



# 北京高密度城市社区 公众参与生物多样性保护示范项目

Demonstration Project of Public Participating Biodiversity Conservation  
in Highdensity Urban Communities in Beijing

联合国开发计划署（UNDP）全球环境基金小额赠款计划（GEF SGP）





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在此致以感谢  
本手册内容不代表其立场



## 北京常青藤可持续发展研究所

常青藤可持续发展研究所于 2012 年注册成立，2015 年被评为 4A 级社会组织，主管单位是北京市西城区科学信息委员会，团队成员涵盖多个学科领域。机构确立了“建设儿童友好、环境友好、睦邻友好”的三好社区的愿景，以自然启蒙、社区实践和生态公民为方式推动小手拉大手的社区环境友好建设。2012 年成立的“小木屋成长营”自然教育项目以及 2014 年成立的“在城长生活馆”社区项目是机构的两大核心业务。

Evergreen Center for Sustainable Development is established in 2012, with Science and Information Commission of Xicheng District assupervising department, and was ranked as AAAA social organization in 2015. Our institutional vision is to build “triple-friendly” communities: child-friendly, environmental-friendly and neighbor-friendly. To achieve such vision, we developed series of parent-child community building programs, including nature education, community-based social practice and civic ecology. The two main businesses of Evergreen are: "Log Cabin" nature education program launched in 2012, and "New Citizen Activity House (short for NCAH in below)" community program.



## 联合国开发计划署 (UNDP)

联合国开发计划署是联合国系统为终止贫困、不平等和气候变化而工作的主要机构。与全球 170 多个国家的专家和伙伴组成的广泛网络合作，联合国开发计划署帮助各国建立人与地球和谐的综合性和持续性解决方案。

四十多年来，作为联合国从事发展的全球网络，联合国开发计划署充分利用其全球发展经验，支持中国制定应对发展挑战的解决之道，并为中国开展南南合作和参与全球发展提供协助。联合国开发计划署目前在中国的重点工作领域为：减少贫困、善治、危机预防与恢复及能源与环境。

UNDP is the leading United Nations organization fighting to end the injustice of poverty, inequality, and climate change. Working with our broad network of experts and partners in over 170 countries, we help nations to build integrated, lasting solutions for people and planet.

UNDP has drawn on world-wide experience for over four decades to assist China both in developing solutions to its own ongoing development challenges, and in its south-south cooperation and engagement in global development. Domestically, our work focuses on Good Governance, Energy & Environment, Poverty Reduction and Disaster Management.

## 全球环境基金小额赠款计划

小额赠款计划成立于 1992 年，是全球环境基金的共同项目，由联合国开发计划署负责实施。小额赠款计划在全球 125 个国家，向当地民间组织，特别是原住民、妇女、青年实施的可持续发展项目提供资金，以促进基于社区的创新、能力建设和赋能。小额赠款计划在全球已经支持了 20000 多个社区项目，工作领域包括保护生物多样性、减缓和适应气候变化、防止土地退化、保护国际水域、以及减少化学品的影响，同时发展可持续的生计。

## The Global Environment Facility (GEF) Small Grants Programme (SGP)

The Small Grants Programme (SGP) is a corporate programme of the Global Environment Facility (GEF) implemented by the United Nations Development Programme (UNDP) since 1992. SGP grant-making in over 125 countries promotes community-based innovation, capacity development, and empowerment through sustainable development projects of local civil society organizations with special consideration for indigenous peoples, women, and youth. SGP has supported over 20,000 community-based projects in biodiversity conservation, climate change mitigation and adaptation, prevention of land degradation, protection of international waters, and reduction of the impact of chemicals, while generating sustainable livelihoods.



# 项目简介

## 北京高密度城市社区公众参与生物多样性保护示范项目

作为世界上生物多样性最丰富的大都市之一，北京正面临着挑战与危机：高速的经济发展使得城区迅速致密化，割裂了城市居民与自然的连接；空气污染、水资源危机、城市同质化等现象无不直接或间接冲击着城市生物多样性。与此同时，城市居民对于生活城市的生物多样性，尤其是日常生活中手可及的社区环境中的生物却仍然了解甚少，亟需建立起生物多样性保护意识，并加入到首都生物多样性保护队伍中来。

基于国家对生态文明建设、可持续发展、新时代文明实践的大力倡导，在联合国开发计划署（UNDP）全球环境基金小额赠款计划（GEF-SGP）的资助下，常青藤可持续发展研究所自2021年起在北京市海淀区中关村街道和西城区新街口街道开展“北京高密度城市社区公众参与生物多样性保护示范项目”。项目在海淀区“1+1+N”街镇责任规划师机制的支持下，着眼于城市可持续社区，为公众参与生物多样性保护提供一系列综合解决方案。

项目打造社区环境教育基地，恢复社区的小微生态环境，增设社区生态保护设施，提高社区生物多样性；并通过一系列公众参与的活动，提高社区居民对城市生物多样性的整体意识，带动更多的居民参与到城市生态环境保护的实践中来。

# Introduction

## Beijing High-density Urban Community Public Participation in Biodiversity Conservation

As one of the most biodiversity-rich metropolises in the world, Beijing is facing challenges and crises: rapid economic development has led to the rapid densification of urban areas, severing the connection between urban residents and nature; air pollution, water crisis, and urban homogenization are all directly or indirectly impacting urban biodiversity. At the same time, urban residents still have little understanding of the biodiversity of the city they live in, especially in the community environment that is within their reach in their daily lives, and need to build up awareness of biodiversity conservation and join the biodiversity conservation team in the capital.

Based on China's national advocacy for ecological civilization, sustainable development, and civilizational practices in the new era, and with funding from the United Nations Development Programme (UNDP) Global Environment Facility Small Grants Program (GEF-SGP), Evergreen has been conducting the "Beijing High-Density City Community Public Participation Biodiversity Conservation Demonstration Project" in Zhongguancun area (Haidian District) and Xijiekou area (Xicheng District) since 2021. The project focuses on sustainable urban communities and provides a range of integrated solutions for public participation in biodiversity conservation.

The project creates a community environmental education base, restores small-scale ecological environments in the community, adds community ecological protection facilities, and improves community biodiversity. Through a series of public participation activities, raises community residents' overall awareness of urban biodiversity and drives more residents to participate in the practice of urban ecological environmental protection.



从零开始，改善城市绿地

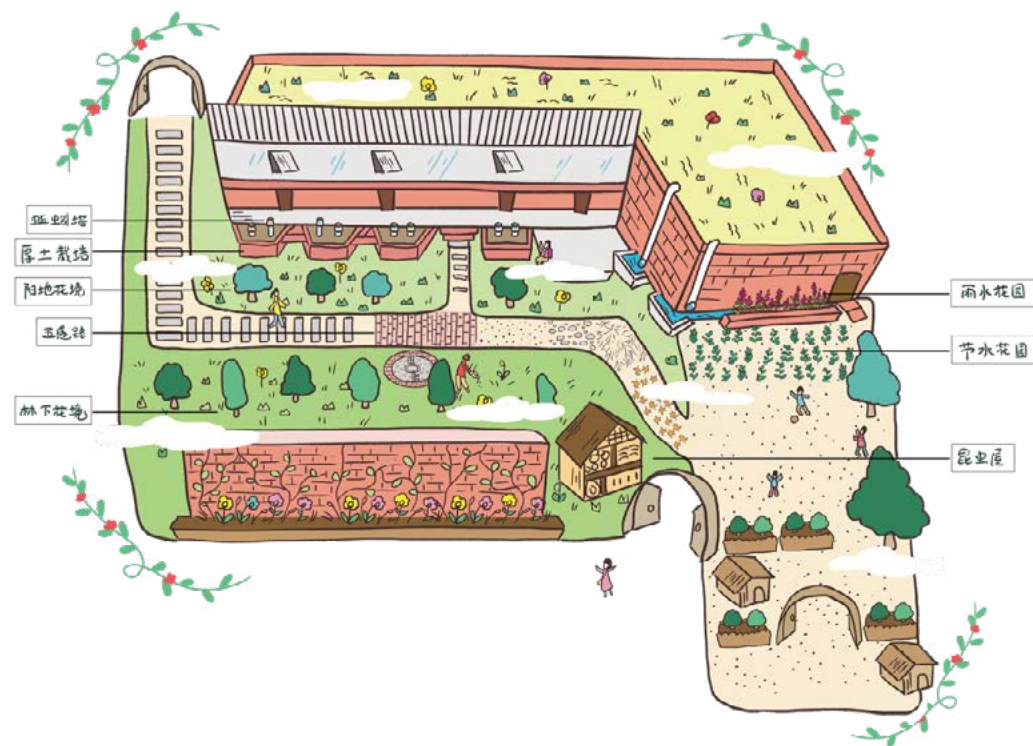
Start to improve urban green  
spaces from scratch



