is highly commendable. The Lastovo Archipelago Nature Park currently owns around two hundred cups, and they are planning on purchasing around three hundred more in cooperation with the tourist board, which would suffice for events with various numbers of visitors.

The respondent in Međimurska priroda pointed out that, along with measures to reduce single-use plastic, they are also trying to choose biodegradable cleaning products and as many products made from recyclables as possible, which is also commendable.

Concerning the measures for reducing the use of plastic bottles, it has already been mentioned that there are currently no water fountains in the Lastovo Archipelago Nature Park. However, there are two water fountains in Međimurska priroda and the Public Institution uses signs to encourage visitors to bring their own refillable water bottles.

When it comes to food waste generated in protected areas, the Lastovo Archipelago Nature Park uses food remains to feed domestic animals, while the hotel and some economic operators such as taverns and restaurants, which are the ones that generate the most food waste, dispose of their waste in a mixed waste container, using the excuse that they are "paying for waste pickups" and are not motivated towards a reduction. A workshop was organised in partnership with Zelena akcija and 30 composters were distributed for home composting in thirty households, but less than ten of them are still actively used due to the lack of a financial incentive from the utility company. The ideal scenario would be to reduce the monthly fee for households who manage their own bio-waste by about 30%, which would encourage more citizens to start composting.



Lastovo Archipelago, Zelena akcija's workshop on composting

As for the residual waste of biological origin such as green waste (olive and fruit tree branches, etc.), there is a lack of an adequate facility for managing that type of waste (e.g. a local small composting plant), so that type of waste is disposed of in mixed waste containers and taken to the landfill.

Again, Međimurska priroda provided the best answer to the posed question by claiming that not the slightest amount of bio-waste ends up in a landfill – it is composted or fed to pets and domestic animals. They own two composters that are managed by the employees. While one is maturing, the other is getting filled, and this is how they are alternated. When the compost matures, it is used to feed flower beds planted next to the Visitor Centre.

THE DIFFICULTIES AND OPPORTUNITIES OF IMPROVING THE WASTE MANAGEMENT SYSTEM

The last part of the interview consisted of four questions that were aimed at examining and detecting the potential problems that Public Institutions face in order for the recommendations to be as relevant as possible to the situation on the ground. The respondents' answers showed that the biggest problems with the current waste management system and the biggest challenges in implementing the sustainable waste management model are different for each institution.

The respondent for the Lastovo Archipelago Nature Park says that their waste problem is systemic and should be solved at system level. However, simultaneous everyday endeavours and small actions are more than welcome. This also opens up an opportunity for educating the local population together with the Lastovo Archipelago Nature Park's staff, who have proven to be a significant and active stakeholder when it comes to small waste management actions in Lastovo. In their opinion, the problem is that any larger changes occur slowly, which is, on one hand, the fault of the inert system, but also of the citizens who are passive and lack education.

As another problem, they also pointed out the fact that the utility company does not apply for waste management tenders and the only project they applied to was the landfill clean-up. Today, all non-hazardous mixed waste from the whole island is still taken to the "cleaned up" landfill which isn't finished because it still doesn't have a sorting house or a recycling yard. The Lastovo Archipelago Nature Park's staff showed willingness to participate in such projects, but, as a nature protection institution, it doesn't meet the tender criteria since only the local utility company can apply. Later, the Park could form a partnership with the utility company. The local utility company's justification for not applying for tenders is the obligatory co-financing rate of 15%. Although this sounds like a problem, it is relatively easy to achieve 15% of co-financing in partnership with the park or the municipality, but what is crucial is sincere interest on the part of the utility company itself.

The respondent in Međimurska priroda stressed that waste problems occur very often in locations that were previously problematic in terms of illegal activities, such as gravel removal, which created dump sites that are still there to this day. Apart from this, another big challenge they are facing is the fact that wetlands and wetland areas aren't appreciated enough by the residents, despite being protected and recognised by the international community. They also stress the problem of burning waste in the city's outskirts – mostly inhabited by the Roma ethnic minority population who are largely neglected by the authorities.

Still, there are some positive sides to the story. The Lastovo Archipelago Nature Park sees the greatest opportunity for establishing models of sustainable waste management based on the zero waste principle in being a small community of around five hundred people, which makes it easier to apply the model. They also see an opportunity in communication and establishing a better connection with other islands, which would increase the chances for better waste management. They state that they will keep the emphasis on waste prevention and that they will try to keep promoting positive practices through their work, such as using tote bags and reusable water bottles.

Considering the fact that there is a different scenario in the Međimurje area, where the majority of citizens are educated and mostly aware of the importance and the advantage of sustainable waste management, they point out that the problems would be significantly reduced if the capacities on the ground, within the Public Institution, would be increased. Larger capacities would enable them to detect problems in time, such as temporary illegal dumping which quickly turns into dump sites due to the failure to penalise it. They mentioned that it does not suffice to merely occasionally charge a fine and clean up the area, since true change will only come about when we no longer witness such situations.