# 1.

## 改造前的准备

Preparation work before renovation



中关村村史馆生境花园

# 01 资源募集

## Raising of resources

改造开始前，统计可用于社区绿色空间改造的资金/资源。  
如果资金/资源有限，可以制定资金/资源募集方案。此外，应倡导以可持续、“零废弃”的理念进行营造。

Before the renovation started, count the funds/resources available for community green space renovation. If funding/resources are limited, a funding/resource collection program should be developed. In addition, a sustainability and "zero waste" philosophy should be promoted.

中关村村史馆生境花园在有限条件下，所有材料和施工都以经济节约为原则，在花园的建造中大量使用了拆选过程中产生的建筑垃圾，例如：将品相比较好的钢管做成雨水导管，有一定历史痕迹的房梁木头做成护栏，以及树木修剪之后的园林垃圾打碎之后用做地面铺装。

Under limited conditions, all materials of Zhongguancun Historical Museum Community Garden are collected based on the principle of economic saving, a large amount of construction waste from the demolition process was used in the construction of the garden. For example, steel pipes of good quality were made into rainwater ducts, wooden beams with certain historical traces were made into guardrails, and garden wastes from tree pruning was broken into peices and used as ground paving.



# 02 制定计划

## Make a plan

根据所能获得的启动资金和资源支持进行设计方案的调整，并制定行动计划。在这个过程中，为保证对于资金投入、工程量、实施难度的预估的准确性，可寻求专业人士的协助。明晰整体计划之后，可将营造工作进行拆分。若需要公众参与到改造中，应提前整理场地中的废弃物和杂草，需保证活动场地的安全性。

Adjust the designing plan according to the available start-up funds and resource support, and develop an action plan. To ensure the accuracy of the estimation of capital investment, volume of work, and difficulty of implementation, professional assistance can be sought in this process.. Once the overall plan is clear, the creation process can be broken down. If public participation is required in the renovation, waste and weeds in the site should be sorted out in advance, and the safety of the site should be ensured.

14 项共建任务	植物	昆虫	人类
确定基础结构 完成材料准备	砌花池	锯木头	
奠定土壤基础 铺设主要园路	设置围栏 厚土栽培	搭建昆虫屋 制作蚯蚓塔	铺设五感路 铺设汀步
确定种植分区 亲手栽种植株	花草栽植		
优化花园景观 做好善后工作	土壤覆盖 植物整理		铺设路桩 LOGO铺路

清扫整理



# 03 工具及材料准备

Preparation of tools and materials

## 可能用到的工具 Tools

手套 gloves  
斗车 bucket  
枝剪 branch shears  
手锯 / 电锯 hand/electric saw  
尺子 ruler  
螺丝刀 screwdriver  
铁锹 spade  
电锤 electric hammer...  
小镐 pickaxe  
.....  
尺子 ruler  
钉子 nail  
浇灌工具 (水管、水壶) watering tool (water pipe, kettle)

## 可能需要的材料 Materials

石材 (石块或碎石) stone  
木材 wood  
碎木屑等覆盖物 surface covering  
沙子 sand  
砖块 brick  
水泥 cement  
.....



建造过程中工具和材料的管理也是儿童重要的工作之一。活动前后均需清点相应的工具和材料，活动结束后清洗、归放到原处。

# 04 安全防护保证

Safety guarantee

活动开始之前，需要保证每一位参与者的安全。组织者应提前做好充足的准备工作：整理盘查场地中的风险点，准备安全防护物质，开展参与者的安全教育，配备基础急救包并制定应急送医方案。

Before the event starts, the safety of every participant needs to be ensured. Organizers should make sufficient preparations in advance: organize the inventory of risk points in the venue, prepare safety protection substances, carry out safety education for participants, equip basic first aid kits and develop emergency medical evacuation plans.

## 安全物资



# 04 绿地围栏设计

## Green area fencing

围栏的设置可以使活动区域与社区中其他的开放空间分割开来。可选择木板、木桩等材料现场制作；也可购买成品，组织大家一起安装。在安装完毕之后，可进行彩绘装饰，这项工作各年龄段均可参与。

The fence can be set up to divide the activity area from other open spaces in the community. Materials such as planks and stakes can be selected for on-site fabrication; or finished products can be purchased and organized for installation. After installation, it can be painted and decorated, a task in which all ages can participate.



结合花池的围栏



儿童在小花园的入口绘制图案，形成自己独一无二的标识

# 05 道路

## Road



道路和广场是人群活动的区域，也是雨水汇集、下渗和排放的通道。为了便于通行且减少损耗，人流量大的区域可以选择较为坚硬的材料，如石材或透水砖；人流量少的区域可以选择松散的路面铺装，如碎石路面，也可以设计成汀步。

Roads and squares are areas where people are active and where rainwater is collected, infiltrated and discharged. In order to facilitate the passage and reduce loss, areas with high flow of people can choose harder materials, such as stone or permeable tiles; Areas with less pedestrian traffic can choose loose pavement, such as gravel pavement, or can be designed as Ting-steps.

### 道路 / 广场建设的步骤：

#### Steps for road/square construction:

- |             |   |
|-------------|---|
| 1) 确定位置和高程  | 1) Determine the position and elevation |
| 2) 放线       | 2) Set the line                         |
| 3) 夯实基础     | 3) Consolidate the foundation           |
| 4) 铺设无纺布    | 4) Lay non-woven fabric                 |
| 5) 铺设垫层（找平） | 5) Lay the cushion (leveling)           |
| 6) 铺设面层     | 6) Lay the surface layer                |



# 06 种植池

## Planting bed

如果社区中可供改造的空间有限，可以在社区原有的绿地中设置一些种植区域。种植池的围合可选用木、竹、石、砖、瓦等材料。

可以采用回收物品制作，例如：啤酒瓶、旧轮胎等。

可直接选用回收物品作为种植池，例如转运箱。

发挥你的巧思吧，看看还有哪些方式可以做成种植池。

If there is limited space available for renovation in the community, some planting areas can be installed in the original green space of the community. The planting pond can be enclosed by wood, bamboo, stone, brick, tile and other materials. It can be made from recycled items, such as beer bottles, old tires, etc. Recycled items can be directly selected for planting ponds, such as transfer boxes. Use your ingenuity and see what other ways you can make a planting bed.



采用工业转运箱子和木拍子打造的屋顶花园，集合了种植和休憩的功能

A roof garden with industrial transfer boxes and wooden paddles combines planting and relaxation





提高城市绿地生物多样性

Improve the biodiversity of  
urban green space



## 2.

# 城市生物多样性 改善的途径

## Ways to improve urban biodiversity.



## 为城市中野生动物创造生境的 12 条建议 12 tips to help wildlife in the city

观察自然，分享你的发现

改善土壤

建造蚯蚓塔

建立拟自然群落

为传粉者种植植物

采用乔灌木组合的方式

建造昆虫屋

放置小鸟喂食器和人工鸟巢

建造一个池塘或创建一个鸟浴盆

为野生动物提供庇护（本杰士堆）

栅栏底部预留刺猬通道

看管好猫，减少对野生动物的威胁

Observe nature and share your discoveries

Improve the soil

Build an earthworm tower

Build a proposed natural community

Growing plants for pollinators

Use a combination of trees and grasses

Construction of insect houses

Placement of bird feeders and artificial nests

Construct a pond or create a bird bath

Provide shelter for wildlife (Benjamin's pile)

Reserve hedgehog access at the bottom of the fence

Watch over cats to reduce the threat to wildlife

# 0 | 改善土壤

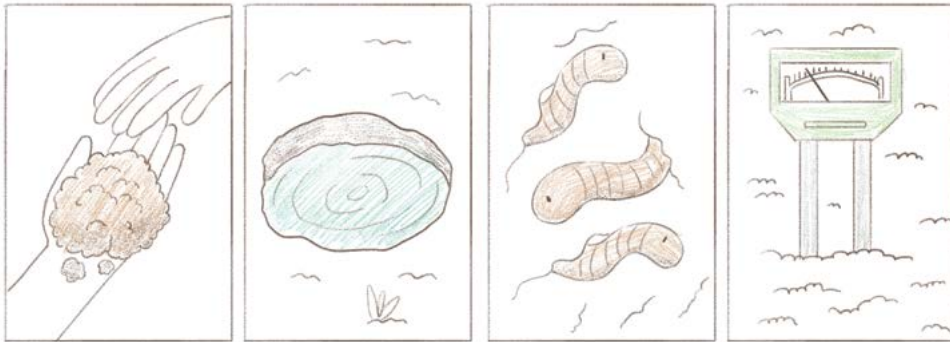
## Improve soil

土壤不仅是一些疏松或者粘稠的矿物质，也不仅仅是各种化学元素的集合体，更重要的是，土壤是一个生机勃勃的世界，它是地球无机世界和有机世界的连接中转之地。

土壤是活的、有生命的，水分和养分返回到土壤中，就可以保持高水平的土壤生物区系，从微小的细菌和真菌，到各种蠕虫和昆虫。

土壤的健康程度直接影响植物生长，基本的土壤调查是必须的。了解清楚土壤状况不仅可以确认适宜种植的植物类型，还可以确定后续将会采用的土壤改良措施。

### 土壤性质调查 Soil property survey



(1)  
观察土壤是否板结  
Squeeze Test

(2)  
分析土壤类型  
Percolation

(3)  
调查土壤生物  
Worm Test

(4)  
确定土壤 pH 值  
PH Test

Soil is not just a collection of loose or sticky minerals, nor is it just a collection of chemical elements, but more importantly, it is a living world, a transit place that connects the inorganic and organic worlds of the earth.

Soil is living and breathing, and the return of water and nutrients to the soil maintains a high level of soil biota, from tiny bacteria and fungi, to a variety of worms and insects.

The health of the soil directly affects the growth of plants, and a basic soil survey is necessary. A clear understanding of soil conditions will not only confirm the type of plants suitable for planting, but also determine the subsequent soil improvement measures that will be used.

### 一个简单的土壤测试：

1. 用一个透明罐子从观测点取土，装满半罐。
2. 观察它的颜色、闻它的气味、数数它里面的生物。
3. 给土壤样本加水，然后静置，其中的有机质会漂浮起来。

### A simple soil test:

1. Take a clear jar from the observation point and fill it half full.
2. Observe its color, smell its smell, and count the creatures in it.
3. Add water to a soil sample and let it sit. The organic matter in it will float.



## 厚土栽培

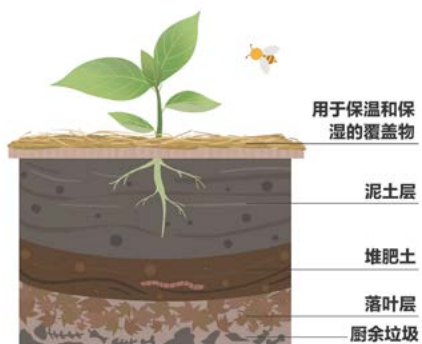
在自然森林生态系统中，会形成天然的堆肥层，也会自行演化，分级形成多层土床。厚土堆肥通过模拟原生态土层结构，设计出模拟的分层土床。通过建立土层、微生物与植物间的微循环系统，建立具有多重功效的生态系统。厚土栽培就是一种模拟了自然界能量循环的土壤抚育方式。

厚土改造后，持续在上层进行有机质的覆盖堆积（添加堆肥），不必翻耕土地和额外施用化肥，即可保证土壤肥力的持续。化肥直接作用于植物的根系，而有机质则由土壤的微生物进行分解，转化成植物可以吸收的营养。厚土栽培将有机质返还土地，重构土壤微生物、土栖生物和植物之间互利共生的关系。

## Thick-soil cultivation

In natural forest ecosystems, natural layers of compost are formed, and also evolve on their own, grading into multi-layered soil beds. Thick soil composting designs a simulated layered soil bed by simulating the original soil structure. By establishing a microcirculation system between soil layers, microorganisms and plants, an ecosystem with multiple functions is created. Thick soil cultivation is a way of soil nurturing that simulates the energy cycle of nature.

The thick soils are transformed so that the organic matter continues to accumulate in the upper layers (compost is added) and the fertility of the soil is maintained without tilling the land and applying additional fertilizers. The fertilizer is applied directly to the plant roots, while organic matter is broken down by soil microorganisms and transformed into nutrients that can be absorbed by the plants. Thick-soil cultivation returns organic matter to the land and reestablishes a mutually beneficial symbiosis between soil microorganisms, soil-dwelling organisms and plants.



## 土壤覆盖

覆盖物是覆盖在土壤表面，用来保护土壤的材料，与自然森林中落叶堆积于地面异曲同工。

覆盖表层土壤，可以减少表土的水分蒸发，抑制杂草生长，腐熟的覆盖物还可以为土壤提供养分。在冬季则起到保温隔热的作用，让宿根植物的根系能够度过寒冷的冬天。

### 常用的覆盖物可以选择：

有机类：松针、松树皮、木屑、干草、稻壳等；

无机类：碎石、砾石、河沙石。

## Soil cover

Mulch is the material that covers the surface of the soil and is used to protect it, in the same way that fallen leaves pile up on the ground in natural forests.

Covering the topsoil reduces water evaporation from the topsoil, inhibit weed growth, and the decaying mulch provides nutrients to the soil. In winter, it acts as a thermal insulator, allowing the roots of perennial plants to survive the cold winter.

### Commonly used coverings can be selected from:

Organic: pine needles, pine bark, wood chips, hay, rice husk, etc.

Inorganic: gravel, gravel, river sand.



修剪后的园林枯枝，粉碎后作为植被的覆盖层



### 酵素制作

酵素是适合在家中操作的液肥制作方法。以水果皮和水果渣为主要材料，加以红糖和水以一定比例混合，在塑料容器中发酵约三个月即可使用。

酵素可作为液体肥，有助于减少病虫害，也可以用于清洁。余下的酵素渣滓可与其他肥混合进行堆肥，无异味且能加速堆肥过程。

### Making enzymes

Enzyme is a liquid fertilizer making method suitable for operation at home. Fruit peels and fruit residue are the main ingredients, mixed with brown sugar and water in a certain ratio, and fermented in plastic containers for about three months.

Enzyme can be used as a liquid fertilizer, which helps reduce pests and diseases, and can also be used for cleaning. The remaining enzyme residue can be mixed with other fertilizers for composting, which is odorless and can speed up the composting process.