Sozanj landfill on Lastovo island

When it comes to available and necessary resources, the respondent from the Lastovo Archipelago Nature Park said that their utility company should finally start applying for existing tenders because they see tenders as a large untapped resource. They also believe that, for some types of waste, it would be good to cooperate with, for example, the island of Korčula, to also reduce the transportation costs related to some types of waste. Rangers and on-site work are seen as the main necessary resource in Međimorska priroda, as they are a necessary prerequisite for a timely detection and sanctioning of various incorrect procedures. In conclusion, conversations with employees from nature protection institutions showed there is a high level of motivation and ambition regarding the sustainable management of protected areas.

RECOMMENDATIONS FOR SUSTAINABLE WASTE MANAGEMENT IN PROTECTED AREAS

PREVENTION

The most important step in the hierarchy of sustainable waste management is prevention, or the reduction of the generation of waste. If the primary focus is on the first step, many problems can be avoided in the following phases of waste management, such as the organisation of separate collection, transportation and the sorting of waste. Since the situation in protected areas in Croatia and Switzerland varies based on the respective location, a site specific approach is required, aided by general guidelines.

Since the examples from the interviewed Public Institutions show that protected areas in Croatia are facing the problem of illegal dump sites, one part of the preventive measures should be aimed at adequately fining any breach of the Waste Management Act.

In terms of the Public Institutions themselves preventing the generation of waste in protected areas, and considering the particularity of the respective location, several mitigation measures are available. These mitigation measures apply to public institutions for nature protection, the local utility company, the local community and the visitors to protected areas.

Public institutions for nature protection can achieve this by not selling products in their visitor facilities that, once discarded, become waste that is difficult and expensive to manage, and that often come in unnecessary packaging, very often in single-use plastic packaging. By banning unnecessary packaging and useless products (plastic souvenirs, plastic-coated information leaflets, etc.), the strain on the waste

management system is reduced, which prevents improperly disposed of waste from ending up in the environment. This is already being practised in the Lastovo Archipelago Nature Park and in Međimurska priroda, but the recommendation also applies to other protected areas. It is also important to create conditions for developing a reuse system, for example by placing drinking water fountains in different locations within the protected area and by encouraging visitors to use them, which affects the reduction of waste generated by plastic bottles.

If there are any hospitality facilities within the protected areas, they should also abide to preventive practices and ensure enough reusable tableware to avoid the inflow of plastic waste while holding various events.

The distribution of information leaflets, brochures and maps in visitor centres must be rationed. To achieve this, it is necessary to identify the number of visitors in a particular period and print the materials according to the needs. The choice of material for printing can also play a large role, so it is advisable to use recycled paper instead of plastic-coated versions. Finally, it is also possible to replace that mode of informing people with a more interactive form which avoids waste generation, such as smartphone apps.

Depending on the type of protected area, it is also possible to prohibit people from bringing certain products that have proven to be big polluters.

It is important to also separate bio-waste, i.e. waste of biological origin. The example of Međimurska priroda can also be used here, since they compost all of their green waste in their own composters, thereby additionally relieving the strain on the local waste management system. The simplest adequate solution for these locations are composters, while larger sites that don't have a clear border between inhabited and uninhabited parts are recommended to build small open or closed composting plants that correspond to the needs of the local population. Composting creates high-quality natural fertiliser that can later be used for feeding ornamental plants or on the local population's agricultural land.



EDUCATING THE PUBLIC INSTITUTION'S EMPLOYEES AND THE LOCAL POPULATION

Because some protected areas' locations have their particularities, it is sometimes a considerable challenge to establish control over the entirety of their protected territory, which brings us to the next recommendation in terms of educating the local population and the park's visitors.

Since improperly disposed of waste has a negative impact on the plant and animal world, public institutions for nature protection bear the responsibility to, according to their needs, but also the needs of the local community, create educational materials with the goal of encouraging visitors and the local community to correctly handle waste. Depending on the assessment of those needs, it is recommended to organise workshops and educational activities for various target groups in cooperation with local environmental associations and/or the local utility company, but also aimed at local associations together with the local utility company. The topic of waste management should also be represented in the visitor information leaflets and brochures, so they can relate their own behaviour to the broader impact on biodiversity and functioning of specific ecosystems. An additional recommendation is to visually display the negative examples in the

educational materials to amplify the message and to ensure that the local population condemns this kind of behaviour and to become sensitised towards improper behaviour connected to this problem.