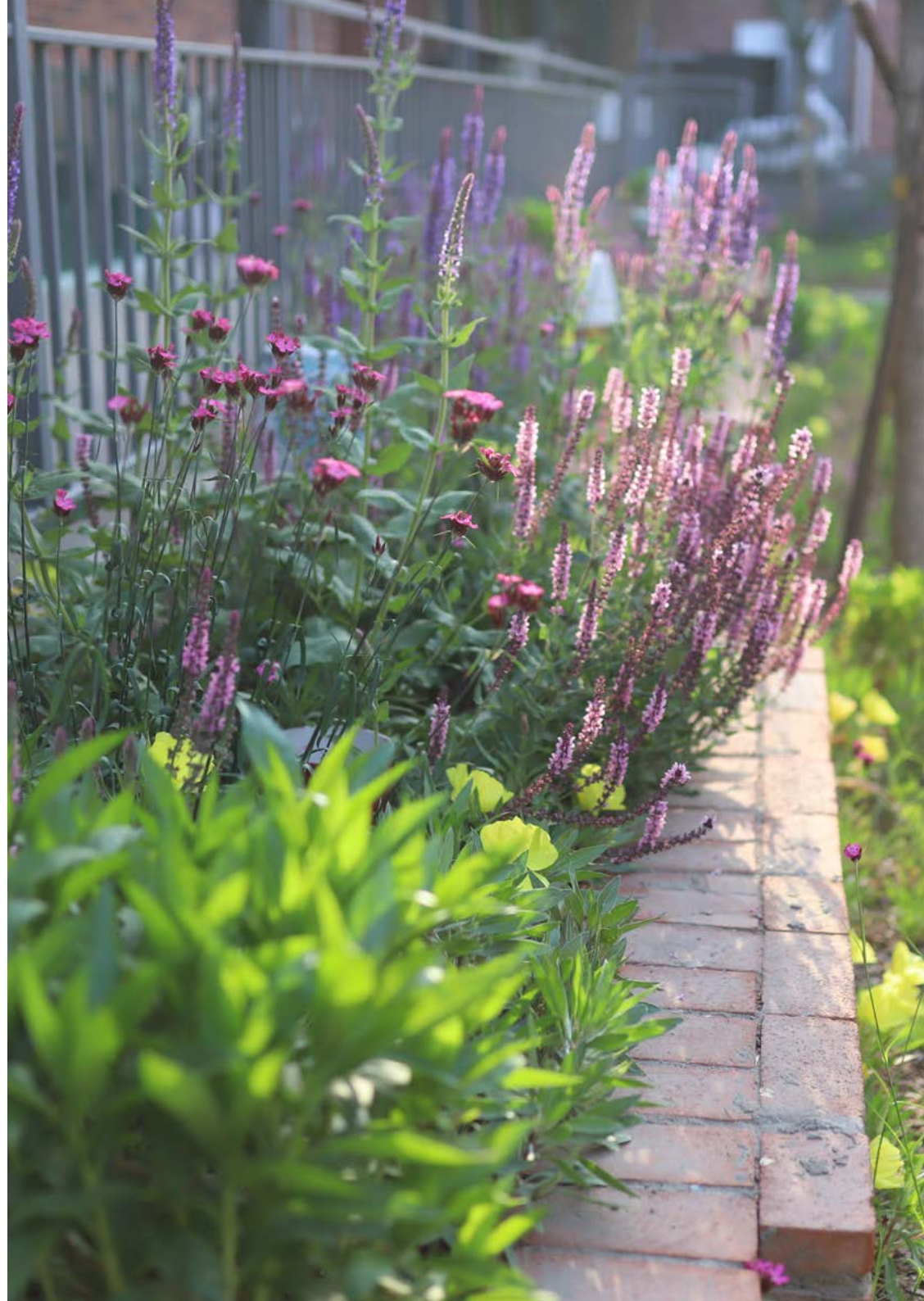
### 落叶堆肥

将社区绿地中的枯枝落叶集中粉碎堆放，待腐熟之后再回填入土壤中。

可制作堆放箱，集中收集枯枝落叶。

### Leaf compost

The dead branches and leaves in the community green space will be shredded and stacked together, and then backfilled into the soil after decomposition. Composting boxes can be made to collect dead branches and leaves.



# 02 建造蚯蚓塔

## Build a worm tower

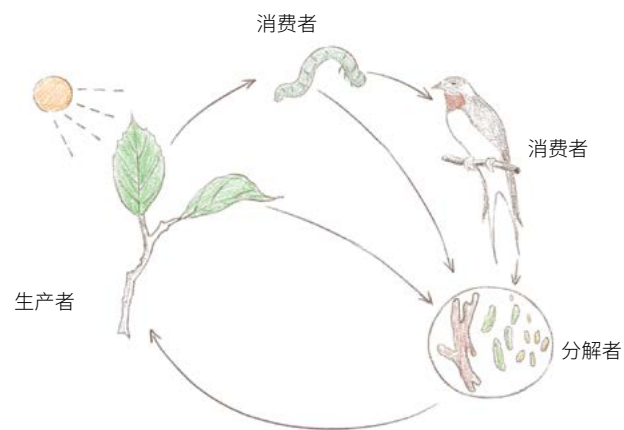
蚯蚓可以将有机废物转化为天然肥料。蚯蚓粪含有丰富的水溶性植物营养物质，比表层土壤中含有的腐殖质还多50%以上。同时，蚯蚓在土壤中的蠕动，也会起到疏松土壤的作用。

蚯蚓塔是一种简单又经济的土壤改善方法。只需把下半部分打孔的管子插到土地里，在管子里投放蚯蚓爱吃的厨余垃圾即可。蚯蚓的嗅觉十分敏锐，一个蚯蚓塔可以吸引周围半径200-300米的蚯蚓前来取食。不断向蚯蚓塔中投放厨余，蚯蚓塔周围的土地会随着蚯蚓的活动变得愈发肥沃、有生机。



Earthworms can convert organic waste into natural fertilizer. Earthworm manure is rich in water-soluble plant nutrients, and contains 50% more humus than the surface soil. Also, the peristaltic movement of earthworms in the soil will act as a soil loosening agent.

Earthworm towers are a simple and economical method of soil improvement. Simply insert the bottom half of a perforated tube into the soil and drop kitchen waste that earthworms love to eat into the tube. Earthworms have a keen sense of smell, and an earthworm tower can attract earthworms from a 200-300 meter radius feed. As you keep putting food waste into the towers, the land around the towers will become more fertile and vibrant as the earthworms move around.



我属于哪一类呢？



**材料：**PVC管（直径大于10cm，长度大于50cm），配套的PVC管堵头，电钻及打孔钻头，铁锹，丙烯笔，生厨余，活体蚯蚓（非必须）

#### 制作方法：

1) 选择PVC管靠近某一端，20cm长的一段，用电钻进行打孔。PVC管另一端可以进行图案绘制。

2) 在提前选定的位置挖坑准备埋管，一片区域可以安放多个蚯蚓塔，根据地块大小，一般可以每隔十到二十米左右均匀分布一个。坑的深度至少需要20-30cm。

3) 挖坑完成后，将PVC管打孔的一端向下，直立着插进坑里并填土，保证管子能够支撑住。

4) 在蚯蚓塔内放置生厨余（果皮菜叶）及活体蚯蚓（没准备蚯蚓可忽略），生厨余不可为柑橘类、柠檬等具有刺激性气味的水果蔬菜。

5) 给蚯蚓塔带“帽子”。



**Materials:** PVC pipe (diameter > 10cm, length > 50cm), matching PVC pipe plug, electric drill and drilling bit, spade, acrylic pen, raw kitchen waste, live earthworm (not required)

#### Production method:

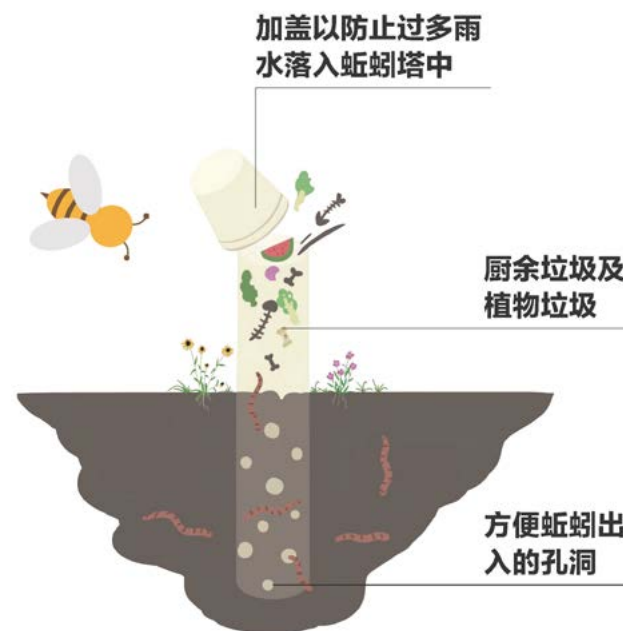
1) Select a 20cm long section of PVC pipe close to one end and drill holes with an electric drill. The other end of the PVC pipe can be patterned.

2) Dig pits in the selected position in advance to bury pipes. Multiple earthworm towers can be placed in an area. According to the size of the plot, one can be evenly distributed every ten to twenty meters. The depth of the pit needs to be at least 20-30cm.

3) After digging the pit, insert the perforated end of the PVC pipe into the pit upright and fill it with soil to ensure that the pipe can be supported.

4) Put raw kitchen waste (peel and leaves) and live earthworms in the earthworm tower. The raw kitchen waste should not be citrus, lemon and other fruits and vegetables with pungent smell.

5) Cap the worm tower.



# 03 建立拟自然群落

## *Built naturalistic planting community*

基于生态学原理，将草本植物以拟自然化的形式组合形成有机且稳定发展的群落式种植设计，可兼顾美观性、生态性、可持续性。这种种植方式植物种类的丰富度较高，重视使用符合生态需求的植物，以适宜的群落结构进行种植，使用吸引昆虫、鸟类及爬行动物的植物。

建立自然生境的方式可以混合播种适宜的种子，或者在本地苗圃购买苗木。

Based on ecological principles, herbaceous plants are combined in a naturalistic form to form an organic and stable community planting design that is aesthetically pleasing, ecological and sustainable. This type of planting has a high diversity of plant species and places emphasis on using plants that meet ecological needs, planting in a suitable community structure, and using plants that attract insects, birds, and reptiles.

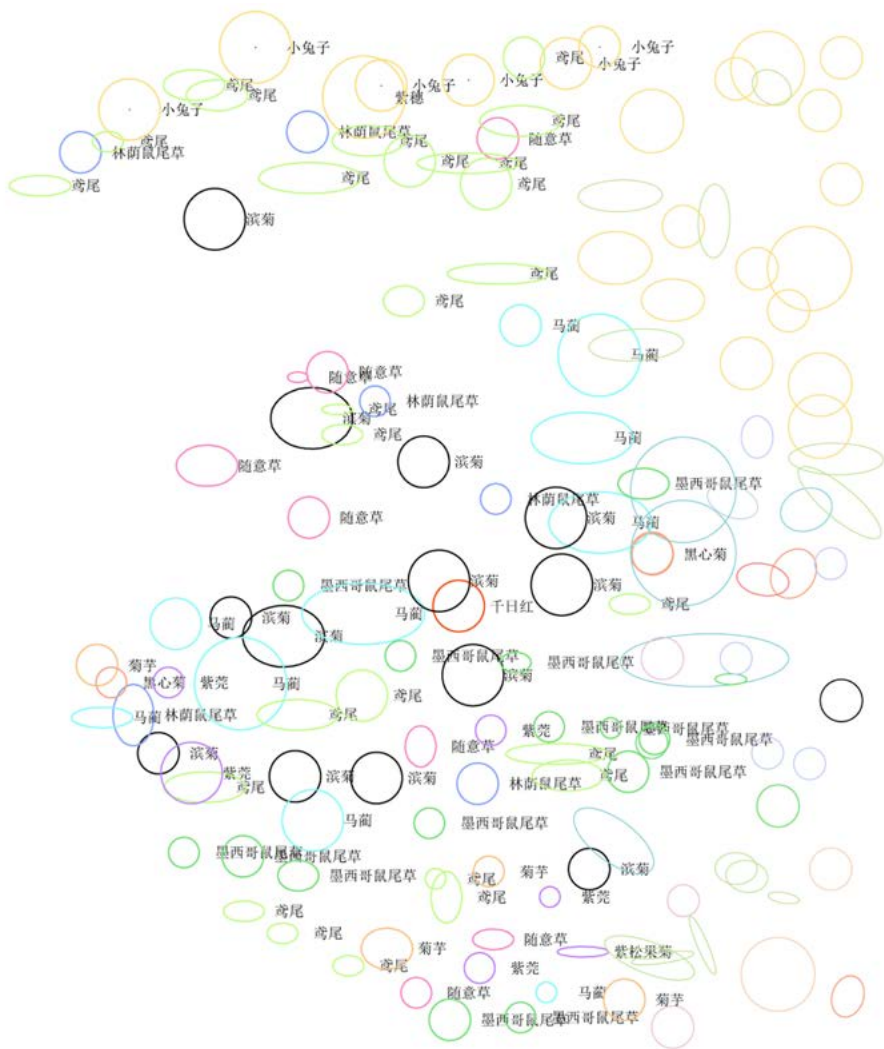
Natural habitats can be established by sowing a mixture of suitable seeds or by purchasing seedlings at local nurseries.







0.5m

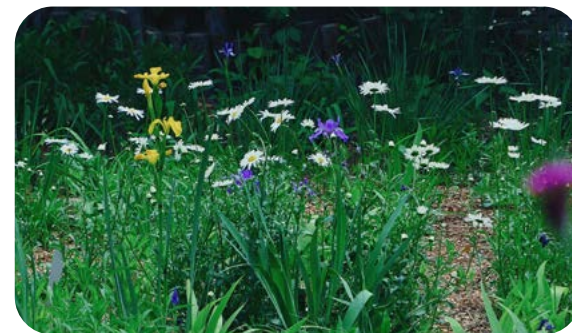


中关村村史馆生境花园种植图

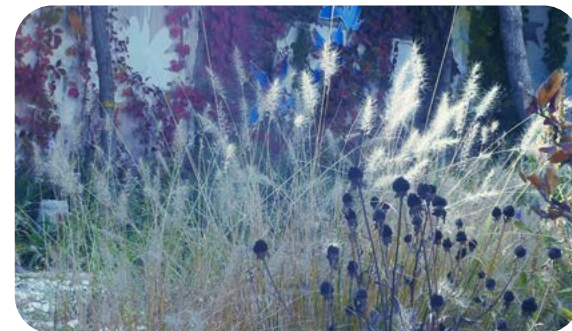
# 春



# 夏



# 秋



# 冬





# 04 种植支持传粉昆虫的植物

## Plant for pollinators

传粉是成熟花粉从雄蕊花药或小孢子囊中散出后，传送到雌蕊柱头或胚珠上的过程。自然界中的传粉者有很多种，昆虫，鸟类，哺乳动物，甚至人类；研究表明，90%的野生植物和75%的粮食作物依赖于昆虫传粉；全球粮食产量三分之一以上受益于传粉昆虫，其中野生传粉昆虫服务功能贡献率达70%。在我们的日常生活中能见到的传粉者大多是泛化传粉者，它们能给大多数植物传粉，也能接受不同传粉者的传粉。

为城市中的传粉者可以做如下工作：

- 增加种植多样性，多种植蜜源性植物，尽可能延长全年花期持续时间。
- 多种植乡土植物，尽量减少农药和除草剂使用。
- 在保证人身安全和消防安全的前提下，尽可能保留植物凋零物，为传粉昆虫提供栖息和繁殖场所。