ESTABLISHING A SUSTAINABLE WASTE MANAGEMENT SYSTEM AND SEPARATE COLLECTION

It is important to establish an adequate waste management system where such a system doesn't exist, like in the case of the Lastovo Archipelago Nature Park, where waste management boils down to disposing mixed non-hazardous waste in the local landfill and where there is no necessary infrastructure. This also requires for separate waste collection to be possible, especially in highly frequented sites. In order to have sustainable waste management, it is necessary to establish a door-to-door separation system (in inhabited areas), charging by the quantity of waste, a reuse centre, an open or closed composting plant and a sorting house.

Bins for separate waste collection have to be visibly labelled to show which type of waste they are for. They should potentially also include information on the time period when they are emptied. If preventive measures and education affect visitor awareness, it is important to inform visitors on

such locations and ask them to dispose of their waste only where specified. If waste is produced in an area without a bin, visitors are expected to pick up their own waste. It is also important to ensure free collection of bulky waste upon the citizens' request at least twice a year as a preventive measure against improper disposal of bulky waste.

CONSTANT MONITORING OF THE SITUATION ON THE GROUND AND COOPERATION WITH THE LOCAL UTILITY COMPANY

As previously mentioned, cooperation with the local utility company is extremely important. Međimurska priroda provides a good example with their successful cooperation with several utility companies.

The case of Međimurska priroda shows that a reduced generation of mixed waste – or the reduction in the disposal of waste in landfills – has been applauded and encouraged by the local utility company. Apart from participating in picking up waste from dump sites, the utility company also participates in the sorting. Such activities are not charged additionally due to the value that this waste can achieve on the market as a raw material. The case of Međimurska priroda also shows the importance of continued two-way communication between the local utility company and public institutions for nature protection. If the public institutions are lacking in capacities, they can also include the local community in continued monitoring and in reporting problems, which is a way of including it in activities aimed towards protecting particular areas. Along with engaging the local community, the local utility company should also improve the promotion of its services as a preventive measure against the improper disposal of bulky waste and ensure its free collection upon the citizens' request at least twice per year.

CLEAN-UPS, BRAND AUDIT AND VOLUNTEERING

Since preventive measures and education don't guarantee the prevention of pollution because it is sometimes also caused indirectly through human activities (e.g. through pollution created in another location) and it reaches the protected area naturally, we have to expect that there will still be a need for clean-ups.

Once communication has been established between the local utility company and the local community and once ongoing on-site monitoring detects the polluted area, clean-ups should be organised.

It is important to emphasise that clean-ups don't bring about relevant social change in and of themselves, but they serve the purpose of fixing the damage that was caused in spite of the implementation of all the other measures. They are, in that sense, essential, especially for the conservation of specific sites that are habitats to numerous plant and animal species who are threatened by that type of pollution. This is exactly why it is important to inform the general public that such actions are being organised. Informing the public can, in that case, serve as an extensive educational measure. The locals usually join in as volunteers, but to raise greater awareness of this problem, informing visitors would also be a good step forward. The employees of the Lastovo Archipelago Nature Park carry out seabed, seashore and islet clean-ups every year to remove marine waste. In 2020 they joined forces with seasonal workers, students, volunteers and visitors to remove over 4 tonnes of waste from the Nature Park's seabed, sea and shores. We learned from the example of Međimurska priroda that local utility companies should also be included in these types of actions, so they wouldn't have to charge for their services additionally if they ensure that the waste is correctly sorted and later sold as raw material.

To go one step further, it would be advisable to occasionally carry out the so-called "brand audit" method or to detect the origin of the waste found in specific locations and to publicly call out companies whose waste is found in such locations, asking them to account for their product design and to partially or fully cover the costs of clean-ups. This type of method was carried out in 2018 by Greenpeace Croatia in partnership with volunteers and the Lastovo Archipelago Nature Park. Since undertaking such an activity calls for expertise, it is necessary to cooperate with local environmental associations that can aid in the process of public advocacy. takve aktivnosti iziskuje stručno znanje, nužna je suradnja s lokalnim udrugama za zaštitu okoliša koje mogu pomoći u procesu javnog zagovaranja.



Lastovo Archipelago, coast cleaning action



Lastovo Archipelago, waste clean-up / photo: Tomislav Impric, Greenpeace Croatia



Lastovo Archipelago, waste clean-up / photo: Tomislav Impric, Greenpeace Croatia



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AUTHOR: ANA-MARIJA MILEUSNIĆ

ENGLISH TRANSLATION: LORA RAJIĆ

DESIGN: TOMISLAV TURKOVIĆ

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COVER PHOTOS: THE LASTOVO ARCHIPELAGO, AN EXAMPLE OF THE "BRAND AUDIT" METHOD IN APPLICATION / PHOTO: TOMISLAV IMPRIĆ, GREENPEACE CROATIA (ABOVE) AND THE LASTOVO ARCHIPELAGO, WASTE CLEAN-UP / PHOTO: TOMISLAV IMPRIĆ, GREENPEACE CROATIA (BELOW)



Medimurska priroda, composter