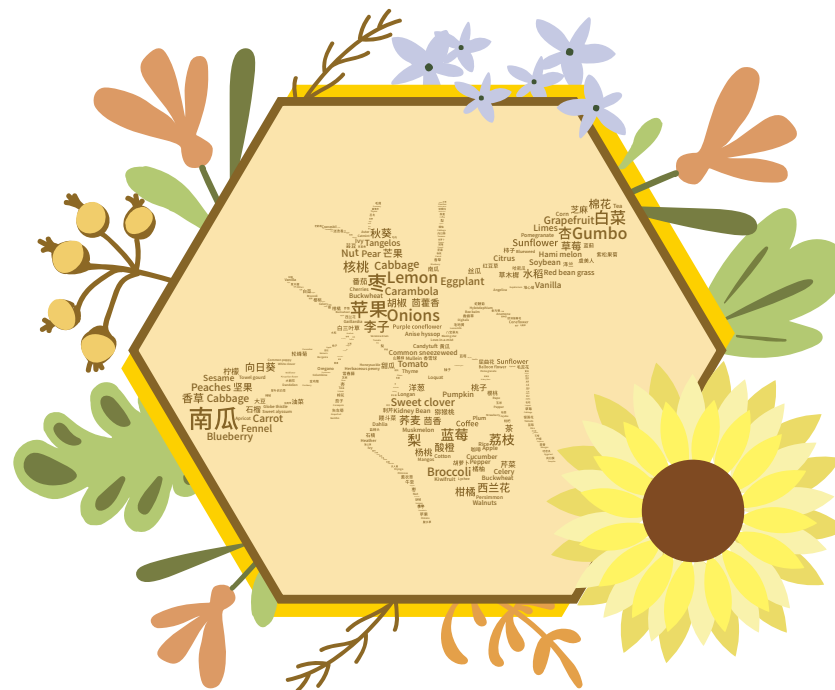
完全变态昆虫生命周期  
Complete metamorphosis of the butterfly

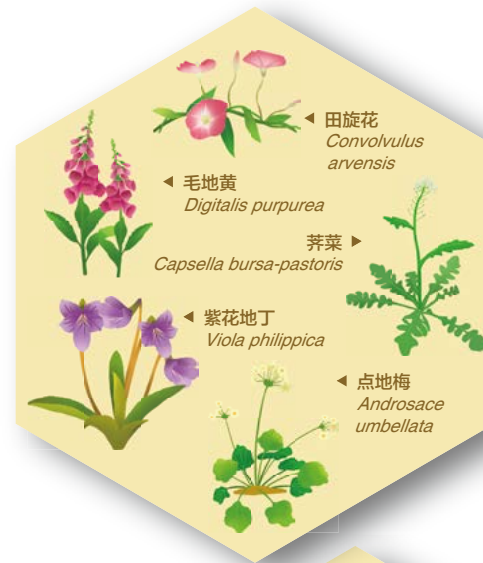


Pollination is the transfer of mature pollen from the anther or microsporangium of the stamen to the stigma or ovule of the pistil. There are many types of pollinators in nature: insects, birds, mammals, even humans; Studies show that 90% of wild plants and 75% of food crops depend on insect pollination; Pollinators account for more than one third of global food production, with wild pollinators contributing 70 percent to their service functions.

Here's what can be done for pollinators in cities:

- Increase the diversity of planting, plant more nectar source plants, and extend the duration of annual flowering as long as possible.
- Plant native plants and minimize the use of pesticides and herbicides.
- Under the premise of ensuring personal safety and fire safety, plant litter should be retained as far as possible to provide habitat and breeding sites for pollinating insects.





北京地区常见传粉者及被访植物  
Common pollinators and visited plants in Beijing



# 05 建造昆虫屋

## *Build insect hotels*

昆虫屋是一种环境友好的生态治理方法——以虫治虫。选材得当的昆虫屋可以吸引以害虫为食的肉食性昆虫栖息，帮助控制虫害。例如，瓢虫可以防治蚜虫、介壳虫等。

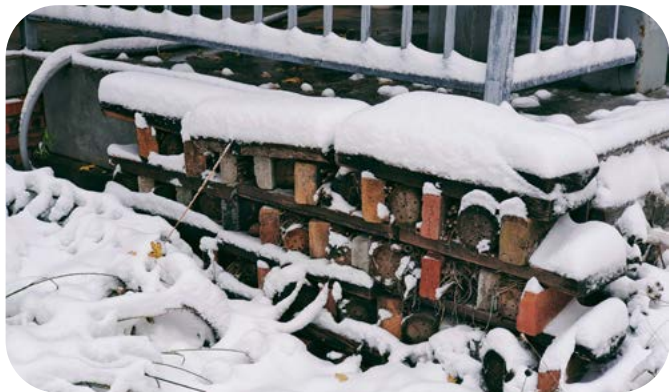
昆虫屋中不同种类的填充物，会吸引来不同的昆虫住客，因此我们可以根据自己的需求来选择引入的昆虫种类。

制作昆虫屋的材料十分多样，原木、瓦片、秸秆、空心砖、竹子、松果……能搭建遮蔽的空间和放置不同的填充材料即可，建议使用无涂料的天然材料，避免对昆虫产生刺激。

A well-chosen insect hotel can help control pests by attracting carnivorous insects that feed on them. Ladybugs, for example, control aphids, scale insects, and so on.

Different types of filling in insect hotels attract different insect residents. So we can choose which insects to introduce according to our own needs.

Insect hotels are made of a variety of materials, including logs, tiles, straw, hollow bricks, bamboo, pine cones... Build a sheltered space and place different filling materials. It is recommended to use natural materials without paint to avoid irritation to insects.



### 材料:

**昆虫屋框架:** 木板 (至少15cm宽, 长度根据昆虫屋大小计算), 凤尾螺钉1盒。

**昆虫屋填充物:** 竹竿 (空洞大小不同更好), 秸秆, 圆木 (直径5-10cm), 空心砖, 大颗粒砾石, 松果, 干草等均可。

**工具:** 充电式手钻, 钻孔用钻头 (多种尺寸), 内六角钻头。

### 制作步骤:

- 1) 设计昆虫屋的整体造型。
- 2) 搭建昆虫屋的框架; 并填充内部材料。
- 3) 在昆虫屋制作完成后, 尽量选择环境中靠近植被且避风的位置, 放置好昆虫屋。一定要注意检查昆虫屋安装后的稳定性, 避免昆虫屋在大风或极端天气下可能出现坍塌等情况, 对周边居民造成安全隐患。



### Materials:

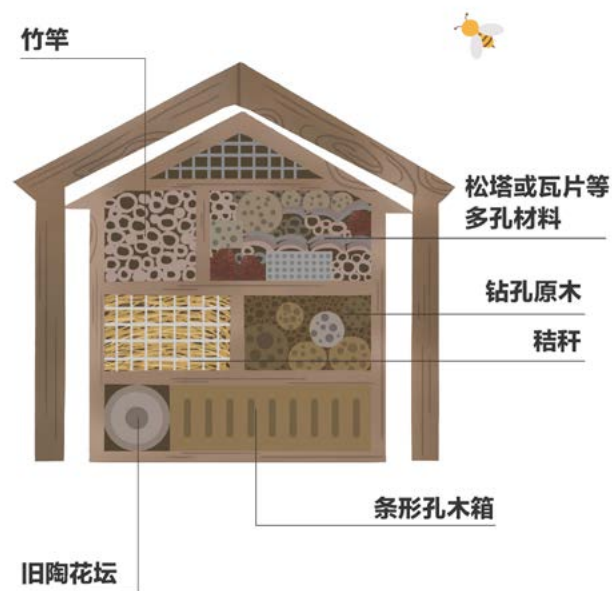
Insect hotel frame: wooden board (at least 15cm wide, length calculated according to the size of the insect hotel), 1 box of self drilling screws.

Insect hotel filling: bamboo pole (different hole size is better), straw, log (5-10cm diameter), hollow brick, large grain gravel, pine cone, hay, etc.

Tools: rechargeable hand drill, drill bit (multiple sizes), hexagon drill bit.

### Steps:

- 1) Design the overall shape of the insect hotel.
- 2) Build the framework of the insect hotel; And fill the inner material.
- 3) After the completion of the insect hotel, try to choose a location close to plants and sheltered from wind to place the insect hotel. It is important to check the stability of the insect hotel after installation to avoid the possible collapse of the insect hotel in strong winds or extreme weather, which may cause safety risks to the surrounding residents.





# 06 制作小鸟喂食器

## Pop up a bird cafe

北方的寒冬给城市里的小型鸟类带来了饥荒等生存困境。许多观鸟爱好者会在冬季为鸟类准备食物，帮助鸟类的同时，也更方便人们近距离地观察它们。

### 材料：

松果  
长树枝  
园艺铁丝  
猪油/面糊  
冬青和其他叶子  
小米、面包屑和干果

### 制作步骤：

- 1) 制作一个框架，注意要预留小鸟可以站立的位置。
- 2) 将小米、干果等食物和面糊或者猪油搅拌混合成糊状。
- 3) 将食物塞进松果的缝隙中。
- 4) 将松果和叶子用园艺铁丝捆绑在树枝上。
- 5) 将小鸟喂食器悬挂在社区中僻静的地方。



The cold winter in the north brings famine and other survival hardships to small urban birds. Many birdwatchers prepare food for birds in the winter to help them while making it easier for people to observe them up close.

### Materials:

Pine cones  
Long branch  
Garden wire  
Lard/batter  
Holly and other leaves  
Millet, bread crumbs and dried fruit

### Steps:

- 1) Create a frame, with space for the bird to stand on.
- 2) Mix millet, dried fruit and other foods with batter or lard to form a paste.
- 3) Stuff the food into the crevices of the pine cone.
- 4) Tie pine cones and leaves to branches with garden wire.
- 5) Hang bird feeders in secluded areas of the community.



一些更简单的小鸟喂食器  
Some simpler bird feeders

# 07 提供水源

*Provide water for wildlife*

在条件适宜的场地制作简易的雨水收集装置，对雨水进行收集，雨水可以被收集起来进行初步过滤，清除水中的杂物后，储存在蓄水桶中。这些原本会被排入下水道的雨水，被收集起来用于绿地的浇灌。

A simple rainwater collection device is made in a suitable site to collect rainwater, which can be collected for preliminary filtration, and then stored in a storage barrel after removing debris in the water. This rainwater, which would otherwise go down the drain, is collected and used to irrigate green Spaces.



水对于野生动物的繁衍生息至关重要，但它不仅仅是为了饮用。青蛙和蟾蜍等两栖动物利用水作为庇护所和繁殖地。蝴蝶从略带浑浊的水中获取有价值的矿物质和盐分，鸟类则用水沐浴和驱除寄生虫。

Water is essential for wildlife to thrive, but it isn't just for drinking. Amphibians like frogs and toads use water as shelter and breeding grounds. Butterflies get valuable minerals and salts from slightly muddy water, and birds use water to bathe and remove parasites.







在城市中开展生物多样性  
观察

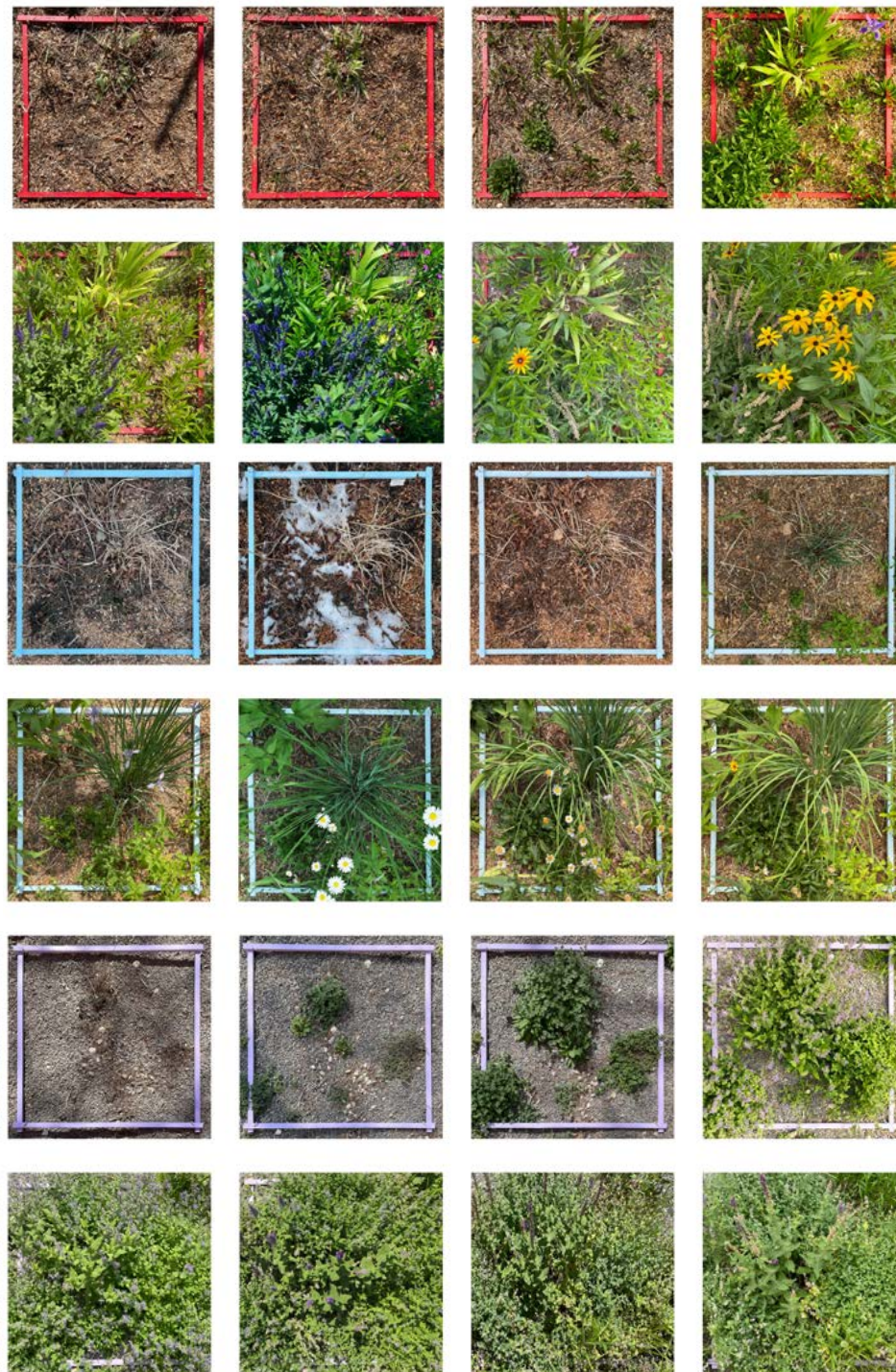
Nature observation in  
urban green space



3.

# 城市生物多样性的观察活动

Observation activities on urban biodiversity





# 0 | 样方观察

## Quadrat observation

选择一块平坦、安全、植物种类丰富的草地或林地开展“1平方米的调查”。在草地上选择一块地面，用毛线和棍子在地上框出一个边长为1米x1米的正方形线框；然后依照调查表的提示来进行观察和记录。

Choose a flat, safe, plant-rich grassland or woodland to conduct "1 square meter survey". Select a patch of ground and use wool and sticks to frame a square with a side of 1m x 1m. Then follow the instructions on the survey form to make observations and record.

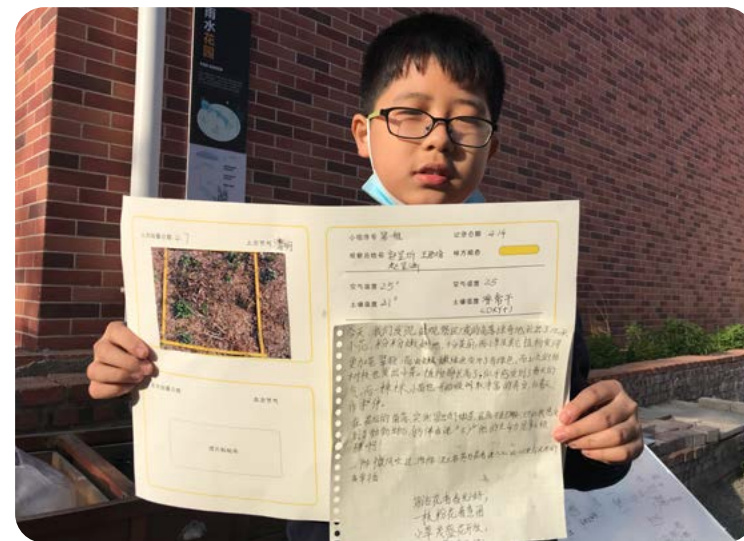
上次拍摄日期	上次天气	小组序号	记录日期
照片粘贴处		观察员姓名	样方颜色 <span style="background-color: #FFD700; width: 20px; height: 10px; display: inline-block;"></span>
		空气湿度	空气湿度
照片粘贴处		土壤湿度	土壤湿度
		观察记录区域	

持续观察活动记录表

一平米的土地		
序号	叶子/花的样子	1平方米里有多少颗
○		
○		
○		
○		



测量植物高度



# 02 标本制作

## Make a specimen

采集和制作标本是对植物多样性进行探索的另一种更为深入的方式植物标本中，最常见、应用最为广泛的是腊叶标本。

腊叶标本的制作过程可以分为三个阶段：采集、压制和装订。具体制作方法可以参考植物压制标本的制作流程。整个过程都需要练习识别植物物种。

使用这个工具表格开展植物标本的采集和调查工作，能过帮助公众拓展对植物的生态关系、生活应用方面的认知。

Collecting and making specimens is a way to explore more deeply the diversity of plants. Among plant specimens, waxy leaf specimens are the most common and widely used.

The preparation of waxy leaf specimens can be divided into three stages: collection, pressing and binding. The whole process involves practicing identifying plant species.

Using this tool form to collect and investigate plant specimens can help the public expand their understanding of the ecological relationship and life application of plants.

植物标本档案	
植物身份照粘贴区	编号:
	种名:
生活用途:	俗名:
	能否食用或食用是否有毒
这种植物身上有什么又有趣的故事:	
本种植物的提供人:	
在哪里发现/从哪提供:	





# 03 红外相机

## Set infrared camera

红外相机即应用红外感应设备自动拍摄静态和动态影像的技术，目前广泛应用于自然保护区野生动物的实时监测。红外相机的两种模式分别为主动式和被动式，其中，当移动的物体经过，引发红外相机拍摄的即为主动式；当恒温动物的体温与环境温度产生温差，触发相机拍摄的即为被动式。可以说红外触发相机是我们窥探自然的一个个窗口。

Infrared camera is the technology of automatically shooting static and dynamic images with infrared sensing equipment, which is widely used in the real-time monitoring of wild animals in nature reserves. The two modes of infrared camera are active and passive. When a moving object passes by, the one that triggers the infrared camera to shoot is active. When there is a temperature difference between an endothermy's body temperature and the ambient temperature, the camera is passive. It can be said that the infrared camera is a window for us to peek into nature.



花园中的黄鼠狼  
A weasel in the garden

流浪猫在花园中捕食鸟类  
Stray cats hunt birds in the garden

# 04 入侵物种监测

## Invasive species monitoring

外来入侵物种是指在过去或当前天然分布之外引入和传播会威胁生态系统、生境或生物多样性的物种。入侵物种由于缺少天敌，快速繁衍，会破坏本地生态系统平衡，威胁本地物种生存，导致生物多样性降低，还可能成为新疾病的病源或宿主，威胁人类健康。由于缺乏自然干扰机制，城市生态系统更容易受到外来入侵的影响，但并非所有的外来物种都是有害的，正确引种也可以增加城市生物多样性。

Invasive species are those whose introduction and spread outside their past or current natural distribution threaten ecosystems, habitats or biodiversity. Due to the lack of natural enemies, invasive species proliferate rapidly, which will destroy the balance of local ecosystem, threaten the survival of local species, lead to the reduction of biodiversity, and may become the source or host of new diseases and threaten human health. Due to the lack of natural disturbance mechanisms, urban ecosystems are more vulnerable to invasions. However, not all alien species are harmful, and correct introductions can also increase urban biodiversity.



美国白蛾幼虫  
Larva of the American white moth



受美国白蛾侵害的树木  
Trees infested by the American white moth

# 05 野生动物救援

## Wildlife rescue

如果在城市中遇到受伤的野生动物，可以拨打北京市野生动物救护中心电话：89496118，等待救护。但要记住，临时安置期间不要给他们饲喂食物，同时也要减少干扰，争取更多救助时间。

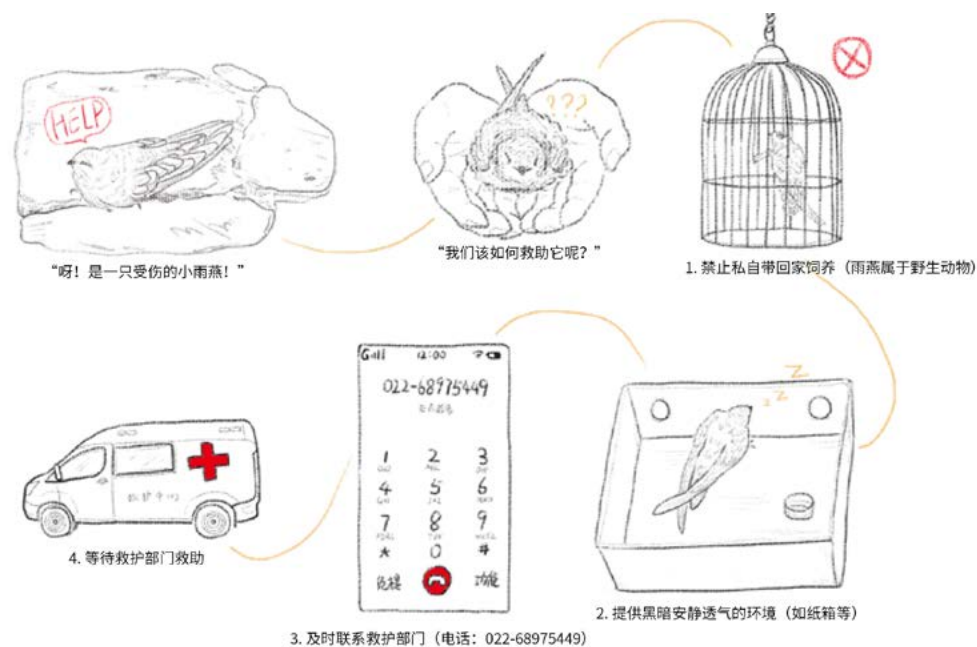
If you encounter an injured wild animal in the city, you can call the Beijing Wildlife Rescue Center at 89496118 and wait for rescue. But remember not to feed them while they are in the shelter, and also to reduce distractions and buy more time.



花园中受伤的蓝喉歌鸲  
Injured bluethroated Robin in the garden



花园附近人为伤害的白头鹎  
An injured bulbul near the garden



# 致谢

感谢北京市海淀区人民政府中关村街道办事处、北京市西城区新街口街道办事处、北京市妇女国际交流中心对本项目的支持。

感谢中科院行政管理局对双榆树中心小学学生社团的支持，手册中亦收录了中国人民大学附属中学、中国人民大学公益社团、北京十一学校 Step Into 教育公益社团、A+ 学习中心、启明星双语学校的相关社会实践、志愿服务及课外教育活动。

对本项目中合作单位一并致谢：

方案设计：中国建筑设计研究院建筑一院城市更新工作室

活动设计：北京营者教育科技有限公司

施工支持：北京街景园林工程有限公司

平面设计：北京导先路文化传播有限公司

智能支持：北京斜杠田园文化发展有限公司

种植指导：詹姆斯·希契莫夫设计与管理公司 & 新自然主义（北京）景观设计有限公司

艺术活动：冇 Mao 原创生活实验室

朴门活动：耘野工作室

苗木支持：衡水丰草争茂花木有限公司

